

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) 12-31-2013	6. Is this the last Annual Report of the Award Period? <p style="text-align: center;"> <input type="radio"/> Yes <input checked="" 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 Jana Katz-Bell Asst Dean Interprofessional Pr	7c. Telephone (area code, number and extension) 530-754-8115	
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7b. Signature of Certifying Official Submitted Electronically	7e. Date Report Submitted (MM/DD/YYYY): 02-28-2014	

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
3M	Littman Stethoscope peripheral	413	8	Deployed to multiple Model Community sites to be used on clinical telemedicine carts for remote consultations.
AMD Global Telemedicine	General Exam Camera	4,990	2	Deployed to rural healthcare hospital and clinic to be used with existing clinical telehealth cart for telemedicine consultations
AMD Global Telemedicine	Ped/Adult Otoscope	8,282	1	Deployed to rural community health center to be used for telemedicine consults with existing equipment
Apple	iPads	630	15	Deployed to Medicaid insurance program to use for their eConsult program, a telehealth program that provides eConsults to safety net primary care providers from specialists.
CJPS Medical Systems	Temp probe remote monitoring peripheral wifi adapter	335	3	Deployed to community health center to be used for remote patient monitoring with existing equipment.
CJPS Medical Systems	ECG cable, 5 lead	169	1	Deployed to community health center to be used for remote patient monitoring with existing equipment.
CJPS Medical Systems	ECG Lead electrodes	55	1	Deployed to community health center to be used for remote patient monitoring with existing equipment.
CJPS Medical Systems	Wi-Fi connectivity adapter	114	3	Deployed to community health center to be used for remote patient monitoring with existing equipment.

Manufacturer	Item	Unit Cost per Item	Number of Units	Narrative description of how the equipment and supplies were deployed
GlobalMed	USB Otoscope	1,117	3	Deployed to multiple sites to be used for telemedicine consults with existing equipment
GlobalMed	12 Lead ECG with interpretive software	3,260	1	Deployed to County Juvenile Justice Center to be used for telemedicine consults with existing equipment
GlobalMed	TotalENT Otoscope	8,282	1	Deployed to urban children's hospital to be used for telemedicine consults with existing equipment
GlobalMed	StethOne Patient Side Stethoscope	1,549	5	Deployed to multiple sites to be used for telemedicine consultations with clinical telemedicine carts.
GlobalMed	StethOne Physician Side Stethoscope	1,319	2	Deployed to two healthcare sites to be used for telemedicine consultations with clinical telemedicine carts.
GlobalMed	TotalExam Camera on Reel	4,230	9	Deployed to multiple clinics and hospitals to be used for telemedicine consults with existing equipment
GlobalMed	Derm-o-collars	259	9	Deployed to multiple clinics and hospitals to be used with TotalExam cameras
GlobalMed	USB Spirometer	2,249	2	Deployed to two healthcare provider sites to be used for telemedicine consults with existing equipment
GlobalMed	TotalExam HD Camera	5,695	1	Deployed to Indian Health center to be used for telemedicine consults with existing equipment
HP	Elitebook Laptop	1,095	4	Deployed to non-profit agency to be used to conduct hands-on computer web-based health literacy courses for seniors and other medically underserved populations.
Kensington	Mouse	22	1	Deployed to non-profit agency to be used during computer health literacy training provided to medically underserved populations.
Kensington	Mouse	32	4	Deployed to non-profit agency to be used during computer health literacy training provided to medically underserved populations.
MarketLab Inc.	Privacy Screens	158	3	Deployed to non-profit agency to provide semi-private space for telemedicine consultations with primary care providers held in community rooms at senior housing facilities.
MiL	Laptop carrying cases	560	2	Deployed to non-profit agency to be used to carry multiple laptops to computer health literacy classes held at health clinics, senior resource centers, subsidized housing facilities for seniors
NEC	Projector	1,100	1	Deployed to non-profit agency to be used during computer health literacy training provided to medically underserved populations.
Polycom	Video conference care including HDX6000, 46" monitor	9,311	1	Deployed to non-profit agency to be used to provide health education to medical underserved populations via video conference.
Polycom	HDX8000 codec, 2 - 45" monitors, MPPlus software	14,947	1	Deployed to non-profit agency to provide behavioral health services to consumers at rural clinics and hospitals.
Polycom	HDX6000 Codec including 46" monitor, MPPlus software	7,042	3	Deployed to community health centers to be used in primary care health center to conduct specialty care telemedicine consults.
Targus	Wireless laser	48	1	Deployed to non-profit agency to be used during computer health literacy training provided to medically underserved populations.

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Targus	Wireless Laser	27	1	Deployed to non-profit agency to be used during computer health literacy training provided to medically underserved populations.
Hospital Mobility	Multi-Purpose Mobile Medical Carts	2,148	4	Deployed to community health centers to be used to enable ECG monitors purchased through the grant to be mobile.
GlobalMed	Clinical telemedicine carts w/ otoscope	77,317	2	Deployed community health centers to use for outpatient telehealth services
GlobalMed	Clinical telemedicine cart	31,973	6	Deployed community health centers to use for outpatient telehealth services
GlobalMed	TotalExam Camera	3,907	8	Deployed to multiple sites to replace cameras originally deployed with carts that were no longer compatible
Cisco	Desktop Video conference unit	7,818	15	Deployed to multiple outpatient clinics in San Francisco.
Cisco	Telemedicine Cart with Peripherals	34,634	14	Deployed to multiple outpatient clinics in San Francisco.
Totals		235,087	138	

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).

