THE AMERICAN LIBRARY ASSOCIATION
OFFICE FOR INFORMATION TECHNOLOGY POLICY
PUBLIC LIBRARY CONNECTIVITY PROJECT

FINDINGS AND RECOMMENDATIONS

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This document has been slightly modified from its original version. While transparency is intended, portions have been removed to protect confidentiality.
# Contents

Problem statement and Overview 1  
Methodology 8  
Analysis 10  
  Focus group responses 10  
  State networks 24  
  State government employees 27  
  Telecommunications industry 30  
Findings 36  
  Options considered 42  
  One possible model 44  
Suggested interventions 50  
Assessment and recommendations 54  
Conclusion 57  
Appendices  
  A. OITP Study Team 59  
  B. Interview questions 62  
  C. State network comparison chart 67  
  D. Examples of Collaborative Planning Process Model 70  
  E. Collaborative Planning Process Model 75  
  F. Documents examined 77  
  G. State profiles 79
Problem Statement and Overview

Over the last twenty-five years, as the Internet first emerged from the research community to become a major public medium for communication and information access, libraries have become crucial instruments for public participation in the global knowledge network. Nearly all public libraries in the United States now provide some form of public access to computing and Internet services (see Figure 1).

![Figure 1: Percentage of Public Libraries Connected to the Internet](image)

The issue for most libraries has moved from one of getting connected to an even more difficult one of maintaining and improving the quality of service. **The problem has become not basic connectivity, but obtaining and sustaining access to the Internet services and resources the public needs as the demands of the medium and its users grow rapidly.** This problem is made particularly difficult by both the rapid growth of society’s dependence on the Internet and the increasing demands on computing and communication capacity as new and ever more complex Internet applications are brought on-line.

The challenges that providing quality Internet access presents to libraries are manifold, but one of the most crucial issues to emerge in recent years has become maintaining adequate connectivity, or bandwidth. In some sense, the issue of adequate library connectivity reflects a broader national debate in the U.S. over the deployment of broadband. However, libraries have particular and immediate concerns that are at the
same time both clearly related to their emerging societal role as access providers and an integral part of this broader discussion.

The purpose of this study was to examine in some detail the issues of library connectivity and to recommend some practical, immediate strategies that, while not solving the universal problem, will help libraries address the challenges they face.

In the course of this research, the Office for Information Technology Policy (OITP) study team found that the challenges libraries confront were indeed serious and widespread. The challenges stem both from lack of availability and affordability of high-speed connections and, on the other side of the equation, from the continually growing demands of Web sites and Internet-based services and applications for ever-greater bandwidth.

However, the study team also found that, while no panaceas seem to exist, there are many promising avenues that the public library community and those who support it should explore in order to help solve its connectivity demands, at least in the short term. The OITP study team also concluded that it would be vital for the library community to play an active, even central, role in the broader national debate over broadband deployment.

**Libraries Are Challenged to Keep Up With Demand**

Interviews with focus groups conducted by the OITP team confirmed and enriched the recent picture shown by surveys. Both the growing use of library computing by the public, and the inherently increasing bandwidth requirements of the Internet itself are challenging libraries to provide adequate connectivity.

Cost is, of course, a major issue. In parts of the U.S., simple T1 service (1.5 million bits or megabits per second, or 1.5 mbps) can cost more than $1,000 per month. There is also tremendous disparity in cost from one area of a state to another, between states, and from region to region. In some locations, a six-megabit fiber service is offered to homes for $39 per month. As might be expected, the cost of connectivity is most expensive in rural areas, which tend to be areas served by smaller libraries with smaller budgets. Libraries in rural areas may also be served by small telecommunication companies that lack the financial resources to build out needed capacity.

The key problem in many areas of the nation, particularly but not exclusively rural, is simply the lack of high-speed connectivity at any price. Thus, even if the library could afford it, the service is not to be had.

These issues of cost and availability of adequate, ubiquitous, and affordable high-speed connectivity are not unique to libraries. Indeed, the relatively low and steadily-dropping status of broadband connectivity in the U.S. when compared to that of other nations is considered by many telecommunications policy advocates, including ALA, to be a critical national problem that needs to be addressed as a fundamental policy question (Bleha, 2005).
Nonetheless, that broader context does not mean that libraries can do nothing to address their problems. In fact, these investigations suggest that libraries can indeed take steps to improve their connectivity needs substantially. In some states, libraries may even be in a particularly advantageous position to play a leadership role in this broader policy debate by pushing high-speed connectivity out to unserved or underserved regions.

**Libraries Serve Increasingly Critical Roles in the Knowledge Society**

Interviews with state policy makers suggest why libraries could play this leadership role in telecommunications. Libraries provide a major outlet for critical information services, services that offer benefits, efficiencies, and cost-savings to state and local government. Furthermore, while realizing these benefits, a library with improved connectivity can become an “anchor tenant” or an economic incentive for industry to build its infrastructure out to underserved communities. Unfortunately, not all policy makers understand and believe that libraries can play this role.

Some of these critical services mentioned in interviews include the following:

**Provider of general access:** Libraries provide Internet access to those who do not have access, particularly poor and minority communities. This role is more complex than simply addressing the division between “haves” and “have-nots.” For the reasons listed above, by providing high-speed connectivity, libraries offer access to a range of sites and services unavailable to individuals who may have basic, low-speed access.

In today’s libraries, Internet-based content and services demand a wide continuum of connectivity and end user technology, from minimal to very high end. Furthermore, many valuable content sites are available only through subscription, and some of those can be quite expensive, beyond the reach of most consumers. Thus, access is not just simply an issue of whether or not users are connected, but also a question of the level of connectivity and cost of content. Thus, while providing access to those with no connectivity at home continues to be a vitally important function for libraries and will be so for the foreseeable future, libraries also serve the access needs of a much broader continuum of the public they serve.

It is important in considering this broader definition of access to consider dimensions of support beyond simply access to technology. The library is usually the only place in the community where people can get free access to (1) computers; (2) connectivity to the Internet; and (3) someone to help them use it. That is, libraries provide reference and navigation services that guide users to the credible and usable information they need. Many offer training on computer and information navigation skills. Public libraries are also beginning to put important community information and local cultural resources on their sites, so they are a source of information and content as well as an access point.

**Economic Development:** Recently, libraries have begun to document and articulate their role in local economic development (Urban Libraries Council, 2007). These claims are consistent with a growing body of research in the economics community about
information and the so-called “knowledge economy.” This research (Foray, 2006) and the policy documents that reflect it (Atkinson & McKay, 2007) assert that investment in knowledge and information communication technologies are key factors in a modern competitive economy. Although to date few economists have studied libraries per se, the conceptual link would seem to be clear between the knowledge economy and the beneficial role libraries play as institutions that collect, organize, and provide unfettered access to information. Of course, some economists have expressed broader concerns about the state of high-speed communication availability in the U.S due to the underlying political urgency of the knowledge economy perspective.

E-Government: ALA investigation has documented a rapidly growing trend toward E-Government, coupled with an underlying, often unstated, assumption that libraries would be access providers of the last resort. OITP, Florida State University, and the Florida State Library jointly convened a workshop in Atlanta in December 2006 that examined some of the evidence for this trend and assessed some of the issues this poses for libraries. In general, the conclusion was that the growth of E-Government presented an opportunity for libraries to engage local political leaders more deeply into the community debate over the growing importance of libraries as community access centers. On the other hand, the trend also presented libraries with another source of growth in public demand and additional pressures on facilities.

A discussion draft report on the E-Government meeting (Bertot, Lesley, & McClure, 2006) presents some findings from a brief informal survey conducted by the State Library of Florida of public libraries in Florida. These findings document the nature and resource demands of public access to E-Government in the respondent institutions. E-Government is a growing and important service for public access computing and is one source of new pressures on connectivity.

Emergency Response: Although in some sense a form of government service, emergency response is an important enough application to be mentioned in its own right. Bertot, McClure, Jaeger, and Ryan (2006, p. 20) began to document this as they captured striking information about the response of libraries to the recent disasters of Gulf Coast hurricanes. Librarians and policy makers increasingly see public libraries as locations where local people can go for emergency services and even for access to the outside world in times of crisis. This role, however, will also create significant additional demand for connectivity. However, it can also be a potentially a powerful argument to local and state government for resources.

Range of other information services: Public access computing and Internet use provide a wide range of valuable services to the public, each meriting more discussion (and further investigation) than can be incorporated here, including:

- health care information
- financial information and banking
- education, including distance education, after-school education, and home schooling education
- job seeking
• community participation, including collaboration and social networking
• gaming and entertainment

The key here is that each of these on-line application areas is increasing in importance. In many of these cases, access to the Internet has become, or is becoming, the medium of choice to obtain services.

Wireless access: Nearly 60% of libraries now offer wireless or are planning to offer it in the near future. It appears that the main reason for this rapid growth in wireless is to relieve pressures for more public access computing where increasing the number of physical workstations is not feasible because of space or budget constraints. Wireless is categorized as a separate service, even though it is a form of public access computing. Different technologies have different characteristics. It is not unreasonable to assume that library wireless service will not only serve existing communities of library public access users, but it will draw new users in search of high-speed wireless connectivity. Wireless service presents one more demand on library bandwidth.

The Rapid Evolution of the Internet Requires Increasing Bandwidth

When libraries first began connecting to the Internet and providing public access to its resources, few imagined the rapid growth of demand for connectivity that they would be experiencing in the succeeding years. Simply getting connected was a difficult enough problem for many libraries. However, with major assistance from the Gates Foundation, E-rate (the Universal Service Support Mechanism for Schools and Libraries), and LSTA (Library Services and Technology Act), nearly all libraries have overcome the initial barriers and now provide public access of some sort (Bertot, McClure, Jaeger, & Ryan, 2006).

But the Internet has not stood still, and most libraries are facing explosive growth in requirements for connectivity bandwidth, due to both the growth in demand by their increased number of users and the increasing bandwidth requirement of the Internet services people use. In focus group interviews, many factors were identified as responsible for this rapidly growing demand, among them:

New critical uses—Over the last decade, the Web has become an important access tool for a growing range of uses, including financial services, shopping, government services, health care, and more. People simply have more things to do with public Internet access.

Growing complexity—Most Web pages are increasingly information rich, including sound, images, and even streaming media. Thus, even when accessing traditional Internet pages—shopping, government information, search engines, and the like—users are downloading ever-larger files to load the page.

Multimedia applications—Early Web pages were mainly composed of text and simple images. Now, content providers are offering a much richer variety of media, high-definition sound and video, three dimensional images, real time immersive gaming
environments, and so on. These applications inherently consume greater quantities of bandwidth.

**Two-way interaction**—From the beginning of the Internet, one of its most important uses has been interactivity and two-way communication. Now, new services have appeared that exploit the multimedia capacity of the Internet to enhance communication and sustaining of interactive networks. Sites like YouTube, Flickr, and similar Web services offer users access to a rich variety of media. More significantly for connectivity, these services encourage users to upload their own material, placing new pressures on upstream bandwidth.

*Issues of High-speed Connectivity Are Increasing*

Two general technology issues underlie this connectivity analysis.

*What is broadband, and how fast is fast?*

For several years, it has been common to divide connectivity into two general categories, “dial-up” and “broadband.” Although this may have been a useful simplification, especially in considering connectivity to the home and small users, it is no longer useful. Rather, bandwidth needs to be viewed as a complex continuum. Depending on technology, the provider and the community served, so-called “broadband” availability to the home ranges from a few hundred thousand to as much as fifteen million bits per second. Likewise, Internet applications exist that require a wide range of bandwidth. Furthermore, theoretical speed is not the only metric that describes the quality of connectivity. For example:

*Asynchronous service:* Bandwidth is two-way. For many years, use of the Web was principally a “downstream” service and it became common to talk about bandwidth as a one-way, or “asynchronous,” metric. Upstream bandwidth needs were considered limited to the speed with which a user could type—a very slow process by digital standards. Now, as people are engaged in complex two-way communication, sending images, sound, even digital movies, two-way bandwidth is becoming much more important, particularly for libraries.

*Theoretical versus actual bandwidth:* For many services, the bandwidth as advertised is a theoretical maximum. The actual bandwidth delivered can depend on factors such as distance from the network access point for a circuit provider or wireless access point, the number of other subscribers on the system, and the existence of chokepoints within the network. As higher bandwidth is deployed to end users, the intermediate facilities in the network need to be upgraded to accommodate the increased demand.

*“Capped” service:* In some cases, service providers will constrain or cap usage of bandwidth, even when the system can theoretically accommodate high usage. For
instance, users may be contractually limited in the amount of time they are actually using
the system at its advertised maximum bandwidth.

The upshot is twofold. In the first place, capacity planning for libraries is a very
difficult and problematic process. It can no longer focus mainly on simple decisions of
fast or slow, but must make more refined assessment of need and be concerned with the
nature and quality as well as raw speed of service. Secondly, because of this complexity,
procurement of library telecommunications requires sophisticated expertise to
match library capacity needs to services available in an economic, efficient, and scalable
way (Bertot & McClure, 2006).

What are technologically neutral policies and the “gold standard”? A wide variety of technologies have been proposed as solutions to the “broadband” needs
of the nation and, by extension, of libraries—fiber, coaxial cable, wireless, power lines,
twisted pair copper, even gas lines have all been suggested in various contexts. By and
large, the analysis will be technology neutral, assuming that the “right” solution will vary.
It can depend on such state or regional factors as:

- geography
- existing infrastructure
- relationship to other local/regional government agencies
- demographic distribution of population
- structure of the telecommunications industry
- regulatory barriers and incentives

In terms of pure theoretical capacity and in the long-term, optical fiber seems to be the
“gold standard.” A single fiber to a library could potentially provide connectivity of up to
a billion bits per second (bbps) even with existing technology. But, in the shorter term,
many technologies could potentially offer substantially improved connectivity.
Methodology

The OITP study team began with three initial questions.

1) Where states have a high percentage of public libraries with high-speed broadband connectivity, what accounts for the high connectivity? Are there factors that led to this high connectivity that can be replicated in other states?

2) Where states have a low percentage of public libraries with high-speed broadband connectivity, what are the barriers that prevent such connectivity? Can they be overcome?

3) Is it possible to determine whether high-speed broadband connectivity is more successful in states with statewide or regional networks?

An extensive list of questions was developed for the different individuals and groups being interviewed. These are included in Appendix B. In addition to answering the three basic questions above, other information sought included:

- What is the status of Internet access and broadband use in the libraries participating in the focus groups?
- Is the present access level meeting the public’s and library’s needs for broadband?
- What is broadband being used for in libraries and what would libraries do with more bandwidth?
- How do libraries manage Internet use if bandwidth is too limited?
- What barriers prevent the acquisition of more bandwidth?
- How do libraries plan for their broadband connectivity needs?
- What is the minimum broadband speed that should be acquired if a library is acquiring broadband for the first time?
- If broadband is extensively available in the state, how was this acquired?
- How is broadband funded?
- What is the understanding of, and attitude toward, broadband connectivity in libraries by government agency staff and political figures?
- What is the understanding of, and attitude toward, broadband connectivity in libraries by broadband providers?

The OITP study team began by holding two focus groups with fifteen state librarians to obtain initial information. The team then examined data from Public Libraries and the Internet 2006, Study and Findings (Bertot et al., 2006) to help select states to be visited by a team of consultants. Seven states were selected for full visits: California, Ohio, Missouri, Michigan, Kentucky, Kansas, and Idaho. During these visits, interviews or focus groups were conducted with librarians, state agency staff, state and regional network staff, political leaders, and broadband providers. Two consultants made separate visits to New Mexico, where one focus group included librarians.

The focus group questions (Appendix B) were designed to elicit the opinion of librarians about their broadband connectivity. The librarians in the focus groups were very
forthcoming about their libraries’ experiences with connectivity in general and use of the Internet and World Wide Web in particular.

In addition, six states were chosen for phone calls to gather information about their networks. These were: Maryland, Wisconsin, Florida, New Jersey, Georgia, and Maine. These interviews were conducted with state library staff or other librarians only. Other state networks were interviewed by telephone and email.

The purpose of all the questions was to get an understanding, as far as possible, of the broadband connectivity status in the states being visited. All the states that were only contacted by phone had robust networks; the questions focused on its design and how it was implemented. Additional state networks were interviewed by telephone and email.

A list of the OITP study team can be found in Appendix A. The team also studied data on connectivity from various national, state, and local sources. For a sample of the documents studied, please see Appendix F.
Analysis

What follows is an analysis of the answers to the questions asked in the focus groups, augmented by the information from the phone interviews.

Analysis of Focus Group Responses

In Missouri and Ohio, where most of the libraries already have high-speed connectivity via a statewide network, focus group participants had more similar opinions. In the rest of the states in which focus groups were conducted, there was a wide range of experiences. Some libraries had high-speed broadband while others may have very little connectivity.

While an attempt is made to summarize the discussions in the focus groups, a key conclusion from a review of all the focus groups is that states differ from one another and each library’s situation is also unique. The degree of leadership, collaboration, vision, funding, telecommunications provider availability, training, political structure, and perception of the library varied from state to state and from library to library. This finding will impact any interventions.

1. What do you use your bandwidth for? What would you do with more bandwidth if you had it for your library?

When librarians were asked what kinds of library functions used the most bandwidth, they mentioned many services. This answer needs to be compared with what they would offer if they had more bandwidth. At least one library is offering each of these services but not all libraries offer all of them.

Use of the bandwidth can be divided into five categories: (1) general use of the Internet; (2) training; (3) library operations; (4) access to resources and services; and (5) E-Government and economic development.

General use of the Internet
If there was one use that was reported by all libraries it was an increase in general use of the Internet. However, in the last year, the use has exploded with the advent of social or interactive networking and video and audio streaming. Use of the library for Internet connectivity and Web searching has been increasing. Libraries report that people come to the library because they do not have high-speed Internet at home and to use the library’s higher speed (if it exists) or because they don’t have a computer at home at all. These patrons tend to be from lower income brackets or older adults who have never had an experience with a computer and now find they need or want one. Immigrants come to the library to read their home country newspapers or to stay in touch with relatives far away. Grandparents come to see and print photos of their grandchildren from Flickr. People come to the library because all of the computers at home are being used by family members and because they want a social situation.
Where access to the Internet is limited in a community, the library is often the only place in town to get access. Users come to the library to purchase airline tickets, do their banking, or stay in touch with friends or relatives in the military.

The extreme increase in bandwidth demand, however, comes from new interactive sites such as MySpace or FaceBook, and video or picture downloads from sites such as YouTube and Flickr. Such use has become controversial in some libraries, with heated discussion on its validity. However, the public is demanding that the library provide such access. People want to be able to get books for work, school, hobbies, and entertainment. They want to use the Web for the same reasons and many more.

Some high bandwidth usage is voluntarily initiated by the user. However, as audio and video downloads are increasingly embedded in Web sites, the user may not even know the bandwidth demands that will emerge from a simple Internet search.

**Education and training**

More and more libraries are using online distance learning and video conferencing for training. As a means of cutting travel costs, libraries are using Web-based and video conferencing for training their own staff. WebJunction offers a plethora of online training for librarians. The popular DuPage College Web Seminars are available across the country. The Missouri State Library does a videoconference every week during the legislative season to communicate information about legislative proceedings.

The public is also interested in accessing distance-learning opportunities. Some libraries now offer special computers without timing requirements so that users can participate in extended online classes. Students participate in online forums and education events such as the migration of butterflies to Mexico or following an expedition to the arctic wilderness. They may begin this in school and then follow up at the library after school hours. Home schoolers use the library extensively as their online classroom. Several states offer a statewide online tutoring service for K-12 students.

Finally, the public library’s mission has changed dramatically in the past few years with a move toward training people how to use the Internet—everything from classes in simple searching, through how to create your own Website, to how to search eBay and other interactive networks. Libraries reported holding regular classes, always full, and that people learn how to use online resources in the library, returning to use them again and again.

**Library operations**

Another major source of bandwidth use is library operations. This includes communication among branches and with other libraries for interlibrary loan (ILL) and integrated library systems (ILSs). Where many libraries share the same ILS, libraries reported heavy bandwidth use. More and more libraries are also using VoIP (voice over Internet protocol) as a way to cut costs. Some offer it only for library staff, while others offer it to the public as well. One librarian said, “Almost all facets of library work, including backend processes like book ordering, are dependent on the Internet.”
Libraries also reported that they use the Internet to monitor library operations such as HVAC, security, lighting, and computer maintenance. One library reported that their building maintenance was monitored on contract by a company many states away and was totally dependent on a stable and high-speed Internet connection.

MOREnet, the Missouri statewide network, operates the network not only for libraries but also for K-12 and higher education. The higher education community has described MOREnet’s services as “mission critical” and that they cannot go without Internet services for even a few minutes.

**Access to resources**

A major use of bandwidth is to access the growing number of resources only available online. The library itself often has, in addition to the ILS, online databases with full-text for the public to access. Many now also offer broadcasts and podcasts of community programming and library services such as online story hours or MySpace pages. Several offer online reference, more often now in real time. Libraries offer downloadable audio, video, and e-book resources that can be checked out like books.

Many libraries are now creating “virtual branches” with the goal of having all library services that are delivered in a physical library also available online. This includes access to books, databases, reference, children’s services, blogs, wikis, audio-visual resources, programming, podcasts, and any other services offered in the library.

