High-speed Broadband in California Public Libraries:
An Initiative of the California State Library

Needs Assessment & Spending Plan

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The High-speed Broadband in California Public Libraries Project responds to a charge from the California State Legislature and Governor to the California State Librarian (2013/14 budget bill, Chapter 20, Statutes of 2013 (AB 110). The charge is as follows:

The State Librarian shall prepare a needs assessment and spending plan to connect local public libraries to a statewide high-speed Internet network. The needs assessment, at a minimum, shall (1) evaluate local public libraries' current Internet connectivity and expenditures; (2) identify the requirements of connecting all public libraries to the Internet using available options, including the Corporation for Education Network Initiative in California (CENIC); and (3) estimate the costs of the identified connectivity options. The spending plan, at a minimum, shall identify total project costs, broken down by onetime and ongoing costs, and identify available funding sources, including non-General Fund sources. The needs assessment and spending plan shall be submitted to the Department of Finance, the Legislative Analyst's Office, and the chairs and vice chairs of the budget subcommittees on education by February 1, 2014.[1]

[1] The original text stated a due date of December 1, 2014, which was identified as a typographic error, with February 1, 2014, as the actual due date.

Executive Summary

Introduction

This report addresses fundamental questions regarding bringing high-speed broadband to all California public libraries.

- Why is broadband in public libraries essential to guarantee access to information for all California residents?

- What is the current state of broadband network access in California public libraries?

- What are the steps necessary to ensure every resident of California has access to high-speed broadband networks in his or her public library?

- What are the costs associated with bringing broadband into all public libraries?

- How can these costs be met?

Over the past three decades, the revolution in computers and telecommunications networks has created unprecedented changes in business, commerce, government, science, healthcare, and education. Yet, the fruits of this information age are still unevenly distributed. For some individuals, technology brings the promise of inclusion, education, opportunity, wealth, and better health; for others, who lack access to technology, it brings continuing poverty and even greater isolation. Many look to public libraries to bridge this gap, as public libraries remain both the core safety net, as well as the high-touch access points, for many residents, particularly in low-income or economically distressed areas.

The Library is a community commons, a community cooperative, and a life-long learning center. Libraries are founded on the democratic principle of providing free and equal access to knowledge, information and ideas. Expanded broadband would make it possible for libraries to continue to fulfill this role and equalize access to information and ideas for people of all income levels and all ages.

Deborah Mazzolini,
Belvedere-Tiburon Library

The federal government issued the National Broadband Plan to address how this equity of access to technology could be achieved. The Plan calls for all anchor institutions such as schools, public libraries, colleges and universities, hospitals and health facilities, local government offices, and public safety agencies to have at least 1 gigabit per second (1Gbps) broadband access by 2020. Also, in the summer of 2013, President Obama announced his ConnectED Initiative, which calls on the

Federal Communications Commission to take the steps necessary to build high-speed digital connections to America's schools and libraries, ensuring that 99 percent of American students can benefit from these advances in teaching and learning. Ensuring that California's libraries have access to high-speed broadband is critical to meet the demands of a robust 21st Century economy.

Project Purpose

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California Public Libraries And Why This Matters

The State of California has long had a commitment to public libraries in order to ensure that all Californians have access to the information resources they need to be successful through their local library, no matter where they live. Starting with the passage of the California Public Library Services Act (PLSA) in 1957 and subsequently the California Library Services Act (CLSA) in 1977, public libraries and cooperative public library systems have provided the mechanisms for sharing resources, helped coordinate information services, and facilitated communication and delivery among libraries.

During the 1990's most public libraries were in the midst of adapting and improving their services via the Internet. This also marked the expansion of California's economy based on the "dot.com" phenomenon. Since then, libraries have wanted to expand Internet-based services to better serve their patrons.

The California Public Library statistics for 2011-2012 reveal the following:

- 183 public library jurisdictions and 1115 library outlets

- Physical visits – 160,613,142

- Virtual visits – 757,395,614

- Library cards – 21,955,842

- Internet terminals – 20,392

- E-books – 1,355,018

Currently people use public library computers to access government, find and apply for jobs, conduct research for school or work, connect to the world, find information to help them to be healthy, communicate with family and friends and participate fully in the social, economic, and civic fabric of their communities. While connectivity is important, the speed of the network is even more crucial. The speed of the network determines the number of PCs, tablets, smartphones or laptops that can be connected, the ease of access to media rich resources, and the ability of a person to use a public computer to fill out online government or job forms completely within the time limits of the library. The need for speed will continue to increase as people will need to access media rich information like medical records, and as technology changes.