The equipment and supplies listed above were deployed in 2013 to organizations within the various Model eHealth Communities. Organizations submitted requests for supplemental equipment such as telemedicine peripherals and additional video conference equipment to enhance the eHealth equipment received in 2012. The organizations that received supplemental equipment included: community and Indian health clinics, rural and urban hospitals, county juvenile justice center, non-profit organizations, and a school-based health center. All equipment and supplies purchased were used to provide eHealth applications to a wide range of populations including rural healthcare consumers, medically underserved populations including seniors and disabled adults, and youth residing in a juvenile justice center.

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	24,304	0
Multimedia	0	0	0
Office Skills	0	0	0
ESL	0	0	0
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): In person eResources; Community College eHealth courses & Telemedicine Education Program	18,045	8,462	2,101,767

Types of Access or Training	Number of People Targeted	Number of People Participating	Total Training Hours Offered
Total	29,745	32,766	2,101,767

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). California is one of the most effective states at successfully leveraging FCC subsidy dollars with other federal and foundation support. CTN successfully activated broadband connectivity to 795 sites by the close of 2013 through participation in the Federal Communications Commission (FCC) Rural Health Care Pilot Program (RHCPP), including 532 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). 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: All 15 Model eHealth Communities experienced significant improvements and expansion of eHealth applications due to this grant: 1) Nearly 60 organizations within the 15 Model eHealth Communities acquired low cost broadband connectivity through the CTN; 2) Supplemental equipment was distributed to over 30 locations; more than 25 clinical telehealth applications resulted in over 40,000 telehealth visits during the grant period; local health partnerships are stronger and reported by grantees to be a core competency that will be sustained as well as an important foundation upon which to build future projects and meet challenges such as health information exchange; 3) Communities leveraged the BTOP grant to acquire additional in-kind resources and new funding; consumer awareness and engagement in eHealth is rapidly growing particularly in rural communities where broadband is new. 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 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. 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).
0	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 December 2013 the total number of anchor sites involved with the project is 1,317. In addition to the 795 CTN sites, 135 sites (77 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 238 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 136 unique sites accessed the continuing education courses for registered nurses.

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)?

The most common barriers to broadband adoption continue to be site education of the benefits of broadband and providing the required technical and operational support to enable the sites to install and effectively utilize the services. In 2013, CTN continued to utilize site

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Outreach contractors to provide site education and drive awareness of the CTN broadband network. This tactic helped improve CTN adoption, fully encumbering the available FCC RHCPP funding. On-site technical support funded by United HealthCare to assist sites with on premise wiring and technical site assessment and preparation issues continued to be offered.

As stated in the original proposal, funding from the Federal Communications Commission (FCC) was estimated to allow enrollment of 863 Community Anchor health care sites to the California Telehealth Network (CTN) for medical grade, secure access. CTN still plans to reach this site goal but 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. The Vendor RFP, launched in 2012, was completed and deployment of the service "CTN Connect" has been accomplished. A new RFP specifically for Health Care Fund program vendors is in process with deployment expected in February/March 2014.

One of the biggest challenges that health care organizations face in adopting telehealth continues to be developing a sustainable business model. Technical assistance and trainings for new and existing CTN sites continues to be offered through the California Telehealth Resource Center. A second challenge is rural expansion of Medi-Cal; it is still unclear how the newly contracted Medi-Cal Managed Care plans will support and promote telehealth services in the rural counties.

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)

No subcontracts with SDB entities have been initiated.

8. Please describe any best practices / lessons learned that can be shared with other similar BTOP projects (900 words or less).

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.

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.

Model Communities implemented a number of innovative consumer eHealth applications including:

- 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.

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Telehealth services require attention to contracts, credentialing, facility, insurance, billing and bylaws, involving multiple administrative departments. Beyond the specific administrative changes, telehealth also brings new partnerships, organizational practices and work flow that demand organizational change. These efforts benefit from proactive leadership attention to champion the change. Space considerations are paramount to easy access to equipment and can mean the difference between using telehealth or having equipment gather dust. Planning ahead by someone who has experience with telehealth visits can save frustration and expense later when equipment and technology installations must be relocated because the room is too small to accommodate the equipment or the telecart is in a room not easily accessible to all the different specialists.

Model Communities readily acknowledged the need for initial and ongoing organizational investments to start and sustain eHealth services however, they also point out revenue considerations to round out the business case for eHealth. Examples cited include billable patient revenue from increased local visits and services, patients retained in the local health system, leveraging outside grant funding and efficient use of existing resources. Telehealth visits for incarcerated individuals removed the need for correctional officers to leave the facility for extended visits to specialty providers and shortened the stay of some juvenile offenders, saving public resources and improving care. And, particularly in rural communities, where referral to a specialist or a higher acuity hospital means the patient often leaves the community for care, the availability of telehealth means visits, inpatient days, and ancillary revenues for laboratory and imaging, as well as pharmacy and other services that remain in the local economy.

Findings from the Model eHealth Community component of the eHealth Broadband Adoption Initiative were compiled in a project Compendium available to the public on the UC Davis Center for Health and Technology web site.