**E-government and economic development**

As a way of cutting their own costs and serving the public better, more government agencies are now offering their services online and sometimes only online. Often, people who need the services the most have no other access to a computer than those provided by their local library. Employment security offices now require that the unemployed apply for jobs online. The program also requires applicants to have an email address to receive a reply. The federal Medicare program brought many senior citizens and their families to the library looking for information about drug programs and to file the applications online. People, who come to the library to learn how to use a computer and the Internet, stay and come back again. Georgia requires all its licensed truck drivers to view an online safety video. Business people use the library’s Internet access to do business. Michigan requires that driver’s licenses be authenticated online; patrons use the library to do this. Some go to the library to file taxes. Idaho librarians reported that firefighters recently in Idaho used the library (as the only Internet access in town) to stay in contact with their supervisors and their families.

Focus group results confirmed what Bertot et al. (2006, pp. 20-21) found in relation to E-Government. Government either relies on public libraries to provide access to government services or it assumes people will be able to find a way to get online. Often people who need the services most do not have a computer and come to the library both to use the computer and to learn how to use it. Even those with computers come to the library for assistance and often faster connectivity speeds. Over the years, libraries have
built an infrastructure that promotes economic development, allows government agencies to serve their clients better, and allows the public to take advantage of these benefits.

The survey by Bertot et al. (2006, p. 104) focused on “public access Internet services” and “community impact of public access Internet access.” They divided the responses regarding most important impact into 9 categories:

- access 71.7%
- education 23.4%
- library as a place in the community 19.4%
- commerce 15.5%
- communication 15.5%
- government information 6.2%
- provision of high-speed access 6.0%
- library instruction 5.6%
- recreational purposes 2.7%

The results of the OITP focus groups were similar but focused not on the specific use but on which uses take up the most bandwidth. The highest reported use in the OITP focus groups was simple Internet access, specifically e-mail and new interactive networking. There is a great deal of overlap in the responses, which suggests that, as use in Bertot’s nine areas continues to grow, even more bandwidth will be needed.

Wireless
While wireless is a method of accessing online resources rather than a specific use such as those items listed above, it is mentioned here because a growing number of libraries are offering wireless in the library and it takes up considerable bandwidth. One librarian said, “People just expect the library to have wireless access now.” Wireless is used as a way of providing more computer access without having to provide the space for desktops. People can bring their own computers and sit at regular library tables rather than at the computer tables. Some libraries are even buying and loaning laptops to patrons to use in the library as a way of saving space.

Using data from their Internet, 2006 study about wireless access, Bertot and McClure (2006) report that 36.7% of public libraries indicate they have wireless now and 23.1% intend to add wireless in the next year for a projected total of 59.8% wireless by the end of 2007. Bertot and McClure (2006, p.13) go on to suggest that the growth of wireless will have significant input on bandwidth and say that unless libraries added more bandwidth at the same time “then wireless access created an even greater burden on an already problematic bandwidth capacity and may have actually reduced the overall connectivity in the library.” If libraries do add more bandwidth, their cost for bandwidth increases.

There were also frequent reports of “parking lot use” of wireless access, confirming findings by Bertot et al. (2006, p. 77). Some patrons use the library’s wireless connection from the parking lot and do not use other library services. Some libraries turned their
wireless connection off at night to prevent nighttime wireless use, which sometimes upset people in nearby neighborhoods.

*What would you do with more bandwidth?*

The answers can be summarized as “more of the same” or “what I can’t do now.” For example, a librarian in California answered, “Faster services to enhance the Internet experience for staff and the public.” A Michigan librarian said, “Patrons being allowed to do what they want to do.” An Idaho librarian responded, “Do everything we can’t do now without being kicked off.”

Librarians wanted to use technology, particularly as a way to attract children and teens. In all states, they wanted to do more video-conferencing. One said she wanted “live, real time, interactive training.” Others wanted desktop training, virtual schools, online meetings, and more online homework help for students.

Those responsible for library operations and services wanted:

- an integrated phone system
- better online circulation systems
- the ability to do federated searches of all available library resources, regardless of format
- customized Web interface based on electronic profiling of patrons
- automatic notification of books or programs based on user profiles
- patron initiated ILL
- VoIP
- Web-cams
- the ability to do podcasts of multi-media, broadcast programs of local authors reading their books, story times and online book clubs
- the opportunity to engage patrons with user feedback on blogs and wikis about books and movies they like

For some libraries, increasing bandwidth is necessary for participation in statewide resource-sharing programs such as ILL, statewide ILS, full-text databases, and online reference services. Denise Davis and colleagues, in an unpublished work, found the same concern about local library participation in statewide services from state librarians. Librarians would like to increase access to online resources and service, such as video recordings of government meetings, telemedicine, community bulletin boards, and resources for economic development.

There was no end to the creativity of the librarians in what they would do with more bandwidth, and some considerable frustration from many librarians about their inability to obtain more. Bertot et al. (2006, p. 2) report that 16.6% of public library branches plan to add more workstations and 28.6% are considering doing so. Over 72% of public libraries plan to replace some workstations. In addition, 23.1% plan to add wireless access, which means over 60.0% of public libraries would offer wireless access.
This confirms views expressed in the focus groups and also predicts even greater bandwidth needs.

2. Is your bandwidth sufficient? If not, what problems does the insufficient bandwidth cause for your staff and patrons?

In all the focus groups, only one librarian claimed sufficient bandwidth, although admitting that the library’s network slowed down in the afternoon. Where there is a statewide network, most libraries have T1 or higher but the networks report approaching capacity. In California, high-speed bandwidth is sometimes provided by a regional cooperative. One California network librarian said she needs a total reconfiguration of her network for more efficiency. Several Michigan attendees mentioned outdated library LAN infrastructure issues. In Kentucky, Kansas, Idaho, and New Mexico, respondents said they get what’s available and what they can afford. A Georgia state library staff member said, “We are finding that demand increases to fill available supply, whatever that is. Always playing catch-up; more services are available using bandwidth.”

The most common report of the result of insufficient bandwidth was a general slowdown of the network, often in the afternoon when students get out of school and come to the library. Staff report scheduling online training activities or other online work in the morning because they were unable to do it in the afternoon. The Kansas State Library offered video conferencing equipment to local libraries: Some turned the equipment down due to insufficient bandwidth, while one took the equipment but was forced to turn off the video and use only the audio.

Bertot and McClure (2006, p. 8) also report “45.5% of public library branches indicate that their connection speeds are inadequate to meet user demands some or all the time.” They go on to say their data show, in general, that rural libraries have fewer workstations and lower bandwidth, as compared to suburban and urban libraries. Looking at the number of workstations, Bertot and McClure add that 85.4% of public libraries regularly say they cannot meet patron demand for workstations some or all the time, regardless of the number of workstations available. The OITP focus group data suggest that, as almost half of libraries already report insufficient bandwidth, the addition of more workstations or wireless to limit the need for workstations because people can use their own laptops, will only exacerbate the bandwidth problem.

These focus groups indicated that the last nine months alone have shown such a huge explosion in Web use and bandwidth demand that this percentage will increase dramatically in the next survey.

According to a California librarian, “The greatest impact is on the ILS. As a result, not enough bandwidth is available to effectively check out books during peak hours. In fact, today we found out that 10 dedicated computers used to check out books take up over 95% of available bandwidth. And, because the various services compete for bandwidth, response time hurts the public with slower transaction times.” An Ohio librarian added, “The pent up demand is ready to explode.”
A Kentucky librarian believed, “Lack of bandwidth has an impact on the way librarians think. They don’t think about new services because they know they don’t have the bandwidth to develop or offer them. It produces ‘intellectual limits’ in the librarians.” Another said, “The digital divide is now among libraries on access to high-speed resources.”

A New Mexico librarian reported, “It’s difficult to help patrons. Some volunteers in our library say they don’t want to work the reference desk because it is so difficult and embarrassing to try and help them with the poor Internet connections.”

Another librarian warned, “The millennial generation has a set of expectations about the way they communicate. They use MySpace, chat rooms, FaceBook, etc. They want to communicate that way in the library as well. If their needs are not met, they will go elsewhere. Libraries need to change their attitudes toward social networking, need to learn what it is and how it is used and to be comfortable with it.”

A Kansas librarian stated, “It’s not just the bandwidth that’s the problem. It’s planning and space and wiring, what do you do when something goes wrong – smaller libraries can’t pay for support – just don’t have the monthly cost – may need new router or server, things to increase functionality – also there are problems with security issues when you increase bandwidth.”

Bertot and McClure (2006, pp. 3-4) list eleven factors that influence the sufficiency of bandwidth in a library and conclude by saying, “It is difficult to precisely answer ‘how much bandwidth is enough’ within the evolving and dynamic context of public access, use, and infrastructure.”

Addressing slowness.

Reports of the means used by local libraries to deal with slowness in their network fell into three categories: limit services; prioritize and segregate use; buy more if possible.

Limit use and services
Some libraries are limiting the use of Internet access because it takes up so much bandwidth. Some limit audio and visual downloads when they can control this.

Prioritize and segregate access (Quality of service)
Where there was a technical person who could do this, library functions were segregated so that the higher priority services would have the most bandwidth. One California librarian put it this way, “We make business decisions about limiting use. We select and guarantee a core set of services, prioritizing IP addresses and what’s left is slower. We segregate use so that administrative work of circulation, reference, and workroom can operate. Staff computers are guaranteed bandwidth.”
Purchase more bandwidth
Where possible, libraries simply try to buy more bandwidth. Where libraries are part of a state or regional network, libraries ask the network to provide more bandwidth. Networks report approaching capacity and needing more for the entire network. Others reported needing to study and reconfigure their network to get more efficiency.

3. What do you consider sufficient bandwidth? How do you arrive at that amount?
From almost all the participants in the focus groups, the answer to this question was “it depends.” General statements included, “As much as you can afford;” “The more we have, the more they want and the more we need;” “When you click, it happens;” and “Insufficient bandwidth is determined by the number of irritated patrons.” A state librarian managing a statewide network said, “More than we have.”

However, the general opinion was that the absolute lowest would be 1.5 mbps (identified as a T1 by the focus groups) and that this must be scalable to higher bandwidth. Anything less than a 1.5 mbps would need to be increased almost immediately.

However, the more intriguing question was how to arrive at the amount of bandwidth that would be needed. This question produced some of the most problematic answers. Only statewide or regional networks engage in long term planning. None of the individual libraries in the OITP focus groups seemed to have a plan to address the amount of bandwidth needed. The only commonality was that anything less than 1.5 mbps would be insufficient. The most widespread method was to track current use and scale up to more bandwidth when a certain percentage of capacity was used most of the time. This method was used most by the state and regional networks and the larger libraries that had an IT person with the skill and software to carry out the monitoring. A person from the Ohio network said, “We look at the growth of use in the past and increase in an order of magnitude.”

Where such expertise did not exist, librarians responded to the slow down in response time and began to look for ways to increase the bandwidth if possible.

Those libraries that belonged to a state or regional or community network believed that aggregation of demand and the ability to negotiate a group price allowed for more scalable bandwidth. Some resisted aggregation in a community or state-run network, however, because they feared the library would get a lower priority.

One librarian in Missouri suggested that, rather than selecting a bandwidth speed, performance standards be set and telecom providers be asked to provide speed that results in those performance standards. One suggested format for creating such standards is:

- videoconferencing with no degradation
- download ____KB or ___ MB in _____ seconds
- screen refresh in ___ seconds
- support full use of ____ computers
- support ____ seats for wireless users
However, many librarians exhibited distrust of telecommunications providers and might wish to do their own planning. They want a standard planning strategy that would take into account the above criteria while allowing libraries to adapt it to their individual requirements.

A Communication Workers of America (CWA) position paper (2006, p. 4) lists five key goals, several of which are relevant to this report. Their first goal is to recommend that the FCC immediately increase its definition of high-speed bandwidth for residential use to 2 mbps upload and 1 mbps download and that by 2010 this be increased to 10 mbps download.

Both Bertot and McClure (2006, p. 4) and the CWA policy paper (2006, p. 6) suggest the download speed necessary for certain functions such as streaming video (1 mbps) or video conferencing (6 mbps), which could be used as starting points in this analysis.

Bertot et al. (2006, pp. 3, 173-210) describes in detail a “successfully networked public library” (SNPL). These descriptions include:

- networked services within the library
- library’s virtual branch
- networked infrastructure
- advocacy strategies
- sustainable support

This description of an SNPL, combined with the Collaborative Planning Process Model discussed in the section on Findings, could be turned into a planning guide for high-speed broadband connectivity and be the basis of training workshops. Bertot et al. (2006, p. 112) suggest it might be used this way by saying that the characteristics of a successfully networked public library could be “a road map for public libraries to use when assessing their networked services and planning for the future.” This is discussed in greater detail later in this report.

Bob Bocher from the Wisconsin State Library expanded on this concept in a private email message. “I’d like to see work done to try and provide even generalized benchmarks to libraries on what constitutes ‘acceptable’ vs. ‘unacceptable’ network connectivity and Internet access. At a minimum, factors that would go into determining such a benchmark would include: (1) service population, (2) library visits, (3)
4. **What is your vision for your library’s connectivity?**

Most of the answers to this question were general. A librarian in California said, “A flexible scalable network infrastructure that meets the service goals and objectives of the organization. . . State of the art technology beyond the current. . . Adequate fiber throughout the state. . . Capacity at both the human and technical level.”

It is significant that no library OITP team members interviewed (with the exception of the state networks) had an existing vision of connectivity; rather, these visions were developed as the question was answered. On the other hand, the statewide networks had developed after visions had been articulated.

A California State Library staff member stated, “There is an issue of folks not visioning what to do with capacity. We know there is content out there, but some may not know how to connect, may not know what to do with connectivity.”

The Collaborative Planning Process Model described later in this paper identifies vision as a key element in network creation or expansion. The Bertot et al. (2006) model of a successfully networked public library could be used to help develop a vision.

5. **What are the barriers to getting more bandwidth?**

Relatively few barriers were mentioned in Missouri and Ohio because the statewide networks take care of most of the libraries’ needs, except the need for more state funding. In fact, *Meeting the Goals if the Missouri Five-Year State Plan 2003-2008 Library Services and Technology Act* (IPP UMo, 2007) reports, “Libraries of all sizes and from all regions of the state were adamant in support of the electronic and connection services provided by LSTA funding. MOREnet, in particular, is considered a key element in the successful functioning of Missouri’s libraries.”

In the other states, five barriers to getting more bandwidth were identified: (1) economic, (2) industry reticence, (3) planning and training, (4) political, and (5) geography.

The ALA-FSU study reports some of the same barriers as those found in the OITP focus groups: connectivity capacity, cost too high, state policy, and lack of local expertise.

**Economic barriers**

A major barrier was funding and the librarians made it clear it was not just the cost of connectivity itself but also the total cost of getting or expanding connectivity. A librarian from California put it this way, “Expense of both Internet connectivity and expense to reconfigure library space to accommodate more Internet stations and, of course, the
expense of more computers and then the expense of managing a larger network and number of computers." Other OITP focus group members mentioned the expense of new equipment—routers, switches, etc.—that also must be acquired. The ALA-FSU study (2007) added that grants for connectivity often included a matching or maintenance-of-effort requirement that some libraries could not provide or guarantee.

Even when offered funding for high-speed broadband, libraries decline because they fear they will not be able to pay for ongoing costs or equipment upgrades. The Bill and Melinda Gates Foundation offered connectivity grants to assist state libraries in getting or increasing bandwidth. Some state libraries reported that the money went unused for several reasons: (1) there were not enough funds available to significantly increase bandwidth; (2) no provider was available; and/or (3) libraries were unsure how they would pay for increased bandwidth in the future.

The problem of funding is compounded by the difficulty of convincing the state to invest in connectivity for libraries or convincing the local city or county authorities that the library’s connectivity should receive priority. In some cases, the librarians and the board of trustees are not convinced that the library should offer new, Web-based services. One librarian said, “We don’t need the level of bandwidth for video to do the things we want to do.” Another stated, “We don’t see the advantage to increase speed and invest money because we have no overwhelming reasons for more bandwidth.” The reality of other libraries’ experiences of patron demand and of increased bandwidth required for even routine services may change these attitudes in the near future.

For some libraries without any connectivity, telecommunications connectivity was available in their general geographic area, but the cost of the last mile to connect the library to the network was prohibitive.

Many indicated that E-rate discounts were the only way they could afford to pay for connectivity. Smaller libraries not in a network often chose not to apply for E-rate discounts because it did not seem “worth the effort.” The payback to the library for the additional paper work was too small. However, where there was a consortium applying for E-rate on behalf of smaller libraries, the value of E-rate rose dramatically.

Bertot et al. (2006, p. 43) found that 35.3% of libraries felt the E-rate application process was too complicated; 31.7% felt it was not worth the effort; and 13.4% were part of a consortium that applied for E-rate on their behalf.

Bertot et al. (2006, p. 2) also reported on budget issues facing public libraries—either reduced (reported by 6.8% of respondents) or flat (36.6%) funding in the previous fiscal year. They go on to say, “Given inflation and increased personnel and benefits costs, flat funding equates to a cut in funding. Thus, nearly half of public libraries essentially experienced reductions in funding.”

The CWA policy paper (2006, p. 11) compares the cost of high-speed broadband in other countries with the cost in the U.S. under the heading “U.S. consumers pay more for slower speeds.” Their summary of this issue reports that the top speed (51 mbps)
generally available in Japan costs only $0.06 per 100 kbps while the top speed generally available in the U.S. is 6 mbps at a cost of $0.72 per 100 kbps. “In other words, the Japanese have 85 times the speed at 1/12 of the cost.”

**Industry barriers**

There was general agreement that the telecommunications providers go where the market is. Many librarians in rural areas reported inability to get high-speed bandwidth because it just was not available. One California librarian said, “I waited 3 years to get a T1 and will wait 3 more years for fiber.” One library alone often was not able to make a business case for a telecommunications provider to enter the market.

Despite federal legislation to increase competition, many librarians reported only one provider in their area who could charge what they chose to charge. A librarian from Maine said they signed a contract with a telecommunications provider to provide T3 to high schools and libraries for $2200 per month. Ten years later, the cost has not gone down because there is no competition. “Prices go down elsewhere but not in a no competition environment.” In other areas, the multiplicity of phone companies was a problem. Some were too small to offer high-speed broadband and consortia had difficulty negotiating with multiple providers.

In general, however, a collaborative approach or a consortium seemed to bring about the best results. Consortia were able to develop a business case to bring a provider to a smaller, rural community and to negotiate more favorable rates for all participants in a consortium. The ALA-FSU study (2007) also found that collaboration helps cut the total cost of a network, including staff and management costs to operate the network.

The CWA policy paper (2006, p. 24) comments that “demand obviously influences providers’ deployment decisions. Potential providers will seek to deploy broadband infrastructure in markets where demand for their services will be sufficient to yield substantial revenue and profits.”

**Planning and training barriers**

Many librarians from smaller libraries indicated a lack of knowledge about connectivity in general. They did not know how to plan for their bandwidth needs, how to negotiate with a telecommunications provider, how to evaluate a provider’s suggested configuration, how to configure a network on their own, or how to trouble-shoot connectivity problems.

Bertot and McClure (2006, p. 14) came to the same conclusion. “The library community needs to become more educated and knowledgeable about what constitutes sufficiency and quality connectivity in their library for the community they serve.” They suggest that libraries learn about connectivity options and conduct an internal audit that looks at networked services, bandwidth consumption, current and projected demand, and broadband availability (which may, in fact, limit their options).
Larger libraries with IT staff reported frustration in planning for the future. They wanted a planning guide or template to help them.

The most successful planners were the larger networks with more sophisticated tracking software and IT staff. Where these existed, smaller libraries received more technical assistance. The Ohio Public Library Information Network (OPLIN) Plan is an example of how a state network combines state and local support activities. OPLIN requires that local libraries provide their own technology support for all equipment inside the library except the router (OPLIN, 2007, p. 22). However, OPLIN also commits to an expanded training program for local library staff.

OPLIN provides an excellent example of state wide planning in its OPLIN Technology Plan 2006-2009 (OPLIN, 2007, pp. 4-5). Their mission is to “provide access to electronic information for all Ohio citizens, regardless of format and regardless of location of the user.” Their first goal is to connect libraries to the Internet so libraries and their users can get access to resources in libraries. The objectives include to “provide a backbone of broadband telecommunication to every Ohio public library system” and to “provide Internet access bandwidth and circuit capacity to each Ohio public library system proportional to the library system’s needs.” The minimum provided, however, is 1.5 mbps and speed goes up from there.

Political barriers
The main political barrier mentioned was the difficulty of convincing government authorities at both the local and state level that libraries needed high-speed bandwidth. In some cases librarians noted a lack of leadership overall in bringing high-speed bandwidth to the state. Again, where there was a strong library coalition or where libraries could combine their needs with other entities (schools, higher education) they were more likely to be included in network development.

Some libraries also mentioned clashes in philosophy where a city’s IT department wants to close down interactive networking sites and the library wants to offer them. Another example was the city shutting down the network for maintenance on Saturdays when city employees are not at work yet the library is open and full of customers. Some local government units wanted the library off their network because they didn’t want to deal with the growing demands of public access.

The ALA-FSU (2007) study found similar political challenges in their survey. Their report also noted concern about the safety of the Internet by government officials and debate over whether library funding was a state or local responsibility. This last issue did not come up in the focus groups.