During the recent era of budget challenges, new efficiencies were developed that improved library services. Over the past several years the State Library has engaged the public library community in a series of discussions about changes they would like to see at the state level. In 2011 a taskforce was formed to review CLSA and make recommendations. Their work resulted in proposals to amend CLSA to increase efficiency and give high priority to the pursuit of broadband connectivity for all public libraries. The former, was accomplished by the passage of SB1044 in 2012 and the latter is being addressed by this report and assessment.

Methodology

California public libraries are organized into jurisdictions. There are 183 jurisdictions and 1115 branches. The survey needed to gather general information about the jurisdiction and specific technical information about each branch. In order to get a picture of current and desired broadband capacity and use, a two-part survey was administered. 178 jurisdictions out of a total of 183 responded to the survey, a 97 percent return rate. 883 branches out of a total of 1115 responded to the survey, a return rate of 79 percent. (Although there were 883 responses, not every branch responded to each question. Therefore individual data points generally reflect

We live in an increasingly inter-connected world. To fully participate in this world - whether students learning at a distance, job-seekers remotely interviewing with a potential employer via video conferencing, or a group of teens uploading the film they've created to YouTube - requires ever increasing bandwidth. The digital divide has decreased, but it has not disappeared, and libraries - open to all - are key to providing this kind of access to all in our communities.

Sara Jones,
Marin County Free Library

lower numbers.) This high rate of return attests to an extraordinary commitment on the part of California public libraries to this project.

Need: Current state of broadband network access in California public libraries

The survey results establish a strong need for faster Internet connectivity and all of the programs and services this would make possible; a readiness to implement infrastructure changes within public libraries to support connectivity; and an eagerness to use enhanced connectivity to serve patrons.

Speed of Internet connection

- More than 25 percent of responding California public libraries (227) make do with a "Very Slow" connection to the Internet which is 1.5 Million bits per second (Mbps) or slower.

- 52 percent of responding California public libraries (431) report connecting at 10 Mbps or slower.

- 71 percent of responding California public libraries (589) report connecting at speeds at or below 20 Mbps.

- In total, fewer than 5 percent (34) of responding California public libraries report operating at speeds of 500 Mbps or above.

It is worth noting that in areas of California where there is plentiful access to broadband, an average home may have access to 50-100 Mbps, where many libraries have 1.5 percent of this (1.5 Mbps) and serve 100 or 1000 times as many patrons as there are individuals in the average family home.

California public library networks are undersized in capacity and over-subscribed in their utilization levels. Nearly one-half of the respondents say that their network is operating at 75 to 100 percent of capacity, which makes the user experience extremely frustrating and renders the network unusable for many applications. The result for public libraries and their patrons is slow response times, a limited number of computing and communicating devices (smartphones, tablets, notebook computers) that can be attached to the network, and frustrating delays as networks struggle to handle demand.

Readiness to support high-speed broadband

In addition to seeking information about the speed of their Internet connection, the survey sought information to gauge the readiness of libraries to upgrade to broadband in the following areas:

- Space and equipment;

- Library networking equipment;

- Security, access control, and fire detection and suppression;

- Power, environment, heating, ventilation, and air conditioning;

- Location permanency; and,

- Staff support

The wealth of data provided by librarians and presented in this report show that many public libraries have the necessary infrastructure to support a high-speed broadband connection. Most jurisdictions have their own staff (55 percent) or access to staff in other agencies (42 percent) to provide technical support as needed.

Expanded broadband is not only critical to the future growth of electronic services to the El Segundo community, but for our immediate needs today. Our system network is already maximized to the point of being slow or with blackout periods where there is no internet service for patrons or staff. The expectation of expanded internet, wireless, e-books, and database services will only continue to grow -- broadband is the solution which needs to be addressed and implemented as soon as it is feasible.

Debra Brighton,
El Segundo Public Library

Desire for and plans to use high-speed broadband

Librarians were asked to respond to a series of questions in the survey about how they might use high-speed broadband to better serve their patrons. They were asked to consider potential uses in three categories: digital content, instruction, and library administration.