Further, in the ALA-FSU (2007) study, state librarians reported that local librarians must comprehend the need for the Internet and convey this need to political leaders.

The CWA policy paper (2006, p. 18) reports, “Almost every economically developed nation has a national telecommunication policy to promote broadband development-
except the United States.” Their report is an example of policy recommendations being made to improve deployment of broadband in the U.S. They recommend:

- creation of an Office of Telecommunication in the White House
- immediate increase in the FCC’s definition of broadband
- including broadband in the definition of services allowed to receive universal fund support
- developing a high-speed broadband map of America
- assisting in aggregating demand to make a business case for telecommunications providers to deploy broadband
- funding demonstration projects to show what high-speed broadband can do

The CWA policy paper (2006, p. 28) also has recommendations for the state level:

- formal plans that include broadband deployment strategy
- state broadband authority and agencies
- financial incentives for deployment
- statewide networks (which OITP would recommend include libraries)
- aggregation of demand programs
- public/private partnerships
- state demonstration projects

President Bush in 2004 called for more deployment of broadband in a speech to first time homeowners in New Mexico and Arizona. He said, “This country needs a national goal for broadband technology, for the spread of broadband technology. We ought to have a universal, affordable access for broadband technology by the year 2007, and then we ought to make sure as soon as possible thereafter, consumers have got plenty of choices when it comes to purchasing the broadband carrier. See, the more choices there are, the more the price will go down. And the more the price goes down, the more users there will be.”

Geographical barriers
Finally, a major barrier is geography, or as Kentucky calls them, “hills and hollers”. Idaho, for example, has telecommunications providers willing to serve southern Idaho but none who are willing to serve the northern mountainous area. In northern Wisconsin the population is not only sparse but bedrock is very near the surface, dramatically increasing trenching costs for fiber. Many states with rural population centers find it difficult to identify a telecommunications provider willing to deliver service. Another benefit of collaboration is that some state networks take care of these “accidents of geography” by aggregating demand.

6. Who provides you with assistance in analyzing your needs and getting your library more bandwidth?
In general, the answer was, “Wherever I can find it.” Where the library was part of a collaborative network, the planning and technical assistance tended to come from the network staff. This was true in Missouri, Ohio, Maine, Maryland, and New Jersey, and where regional cooperatives provided the high-speed bandwidth (California, Michigan). If the library was part of local government network, IT help came from the local
government although there was also the fear (and sometimes reality) that the library received a lower priority of service. In fact, some libraries actively resisted being part of a local government network for that reason. Beyond this, libraries received help from the telecommunications providers, by contractors, from volunteers, peers, online (WebJunction), and, if they had sufficient budget, their own IT staff.

Seeking and receiving stable IT assistance was mentioned by many libraries. While they could indicate where help was coming from, they also mentioned this as a barrier to getting and maintaining high-speed connectivity.

**Analysis of State Networks**

In some states, broadband connectivity to the Internet is achieved via a statewide network that connects libraries and/or other entities or through regional networks. During the OITP visits, interviewers met with several of these entities to gather information on their activities. The entities the OITP team met includes:

- Missouri Research and Education Network (MOREnet)—a network in Missouri that connects libraries, K-12, and higher education
- Ohio Public Library Information Network (OPLIN)—an entity that connects all main branch libraries in Ohio
- MERIT Network, Inc.—a Michigan network that connects several library cooperatives, higher education, and some K-12
- Kentucky Education Network (KEN)—a part of the KY Department of Education that provides connectivity to all K-12 schools
- Kan-Ed—a network in Kansas that provides connectivity for video conferencing and intra-state data, but does not provide Internet connectivity
- Kansas Research and Education Network (KANREN)—primarily a higher education network, this Kansas network also connects a few libraries, public schools and other entities

In addition to these specific networks, the OITP team had discussions with library co-ops in Michigan and California that provide regional networks, and, through telephone interviews, additional data were gathered from six other state networks.

Though the networks differed in size, purpose, history, and many other aspects, many common points can be categorized into the following areas:

- broadband deployment through collaboration and efficiency
- how their networks were formed
- active participation of the state library
- funding sources
- planning for capacity and bandwidth
- challenges ahead

A brief summary of these key points follows. Additional data can be found in Appendix C, which contains a summary table of information from the interviews.
Two overarching themes were critically important in the creation of these networks: collaboration and efficiency. In all cases there was a group of people who came together with a shared vision of a network that would connect libraries and/or other entities via a state or regional network. The exact job functions of the group members varied from network to network. However, they all collaborated to create these networks, providing an essential service to their communities.

The state and regional networks provide efficiency in several ways. The state and regional networks are centralized organizations that sometimes hire experts to perform specific tasks. Having the experts in one place reduces the cost needed to perform tasks, such as negotiating with ISPs and submitting E-rate applications. Further, having a centralized authority presents a better business case for ISPs or other providers of service and it allows libraries and other entities to leverage their buying power by placing libraries in a better negotiating position. Through demand aggregation, libraries are in a better position to drive down costs.

The networks were formed through this collaboration for a variety of reasons. (The following categories are not mutually exclusive.) Some were formed to connect higher education institutions to NSFnet (the immediate precursor to the modern Internet) or to the commercial Internet in its infancy, and many of these broadened their focus to connect schools, libraries and other organizations. Others were formed for the explicit purposes of connecting libraries and/or other institutions. To take advantage of postalized rates (flat rates negotiated by an agency), several networks formed to buy into statewide contracts. (Postalized rates eliminate the disparity in costs between rural and urban areas.)

To help bring their vision of networks about, entities employed common methods to build support. One such method was demonstrations to show the potential of the Internet. Another was to stress equity of access for all institutions, with the argument that all libraries need to have access to the same levels of Internet connectivity. Further, some stressed the need to have collaboration among entities and that a state network helped facilitate the collaboration.

In states with well-connected networks, state libraries are an active player in ensuring libraries receives adequate broadband. (This is not to say that the converse is also true.) Some state libraries actively participate in or operate a state network to ensure that libraries are connected. Other state libraries have delegated this task to regional co-ops. In the former situation, not all libraries connect via a state network and in the latter, not all co-ops accept the responsibility of connecting their member libraries. For a variety of reasons, other state libraries seemed to have a hands-off approach (no co-op or state library support for connectivity). State libraries also take an active role in ensuring that there is content available in the form of subscription databases available for use by patrons. However, OITP state library focus groups also reported that they rejected or delayed making some content available (ILS, audio or video download subscriptions,
virtual reference) because so many libraries within the state did not have enough bandwidth to take advantage of these services.

E-rate is an important source of discounts on telecommunications and information services for several of the networks. Some of the networks file a “consortium” application, where the network files for E-rate discounts on behalf of the libraries and/or schools connected to it. Several of these consortium applications have over 700 schools and libraries as members. This process relieves the application burden on the individual libraries and helps increase participation in the program. Some state networks that do not directly apply for E-rate for their members do provide eligible services and act as service providers.

While E-rate is one factor that has allowed libraries to connect to the network at an astonishing rate, participation in the program presents significant administrative burdens. It is essential that applicants understand the intricacies of the E-rate program to allow them to gain maximum benefits of the discounts and ensure that they don’t lose out by having their application denied.

To cover the portion of the circuit that is not discounted by E-rate, as well as to pay for Internet and other charges, libraries contribute funding through a variety of sources, including local funds. State governments often help pay for portions of these networks via state appropriations or State Universal Service Funds. State libraries will occasionally use LSTA funds for these networks and/or subscription databases provided to libraries. Other sources of revenue for state networks include membership fees, cost recovery for telecommunications circuits, fees for extra services they provide (for instance, Webhosting), grants, and in kind contributions.

Several of the networks indicated that the services they provide to members are more than just a connection to the Internet. These other services may include:

- E-rate application support and/or filing
- technical support
- training
- advocates for funding
- network operations
- Web and email hosting
- video conferencing support
- technical solutions, e.g., SPAM Guard and DNS

When queried about planning for bandwidth, many of the networks indicated that planning for bandwidth capacity is empirically based. One might think that bandwidth could be dependent on number of workstations, but bandwidth usage is also dependent on the activities on the workstation. For example, a patron watching a mandatory government video to get a commercial drivers license (as reported by one of the respondents) takes up more bandwidth than a patron engaged in filling out government forms online. One organization receives state appropriations based upon the number of
public access computers and the number of staff computers, but this is a funding mechanism, not a bandwidth allocation formula.

There are many important factors to take into account when planning bandwidth. One such factor is reaching out to connected libraries to see what new uses they are planning, to ensure they will have the bandwidth available. When receiving E-rate discounts, it is important to take the E-rate funding cycle into account to ensure that the appropriate discount is received. Further, as reported by one administrator, “It is also important to take into account contract length and early termination charges. Increasing bandwidth may force a penalty, which is often as expensive as the term of the contract.” Most libraries lack expertise in telecommunication contract negotiations.

There are several challenges that state and regional networks face, which is summarized by asking “What next?” First is a lack of deployment, in some areas, to increase the bandwidth to the entity connected to their network. One network noted that current business models for selling connectivity were not meeting the needs of the connected entities. The same network noted that when they wanted to deploy T1s to their institutions, the telecommunications company had to first upgrade their facilities to provide this capacity. Several noted that the best available option was to string fiber to the premises to bring about scalable connections without increasing the circuit charge. The second part of the “what’s next” paradigm is what they should do to improve their service offering to libraries and K-12, such as increasing participation in programs offered by Internet2.

Another challenge they encounter is showing added value. Many state networks cost more than just a circuit and Internet from an ISP, but provide a higher quality service and additional services (see above). One network noted that some of the larger public libraries could get the same speed from a commercial ISP and, with E-rate, have a smaller cost than the membership fee. Another noted that their cost for service was higher then those available from a commercial provider, but they provide a quality of service and technical assistance not available from commercial services. Further, state legislators who budget for some networks don’t truly understand what these networks are providing and occasionally try to not fund networks.

**Analysis of Interviews with State Government Employees**

The OITP study team met with a variety of state employees, representing state Chief Information Officers (CIOs), Public Utilities/Public Service Commissions, Economic Development Authorities, state legislators, and other organizations.

*State government efforts to promote broadband.*

State government assumes many roles in broadband deployment. State governments have adopted a wide variety of approaches to promoting broadband, ranging from proactive (subsidy programs, mandated build-outs, tax law changes, video franchise reform, merger conditions, the construction of state owned and operated telecommunications
networks, the creation of E-Government and e-learning initiatives) to more laissez-faire (the creation of public-private partnerships, deregulatory legislation, and consumer education programs). It is impossible to say with any certainty, based on visits to only seven states, which of these policies is the most effective. The success of each approach will vary depending on local politics, geography, economic growth, leadership of the government officials, and many other factors.

The one commonality among all states is that every state visited seemed to understand the importance of promoting broadband as an economic development tool and as a benefit to social services. Almost every state had charged a specific government agency with the responsibility for developing a broadband initiative, and many of the Governors have a specific staff person assigned to work on broadband issues.

*State regulators.*

The traditional state regulators (the Public Service Commissions or Public Utility Commissions) generally have very little authority over broadband deployment and pricing. The FCC has largely preempted states from regulating broadband by maintaining that broadband services are inherently interstate in nature. Furthermore, many states have limited the state regulators by statute to consider only basic telephone service. For instance, the legislatures in Idaho, Michigan and Kentucky recently passed bills that restrict the regulators’ authority in telecommunications to basic local telephone service only. Often the one opportunity that state regulators have to influence the telephone companies’ broadband strategies occurs when the major telephone companies seek approval to merge (such as when AT&T and SBC merged, or when Verizon acquired MCI). For instance, the Ohio regulators convinced then-SBC to greater build-out requirements when it approved the SBC-AT&T merger. California was able to create a $60 million Emerging Technology Fund from funds it acquired from AT&T and Verizon when approving their mergers.

*State legislatures.*

Some state legislatures have imposed broadband build-out conditions as a condition of deregulating the industry. For instance, the Kentucky legislature required the telephone companies to agree to deploy greater broadband as part of a package of legislation that reduced the Kentucky PSC’s authority. Some were was skeptical of the approach when it occurred, because the build-out requirements were not specified in detail, but consensus was that the telephone companies had stepped up their broadband deployment after the legislation passed.

Some states were also imposing build-out requirements as a condition of awarding video franchise relief to the Bell companies (AT&T and Verizon). Again, it is difficult to know how effective these build-out requirements have been, because AT&T and Verizon agreed to accept the build-out provisions as a condition of the legislation. The OITP study team was told that California adopted the most stringent build-out requirements of any state, yet the OITP study team was also told that the build-out requirements for the entire
state could be satisfied by building out in only one county—Los Angeles County. For this reason, those who objected to this legislation at every stage, allege that the Los Angeles build-out requirements are virtually meaningless.

**State-subsidized broadband deployment.**

The issue of state-subsidized broadband deployment was quite controversial. In Michigan, both the telephone companies and cable companies vehemently opposed the creation of the Michigan Broadband Authority, whose mission was to award grants to providers of broadband connectivity, and criticized the program as a waste of taxpayer resources and even a fraud. The 5-year program was set to expire earlier this year and there was no movement to renew it. This refrain—"it is unfair for government to subsidize companies to compete against the private sector"—was repeated by the industry in several states that were visited, and often the state policy-makers agreed.

On the other hand, some state legislatures had explicitly adopted programs to fund broadband initiatives. Idaho adopted a 50% tax credit program for broadband deployment, at the urging of Qwest, even though the cable industry vehemently opposes the measure. The OITP study team heard that similar broadband funding provisions are under consideration in Utah and Minnesota and perhaps other states. California has adopted its own state subsidy program, called the TeleConnect Fund, which raises fees from the telecommunications industry and provides a 50% discount off broadband rates for schools, libraries, health care organizations and community centers. It is funded from a 0.13% surcharge on each person’s telephone bill.

**State telecommunications contracts.**

Many states have negotiated large, bulk contracts, with the principal telecommunications carriers in the state for government agencies’ telecommunications needs. Some states use these contracts to offer discounted broadband access to local governments and the schools and libraries, often incorporating “postalized rates”. For instance, California has recently completed the award of four different state contracts with AT&T and Verizon. The four contracts reflect somewhat different terms and technologies with the understanding that the authorized carriers would compete with each other to serve the government agencies. Although the primary focus of the contracts was to provide service to state agencies, the state permitted municipalities to purchase service under these contracts, and also permitted municipal institutions such as public schools and libraries to purchase service under these contracts as well. In one state, the government owned and operated a fiber optic network that was given to the state in exchange for rights-of-way. It was difficult to determine how beneficial these state contracts were in practice—some alleged that libraries could obtain cheaper rates by negotiating directly with the telecommunications providers rather than purchasing out of the state contract.

Through these negotiations, several states run networks that aggregate demand, centralize services, provide one place for negotiations, and improve efficiency. One state agency reported that by having a central network, they were able to take two fractional T1s,
combine the traffic onto one T1, and save both entities money. In some states, libraries are able to buy into these contracts in order to receive connectivity to the Internet. In other states, such as Ohio, the OPLIN network buys into the contract through a state appropriation for all of the main branches of library systems.

State government as champion.

The other role the state government assumes is to act as a champion for broadband deployment. In Kentucky, for example, the Governor and legislature champion broadband as a way to bring jobs to Kentucky. They work closely with a non-profit entity, ConnectKentucky, to help spur broadband deployment. ConnectKentucky engages in many efforts to help deploy broadband in Kentucky:

- targeting the supply of broadband by assembling maps of deployment to show unserved areas and help providers make strategic decisions on where to deploy
- increasing demand of broadband by encouraging adoption
- forming eCommunity leadership teams in every county, which consists of 12 sectors including, libraries that assess their IT situation and goals for where they want to be.
- engaging in education and advocacy efforts
- helping provide computers for the home via their ‘No Child Left Offline’ program

California has established a Broadband Task Force, consisting of a wide variety of industry and government officials, to explore solutions to promoting broadband. The task force is scheduled to issue a final report and recommendations in October 2007.

Other states the OITP team visited are not quite as organized as Kentucky or California in their champion efforts. Some states were replicating or examining the ConnectKentucky program to see how it could be adapted for usage in their state. Others were unorganized, with some stating, “We have no deployment strategy.” Others had multiple competing views on how best to deploy broadband. In one state, libraries were not on the radar as a possible outlet for broadband or as important institutions that could be used to help broadband deployment. Further, in states with deployment strategies, some government officials did not understand the value that the libraries bring to communities.

A significant conclusion from the interviews with state government employees is that there is a growing interest in extending broadband connectivity throughout many states. State agencies and entities are choosing different approaches to accomplish this. In some states libraries are included; in other states libraries are ignored. In some states libraries are eligible to participate; in other states libraries are advocating strongly for full inclusion. As confirmed in the focus groups and other interviews, each state is forging its own solution to the broadband issue.

Analysis of Interviews with the Telecommunications Industry

The OITP study team visited federal representatives of the telephone and cable industries in Washington, DC and state representatives of both industries in almost every state, and
also visited a few representatives of alternative technology providers. (According to the FCC’s data, 96% of all broadband connections are provided by either cable or telephone companies.) The predominant attitude of the telecommunications industry across all sectors and states was that broadband deployment was proceeding at a healthy pace, that those areas without broadband capability are simply uneconomical to serve, and that no special governmental efforts are necessary to stimulate broadband deployment. In general, the industry opposes government-subsidized competitors, build-out requirements, or discounted prices for broadband services. For the most part the telecommunications industry was surprised to hear that libraries were not able to obtain adequate connectivity and often responded that the facilities were available—libraries, in their view, only need acquire the funds to pay for them.

When asked for recommendations for changes, the telecommunications industry generally urged policy-makers to create a favorable investment climate that would incent the companies to deploy greater broadband. They provided the following suggestions:

- remove the barriers to greater investment in broadband, rather than impose any specific government mandate
- promote greater cooperation, coordination and dialogue to determine broadband needs and goals
- provide additional financial incentives, such as tax breaks or (in some states) grant or loan programs, to make it more economically feasible to build broadband in rural areas

Telephone companies.

The OITP study team met with representatives of the telephone companies in all seven states that were visited. The telephone industry is dominated by three providers—AT&T, Verizon, and Qwest—but also consists of several hundred small rural telephone companies. In many of the states visited, AT&T or Qwest was the dominant provider of service, while Verizon provided service in less-urban markets. (These are often the territories served by the old GTE, which Verizon absorbed in the late 1990’s.)

For broadband service, the telephone companies largely provide DSL service (with speeds usually in the range of 300 kbps to 1.5 mbps) to residences and T1’s (1.5 mbps) to business customers. Nationwide, about 35% of residences receive their broadband service from telephone companies. The telephone companies maintain that they already offer DSL service to about 70% to 80% of homes nationwide. They maintain that it is either too costly to deploy DSL in the remaining areas (because the area is so rural) or they allege that the demand is not strong enough for them to make the investment in those rural areas (because many rural homes do not have computers). They claim that wireless services (satellite, cellular, or Wi-Max services) are often better suited to provide broadband to rural areas.

The telephone companies have been pushing aggressively to convince state lawmakers to make it easier for them to provide cable service in competition with the incumbent cable companies. In the past, a firm seeking to provide cable service had to obtain a separate
franchise from each local municipality first; the legislation sought by the telephone companies allows them to receive a single approval from the state agency to serve the entire state. In almost every state visited, the state had either just passed a cable franchise reform bill, or was in the midst of considering such a bill. The telephone companies maintain that they will have greater incentive to invest in broadband facilities if they are permitted to offer video services to more communities with fewer regulatory hurdles.

When asked what the government can do to promote greater broadband investment, the telephone companies’ response was generally that government should reduce the regulatory burdens on the companies so that they will have greater chance to make a profit and thus have more economic reasons to increase their investment. The telephone companies oppose any mandated discount for broadband service as proposed in Texas and California. In Ohio, the telephone industry even opposed a state bill to create a “task force” to study broadband deployment.

In addition to cable franchise reform (discussed above), the telephone companies generally favored the following policy reform proposals:

- changing tax policies to provide accelerated depreciation or “expensing” of broadband investment
- easier access to government-owned rights-of-way (trenches under the streets or state-owned property)
- public-private partnerships, such as ConnectKentucky
- greater conversation, cooperation, and dialogue about broadband needs (They stressed the need to create an “environment” that would encourage investment, rather than mandates.)
- eliminating obligations to share their network with resellers or competitors
- eliminating any build-out requirements
- reducing or eliminating any state taxation of the Internet

Telephone companies frequently oppose government-subsidized broadband competitors. In general, the telephone companies believe government assistance undermines the private investment capital that the telephone companies have made without government support. In Michigan, for instance, the telephone companies opposed the state-funded Broadband Authority, which was created a few years ago to provide financial assistance to broadband providers. The telephone companies believed that the program was inefficient, used much of its funding in administrative costs, and awarded grants to companies serving areas where broadband providers already provided service. (Note that the telephone companies have made the same charges against the federal Rural Utility Service (RUS) grant and loan programs.) The Michigan program will expire this year.

The telephone companies are not necessarily opposed to all government grant programs to deploy broadband to unserved areas, however. In Idaho, for instance, Qwest led the charge to convince the state legislature to adopt a “50% matching fund” program to encourage companies to build broadband in rural areas. The program was launched two years ago and recently awarded grants to deploy broadband in 37 rural communities.
(Qwest won 30 of these grants.) We were told that Utah has copied the Idaho program, and other states, such as Kentucky and Minnesota, are considering it as well.

Smaller rural telephone companies sometimes are more effective at deploying broadband in their service territories than the larger, nationwide telephone companies. For instance, the OITP study team met with Syringa Networks in Idaho, which is a consortium of 12 rural telephone companies that was created to aggregate and connect their smaller rural service territories. Syringa initially focused on constructing a fiber backbone, but has since built out its fiber system to provide “middle mile” connectivity to aggregation centers and towns that had no broadband capability. The rural telephone company owners of Syringa are able to acquire support from the federal Universal Service Fund (USF) and pool their money together to fund Syringa. Syringa provides some competition to Qwest, but principally serves businesses, not residences. Syringa noted that there are 22 similar rural cooperatives in other states. Syringa benefited from a broadband investment tax credit passed by the state of Idaho in 2002. Syringa noted that there was a lack of coordination in Idaho that prevented the schools, libraries, and health care providers from aggregating their traffic into a state network that could provide them greater broadband connectivity.

**Cable Companies.**

The cable industry provides cable modem service, largely to residences, generally at speeds of 1.5 to 5 mbps, although cable companies claim to be upgrading their systems to provide 10 to 100 mbps in the near future. Apparently, once the cable and television industries complete their conversion to digital signals, the cable pipe will have even more capacity available for broadband transmissions. Nationwide, about 60% of residential broadband subscribers receive their broadband service from cable companies. (Cable systems are generally deployed only to residential areas; very few cable systems are deployed in commercial areas for businesses.)

Cable representatives proudly state that the industry as a whole offers broadband service to about 95% of American homes nationwide, having made this investment with no government subsidies or regulatory assistance. The cable industry uniformly believes that the marketplace is working and no special changes to the policy landscape are needed. As do the telephone companies, the cable companies believe that policy-makers should focus on removing barriers to investment rather than proactive efforts to mandate investment. They believe that any government programs should be very narrowly targeted to “unserved” areas, not “underserved” areas where a broadband provider may already exist.

Furthermore, the cable industry is, in general, less regulated than the telephone industry and is trying to preserve that status. When asked what programs or policies should be considered in order to promote broadband, the cable representatives often responded “nothing.”

The cable industry vigorously opposes government subsidies of broadband competitors, whether at the federal or state level, and in at least two states visited (Michigan and
Idaho) had sponsored detailed reports to demonstrate that state-funded broadband subsidy programs were a waste of taxpayer money. The cable companies often oppose or view with suspicion statewide education or library networks that, in their view, offer state-subsidized competition to them.

As discussed above, the cable industry has been battling against the telephone companies’ legislative push for franchise reform. The cable industry’s tactics have evolved over the past three years. While at first they opposed the telephone companies’ efforts, they have shifted to requesting parity. The cable industry argues that, if the telephone companies are able to operate under a single state franchise, then the cable companies should be able to take advantage of the same statewide franchise option so that they can escape the burdensome (in their view) municipal regulation. Many local franchises have explicit build-out and service provisions; it is yet to be seen whether the cable companies will actively choose state pre-emption of their local franchise agreements (and thus abandon these local service requirements).

Cable companies in the states visited often claimed that they were big supporters of libraries and that they provide free broadband capability to libraries, often as a result of their franchise agreements with the cities. (However, the OITP study team did not hear this from many libraries.) Cable companies believed that no special measures were necessary to promote broadband connectivity to libraries because that need was already being met.

Alternative technologies.

The states visited also included meetings with and discussions about satellite and wireless providers and energy companies. Collectively, these companies serve a very small portion of the broadband market (about 5% nationwide) and have a variety of challenges. Satellite companies offer nationwide coverage, but their up-front costs of service are rather high ($500 or more for a satellite antenna). AT&T has a partnership arrangement with WildBlue, a satellite broadband provider, to market broadband service in rural areas. The transmission speeds of satellite service tend to be on the low end of broadband speeds (advertised as between 200 kbps to 1.5 mbps), and are subject to latency (the time it takes for the signal to travel the medium) largely because the signals must travel back and forth to a satellite located 22,000 miles above earth. Cellular and PCS (Personal Communication Services) companies have recently begun offering low-end broadband connectivity, and are working to upgrade their networks to provide “4G” (fourth generation) type of broadband services in the next few years.

Wi-Max services could, in the future, provide affordable broadband service in rural areas. Wi-Max is the name used to describe high-speed wireless service using a different portion of the spectrum than cellular or PCS services and is focused on providing fixed or mobile service. A company called Air Advantage recently received a low-interest loan from the US Department of Agriculture’s Rural Utility Service to provide wireless broadband service in Michigan. The OITP study team also met with an up-and-coming Wi-Max provider (DCI) in rural Kentucky that has been awarded a multi-county contract.
The provider is planning to build a Wi-Max system that will provide wholesale capacity to other companies, which would provide the retail service. While the service is exciting, it is too early to know whether or not it will be successful. The standards for Wi-Max equipment are still relatively new, which limits the ability of equipment manufacturers to produce on a large enough scale to bring the costs down to an affordable level. Wireless broadband providers are also vulnerable to power outages because of a limited capability for back-up power supply. In short, these alternatives may provide an option for libraries in the long term but do not appear to be a realistic alternative for libraries in the near term.

Perhaps the most successful, smaller scale alternative providers are the municipal energy companies that are using their access to rights-of-way to deploy fiber and provide telephone, cable, and broadband service. For instance, the OITP study team met with a representative of the Frankfort Plant Board, a municipal electric company that now also provides cable, telephone, and broadband service in Frankfort, Kentucky. The company competes with AT&T and the local cable company, and it provides discounted rates to the local library (and local schools). These municipal systems are scattered around the country and several (but not all) are successful. Nevertheless, many cities have chosen not to undertake the financial risk of providing service in competition with the private sector, so these examples are isolated and not widespread. These municipal systems also tended to be focused in mid-sized urban areas and typically do not reach into the rural areas.
Findings

There are nine general findings.

1. **Every state is different.** The OITP focus groups as well as interviews with librarians, state networks, government leaders and agencies, and telecommunication providers lead to the same conclusion: While states may have a common goal of broadband connectivity, their approach and their attitude toward libraries is very different. The states’ current deployment of broadband varies widely. Each state’s need for further deployment or speed is different. For a variety of reasons, including prices based on circuit length, the same broadband providers in different states offer the same speed at different prices. Some states have successful statewide networks for libraries and some have successful regional networks. The focus groups indicated several different barriers to getting initial or additional broadband.

Bertot et al. (2006, p. 21) came to the same conclusion in looking at states. Some states are well connected; some are not. Most states have some libraries with high-speed connectivity and some or most with inadequate speed. The researchers also identified gaps between different regions of the country.

The essential conclusion from this finding is that no one approach or level of funding or type of assistance is appropriate for all states or all libraries. Each state’s situation needs to be analyzed and an approach designed for that state that maximizes broadband deployment.

2. **There are viable models.** Despite the differences among the states, there are some process models that have been discovered in successful states that lead to a higher degree of broadband connectivity, either at the state or regional level. One such model is shown as Figure 2.
In this model, the methods used by states and regions with high broadband deployment can be described and taught. Each library must look at broadband within the context of its own range of services and current capacity. Examples of successful models are found in Missouri, Ohio, Maine, Wisconsin, New Jersey, Georgia, and regions in California and Michigan.

The essential conclusion from this finding is that since each state has unique challenges and opportunities available, the process needed to address bandwidth issues will need to be flexible from state to state and even within states.

3. **Collaboration and aggregation works.** The most robust, extensive, and affordable broadband seems to come from a collaborative approach to acquiring broadband that aggregates demand. The collaborations included libraries only, libraries and state government, libraries and schools, libraries and higher education, libraries and local government, libraries and health agencies and other non-profits, and all possible combinations of the above. The collaborations allowed for: (1) joint planning; (2) building a business case for broadband providers to deploy broadband; (3) more affordable pricing; (4) sharing costs; (5) support and maintenance delivery; (6) shared services; and (7) economies of scale. This may not be true for all libraries, particularly in more urban areas where broadband is readily available and there is competition to for affordable pricing.

Bertot and McClure (2006, p. 16) suggest that libraries look at their services in a larger community context and that “investment in technology infrastructure is increasingly a community-side resource.” Furthermore, they note that “pooling resources, planning jointly, and looking across needs may yield economies of scale, better service, and a more robust community technology infrastructure.”

The ALA-FSU (2007) study reports one of the challenges indicated by state librarians was the lack of local public library system or consortia affiliation or partnerships, and that those public libraries which aggregate their broadband demand into district, system, and consortia purchases or obtain bandwidth as part of local government or school partnerships receive better rates and service. Isolated, unaffiliated libraries need to be encouraged to band together for this and other purposes.
One model focusing on collaboration and aggregation is the ConnectKentucky model, now being expanded to Connected Nation (ConnectKentucky, 2007). This model advocates bringing together 12 different community organizations, including libraries, to discuss broadband needs and aggregate demand. Discussions at the local level are augmented by mapping existing connectivity. The ConnectKentucky model has received much deserved attention and is more fully described in the network section. However, according to some focus group participants, a drawback to this model is that, in an effort to implement the model across the entire state, it has become hastened and routinized to the point where libraries report initial inclusion in discussions and publication of a county report but little follow-up that results in actual collaboration or connectivity at reduced costs. None reported any demand aggregation that led to better broadband connectivity for them. Any intervention following this model should emphasize the time necessary for community groups to forge commitment and ongoing facilitation of collaborative efforts.

The essential conclusion of this finding is that a collaborative approach to library broadband connectivity in a state or region may be more successful and sustainable than assisting individual libraries to obtain broadband. Helping many libraries obtain broadband at the same time is the best way to help individual libraries.

4. **The need for higher bandwidth is exploding.** Many public libraries, particularly in rural areas, do not have broadband or have inadequate broadband connectivity to meet the current and projected needs of library users operation. Almost all libraries are having trouble keeping up with the demand for connectivity.

Every focus group reported that use of technology that requires high-speed broadband is absolutely exploding. Part of this explosion is caused by the way library users want to use broadband. There are numerous examples of participatory networking (e-mail, shared research, cooperative distance learning, YouTube, MySpace, Flickr, FaceBook, Second Life). Shared ILS or PACs among libraries also demand high bandwidth, as does searching of full-text databases. Audio and visual downloads demand a huge amount of bandwidth. This is how current users want to use the Internet in libraries. If the library cannot supply these services, people go elsewhere. Those libraries with moderately adequate broadband are drawing people to libraries that have not used them before, such as teenagers, job seekers, and senior citizens. Distance learning courses, particularly those with heavy audio and visual and shared communication requirements, also demand large bandwidth. Almost all libraries, even large library systems like San Francisco and Los Angeles Public Libraries with several megabit connections, report slowdowns from minor to debilitating in the afternoon when the kids get out of school.

Another source of demand comes from outside the library. Local, state, and national governments are closing local and regional offices and mounting services
on the Internet, which require users to obtain services online. For many of these users, the place to get the services is the public library. Medicare, employment, and state licenses are more often only available online. In addition, Web sites are beginning to embed audio and video automatically.

The OPLIN Technology Plan (OPLIN, 2007, p. 10) reports Ohio’s recent experience with the demand for broadband. “In the twelve months between September 2005 and September 2006, Internet access bandwidth demand nearly doubled; since 2004, the demand has tripled. More efficient fiber-optic circuits will certainly help move this traffic, but they may also enable even more rapid increases in bandwidth.”

The essential conclusion of this finding is that online resources and their use will continue to grow rapidly and libraries can expect continued and substantial demand from users for functions that require increased bandwidth.

5. The minimum threshold for broadband deployment should be 1.5 mbps for every library. The minimum bandwidth suggested in the past to serve library patrons has been 769 kbps. The focus groups strongly recommend that 1.5 mbps (T1) should be the absolute minimum for the smallest libraries and most libraries need much more than this. This minimal baseline should be scalable to meet demand. Agreement on a minimum standard is essential.

Bertot et al. (2006, p. 25) indicate that 53.5% of libraries report connection speed is adequate to meet patron needs at all times; 29.4% say it is sufficient most of the time and only 16.1% say connection speed is inadequate at all times. The OITP focus group responses would suggest these figures will change dramatically in the next study, as almost all of the librarians reported less than adequate bandwidth at least part of the time.

Bertot et al. (2006, p. 12) raise a number of research questions that need to be explored, including whether it is possible to define quality public access computing and if so, how, and whether there should be standards for sufficient connectivity. The OITP focus groups and other research would suggest that standard setting is both a moving target and desperately needed.

Bertot et al. (2006, p. 15) also discuss this under the heading “good enough connectivity,” where they offer a definition that “arbitrarily used 769 kbps as ‘high speed’ and computes the number of libraries that had 769 kbps or greater connection speeds.” Looking at this statistic nationwide, in 2006, 63.3% of libraries had reached this target. The OITP focus groups suggested that 1.5 mbps would be the absolute minimum a library would need and this should be easily scalable to higher speeds. In his 2008 study, Bertot will ask which libraries have less than a T1 connection, T1, and greater than a T1 connection. It is also
recommended that the arbitrary figure of 769 kbps as a threshold be increased to 1.5 mbps.

However, the OITP findings strongly concur with the conclusion of the Bertot and McClure study that 1.5 mbps would simply be a new floor and already insufficient for many libraries. Bertot and McClure (2006, pp. 20-21) say, “It is time to move beyond connectivity type and speed questions and consider issues of bandwidth sufficiency, quality, and range of networked services that should be available to the public from public libraries,” to which the OITP study results would add “seek sufficient scalable bandwidth to deliver these services.”

States with robust, high-speed networks, such as Ohio, Maine, Georgia, Wisconsin, Missouri, Maryland, and New Jersey, already provide a T1 to libraries in the state and are seeking ways to increase speed significantly to meet demand. Georgia’s assessment of its bandwidth needs is that “T1 lines are sufficient for well over half of the libraries in the network (approximately 200.) 75 of the libraries could use 2 T1s. 40 could use 3 T1s; and the balance, (about 25) could use 4 T1s.” Please see details in Appendix G.

The essential conclusion of this finding is that even those libraries with what have been considered robust state networks are experiencing slowdowns. Libraries that are just now obtaining broadband have to begin at a much higher speed that ever before. What was considered sufficient before is no longer, and a minimum standard should be established (1.5 mbps) with a process for determining the need for higher speeds. The OITP study team further believes this definition is a sliding scale with the minimum needing adjustment upward as demand increases. These can be used as leverage for increased bandwidth in existing networks for increased funding to pay for it.

6. **There is a need for more training and support.** Many librarians do not fully understand broadband connectivity, what it can do for the library and library users, and how to obtain it. There is a general lack of awareness of how broadband works, what speeds are necessary and available, how to build a business case for connectivity, and even, in some cases, what broadband can do for a library and its users. Libraries large enough to have IT departments that are already connected to broadband understand this, but smaller libraries do not.

The essential conclusion of this finding is that either assistance or an educational program, or both, are needed to assist librarians to understand broadband and what it can do for libraries.

7. **There is a lack of awareness of the roles of libraries.** There is also a lack of awareness on the part of politicians, broadband providers, and policy makers of the role of libraries in serving users and the libraries’ need for more broadband. Focus groups reported that decision makers don’t see the role of libraries, while the librarians reported how much use is being made of broadband by library
patrons. Individual interviews with state agency staff, elected officials, and even broadband providers also demonstrated a lack of such awareness and understanding.

An interview with a top Idaho official revealed that new job offices for public access to online job information were being set up in rural communities. However, the library was not even considered as a location for the offices.

Several people suggested workshops that could teach people about telecommunications technology and a workbook or toolkit that would be available in print and online and might include the following types of information:

- factors that lead to successful collaboration and networking
- models of successful connectivity
- list of potential people to meet with
- ways that libraries can connect to the Internet/Web
- benefits of connectivity of libraries
- sample “dog and pony” show to demonstrate the value of broadband
- sample news releases about the value of libraries
- examples, stories, anecdotes that show the value of libraries
- what needs to be in a business case to a provider
- sample state and national laws that support library connectivity
- time for actual planning

The essential conclusion of this finding is that an awareness campaign needs to be targeted to key decision makers and providers about the role of libraries. The campaign should be targeted at the Governor’s office, state departments and agencies, the education community, business leaders and organizations, broadband providers, local government, homeland security, PUCs (Public Utility Commissions) or PSCs (Public Service Commissions), economic development offices, and higher education.

8. **There is a need for planning.** Closely aligned with the need for training is the need for assistance in planning. Many librarians do not know how to plan for broadband connectivity including the technical configuration, scalability, synchronous communication speeds, ongoing support and maintenance, and the value of collaboration and aggregation in negotiating better prices. Librarians need assistance in such planning at the national, state, regional, and local level through policy advocacy, practical toolkits and methodology, and ongoing training and education.

The OITP study team has developed a Collaborative Planning Process Model (please see Appendix E) for planning at the state or regional level. Bertot et al. (2006) offer a self-assessment of the characteristics of the “successfully networked public library” that allows a library to evaluate its own broadband connectivity. These two could be combined and expanded to become a planning tool.
The essential conclusion from this finding is that the amount of bandwidth needed by libraries varies depending on the number of computers in the library, the services offered by the library, and the Internet-based applications or services. All agree that whatever configuration is chosen, it should be scalable because more bandwidth will be needed, perhaps sooner rather than later. Each library’s needs should be analyzed in relation to the opportunity for broadband that is available, while recognizing that 1.5 mbps as a minimum is essential.

9. **There are multiple funding options.** The use of E-rate discounts is crucial in putting together a financial package to support broadband connectivity. Librarians need to fully understand how E-rate works and how to apply for it successfully.

Reports on funding for broadband tended to include E-rate, with local funding, state funding, and in some cases LSTA used to fund the non-E-rate portion of the cost. Often different sources were required to put together an affordable package. States with a large number of small libraries that were trying to connect to the Internet report that E-rate is not as popular because the amount of work does not seem worth the return. However, states with collaborative networks providing broadband to a group of libraries report that E-rate is critical and that they apply on behalf of the local libraries for the discount.

Librarians have and continue to complain about the complexity of the E-rate application process and their difficulty in understanding why some applications are funded and others are not (Bertot et al., 2006, pp. 42-43). A consistent recommendation is for the FCC to mandate simplification of the process and more efficient distribution of funds directly to libraries.

The essential conclusion of this finding is that multiple sources of funding are often necessary to fully fund broadband on an ongoing basis and that E-rate discounts play an essential role, particularly where applications are aggregated and someone with experience prepares the application.

**Options Considered but Not Recommended**

The OITP research and findings lead to the conclusion that no one solution meets all needs. A macro approach cannot be recommended that treats all libraries the same.

The OITP team rejected a solution based on treating each library as an individual entity. The success of collaboration and aggregation in many environments leads to a conclusion that collaboration is the preferred model. It also allows for better planning, more affordable deployment, and, most likely, sustainability over time.

Also rejected is the idea that either a state network or a regional network is the best solution in all cases. The success of any collaborative efforts depends on several factors
which can be implemented at different levels, including using existing structures or creating new collaboratives organized specifically for broadband. In some cases, networks already exist at the state, region, or local level that libraries can join. This requires yet another approach and different funding options. While there are some overall models that have proven successful, each state, region, and library must be analyzed to determine the best approach to extend broadband.

**Conditions That Must Be in Place and How to Obtain Them**

In order to move forward with more extensive broadband deployment, the following conditions need to be in place.

1) *More extensive and individual data have to be collected.* The current national data (Bertot & McClure, 2006; ALA-FSU study, 2007) are very helpful. However, each state’s situation and the status of individual libraries and regions need to be looked at with ideas in mind on how to extend deployment or speed. There seem to be at least five likely situations:
   a. Existing statewide network with almost all public libraries connected (for example, Ohio, Missouri, Maine, New Jersey, Georgia, and Wisconsin). All these networks are reporting the need to increase speed.
   b. States where there are existing networks to which libraries do not belong (for example, Kentucky and Kansas). Significant planning and funding is necessary to include libraries but, assuming this is available, libraries could be added fairly quickly. Funding of the last mile may be necessary to connect the library either directly to the backbone or to the community connection.
   c. States with regional networks that do or could accept the responsibility for telecommunications connectivity (for example, California and Michigan).
   d. States where is very little connectivity (for example, New Mexico and Idaho). In these states, there may not be economical access to the Internet, due to lack of deployment. These will be the most difficult states in which to plan for and implement broadband deployment. The conditions necessary for a successful collaborative may not be in place (no leadership, no vision, extensive turfism, severe lack of funding, etc.), making the deployment more difficult. New Mexico is a good example, in that the focus group reported that legislation was passed this year to allow for a state network but without funding.
   e. There are also situations where libraries already have ready access to broadband without being in a collaborative. Their access to broadband or an increase in broadband speed should not be difficult.

Again, to determine the most appropriate approach for any library, region, or state, additional data may need to be gathered and analyzed.