Librarians are aware of the cost savings, educational opportunities, and digital collection development that high-speed broadband would make possible and they are eager to embrace these opportunities. All 18 categories of use listed in the survey were of interest to librarians. 13 of the 18 possible use categories were selected by 70 percent of librarians, including online learning, computer classes, community research and distribution of e-books and other electronic resources. All use categories were selected by least 40 percent of librarians. Librarians were also asked to comment upon the value of high-speed broadband and did so eloquently. Quotes from their comments are featured throughout this report.

Current Expenditures for Internet Services

The 731 public libraries that reported their costs (Table 11) are spending about $9.5 million dollars annually on Internet connectivity.

- 27 percent of the library facilities operate at consumer-level speeds of 1.5 Mbps or slower, and spend over $1.1 million per year.

- 14 percent spend $475,000 per year **for** 5 Mbps service.

- 44 percent of the library facilities spend over $5.5 million per year for Internet connectivity that is 50 Mbps or less.

- 13 percent of public libraries report spending $2.1 million per year for 100 Mbps through 500 Mbps of connectivity.

- Fewer than 2 percent report use of Gigabit (1000 Mbps) network connections, paying over $120,000 per year for Internet connectivity.

If the 384 non-responding public libraries' costs are similar, public libraries in the state are spending about $14.5 million annually on Internet services.

Analysis of All Feasible Alternatives

As part of an effort to identify costs and related requirements for implementing high-speed broadband networks for California public libraries, the California State Library (CSL) examined the following alternatives.

Alternative 1-Status Quo

183 separate public library jurisdictions continue to negotiate their own connections. High speed broadband services with capacity up to 1Gbps will only be implemented in library jurisdictions with the funding, skills, leadership, and determination required getting a complex technology project off the ground and keeping it moving.

Alternative 2-Cooperative Library System Consortium

The CSL would create a broadband consortium consisting of the nine statewide library cooperative systems with the CSL serving as oversight for the consortium. Cooperative systems would be responsible for managing consortium effort to obtain best price for circuits and services for their members with requirements to develop specifications, solicit bids from commercial carriers, and each undertake their own broadband plan, according to local policy and procedure. This will be accomplished through funding of the California Library Services Act (CLSA), which provides for the establishment and maintenance of a communications and delivery network between and among cooperative system members. CSL would continue its oversight of the CLSA. Requests for funding would be submitted to the CSL, where eligibility and amounts to be allocated to cooperative systems would be determined in accordance with cooperative system plans of service.

Alternative 3-Statewide Consortium

The CSL would partner with one entity that would create a statewide broadband consortium responsible for obtaining best prices for broadband connectivity, creating a statewide E-rate consortium, and providing connectivity to a high speed Gigabit backbone. Consistent with its current statewide roles and responsibilities, the CSL would provide oversight for the consortium effort.

Recommended Alternative: Statewide Consortium-The Opportunity to Connect Public Libraries to California's High-speed Research and Education Network

California's education and research communities currently leverage their networking resources under CENIC, the Corporation for Education Network Initiatives in California, a non-profit corporation created by the California research and education communities in 1997 in order to obtain cost-effective, high-bandwidth networking to support their missions and respond to the needs of their faculty, staff, and students. The segments that formed and govern CENIC include: the University of California, the California State University, the California Community Colleges, K-12 schools, and Stanford, Caltech, and the University of Southern California. CENIC designs, implements, and operates CalREN, the California Research & Education Network, a high-bandwidth, high-capacity Internet network specially designed to meet the unique requirements of these communities, and to which the vast majority of the state's K-20 educational institutions are connected. CalREN consists of a 3,800-mile CENIC-operated backbone, to which nearly 10,000 schools, colleges, universities and other institutions in all 58 of California's counties connect via fiber-optic cable or leased circuits obtained from telecom carriers. Over ten million Californians use CalREN every day.

To provide the needed bandwidth detailed in this report, California public libraries could join CENIC as a sixth segment. In so doing, public libraries would become a part of a larger "education ecology." California's research and education community has cooperatively created a common infrastructure and support structure (CENIC) to serve their missions. Public libraries are missing from this infrastructure and support system.

Costs to cover the annual CalREN backbone and support fees are $4.5 million. It is estimated an additional one-time $2 million will be required to procure network equipment such as routers, switches, etc. for connectivity to CalREN. Once connected, California public libraries will be among those states leading the nation in providing Internet access to their patrons. Detailed information regarding this option can be found in Recommended Alternative: Statewide Consortium.