2) *Advocacy is critical.* Broadband cannot be deployed in a sustainable manner, without other support mechanisms in place. These include an awareness
program that emphasizes the role that libraries play in helping people get the information they need. The “hooks” that have been most successful in the past (and also mentioned in both the Bertot et al. (2006) and the CWA (2006) reports) include:

- education, particularly distance education but also homework help
- economic development, particularly in rural areas, job applications, workforce development
- E-Government (Medicare, employment security, government activity) and civic engagement
- preserving values of rural community and rural development, and attracting people to rural areas who might not otherwise move there
- emergency preparedness and response, disaster recovery, and public safety
- equity of access
- remote health services and telemedicine

The above should be combined with training in advocacy that includes:

- who to talk to at the state, regional, and local level
- how to talk to them in a compelling way
- possible partners in broadband efforts
- case studies of successful campaigns
- sample documents and laws from other states
- methods to attract positive attention for the library for the way they use technology
- concrete examples of library activities

3) **Training and support.** An education program for librarians should include:

- training in broadband and how it works
- collaboration development
- building a business case for broadband providers
- configuration planning
- advocacy
- E-rate application assistance

**One Possible Model: A Collaborative Planning Process Model**

Based on the interviews done by the OITP study team, background information, and other research, the study team sought to understand factors that led to successful networks. The study team developed a Collaborative Planning Process Model whose elements were common in all the successful networks reviewed. As previously described, Bertot et al. (2006) developed a model for the “successfully networked public library.” Both the OITP and Bertot models could be used in helping libraries plan for and implement higher-speed broadband connectivity. The Collaborative Planning Process Model brings people together to describe and adopt a vision and then work toward its implementation. Appendix D indicates how two state libraries and one regional cooperative used this model to achieve successful connectivity. It also describes how this model was used by
The Bill and Melinda Gates Foundation from the point of view of one state librarian in the early round of computer grants. It shows the elements of the model used for getting local libraries to provide public access computing. Appendix E is a summary of the components of the Collaborative Planning Process Model.

The Bertot model is aimed more directly at an individual library, to assist their evaluation and planning. The description below is organized by the Collaborative Planning Process Model steps, but indicates where the Bertot model fits in. For a complete picture of this model, see Bertot et al. (2006, pp 173-210).

The Collaborative Planning Process Model and the Bertot planning model could be combined in a training program for state, regional, and local libraries, to teach these concepts and assist libraries in planning. To be fully successful, this training should be combined with some attempt to estimate the total amount of bandwidth needed for an individual library and a regional or state network.

Collaborative Planning Process Model

1. **Leadership**
   At the state or regional level, someone takes the lead; sometimes it’s a group of people. Sometimes it’s an outsider who believes in the goal and can motivate others to join the effort. However, there is always strong and continuing leadership. At the state level, the leadership works to bring about agreement and doesn’t take sides, except advocating for the involvement of libraries.

   An Idaho state library staff member said, “We found that it is not the size of the library, it is the attitude of the librarian that makes the difference.” Another state library staff member said, “If there is no leadership at the state, regional, or local level, it won’t happen.” The ALA-FSU study (2007) supports this concept when state librarians were asked to identify “the unexpectedly successful connected libraries.” With the large number of very small libraries in the US (over 50% of libraries serve under 10,000 people with less than 5 staff [ALA-FSU study, 2007]), libraries need to see vivid examples of best practices with a clear path and assistance to offer new services.

   Bertot et al. (2006, p. 121) describe leadership at the local level by “an experienced savvy library director” as critical, and go on to say that this person must be comfortable with “continuous change” and willing to participate in or have staff participate in “continuous education.”

2. **Vision**
   At the state or regional level, there is a clear “big” vision of what is wanted: connectivity of an entire state or region; the level of that connectivity; the services that can be offered; and the benefit to the communities the libraries serve. There is agreement about the vision and commitment to finding a solution to reach the vision.
As previously mentioned, the OPLIN mission (OPLIN, 2007, p. 4) is “to provide equal access to electronic information for all Ohio citizens, regardless of format and regardless of location of the user.” The plan goes on in some detail to describe what this mission means in terms of connectivity and services to members.

The networks also found their vision changing over time. New Jersey, for example, found that ensuring connectivity is not enough. Their statewide network “now provides a platform to launch new statewide electronic resources and services initiated by the state library, regional libraries, or an individual library.”

At the local level, the Bertot et al. checklist (2006, pp. 173-210) could be used both to evaluate a library’s current service and to develop a vision for the future. State and regional librarians can help facilitate this process at the local level.

3. Inclusivity and partnerships
   At the state level, many people representing a variety of interests are involved. If the network includes more than libraries, then libraries and state agencies are often invited to participate in the planning and vision development. If the network is to be a library network, library leaders from across the state are invited to participate. The vision is widely shared. There are various committees (e.g., technical, policy, governance) with people working on ways to implement the vision. All stakeholders whose participation is critical to the success of a network are invited to discussions and presentations. In reviewing this, one state librarian said, “In our state having lots of committees would slow things down.” This emphasizes the overall necessity to customize this process at the state, regional, or local level.

People who might be involved could include, depending whether this is a state, regional, or local network (this is just an example and not meant to be comprehensive)

- library directors
- library technical staff
- library branch managers
- library service staff
- trustees
- regional library staff
- community leaders
- government leaders
- educational leaders
- health community
- police and safety community
- office of economic development
- Chamber of Commerce
- state education agencies
• state economic development agencies
• state Department of Homeland Security
• City and County Associations

Bertot et al. (2006, p. 114) also mention the need for developing partnerships at all three levels—local, community, and state.

4. Advocacy for the vision
Successful projects have a strong advocacy effort that describes and lobbies for the vision. Advocacy must occur at both the state and local level in order to convince policy makers, funders, and even reluctant librarians that the vision is worth funding and implementing.

Part of advocacy is finding partners who share the vision and are willing to combine their efforts. At the state or local level, this could be government, K-12 or higher education, or business.

Bertot et al. (2006, p. 133-135) discusses advocacy at length and begins by saying that Successfully Networked Public Library managers are advocacy leaders. The distinguishing characteristics are that they are “proactive, opportunistic, prepared, and have positive relationships with other local leaders.” This SNPL model could be used to articulate and advocate the vision for what the library can do to meet the community needs for education, economic development, community safety, health care, etc.

OPLIN, in 1994, published a document that fully describes the proposed network; the need to connect librarians; the proposed administration and funding; and includes scenarios of how the new network would be used. This document could still be a model for advocating a new collaborative.

5. Demonstration models
Not everyone understands the need for broadband in general and for its role in helping libraries serve their communities in particular. Successful broadband deployment strategies include showing how broadband can and will be used and the benefit to local communities in terms of E-Government, economic development, emergency preparedness and response, education, and preserving rural values.

A Maine librarian suggested that one of the functions of demonstration models is for librarians to share best practices with each other. Libraries that are defined by Bertot et al. (2006) as “Successfully Networked Public Libraries” are good examples.

The OPLIN focus group reported visiting libraries around the state to demonstrate how access to the Internet would help their patrons.
6. **Aggregation of demand and services**

Demand is aggregated to make the business case to providers that it is worthwhile to deploy broadband. Sometimes this results in “postalized” rates where everybody pays the same rate or categories of rates, allowing more isolated areas to be served. Sometimes one provider responds to an RFP and gets a contract; sometimes it is a coalition of providers who serve the entire state. But the demand is always aggregated.

Bertot and McClure (2006, p. 16) suggest that libraries look at their services in a larger community context and that “investment in technology infrastructure is increasingly a community-side resource.” They go on to say that “pooling resources, planning jointly, and looking across needs may yield economies of scale, better service, and a more robust community technology infrastructure.”

The OITP interviews showed that collaborations allowed for (1) joint planning; (2) building a business case for broadband providers to deploy broadband; (3) more affordable pricing; (4) sharing costs; (5) support and maintenance delivery; and (6) shared services.

7. **Technical plan for implementation and support**

A good technical plan is developed to solve connectivity problems across the state. The people developing this plan look for the best solution for all, include library technology specialists, and tend to be technology neutral. The plan also includes provision for ongoing support of local libraries.

State networks in Ohio, Missouri, Maryland, New Jersey, and Maine and regional networks in California and Michigan all provide some level of technical support, from handling all problems to actively training local librarians to do trouble shooting themselves. Maine, for example, has Circuit Riders who assist local libraries by (1) focusing on libraries with the most serious problems and the fewest resources to deal with them; (2) fostering locally sustainable use of the state network and avoid ongoing technical dependence on the Circuit Riders; and (3) integrating Circuit Rider efforts with end user training contractors.

8. **Training librarians about the new technology**

Some librarians resist new technology (including broadband) because they do not understand it and are uncomfortable. Librarians need to be trained in the new technology so they are comfortable with using it.

Librarians start at different points. Some are already skilled IT managers and want advanced knowledge to make their networks more cost and operationally efficient. Others are complete novices and need a “Telecommunications 101” course. The toolkit previously mentioned would be a starting point for training.
9. **Champion at state, regional, or local governmental level**

In addition to library leadership to make sure there is a library network or that libraries are included in a wider network, it is also helpful to have a state government champion such as the Governor, a legislator, the head of the state education office or higher education or someone in the budget office. The state librarian can also play this role but it helps to have another member of state government acting as an advocate and spokesperson.

At the local level, the champion can be a county commissioner or city council member or school superintendent. Certainly the library board of trustees should be champions too.

10. **Funding**

At the state level, money to support connectivity comes from multiple sources. In some cases, the state appropriates funds to the state library for such purposes or, alternatively, to individual libraries to supplement local funds. E-rate discounts were also used extensively along with LSTA and other grant funds. Often, a financial package using multiple funding sources was required to fund the entire project.

Bertot et al. (2006, p. 120) discuss the need for adequate and stable funding at the local level for a Successfully Networked Public Library. Not only was funding of the connectivity included in this discussion, but also funding of the IT support, training, and equipment.

Some states have passed legislation with funding to encourage broadband deployment and to assist public entities in paying their ongoing telecommunications bills. Examples of states with such programs are California, Maryland, Kansas, New Jersey, and Maine.

11. **The state library plays a role.**

The state librarian plays a role and so do state library staff. They are all involved in bringing people together, deciding to use funds creatively, the “road show”, and training. State library staff can help facilitate partnerships at the state level and encourage partnerships at the regional and local level as well. State library staff are key advocates for libraries at all levels.

Bertot et al. (2006, pp. 127-128) summarizes the state library, library systems, and consortia role as providing the following:

- funding
- demonstration models
- library consulting
- continuing education and training
- evaluation; regulation and standards
- advocacy
- an innovation champion
Suggested Interventions

In the course of the interviews, the OITP study team received many interesting suggestions both formally and informally for possible interventions, both from the Gates Foundation and from other parties. Before turning to the project conclusions and suggestions, it seems useful to examine some of these suggestions. They are listed below, in no particular order of priority or merit.

**Connectivity sustainability grants:** The most straightforward intervention, of course, is to simply give funds to libraries to improve their connectivity. The line of reasoning is that, while nothing can be done in the short term to help libraries that simply have no connectivity available at this time, there are libraries that are having trouble sustaining or improving connectivity because they do not have sufficient funds. Connectivity grants could be made directly to individual libraries, consortia, or state libraries.

**Planning grants:** In the site visit interviews, the need for support for planning was frequently raised as a concern, both in terms of long-term strategic planning and regarding the type of immediate operational planning that must precede any major procurement of telecommunication services. This planning is costly, involving substantial staff time, expert consultants, data collection and assessment, and formation of partnerships and collaborations.

**Training:** Training is an issue that was also raised multiple times in the interviews. As discussed above, planning for, procuring, and maintaining telecommunication services are specialized and complex activities that are quite different from usual library procurement processes. A well-trained and technologically sophisticated library community would be better prepared to articulate, obtain, and sustain needed services.

**Consulting services:** Even with training, planning for and obtaining high-speed connectivity, especially in a sustainable manner, requires consulting expertise that is rare in some regions and costly. Libraries need help in technology, telecommunications policy (both implementation and advocacy), and operational planning. Particularly rare are experts who combine deep knowledge in these areas with an understanding of library needs and the ability to communicate with the library community. Thus, the OITP project team suggests creating a national consulting service to aid libraries, consortia, or state library agencies at key points in their connectivity planning and advocacy.

**Policy assessment and advocacy:** Telecommunications policy is in a state of significant flux, both nationally and locally. At the state level, recent telecommunication policy debates have focused on issues such as government de-regulation, rights-of-way, video franchising, and linking broadband deployment to state economic development. National debates continue on such topics as the future of universal service (including E-rate), rural infrastructure, and network neutrality.

The outcomes of these debates can significantly affect, for better or worse, the prospects of libraries seeking high-speed connectivity. They can do so indirectly, by facilitating or
inhibiting deployment of broadband services into the underserved (few providers) and unserved (no current providers) geographic regions. In addition, some legislative and regulatory rules could directly help libraries obtain broadband connectivity. There is a broad and compelling public policy argument for library-oriented policy, especially since one general purpose of telecommunication policy is to maximize public access to high-speed services.

PR and general advocacy: More broadly, interviewees all expressed a need for broad public advocacy about the role of libraries in providing public access. Of course, this concern far transcends the specific issue of library connectivity, but there was a sense that general public support for funding libraries was not commensurate with what is known about the growth in public use of library connectivity. Somehow, the connection needs to be improved, and several specific steps were suggested:

- training in advocacy
- toolkits with resources for use by librarians in local advocacy
- the Gates Foundation name and reputation in support of library funding (Indeed, the OITP team found in the course of this project that the Foundation name seemed to open doors with state officials who had not prior to the visit thought about public libraries in the context of broadband policy.)
- announcement by a Gates Foundation senior official at a high profile event such as the National Governor’s Association of any Gates Foundation library interventions.
- demonstrations and “Dog and Pony” shows (as they were referred to by the focus groups) that would raise awareness of what high-speed connectivity could provide to the public

Of course, the Foundation, ALA, and other library groups already have projects underway to develop and sustain general advocacy efforts promoting both libraries in general and libraries as access providers to the digital media. However, PR and advocacy is listed here because it seems to remain a concern in the community that was raised repeatedly in interviews.

Create a national library network: The most expansive and expensive idea that was raised by one expert advisor was to create a national library network either out of the dark fiber (unused fibers in laid cable) that exists around the country or by contracting with telecommunications firms to develop the infrastructure. In some sense, this would duplicate existing attempts to build national fiber networks for higher education and research.

This idea, while expensive, is not as infeasible as it may seem, especially if it were done in partnership with existing higher education networks (Internet2 and LambdaRail). Many states have very high-speed networks that interconnect with Internet2 and LambdaRail, and some of those, for instance Missouri, connect libraries (although typically not at full Internet2 speeds.) Others have expressed interest in expanding access to the library community.
The “light” version of this intervention would be to work with the national Internet2 organization and affiliated state networks to encourage the greater incorporation of public libraries into their service communities.

**Continue state assessment visits:** In many states, the OITP team’s visit, which was intended to collect information for the study, actually affected relationships and changed the nature of the policy debate in a very positive way for libraries. Furthermore, several of the state librarians in the subject states asked for a report on the visit. The project team was very reluctant to provide such a report of any substance, because this was not the purpose of the visit, and it seemed inappropriate to make public concrete observations, assessments, or even recommendations, based on these necessarily limited assessments. However, these experiences also suggest that a continuation of these evaluative visits, perhaps in a modified format that would justify a formal report to the state library, would be a useful and positive contribution.

**National “fiber to the library” initiative:** A group in California, The Community TeleStructure Initiative (CTI), is promoting a grass roots approach to library connectivity that begins with local or state dialogues among policy-makers and high-tech industry. These discussions stress the significant contribution a highly-connected library makes to a community, coupled with a business incentive for telecommunication providers. The director of CTI has visions of bringing this process model to other states.

**Internet2 leading edge project:** At the very leading edge of speed (100 million to 1 billion bps), researchers are developing applications that, in only a few years could well be of significant importance to public libraries. The ability to support highly interactive applications that involve high-definition and three-dimensional renderings of objects will transform the nature of services public libraries will be asked to provide to their communities. It is important to begin to understand the nature of those applications and their implications for library services. An intriguing suggestion is a demonstration project involving a partnership among Internet2 and several libraries that already have very high-speed connectivity to explore these leading edge applications and demonstrate their potential.

### Current initiatives

Library connectivity has been a major issue for ALA and OITP for some time. Therefore, not surprisingly, ALA’s Washington Office has already begun taking actions informed at least in part by the investigation under this grant, including the following:

**Telecommunications advocacy preconference:** The Washington Office (WO) sponsored a day-long training session in telecommunications advocacy prior to the 2007 Annual Conference in Washington, DC. Nearly thirty states sent representatives for training on key telecommunications issues and advocacy techniques.

**Amendments to the Agriculture Reauthorization Bill:** This idea, raised in a meeting of telecommunications policy advisors, takes advantage of the current bill moving through
Congress that reauthorizes major programs of the Department of Agriculture. These programs include support for rural infrastructure development, and the WO is promoting language that would explicitly authorize funds for improving the connectivity of libraries in rural communities. Prospects for these changes seem good.

**FCC proceedings:** OITP routinely files comments with the FCC and has been in ex parte communications with them about a variety of issues involving broadband deployment and universal service. OITP has commented on the inadequacy of FCC data collection about broadband and its unacceptable low threshold definition of broadband. ALA has also suggested that the Advanced Services section of the Telecommunications Act of 1996 should be invoked and that it provides the FCC with a legal basis for more aggressive policies to encourage rapid deployment of high-speed service.

**E-rate simplification:** ALA has also been working for over a year with the FCC on a proposal for radical simplification of the E-rate discount process. The complexity of the program is a major deterrent to library participation.

**Discussions with Internet2:** OITP has initiated discussions with Internet2 about a possible demonstration project involving library use of very high-speed communications and advanced applications.

**Discussions with CTI in California:** OITP and the California State Library will cosponsor a workshop and planning meeting focused on library connectivity. Several senior state officials are expected to participate, including representatives form the state PUC, the California Fund, and other key players, as well as key representatives from the library networking community. This meeting has attracted the attention of the Federal Communications Commission and the Library of Congress, which may also send representatives. OITP is considering the possibility of hosting additional meetings in other states.

**State Web analyses:** OITP has worked with Florida State University researchers and programmers to develop an advocacy tool that can produce a colorful, graphical report on library connectivity in states and allows comparisons with other states or national statistics.
Assessment and Recommendations

The project assumed from the start that there would be no easy “silver bullets,” simple forms of intervention that would solve the connectivity problem for all or even the most vulnerable libraries, and the research certainly confirms this assumption. However, it was hoped that the research would identify a set of multiple, creative, immediate interventions that would help address the problem.

The above suggestions all seem to have merit, but they may or may not be specifically appropriate for any particular organization. Many of them reflect what the investigation suggests are necessary preconditions for successfully improving and sustaining high-speed library connectivity. However, taken individually, they are sub-optimal. They are each necessary but not sufficient for success. This outcome was somewhat surprising at first glance, but understandable when one considers the broader context of the problem.

Characteristics of a Successful Intervention

The study findings suggest that a successful intervention must be:

**Integrated:** Improving library connectivity in a sustainable way requires a systematic approach that addresses a range of barriers and needs and addresses the different stages of implementation. For libraries that have the most trouble sustaining connectivity, the barriers to improving high-speed connectivity have a much broader societal context, a complex of social, political, and economic, as well as technological issues. That is, connectivity is an infrastructure development problem, not easily reducible to obtaining sufficient funding to buy a “commodity” service.

In many parts of the country, the cost of even moderately high-speed connectivity can far exceed library budgets. The challenge is to increase the availability of affordable service as well as to find funds to obtain it when it is available. To achieve this end, libraries must engage in careful planning, form partnerships and coalitions to increase market power, place themselves in the general public debate over broadband deployment (a debate that is going on nationally as well as in nearly all states), and be sophisticated, informed consumers of telecommunication services. This is a tall order, and it implies that any successful intervention needs to be broadly conceived and comprehensive.

**Highly flexible:** The situation in each state is unique, principally because of different social and political contexts and a history of telecommunications development in each state, as well as differences in the structure and organization of the state’s library systems. As the findings showed, successful states followed clear, identifiable processes, but the technological, social, and political environments they worked in and the particulars of their solutions varied widely. Thus, while at the level of leadership, planning, and implementation, the investigation identified consistent patterns among the more successfully connected states, the actual strategies and implementations were much more varied.
Substantive and sustained: Improving infrastructure is, in general, a slow multiyear process, and any successful interventions will need to be sustained at a significant level for several years. Thus, depending on available funds, any intervention strategy will likely have more success if it concentrates more support into fewer states and regions than if it spreads support thinner and potentially below the critical level needed to really effect change. That said, the widespread nature of the problem and critical importance of this issue for public access computing would argue for a significant level of support, so that balancing these tradeoffs would be less necessary.

Sustainable: The goal is to leave behind a system of libraries equipped to stay ahead of the connectivity curve for the long term. Thus, from the start, any multiyear program of support must have a clear plan for phasing out. Support should focus on capacity building. At some point, temporary assistance with connectivity costs could be an important component of support, but only after capacity and sustainability issues have been addressed.

Recommended Strategy

Because of the findings and considerations above, the project team believes the Foundation should adopt an intervention strategy that has three principal components:

1. Initiate a **pilot program** of support that would pick a reasonably small number of states or more local groups for significant multiyear challenge grants. (A challenge grant means that the grantee would be asked to make a significant commitment of resources to the project.) These grants would support an initial planning and advocacy process that would concentrate on identifying needs, identifying the available technological opportunities, establishing or identifying exiting consortia or other partnerships, building policy support at the state and regional level, assessing funding sources, and creating a detailed operational plan. Subsequent support in these grants could pay for operationalizing the plan—connectivity, local technical support capacity, and whatever else the grantee identified in the planning effort as a particular need for developing capacity.

   This recommendation is specifically in terms of a pilot because of the complexity and flexibility of the grants being recommended and the need to work actively with the grantees, both to facilitate the process and to monitor the success for each. Thus, perhaps as few as five but no more than ten states should be selected for the first round of support.

2. In support of these state or regional grants, the Foundation should also fund a **national support structure** that would provide needed services targeted to the grant recipients, but that also could be made available to other states when appropriate.

   The initial core role of this national support structure would be to guide and coordinate the state recipients in their planning and procurement process. This
support would also include training by a consulting team with high-level expertise in such areas as technology, telecommunications policy, and planning and procurement and other special areas of need that may arise in the process.

3. Finally, there is a set of **ancillary projects**, which, though not directly in support of the state grants, would help move forward the long-term national debate. Among these are:

   a. A **demonstration project** in very high-speed connectivity that would showcase the new services and new roles in the community that libraries will provide with what are now advanced leading-edge bandwidth, but will in just a few years become commonly available (and probably in public demand) for libraries with adequate connectivity.

   b. A **national training program** in telecommunications advocacy reaching into states through state associations and State Libraries.

   c. A national effort to **develop national public and political support** for enhancing library connectivity, linking the library connectivity issue to the broader national concerns about broadband deployment and economic development.

Figure 3 shows how these activities interrelate.

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**Figure 3: Structure of recommended Intervention Program**

- **“Challenge” Grants**
  - Planning
  - Connectivity
  - Consulting
  - Training
  - Coordination
  - Publicity

- **National Support Activities**
  - Training in Policy Advocacy
  - Leading Edge “Dog and Pony” Demos
  - Building Political Awareness
  - E-rate Support

- **Important Ancillary Projects**
Conclusion

In summary, the investigation of library connectivity showed that:

- **The need is great.** Most libraries are struggling to keep up with growing demands for bandwidth.

- **The importance is profound.** Libraries are increasingly asked to provide vital Internet-based services to their constituents and are the sole or principal source of access. Furthermore, these services are consuming ever more bandwidth.

- **The problem is extraordinarily complex and systemic.** Increasing and sustaining the leading edge in bandwidth access plunges libraries into a much broader social debate about broadband deployment and requires that they deal with a broad range of stakeholders and policy makers with whom they have had little formal contact in the past.

Therefore, it is vitally important to the library community and the public that depends on them that the Foundation and/or some other change agent become significantly involved in addressing this issue and do so in a way that will help develop the long term capacity of the library community to obtain and sustain adequate bandwidth. The evidence from this investigation suggests that the library community is aware of the seriousness of the problem and is, for the most part, ready to act if provided the appropriate leadership and support.
APPENDICES
Appendix A
OITP Library Connectivity Project
Biographical Information

Project Director

Fred (Rick) W. Weingarten is Director of the Office for Information Technology Policy of the American Library Association, where he does policy analysis, advocacy, and education for libraries and librarians. Previously he held positions as Senior Policy Fellow for the ALA and Director of Public Policy for the Computing Research Association (CRA). He also was the first full-time Executive Director of CRA.

Dr. Weingarten was Manager of the Communication and Information Technologies Program at the Congressional Office of Technology Assessment, and prior to that was Program Director at the National Science Foundation, overseeing research programs in networking and the social impacts of information technology. He earned a BS in engineering at the California Institute of Technology and an MS and PhD in mathematics and computer science at Oregon State University. He has served on advisory groups for several government agencies, including service on the federal Computer System Security and Privacy Advisory Board. He currently sits on the Board of Directors of the Open E-Book Forum. The Association for Computing Machinery named him an ACM Fellow.

Principal Investigators

Nancy Bolt was State Librarian in Colorado for 18 years. In that role, she worked with public, school, and academic libraries and represented the interests of libraries to government, industry, and communities. She was also instrumental in creating one of the nation’s first statewide, publicly accessed network of library holdings, the Access Colorado Library and Information Network (ACLIN). In 2005, Bolt left the Colorado State Library and restarted her own consulting company, Nancy Bolt & Associates. Bolt specializes in training, conducting focus groups, project evaluation, and all aspects of planning. She has been active in the American Library Association for over 30 years and internationally for over 10 years. She is currently on the Governing Board of the International Federation of Library Associations (IFLA) and works extensively with libraries in the American Bulgarian Library Exchange (ABLE) project. Bolt has a Master’s in Library Science from the University of Missouri.

Mark Bard joined ALA's Office for Information Technology Policy in September 2006 as an Information Technology Specialist. A technologist by trade and an information scientist by training, he has a keen interest in how organizations use technology to further their goals. As part of that, he is especially interested in the intersection of technology and public policy. Previous research endeavors include investigating the cause and prevention of computer-related incidents within corporations and non-profits. Bard received a Masters of Science in Information from the University of Michigan, specializing in Information Economics and Policy.
Site Visit Team Members

**Bob Bocher** is the Technology Consultant with the Wisconsin State Library and is chair of the OITP Subcommittee on Telecommunications. He has an MLS from the University of Wisconsin-Madison and has been working in the area of information technology for over 25 years. Bocher has been instrumental in ensuring that all Wisconsin public libraries have broadband Internet access and over 97% are connected to BadgerNet, the state's telecommunications network. Bocher works closely with the state's network office to coordinate library access to BadgerNet, which is heavily subsidized by the state, making it affordable for even small, rural libraries. He has a special interest in privacy issues related to technology and recently co-authored *Privacy in the 21st century: Issues for public, school, and academic libraries.*

**Lynne Bradley** has worked on many legislative issues during her thirteen years at the ALA Washington Office. As the primary ALA lobbyist on telecommunications issues, she worked on the E-rate and other proposals in the Telecommunications Act of 1996, and has followed these issues closely during implementation and regulatory activities. She is Director of the ALA Office of Government Relations and has worked in a number of library systems, including the District of Columbia Public Library and the Prince Georges County Library System. Bradley is a graduate of the University of Maryland School of Library and Information Science and also holds a Masters Degree in Communications from the University of Maryland. Before coming to the ALA Washington Office, Bradley served three terms on the Takoma Park City Council as well as managed her own small "for-fee" research company and wrote for a local newspaper. She is a veteran of many local political campaigns and in another life has been a semi-professional art quilt designer and curator of fiber arts exhibits.

**Linda Schatz** is President of EdTech Strategies, LLC, a consulting firm providing expertise in the realm of education and information technology, education and library funding, and project management. Prior to forming EdTech Strategies, Schatz was the Vice President of Outreach and Education for the Schools and Libraries Division (SLD) of the Universal Service Administrative Company. As Vice President, Schatz was responsible for applicant services including the development and presentation of training materials about the E-rate program; the design of implementation procedures to meet Federal Communications Commission program rules; oversight of the SLD’s Client Service Bureau which managed over 150,000 calls annually from applicants and service providers seeking support; and the development and streamlining of online applications for the E-rate program. Prior to her work with the E-rate program, Schatz was responsible for the design and implementation of the Iowa Communications Network (ICN), a statewide video, voice, and data network serving the needs of Iowa’s schools, libraries, colleges, and universities. In addition, Schatz led the Michigan Information Network, providing E-rate training and statewide technology services to education and library agencies throughout the state of Michigan. She holds a Bachelor of Science in Business Administration from Mt. Mercy College and a Master of Science in Higher Education from Drake University.
John Windhausen, Jr. has worked in the communications policy arena in Washington, DC for over 20 years. He began his career as a staff attorney at the Federal Communications Commission in 1984, soon after the divestiture of AT&T. He moved to Capitol Hill in January, 1987, becoming Counsel and then Senior Counsel to Senator Hollings, Senator Inouye, and the Democrats on the U.S. Senate Commerce Committee. He participated actively in the drafting and passage of the 1992 Cable Act, the 1993 Spectrum Auction Act, and the Telecommunications Act of 1996. In June 1996, he joined a pro-competition consumer advocacy organization named the Competition Policy Institute as General Counsel. In January, 1999, he became the President of the Association for Local Telecommunications Services (ALTS), where he was responsible for helping to lead the facilities-based local telecommunications industry in its battles to uphold the pro-competitive principles embodied in the Telecommunications Act. He resigned from ALTS in October, 2004 to form his own consulting practice on telecommunications policy issues called Telepoly Consulting.

Telephone Interviewer

Karen Strege is currently the Project Director for the Western Council of State Libraries’ Continuum Education Project. This project seeks to improve the training and performance of those library directors without formal library education. Strege is also engaged in a number of research projects, including one for a non-profit organization seeking state health care reforms in Washington state. Previously she was the Montana State Librarian for nine years. She has worked in a variety of positions at public and community college libraries. Strege earned an MLS from the University of Washington and Ph.D. in education leadership at Gonzaga University.
APPENDIX B
INTERVIEW QUESTIONS
DATA TO BE COLLECTED IN EACH STATE

These questions fall in several categories. The questions are just guides to the discussion and give us an idea of the kind of information to be collected.

General Questions:

1. Where is the state library in your state’s structure? How does this position impact your ability to facilitate high-speed bandwidth for libraries in your state?
2. How is the state librarian involved in networking efforts at the state level?
3. What is your state's vision for public library Internet connectivity and network service provision?
4. What are the most successful methods that libraries have used to connect to high-speed access in your state? (Type of connectivity: state network, coalitions, regional networks, unique configurations, etc.)
5. What are the general problems and issues you face in getting high-speed access for local public libraries to the Internet and for other library functions?
6. Are there any studies in your state that would be helpful?
7. If the Bill and Melinda Gates Foundation were going to try and help in this arena, what could they do?

Questions about each network  These are the questions the team wants to ask the state run networks rather than the state library networks.

For our research, OITP is trying to determine the following:

1. Are public libraries connected to your state network? (which can be found in the document with us).
2. What kind of technology powers your network?
3. Where does funding come from your network?
4. What was the purpose for the creation of the network?
5. Who governs your network?
6. What are some of the best practices that you have about running your network?
7. What are some of the challenges your network faces?
8. How do you determine adequate bandwidth for a given connected entity?

If public libraries are connected:

1. Approximately how many are connected?
2. Do main library branches connect? or Can all library branches connect?
3. At what speeds are libraries connected?
4. Are the libraries on your network connected to Internet2 and/or Lambda Rail?
5. What was the driving force behind getting the libraries connected?
6. What services that your network organization provides are public libraries using?
7. Are there services that you would like to be able to provide to public libraries that you are unable to?
8. What barriers are faced by libraries when they want to join your network?

If public libraries are not connected (and a lot of these questions may be contextual based upon the environment in the state):

1. Are you planning on connecting public libraries? If so when? What speeds?
2. Why are public libraries not connected?
3. (Depending on the answer) Are you open to allowing public libraries to connect?

Questions for Telecommunications Companies. These are the questions asked of the telecommunication companies and perhaps government officials and the PUC.

   a. Where is the most pressing shortage of capacity? In the long-haul network, the “middle mile” between switching centers and the backbone? Or in the “last mile” connection to the consumer?
2. Who are the leaders in broadband deployment in the state? Cable? Bell Companies? Rural telephone companies? Municipalities? State? Others?
3. Are there any studies documenting the state of broadband deployment in your state?
4. What are the biggest impediments to greater broadband deployment?
5. How active has the state government been in promoting broadband deployment? For instance, has the state helped to aggregate demand? Has the State attempted to coordinate broadband networks? Has the state sponsored education plans for consumers?
6. Are there any restrictions on broadband providers that hinder the growth of the broadband market?
7. Have municipal control over rights-of-way been a barrier to broadband deployment? What kind of fees or conditions do they attach to using their rights-of-way?
8. What is the status of video franchise process? Who has the authority to award video franchises - the cities or the state? Is the current status helpful or harmful to broadband deployment? How could it be improved?
9. Are there any difficulties connecting local broadband networks to state networks or to long-haul networks?
10. Are there any state regulations issued by the state public service commission that particularly affect broadband deployment – either positively or negatively?
11. What affect does the federal high-cost fund have on broadband deployment in the state? The federal E-rate program? Rural health service fund?
12. Since our primary focus is getting affordable broadband capabilities to public libraries, what do you think are the major issues affecting libraries’ access to broadband?

13. Does the state have a universal service fund for schools and libraries? If so, has it worked? If not, should the state adopt such a program?

14. Have you heard from or interacted with the libraries in your state? Is there any coordination with the state librarian to promote greater broadband connectivity to libraries?

15. What recommendations do you have for promoting broadband deployment to libraries? How should the Bill and Melinda Gates Foundation focus its energies?

**Questions for High Connectivity States.** These would be asked of a state library network? They would be asked of the State Librarian or network manager/board.

- How and when was your network formed?
- Who participated in its formation? Who took a leadership role?
- What barriers were encountered and how were they overcome?
- What techniques did you use to get
  - Libraries to participate
  - Funding
  - Other
- Who belongs to your state’s network – libraries, schools, universities, other?
  Does the network only connect to the main library? Is branch connectivity the responsibility of the library entity?
- How is it governed and do libraries participate in the governance?
- Who manages it?
- How many public libraries belong?
- Are there activities at the state level that you feel you would need more bandwidth for?
- What bandwidth is available and how is it supplied?
- Is it scalable?
- How do you help libraries calculate how much high-speed access they will need? Or how do they calculate this?
- What are the general problems and issues you face in getting higher speed access for local public libraries to the Internet and for other library functions?
- Do you have a planning guide that helps local libraries make this decision?
- How is your network funded?
  - State
  - Regional
  - Local
  - E-rate
  - Higher Education Institutions
  - Membership fees
  - State Level Telecommunications Funds
  - Other
- E-rate: What role does E-rate play in high-speed access for public libraries?
Who applies for the E-rate funds?
How does CIPA impact?

If the Bill and Melinda Gates Foundation wanted to assist public libraries to achieve high-speed connectivity, what would be most helpful?

Questions for Low Connectivity States. These questions will be asked of the State Librarian, and State Library staff and anyone else who might provide information.

1. Where is the state library in your state’s structure? How does the state library’s position impact high-speed connectivity?
2. What is your state's vision for public library Internet connectivity and network service provision?
3. Describe your attempts to get high-speed connectivity in your state. Are there pockets of high connectivity? What accounts for these pockets?
4. What do you see as the largest barriers to connectivity?
5. What are the general problems and issues you face in getting high-speed access for local public libraries to the Internet and for other library functions?
6. Are there any studies in your state that would be helpful?
7. If the Bill and Melinda Gates Foundation were going to try and help in this arena, what could they do?
8. E-rate: What role does E-rate play in high-speed access for public libraries?
   1. Who applies for the E-rate funds?
   2. How does CIPA impact?

Questions for Focus Groups

There will be at least one focus group with local public libraries in each state. The state librarian will be asked to set it up with a range of librarians from both small and large libraries, and from libraries with high and with low connectivity if there is not a state network.

We would begin the interview with an explanation of the project and its purpose. Possible questions:

- Describe your current network. How is it configured? How much bandwidth do you have? How do you get it? What does it cost? How is it funded? Is it scalable?
- What do you use your bandwidth for?
  - Internet connectivity – describe uses
  - Internal operations – describe uses
  - ILS/PAC – describe
- What would you like to do with your Internet Connection that you cannot do with your current environment?
- Is your bandwidth sufficient? If no, what problems does the insufficient bandwidth cause for your staff and patrons?
• What would you consider sufficient bandwidth? How did you arrive at that amount?
• If you had more bandwidth, what would you use it for? What is your vision for your library’s connectivity?
• What are the barriers to getting more bandwidth?
• E-rate: What role does E-rate play in high-speed access for public libraries?
  o Who applies for the E-rate funds?
  o How does CIPA impact?
• Who at the regional or state level provides you assistance in analyzing your needs and getting you more bandwidth?
• If the Bill and Melinda Gates Foundation were to offer assistance in getting more of US public libraries with higher bandwidth, what would be most helpful?

Questions for Government
  a. What is your state’s vision for high-speed broadband connectivity in the state? How are you defining high speed?
  b. What steps are you taking (have you taken) to make this vision a reality?
  c. What is taking (has taken) the lead in bringing this about?
  d. How successful have you been so far?
  e. What factors contribute to your establishment of a successful broadband network?
  OR
  f. What barriers are you encountering in your efforts to establish a successful broadband network?
  g. What role do you see for public libraries in your state’s broadband vision?
  h. Is the state librarian involved in your work to implement high-speed broadband access? (Ask if it seems appropriate)
  i. What might the Bill and Melinda Gates Foundation do to help local public libraries get high-speed connectivity?
## APPENDIX C
### STATE NETWORK COMPARISON CHART

<table>
<thead>
<tr>
<th>State</th>
<th>Cal-REN</th>
<th>MOREnet</th>
<th>OPLIN</th>
<th>KEN</th>
<th>MERIT</th>
<th>Kan-ed</th>
<th>KANREN</th>
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<tbody>
<tr>
<td><strong>Purpose of the network</strong></td>
<td>Intrastate, Internet and Internet2 Connectivity</td>
<td>Intrastate, Internet and Internet2 Connectivity</td>
<td>Intrastate, Internet and Internet2 Connectivity</td>
<td>Internet and Internet2 Connectivity</td>
<td>Intrastate, Internet and Internet2 Connectivity</td>
<td>Intrastate Distanced Education Network</td>
<td>Intrastate, Internet and Internet2 Connectivity</td>
</tr>
<tr>
<td><strong>Brief History</strong></td>
<td>Operated by the Corporation for Education Network Initiatives in California, Cal-Ren is designed to connect education centers to advanced networking. MOREnet was founded in the 90s by a group of people realized that it was important for Missouri to connect these entities to the Internet. Formed in 1994 to allow libraries could buy into postalized rates for connectivity; First connection put into place in 1996. Formed as part of the Governor's Prescription for Innovation. KEN is currently being deployed to K12, with a goal of having all connected by end of 2007. authorized in legislation in 2001; funded in 2002; The network came about as a way to connect schools and libraries together for high-speed data and video.</td>
<td>Formed in 1994 to allow libraries could buy into postalized rates for connectivity; First connection put into place in 1996.</td>
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<tr>
<td>Network Architecture</td>
<td>Cal-REN</td>
<td>MOREnet</td>
<td>OPLIN</td>
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<td>MERIT</td>
<td>Kan-ed</td>
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<td>Backbone runs throughout the state, with fiber to some institutions and managed telecommunications circuits to others.</td>
<td>Backbone runs throughout the state, with fiber to some institutions and managed telecommunications circuits to others.</td>
<td>Five network access points linked together by fiber optics. Libraries connect via connectivity to one of the access points</td>
<td>Star Topology--All entities connect back to Columbus via eight routers. Two routers then go out to the Internet, which is provided by the State IT office.</td>
<td>AT&amp;T runs fiber connections out to schools and carries traffic over its backbone.</td>
<td>Fiber backbone that runs throughout the lower peninsula, down through Chicago and up Wisconsin to the UP. Last mile to access points on the network either through fiber owned by MERIT or by circuits owned by telecommunications companies</td>
<td>A backbone that runs throughout the state; with 29 access points. Libraries connect to these access points, and have traffic routed between commodity Internet and Kan-Ed traffic.</td>
<td>Seven network access points throughout the state linked together. Libraries connect via connectivity to NEKLS or the access points</td>
</tr>
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</table>

| Governance | Board of directors from member institutions. | Council made up of members and other stakeholders | OPLIN reports to the State Librarian and a Board of Directors | Overseen by the Department of Education and various Advisory Committees | Overseen by a board of directors from the 12 public universities; Has an advisory board compromised of other stakeholders. | Overseen by the Kansas board of Regents and an advisory panel of members | Overseen by board of directors |

<p>| Services Offered | Internet Connectivity Internet2 SEGP Network Management Video Conferencing | E-rate Application Filing Internet Connectivity Internet2 SEGP Member Meetings Network Management Subscription Databases Technical Support Training Video Conferencing | Circuit Charges Customer Service E-Mail Internet Connectivity Network Management Subscription Databases Technical Support Training | Internet Connectivity Internet2 SEGP Network Management -Within the school districts | Anti-virus DNS Educational meetings E-Mail Internet Connectivity Internet2 SEGP Network Management Security Services SPAM Guard Video Conferencing | Connectivity Grants Database subscriptions Grant Programs Intrastate connectivity Network operations Technical Support Video Conferencing | Internet Connectivity Internet2 SEGP Support and Training Network Operations |</p>
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<th>Cal-REN</th>
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<th>Kan-ed</th>
<th>KANREN</th>
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<tr>
<td><strong>Bandwidth allocation</strong></td>
<td>Monitors bandwidth usage. Works with entities to gauge what new services they may provide that would require more bandwidth. Plans ahead to ensure that they can receive E-rate discounts on bandwidth upgrades.</td>
<td>In the beginning, everyone got a T1. Now, the following is used to compute funding: .010 mbps (per public workstation) + .015 (per staff) OPLIN staff does not think this formula will last much longer.</td>
<td>10 mbps to most schools; 100 to those that need it and 200 to one larger district.</td>
<td>Monitors bandwidth usage Works with entities for future needs.</td>
<td>Connecting entity determines own bandwidth.</td>
<td>Assumptions based upon number of workstations, but mostly empirically based.</td>
<td></td>
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<tr>
<td><strong>E-rate</strong></td>
<td>MOREnet files for E-rate on behalf of all of the eligible entities connected to MOREnet. If they choose to not be CIPA compliant, the entity is charged the amount MOREnet would have received (in 2006, $1300 per T1).</td>
<td>Applies for E-rate discounts on behalf of connected entities for telecommunications. Internet Connectivity for libraries that are CIPA compliant (50%).</td>
<td>Dept. of Ed will apply for E-rate on behalf of schools for connectivity.</td>
<td>Does not directly apply for E-rate since they are a service provider but provides E-rate eligible services.</td>
<td>Applies for E-rate discounts for backbone. Their subsidy program is in lieu of E-rate (that is entities receiving the subsidy don’t need to apply for E-rate).</td>
<td>Does not directly apply for E-rate since they are a service provider but provides E-rate eligible services.</td>
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## APPENDIX D
EXAMPLES of the COLLABORATIVE PLANNING PROCESS MODEL

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<thead>
<tr>
<th>Element</th>
<th>Maryland</th>
<th>Ohio</th>
<th>Michigan’s UP</th>
<th>Bill and Melinda Gates Foundation, A Colorado Perspective</th>
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<tr>
<td>Leadership</td>
<td>Leadership was taken by the Division of Library Development and Services (Maryland State Library) and the Enoch Pratt Free Library. The Pratt Library had an Internet connection that could be used as the base of the network.</td>
<td>Leadership was taken by a professor at Kent State University and the Executive Director of the Ohio Library Council (Ohio Library Association).</td>
<td>Regional library co-operatives in the UP.</td>
<td>Initial leadership was taken by the Bill and Melinda Gates Foundation who described the vision and convinced states to participate</td>
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<tr>
<td>Vision</td>
<td>The initial vision was to provide Internet access in all Maryland libraries for library customers. They saw themselves as pioneers in this effort were the one of the first states (1994) to provide Internet access for the public. The original vision is “Sailor will provide the residents of Maryland with rapid, easy access to information, materials, and services from any available information source.”. The current vision is “Sailor is a trusted, customizable resource that</td>
<td>There was already a statewide network for academic libraries. The vision was to establish a public library network. The vision was stated as “to develop a plan to ensure equity of access to information for all Ohio citizens... All citizens of Ohio must be able to use their public library to access the ever-increasing amount of electronic information sources.”</td>
<td>The co-op realized they needed to get connectivity or risk being left behind in the information age. As they self-describe themselves: “Our connectivity allows us to do what we need to do vs. what we want to do.”</td>
<td>The vision was for every public library serving a population with a certain percentage of people in poverty to have computer access for the public. The vision was clearly articulated and, in fact, state librarians were given a list of eligible libraries. The vision included computers for both the public and staff, software with content in both Spanish and English, and technical support.</td>
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<td>Element</td>
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<tr>
<td>Inclusivity and Partnerships</td>
<td>Partnerships were first between the State Library and Pratt Library but soon all libraries were invited to participate since the network was to be a statewide cooperative network. Because this used a large part of the state’s yearly LSTA funds, local libraries had to agree on this investment. In planning and operating the network there was established a Management Committee and a Network Managers Group of technical staff. A “stakeholders” meeting was and is held each year.</td>
<td>Local librarians were invited to meetings to discuss the design, governance, and services that would be offered by the network. Three task forces were created: 1) a “Blue Ribbon Commission” with membership of library directors across the state; 2) a network/technology issues task force; 3) an administration and funding issues task force. These task forces were asked to plan the network and its implementation.</td>
<td>Works with 5 ISPs, including MERIT, the statewide higher education network. Works with Regional Educational Media Center (REMC, their K-12 regional cooperative) to provide video conferencing capabilities. Also works with a telemedicine network.</td>
<td>The primary partner of the Gates Foundation in this effort were the state libraries in each state that worked to prepare libraries for the new computers. In Colorado partners were also the regional library cooperatives who work closely with local libraries.</td>
</tr>
<tr>
<td>Advocacy</td>
<td>The new network was dubbed “Sailor” to reflect the geographic location of Maryland. After an initial PR campaign, the state library conducted a public opinion poll and discovered 14% of the</td>
<td>The Ohio Library Council prepared a document entitled “Ohio Public Library Information Network (OPLIN)” in 1994. This document was used as the basis of discussions and meetings around the state. It included the vision, need</td>
<td>The Upper Peninsula of Michigan is a rural environment that has a low population density. To not get left behind, the co-op wanted to ensure that all libraries had access to broadband connectivity.</td>
<td>The Gates Foundation published national advocacy material about the importance of libraries in addressing the digital divide. They also assisted state libraries in doing the same. The commitment to fund computers in every</td>
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<td>public respondents and 100% of government officials reported using Sailor. The survey itself was an advocacy tool.</td>
<td>(mainly equity of access), governance, technology design, questions and answers; and a list of people already involved.</td>
<td></td>
<td>library allowed for a significant advocacy campaign on the role of libraries. There was also a press conference when the computers were installed.</td>
</tr>
<tr>
<td>Demonstration Models</td>
<td>No data available</td>
<td>The OPLIN summary document had scenarios of how the network would be used for business, genealogy, disaster preparedness, economic development, resource sharing, videoconferencing, etc. OPLIN also sent people to local meetings to demonstrate what the Internet could do.</td>
<td>No data available</td>
<td>In Colorado, this was primarily a list of the software that would be available and the computers that would have Spanish content.</td>
</tr>
<tr>
<td>Aggregation of demand and services</td>
<td>The Sailor networked established PoPs in 23 counties by 1995. By 1997, local libraries asked and were allowed to share their Internet connection with local government and K-12.</td>
<td>OPLIN wanted as many public libraries involved as possible.</td>
<td>The co-op has 63 libraries and ‘takes 7 hours to drive from one end to the other.’ The libraries are all connected at speeds ranging from 256 kbps to 3 mbps.</td>
<td>This was more a factor in the preparation for the Gates computers. Libraries had to have a minimum of 56k connection. The Colorado State Library worked with regional cooperatives and telecommunication companies to accomplish this in a cost-effective way.</td>
</tr>
<tr>
<td>Good technical plan for implementation and support</td>
<td>The librarians agreed to build a network based on Internet Protocol and built on the Pratt ILL Internet connection. A Sailor Network Managers Group was invited to help design the network. Libraries that were hesitant about joining still sent representatives to make sure that their needs would be met.</td>
<td>A committee of the technical staff of local libraries was invited to help design the network. Libraries that were hesitant about joining still sent representatives to make sure that their needs would be met.</td>
<td>Is required to develop and submit a technical plan to the FCC as part of the E-rate application process.</td>
<td>The Gates Foundation provided staff that unpacked and installed the computers. Local librarians were required to attend a training session.</td>
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<tr>
<td>Ongoing training and support</td>
<td>established to provide technical oversight and planning assistance. Technical staff of 3 regional libraries provide ongoing support and training in their regions. By 2002, the goal was a T1 connection to each library.</td>
<td>Service offered by the network</td>
<td>Service offered to libraries by regional library co-op and/or Michigan Library Consortium.</td>
<td>Phone in service provided by Gates Foundation</td>
</tr>
<tr>
<td>State, regional or local champion</td>
<td>The champion in getting the network established was the State Library. In 1995, when Sailor won a national award, the ceremony was attended by the then Governor and Superintendent of Education.</td>
<td>The Governor in 1994 endorsed the use of technology in education and OPLIN built on that endorsement.</td>
<td>Suzanne Dees, Leader of the library Co-op.</td>
<td>The primary champion was the Colorado State Library along with significant interest from state legislators.</td>
</tr>
<tr>
<td>Funding</td>
<td>Sailor was established using LSTA funds. This involved convincing local librarians that Sailor was worth that initial large investment. LSTA funding continued until 2000 when state funding was established.</td>
<td>Funding came from a state appropriation and with the expectation that local libraries would pay to connect their branches to each other and the network. Ohio public libraries receive most of their operating funds from the state.</td>
<td>E-rate, state supported co-op and local funding.</td>
<td>The initiative of the Gates Foundation urged the Colorado State Library to invest almost ½ million in LSTA funds to prepare all libraries in the state with a minimum 56k connection. While not a requirement of the Gates Foundation, CSL also increased training on E-rate in order to help local libraries pay for their</td>
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<td></td>
<td>The Ohio State Library was less involved in the initial organization of OPLIN.</td>
<td>The state library delegates connectivity to the co-ops in Michigan, with some, such as Superiorland Library Co-op proving telecommunications services.</td>
<td>connectivity. Local libraries were asked to commit to future technology funding.</td>
</tr>
<tr>
<td>Role of the State Library</td>
<td>The State Library took the initial lead and has been involved in all aspects of planning, funding, and implementation.</td>
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<td>The State Library played a major role in preparing libraries for the Gates computers and in supporting them once the computers were installed.</td>
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Appendix E
A Collaborative Planning Process Model
A Summary of Components

1. Leadership
   At the state or regional level, someone takes the lead. Sometimes it’s a group of people who show the leadership. Sometimes it’s an outsider who believes in the goal and can motivate others to join the effort. However, there is always strong and continuing leadership. At the state level, the leadership works to bring about agreement and doesn’t take sides, except advocating for the involvement of libraries.

2. Vision
   At the state or regional level, there is a clear “big” vision of what is wanted: connectivity of an entire state or region; the level of that connectivity; the services that can be offered; and the benefit to the communities the libraries serve. There is agreement about the vision and commitment to finding a solution to reach the vision.

3. Inclusivity and partnerships.
   At the state level, many people representing a variety of interests are involved. If the network includes more than libraries, then libraries and state agencies are often invited to participate in the planning and vision development. If the network is to be a library network, library leaders from across the state are invited to participate. The vision is widely shared. There are various committees (e.g., technical, policy, governance) with people working on ways to implement the vision. All stakeholders whose participation is critical to the success of a network are invited to participate in planning.

4. Advocacy for the vision
   Successful projects have a strong advocacy effort that describes and lobbies for the vision. Advocacy must occur at both the state and local level in order to convince policy makers, funders, and even reluctant librarians that the vision is worth funding and implementing.

5. Demonstration models
   Not everyone understands the need for broadband in general and for its role in helping libraries serve their communities in particular. Successful broadband deployment strategies include showing how broadband can and will be used and the benefit to local communities in terms of E-Government, economic development, emergency preparedness and response, education, and preserving rural values.
6. **Aggregation of demand and services**
Demand is aggregated to make the business case to telecommunications providers that it is worthwhile to deploy broadband. Sometimes this results in “postalized” rates where everybody pays the same rate or categories of rates, allowing more isolated areas to be served. Sometimes one provider responds to an RFP and gets a contract; sometimes it is a coalition of providers who serve the entire state. But the demand is always aggregated.

7. **Technical plan for implementation and support**
A good technical plan is developed to solve connectivity problems across the state. The people developing this plan look for the best solution for all, include library technology specialists, and tend to be technology neutral. The plan also includes provision for ongoing support of local libraries.

8. **Training librarians about the new technology**
Some librarians resist new technology (including broadband) because they do not understand it and are uncomfortable. Librarians need to be trained in the new technology so they are comfortable with using it.

9. **Champion at state, regional, or local governmental level**
Some library networks were created without a state champion but it’s more difficult. Sometimes the state leadership was the Governor, sometimes a legislator, sometimes someone in a state agency, sometimes in the budget office. Sometimes libraries were included in a larger state network, sometimes the librarians were on their own.

10. **Funding**
At the state level, money came from multiple sources. Aggregation of demand led to lower overall costs. State funds to the State Library or directly to a network supplemented local funds. E-rate discounts were used extensively. LSTA and other grant funds assisted; a financial package was put together to fund the entire project.

11. **The State Library plays a role**
The State Librarian plays a role and so do State Library staff. They are all involved in bringing people together, deciding to use funds creatively, the “road show”, and training. State Library staff can help facilitate partnerships at the state level and encourage partnerships at the regional and local level as well. State Library staff are key advocates for libraries at all levels.
APPENDIX F
Documents Examined as Part of This Study

Documents Cited


**Other National Documents Reviewed**


**Other State Documents Reviewed**


APPENDIX G
STATE PROFILES

California
Profile for ALA-OITP

State Library of California

The State Library of California is an independent department reporting to the Governor, who appoints the State Librarian, subject to confirmation by the State Senate. The State Librarian is Susan Hildreth, who was appointed in July 2004. Biographical information is available at http://www.library.ca.gov/html/Hildreth_Bio.cfm

The Library of California Board consists of nine members appointed by the Governor and four by the Legislature. The state board determines policy for and authorizes allocation of funds from programs of the Library of California Act and the California Library Services Act. Members serve for four years, representing various constituencies, and also comprise the State Advisory Council on Libraries for the federal Library Services and Technology Act. The State Librarian serves as Chief Executive Officer of the Board.

State Library Vision for Connectivity


Need 2: Californians need better availability and understanding of technology systems and electronic resources to fulfill their need to learn from all types of library services and resources.

Examples of Solutions (in alphabetical order):
--Development of an infrastructure supporting statewide access to electronic resources
  --Development of electronic networks to enable resource sharing
  --Development of library-centric databases and finding tools
--Development of templates for automation systems that are standards-based in accordance with statewide resource sharing protocols
  --Digitization of special collections
  --Increased interlibrary collaboration to expand resource base
  --Providing increased, affordable access to the Internet
  --Providing increased availability of electronic resources
  --Subsidizing initial start-up costs for high-speed connections
  --Training in use of computers and electronic resources

System Libraries

The California Library Act Statutes created fifteen System Libraries. Systems are responsible for providing back-up reference services and training to members. Systems Libraries also identify and address issues of
common concerns and coordinates collaborative projects among members and are the hub of interlibrary loan activity.

**California's Statewide Universal Services Fund**

**Background:** The California Teleconnect Fund (CTF) was established by the California Public Utilities Commission (PUC) in 1994. It provides discounted telecommunications services for qualifying schools, libraries, hospitals, and community-based organizations.

**Purpose:** Libraries are entitled to a 50% discounted rate for measured business service (local exchange service), switched 56, T1 service, and DS-3 and up to and including C-192 services or their functional equivalents.

**Funding:** The CTF is funded by an all-end-user surcharge billed and collected by telecommunications carriers, which, in turn, remit the surcharge monies to a financial institution as directed by the PUC.

**How Libraries Apply:** The California State Library certifies that the library applicant is eligible. As of January, 2006, the PUC first applies the library's E-Rate discount. A Teleconnect Fund discount is then calculated on the remaining amount. If the library has not applied for E-Rate, the PUC calculates and applies a statewide average E-Rate discount before determining the amount eligible for the Teleconnect Fund.

**Administrative Committee (CRT-AC):** The CTF-AC advises the Public Services Commission regarding the development, implementation, and administration of the CTF and to carry out the program under the Commission's direction, control, and approval. Vivian Pisano, San Francisco Public Library, vpisano@sfpl.lib.ca.us, represents libraries on the CRT-AC. Linda Crowe, Peninsula Library System, crowe@plsinfo.org is the alternate representative.

**Number of libraries participating:** According to the latest available statistics, 96 public libraries apply to the CTF.

**Statewide Broadband Initiatives**

**California Emerging Technology Fund**

As a condition of approving the mergers of SBC/AT&T and Verizon/MCI, the California Public Utilities Commission (PUC) ordered SBC/AT&T to commit $45 million and Verizon/MCI to commit $15 million ($60 million total) over five years to the California Emerging Technology Fund (CETF). The Commission established the CETF to achieve ubiquitous access to broadband and advanced services in California using emerging technologies by the year 2010. CETF will finalize a strategic plan in March 2007 and plans to open a funding window in spring 2007 with grant decisions by summer 2007.

Funds dedicated to the CETF will be used to attract matching funds in like amounts from other organizations. The $60 million initial endowment will be matched by other private, non-profit, or government entities for specific projects to reach a total goal of at least $100 million in funding over five years.
The CETF will focus a significant amount of its resources on the needs of underserved communities and bridging the Digital Divide. At least $5 million will be earmarked to fund telemedicine applications that serve California’s underserved communities, particularly rural areas and facilities with a large number of indigent patients. Underserved communities include but are not limited to individuals, groups, and organizations that face telecommunications challenges or disadvantages due to physical disabilities, low incomes, inadequate telecommunications infrastructure, language and cultural differences, lack of technological understanding and/or equipment, and other constraints.

The CETF governing board is responsible for establishing its own articles of incorporation, bylaws, and charter. The Board is comprised of 12 total appointees. In July 2006, Ms. Sunne Wright McPeak sunne_mcpeak@cetfund.org was appointed President and Chief Executive Officer of the CETF. Ms. Wright McPeak is also a member of the Broadband Task Force.

Broadband Task Force

On November 28, 2006, Governor Schwarzenegger appointed 21 technology leaders to a Broadband Task Force to engineer plans to remove barriers to high-speed cable and wireless access. The governor’s creation of the task force comes as the PUC is starting up the California Emerging Technology Fund. More information about the Task Force is available at http://www.calink.ca.gov/default.asp. A list of task force members is available at http://www.calink.ca.gov/aboutus/privatesector.asp. The co-chairs of the Task Force are Charlie Giancarlo, Cisco Systems, and Michael Liang, mliang@bth.ca.gov Deputy Secretary for Information Technology, Business, Transportation, and Housing.

The Broadband Task Force will recommend ways to expand the high-speed data transmission network, with a preliminary report in 90 days, followed by a comprehensive study within a year of establishment. The preliminary report will focus on strategies that can be pursued at an administrative level and will either reduce bottlenecks or build upon “best practices”. The comprehensive report, at a minimum, will include the following:

State agency role in the Broadband Task Force: The Governor appointed the Business, Transportation and Housing Department (BTH) as the lead agency. The Governor also established a Cabinet work group to assist BTH. Each state agency is required to appoint an executive staff member to serve on the work group. According to the Governor’s order, State Agency liaisons on the working group will actively support interagency broadband efforts. Liaisons will inform interagency decision making by gathering broadband-related material from entities under their agencies. Pursuant to BTH guidance, State Agency liaisons also will have the authority to dictate policies and practices relating to broadband within their respective Agencies, and they will act on behalf of their Agency secretaries. Liaisons will have the right to review all Cabinet working group materials prior to their public release. Information about the Working group is available at http://www.calink.ca.gov/framework/cabinetworkinggroup.asp.

Public Libraries
California has 179 public libraries: 49 county, 111 city, one combined city-county, 12 district and six Joint Power Authority public libraries.

These public libraries include:

- 2,436 total public service points, including mobile library service stops.
- 166 main libraries
- 602 branch libraries
- 325 library stations
- 60 mobile

**Library connectivity:** The most recent statistics show connection speeds in 1100 library outlets as follows:

<table>
<thead>
<tr>
<th>Speed</th>
<th>Number of outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>18</td>
</tr>
<tr>
<td>28.8 (Dial-up modem)</td>
<td>6</td>
</tr>
<tr>
<td>56 -256 (Dial-up modem, ISDN)</td>
<td>44</td>
</tr>
<tr>
<td>257 - 768 (ISDN, T1, Frame Relay, DSL)</td>
<td>224</td>
</tr>
<tr>
<td>769 -1544 (DSL, T1, Frame Relay,)</td>
<td>616</td>
</tr>
<tr>
<td>1544 - 6312 (T2, D52)</td>
<td>82</td>
</tr>
<tr>
<td>44736 - higher (T3, D53, Fiber Optic)</td>
<td>110</td>
</tr>
</tbody>
</table>

**E-rate:** 53% of libraries in California receive E-rate discounts. Since 1998, California libraries have received $28,955,131 in discounts.

**Internet2 SPEGs:** California has an Internet2 SPEG, but libraries are not connected

**FCC Data**

**Providers of high-speed Lines by Technology**

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,001,529</td>
<td>38,728</td>
<td>161,115</td>
<td>2,956,932</td>
<td>132,473</td>
<td>Data withheld</td>
<td>39,329</td>
<td>Data withheld</td>
<td>0</td>
<td>9,395,285</td>
</tr>
</tbody>
</table>

**High-Speed Lines by State (Over 200 kbps in at least one direction)**
### Universal Service Fund

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>507,844</td>
<td>862,835</td>
<td>1,639,921</td>
<td>2,527,275</td>
<td>3,378,373</td>
<td>4,608,822</td>
<td>5,294,566</td>
<td>5,954,876</td>
<td>7,337,831</td>
<td>9,395,285</td>
</tr>
</tbody>
</table>

#### Payments from USF to Service Providers

<table>
<thead>
<tr>
<th></th>
<th>High Cost Support</th>
<th>Low-Income Support</th>
<th>Schools &amp; Libraries</th>
<th>Rural Health Care</th>
<th>Total</th>
<th>Estimated Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>98,866</td>
<td>304,668</td>
<td>220,789</td>
<td>456</td>
<td>624,779</td>
<td>707,331</td>
</tr>
<tr>
<td>% of Total</td>
<td>9.58%</td>
<td></td>
<td></td>
<td></td>
<td>9.58%</td>
<td>10.85%</td>
</tr>
</tbody>
</table>

### Statewide Broadband Deployment Reports


This report updates a more complete report by the PUC released in 2005 and available at [http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/46428_D0505013_BBReport_2of9.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/46428_D0505013_BBReport_2of9.PDF). Of special interest to team members is a discussion in Chapter two, section six entitled “Is Broadband Reaching Everyone?”


### Video Franchising

California was the eighth state to enact a statewide video franchise law. The other states with video franchise laws are Indiana, Kansas, New Jersey, North Carolina, South Carolina, Texas, and Virginia.

The new law is called the Digital Infrastructure and Video Competition Act of 2006 (DIVCA) and creates a new state franchise process that replaces the current local franchise process to speed new infrastructure investment and to promote competition for broadband and video services in California.

DIVCA directs the PUC to issue statewide franchises for the provision of video services in the state. The PUC has a limited role set forth by DIVCA that involves approving
Local entities, not the PUC, have sole authority to regulate the public, education, and government (PEG) channel requirements; Emergency Alert System requirements imposed by the Federal Communications Commission; and federal and state customer service and protection standards. A local entity will be the lead agency for any environmental review with respect to network construction, installation, and maintenance in public rights-of-way. The PUC expects to work in partnership with the local entities to ensure that issues of concern are promptly dealt with. The PUC has until April 2007 to implement the new law.

Idaho Profile for ALA-OITP

Idaho Commission of Libraries

The Commission is in the Executive Branch of Idaho state government under the State Board of Education. The Commission is governed by the Board of Library Commissioners consisting of five members appointed by the State Board of Education.

The Board of Library Commissioners appoints the State Librarian who serves at its pleasure. The State Librarian implements the Board's policies and rules.

Ann Joslin is the Idaho State Librarian, appointed in 2005. Ms. Joslin was an Associate State Librarian before her appointment. She succeeded Charles Bolles, who served as State Librarian for 24 years.

ICFL Statewide activities

In August of 2005, the Idaho Library community gathered in a “Think Tank” to consider the future of Idaho libraries. Working with science fiction writers, experts on trends and libraries, and facilitated by planning expert and futurist Glen Hiemstra, the participants explored trends, discussed alternate future scenarios for Idaho libraries, and proposed ideas for a vision.

After this event, more than a hundred Idahoans gathered in a series of seven regional meetings to learn the results of the Think Tank. Participants in the regional meetings provided recommendations on trends to consider, ideas for improving the vision themes, and suggestions on how the vision might be implemented. Finally, a Steering Committee met to refine the vision and develop proposed strategies based on the input. The report is available at http://libraries.idaho.gov/files/default/2020vision-document.pdf

Libraries Linking Idaho (LiLI)
LiLi is an alliance of libraries and library consortia working together to further the common good. LiLi is a project of the Commission for Libraries and the Idaho library community. LiLi’s vision is to:

1. Offer services to all the libraries in Idaho,
2. Extend and supplement local and regional resources and services to the citizens of Idaho,
3. Build on the strength of existing networking and resource sharing efforts in the state, and
4. Provide a framework for future cooperation that recognizes the diverse missions and strengths of its participants.

The LiLi Web site became available in October 1997. In 1998, the State Legislature approved funding for statewide access to online databases and the funding continues today. LiLi has started a group catalog linking Idaho libraries catalogs through a contract with OCLC. The LiLi Unlimited program (group catalog and unlimited ILL) is being implemented in four phases. As of January 2006, 115 libraries participated. These libraries include all of Idaho’s academic libraries and two-thirds of public libraries.

Idaho Public Libraries

Idaho has 104 publicly funded library jurisdictions including, 51 districts, 50 cities, and three school-community libraries. Idaho has 102 central library buildings, 38 branches, and seven bookmobiles.

Public Libraries and the Internet

Connection Speeds

<table>
<thead>
<tr>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT 769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.40%</td>
<td>7.50%</td>
<td>10.00%</td>
<td>19.90%</td>
<td>24.90%</td>
<td>12.90%</td>
<td>7.50%</td>
<td>54.80%</td>
<td>37.80%</td>
</tr>
</tbody>
</table>

**E-rate:** 41% of libraries in Idaho receive E-rate discounts. In 2006, SLC reports $102,690 in commitments. In 2002, SLC reports $82,630 in discounts to Idaho’s libraries.

**Internet2 SPEGs:** Idaho does not have an Internet2 SPEG.

Providers of high-speed Lines by Technology
High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
<thead>
<tr>
<th>Year</th>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>97,662</td>
<td>480</td>
<td>1,514</td>
<td>75,185</td>
<td>1,078</td>
<td>Data withheld to maintain firm confidentiality</td>
<td>29,915</td>
<td>Data withheld to maintain firm confidentiality</td>
<td>0</td>
</tr>
<tr>
<td>2001 June</td>
<td>20,233</td>
<td>43,119</td>
<td>64,353</td>
<td>99,845</td>
<td>126,121</td>
<td>149,023</td>
<td>167,926</td>
<td>202,521</td>
<td></td>
</tr>
</tbody>
</table>

Universal Service Fund

<table>
<thead>
<tr>
<th>High Cost Support</th>
<th>Low-Income Support</th>
<th>Schools &amp; Libraries</th>
<th>Rural Health Care</th>
<th>Total</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>% of Total</td>
<td>Amount</td>
<td>% of Total</td>
<td>Amount</td>
<td>% of Total</td>
<td></td>
</tr>
<tr>
<td>55,055</td>
<td>3,923</td>
<td>2,797</td>
<td>153</td>
<td>61,928</td>
<td>0.95%</td>
<td>31,945</td>
</tr>
</tbody>
</table>

Idaho Regional Network and Consortia

The following are voluntary associations of libraries in Idaho. Most span county lines and three, INCOL, VALNet, and CIN, have formed the Washington Idaho Network (WIN) that spans state lines.

- Canyon Owyhee Library Group (COLG)
- Cooperative Information Network (CIN)
- Inland Northwest Library Automation Network (INLAN)
- Inland Northwest Council of Libraries (INCOL)
- Library Consortium of Eastern Idaho (LCEI)
- Lynx Consortium
- Valley Library Network (VALNet)
- Valley Mountain Library Consortium (VMLC)
Kansas
Profile for ALA-OITP

Kansas State Library

The Kansas State Library is an independent state agency. The Governor appoints the State Librarian, subject to confirmation by the senate, and serves at the Governor’s pleasure. Christie Pearson Brandau has served as the State Librarian since 2005. Prior to her appointment, she was State Librarian of Michigan for five years. Prior to 2000, Ms. Pearson Brandau served as Assistant State Librarian of Iowa, as Assistant Administrator of the North Central Regional Library System, and as a public librarian in two small towns in Iowa.

Two advisory groups are created by Kansas’s statutes. The first is the State Library Advisory Commission with eight members. The commission consults with and advises the State Librarian to suggest or recommend policies and services that will best promote and advance the use and usefulness of the state library.

The Kansas Library Network Board is the second statewide advisory group. Its purpose is to:

(a) Recommend statewide priorities for interlibrary cooperation and resource sharing;
(b) develop and publish annually a state plan for library network activities;
(c) review and evaluate policies and activities of Kansas libraries, which implement the state plan;
(d) encourage public awareness of the need for interlibrary cooperation and resource sharing;
(e) establish guidelines to carry out its activities

This year KSL sponsored legislation, SB 67, to consolidate these two groups into the State Library of Kansas Board. SB 67 has been favorably passed out of the Senate and is on the hearing calendar in a House committee.

KANFIND: Statewide access to databases is made possible through the cooperative efforts of the Kansas State Library, Regents libraries, regional library systems and other partners. Kansas academic, public, and school libraries are eligible to participate in the statewide subscription database service at no cost. Corporate, for-profit, and other special libraries are eligible if they participate in resource sharing activities.
Regional Library Systems

In 1965, legislation was passed that established seven regional systems of cooperating libraries. These systems were created to extend library service to the unserved and to improve library service where it already existed.

Systems are associations of libraries within defined county areas. The System board governs the library and is composed of one representative from each participating library and the Governor's appointee from each participating county. The Governor’s Appointees are appointed by and serve at the pleasure of the Governor. One Governor’s Appointee is appointed for each member county.

Kan-ed

Background: Kan-ed was created by the Kansas Legislature and administered through the Kansas Board of Regents. Kan-ed's member institutions are K-12 schools, higher education, libraries and hospitals.

Network: Kan-ed deploys a private, secure network to which members can connect for high-speed access and a stable platform for various applications, such as videoconferencing. To build the network, Kan-ed leases telecommunications facilities and equipment from local service providers to create a backbone across the state. Nineteen network access points (NAPs) at strategic locations connect the state’s telecommunication providers directly, minimizing tariffs and access fees. Kan-ed provides access to content and services for members to use through their commercial or private Internet connections.

Network components are leased through Kansas' facility and equipment providers, and individual sites contract with Kansas's commercial communications providers to be connected to a NAP, so that traffic between connected Kan-ed members can traverse the Kan-ed network instead of the commercial Internet.

In addition, traffic between a connected Kan-ed site and any Internet2 site will traverse the Kan-ed backbone on its way to the Internet2 backbone network, also known as the "Abilene" network. Kan-ed connects to the Abilene network through the Kan-ed NOC in Lawrence and the GreatPlains Network Point-of-Presence in Kansas City. Kan-ed has arranged for connected Kan-ed members have direct, high-speed access to Internet2, and through Internet2 to any of the members or affiliate members of Internet2.

Kan-ed is not an Internet Service Provider (ISP) for access to the commercial Internet. Rather, Kan-ed supports access to the commercial Internet through local providers.


Governance: The representative structure consists of a User Advisory Council and Regional Chairs, comprised of constituent groups, members, professional
organizations, private constituent group partners and public constituent group sponsors. Governance also includes workgroups and committees, which are responsible for examining critical issues.

Library participation: According to Kan-ed, 301 public libraries, the State Library and all regional libraries are Kan-ed members.

Library funding: Kan-ed offers subsidies for connections and equipment. In 2006, 141 public libraries received subsidy grants, totaling $182,570.47. Two public libraries received Technology and Equipment grants, totaling $15,199.00. The combined total of the two grant programs is $197,769.47. In addition, regional libraries received subsidy grants totaling $11,879.40.

Kan-Ed current issues

Report of the KAN-ED Oversight Committee to the 2007 Kansas Legislature

The 2006 Legislature created the KANED Oversight Committee in the Omnibus appropriation bill. The provision required that the Committee consist of one member from each of the following standing committees: House Appropriations, House Education, House Health and Human Services and House Utilities; Senate Ways and Means, Senate Education, Senate Public Health and Welfare, Senate Commerce and Senate Utilities; and a member of the Joint Committee on Information Technology. The committee released its report in December 2006. http://skyways.lib.ks.us/ksleg/KLRD/2006CommRpts/KAN-ED.pdf

Based on information presented during its meetings and its conclusions the Committee recommended that:

- The Board of Regents and the Department of Administration should continue the effort that resulted in the Network Study and pursue recommendations made in that report.
- The Board of Regents, KanREN, and DISC conduct a feasibility study of the three consolidation models presented to the Committee and make a specific recommendation no later than March 1, 2007 to the standing committees on Utilities, Education, Health, Commerce, Ways and Means, and Appropriations; and to the Joint Committee on Information Technology. The March 1, 2007 report includes drafts of any legislation required to implement the recommendations.
- The Legislature enacts amendments to the KAN-ED Act that will allow the Department of Corrections and the Department of Health and Environment to become members of KAN-ED.

Consolidation report

The consolidation study was released in March 2007 and is available at www.kan-ed.org/legislature/NetworkConsolidationFeasibility.pdf. The study concluded that, “consolidation would keep each organization from meeting the requirements of their respective constituents. Specifically, this approach would not be prudent because of:
• Diverse network business model requirements and rigorous security constraints
• Exorbitant financial and resource investments required
• A parallel network infrastructure would be required, which is not practical at a statewide level
• A cost benefit analysis would indicate an extended ROI payback period beyond a reasonable level of acceptance and cost recovery.”

Kansas Library Association and Kan-Ed

Kan-ed queried user groups about its future. Fred Atchison, Director of the North Central Kansas Library System and the Manhattan Public Library was the chair of the KLA task force that developed the association’s position paper. The following is an excerpt from this report.

The growth of Kan-ed and its services to Kansans in the first few years of its existence indicates potential for substantial impact on existing and future services to K-12 and higher education, libraries and hospitals. For Kan-ed to improve its relationship with libraries, it must take three actions:

1. Continue to fund informational databases for statewide access,
2. Continue to subsidize broadband connectivity to ensure full participation by all members in the use of network resources, and
3. Join with the State Library to create a strategic plan for the future.

Now that Kan-ed is looking beyond its formative stage toward becoming a more permanent service to the state, libraries must play a primary role in its planning process. No one knows their own users better than libraries, and the contribution libraries can make to Kan-ed’s plans will ensure greater Kan-ed user satisfaction.

Because library participation in the planning process holds so much promise, Kan-ed should fund the expense of drafting the strategic plan. Libraries will accept responsibility for marketing and promoting the plan, and will designate representatives to actively participate in the planning process.

Collaboration between Kan-ed and its constituencies is the greatest benefit of the network. Libraries are confident that Kan-ed can reach its full potential with cooperation from its constituent groups. Libraries are committed to helping Kan-ed reach its potential

Video Franchising

A bill was signed by the governor on April 7, 2006.

Kansas Universal Service Fund
The Kansas Universal Service Fund (KUSF) was created by the enactment of House Bill 2728 (Telecommunications Act) by the 1996 Kansas Legislature. The purpose of the KUSF is to assure quality services be made available to all Kansans. All telecommunications companies must contribute (to the KUSF) a percentage of all intrastate (within Kansas) retail revenues. The company is authorized to pass on its assessment to the consumer. KUSF support is distributed back to the local telephone companies and designated eligible telecommunication carriers to offset the costs of providing service.

Public Libraries

There are 327 legally established public libraries in Kansas, 46 branches and five bookmobiles

Connections: According to the State Library

- Only 38 public libraries are connected to the Kan-ed backbone.
- Only 47, or 14% of public libraries in Kansas have T1 Internet access or better
- Costs of T1 access for libraries in Kansas ranges from a low of $425 per month to a high of $1,125 per month.
- Kan-ed has provided a $2000 yearly subsidy for Internet connectivity to each library that requested one.

E-rate: Kan-Ed, the Kansas State Department of Education, and the State Library of Kansas, contract with the Dietrich Lockard Group to provide E-rate support services to Kansas schools and libraries. DLG's goal is to provide year round training, outreach and Hotline support.

According to the State Library, in 2005, 166 libraries applied for the federal E-rate subsidy; in 2006, 185 applied, and the average subsidy in 2005 was $2,350. If a library applies for the federal E-rate subsidy, the rate is about 70% for rural libraries and 60% for urban. Kan-ed aggregates on behalf of Kan-ed members for the physical backbone infrastructure.

Filtering: Kansas public libraries that filter public access computers in response to the requirements of the Children's Internet Protection Act (CIPA) have the option of using Kanguard, an Internet filter free service provided by the State Library.

FCC DATA
Providers of high-speed Lines by Technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>179,430</td>
</tr>
<tr>
<td>SDSL</td>
<td>3,976</td>
</tr>
<tr>
<td>Traditional Wireline</td>
<td>4,282</td>
</tr>
<tr>
<td>Cable Modem</td>
<td>316,866</td>
</tr>
<tr>
<td>Fiber</td>
<td>2,652</td>
</tr>
<tr>
<td>Satellite</td>
<td>Data withheld</td>
</tr>
<tr>
<td>Fixed Wireless</td>
<td>11,232</td>
</tr>
<tr>
<td>Mobile Wireless</td>
<td>Data withheld</td>
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<tr>
<td>Power Line and Other</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>595,979</td>
</tr>
</tbody>
</table>

High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26,179</td>
<td>42,679</td>
<td>101,478</td>
<td>149,415</td>
<td>248,405</td>
<td>322,742</td>
<td>386,747</td>
<td>419,384</td>
<td>470,287</td>
</tr>
<tr>
<td>Total</td>
<td>595,979</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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Universal Service Fund

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<th>Schools &amp; Libraries</th>
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<th>Total</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount</strong></td>
<td><strong>% of Total</strong></td>
<td><strong>Amount</strong></td>
<td><strong>% of Total</strong></td>
<td><strong>Amount</strong></td>
<td><strong>% of Total</strong></td>
<td><strong>Amount</strong></td>
</tr>
<tr>
<td>178,684</td>
<td>2.96%</td>
<td>192,668</td>
<td>2.96%</td>
<td>57,915</td>
<td>0.89%</td>
<td>134,754</td>
</tr>
</tbody>
</table>

Kentucky Profile for ALA-OITP

Kentucky Department for Libraries and Archives

The Kentucky Department for Libraries and Archives (KDLA) is a department in the Education Cabinet, which coordinates the activities of nine departments. The Governor appoints the Secretary of the Education Cabinet, currently Laura Owens.

The Governor also appoints KDLA’s state librarian and commissioner. In 2006, Governor Ernie Fletcher appointed Wayne Onkst, former director of the Kenton County Public Library, as the new state librarian and commissioner. In November 2006, Onkst replaced retiring State Librarian James Nelson, who served for 26 years. Onkst began his career as a reference librarian at the Kenton County Public Library. Onkst also served as head of adult services and associate director of the library system before becoming library director in August 1999.
The State Advisory Council on Libraries

The Council was established to give advice to the KDLA on federal programs and state issues. The twenty-one members, made up of representatives of all types of libraries, trustees and library supporters, are appointed by the Governor. The Council meets quarterly, with subcommittees meeting more frequently.

The Kentucky Virtual Library (KYVL)

The Kentucky Higher Education Improvement Act of 1997 created the Kentucky Virtual University (KYVU) to help students overcome time and distance barriers by providing anywhere, anytime learning. KYVL reports to the Kentucky Virtual University, which reports to the Council on Postsecondary Education. KYVL’s mission is that, “All Kentuckians will have equitable access to quality library and information resources and qualified, well-trained staff to support the Kentucky Virtual University as well as meet broader needs for learning, working and living”.

All public libraries are member of KYVL. Four public libraries catalogs can be searched through the KYVL’s WebZ interface. KYVL also provides access to 40+ databases. The Virtual Library Advisory Committee (VLAC) advises the KYVL on policies and programs that are needed to improve information services.

ConnectKentucky

In October 2004, Governor Fletcher announced Kentucky’s “Prescription for Innovation: Delivering Broadband Technology for a 21st Century Kentucky,” a statewide initiative to provide broadband (high-speed Internet) access to all Kentuckians by 2007.

ConnectKentucky manages the Prescription for Innovation, which has four key tenets for statewide economic development:

- Full broadband deployment by the end of 2007;
- Dramatically improved use of computers and the Internet by all Kentuckians;
- A meaningful online presence for all Kentucky communities, to improve citizen services and promote economic development through E-Government, virtual education, online healthcare; and
- eCommunity Leadership Teams in every county - local leaders assembled to develop and implement technology growth strategies for local government, business and industry, education, healthcare, agriculture, libraries, tourism, and community-based organizations.

Over the course of implementation, statewide broadband availability and usage have increased by 36% and 45% respectively. An estimated 352,000 previously unserved households can now access broadband. Currently, 82% of Kentucky homes can access broadband, on track to reach 100% availability in 2007. Home computer ownership has grown by 17%, and more than 100 counties are actively engaged in the eCommunity Leadership process to establish a technology growth plan for accelerating technology
locally. The rate of Kentucky’s high-tech job growth is outpacing the national average.

ConnectKentucky produced sophisticated telecommunications inventory map, using advanced GIS mapping technology and grassroots data collection. The maps not only illustrate service gaps, but also serve as an economic development resource for communities to illustrate existing infrastructure for locating companies. A statewide map illustrating broadband deployment is available at http://www.connectkentucky.org/NR/rdonlyres/8CD1BFAF-2662-44C4-8EBD-D177EB30B0FD/0/bb_11x17_01_19_07.pdf.

eCommunity Leadership Teams: ConnectKentucky created eCommunity Leadership Teams in each community. The teams include community leaders and citizens who identify applications and support the build out of infrastructure necessary to provide better government services, improved educational opportunities, healthcare access and an expanded marketplace for local businesses.

Participants represent the nine sectors for a comprehensive picture of the community in terms of broadband deployment. The sectors are: business and industry; K-12; healthcare; libraries; higher education; community-based organizations; government; tourism, recreation, and parks; and agriculture.

The eCommunity Leadership Teams will work with ConnectKentucky to determine ways in which broadband deployment can provide better government services, improved educational opportunities, healthcare access, and an expanded marketplace for local businesses. Once these determinations are made, the eCommunity Leadership Teams, with the help of ConnectKentucky, will identify applications and assist in the build out of infrastructure to further support the initiative.

Kentucky Education Network (KEN)

The purpose of KEN is to:

- To develop a seamless education-centric network that will grow and scale to meet new, increasing, and unforeseen needs to support equitable life long learning for all Kentuckians.
- To break down the physical and political barriers between secondary and postsecondary education.
- To share learning content and resources throughout P-21 both virtual and physical.

KEN Executive Committee.

<table>
<thead>
<tr>
<th>Education Cabinet</th>
<th>Laura E. Owens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Dept. of Education</td>
<td>Gene Wilhoit</td>
</tr>
<tr>
<td>Council on Postsecondary Ed.</td>
<td>Dr. Tom Layzell</td>
</tr>
<tr>
<td>Educational Standards Bd.</td>
<td>Dr. Phil Rogers</td>
</tr>
<tr>
<td>Finance Cabinet</td>
<td>John Farris</td>
</tr>
</tbody>
</table>
Established by the Legislature in 2006, the network will be a high-speed education centric network. KEN will connect every college, university, and K-12 school district in the state to enhance the learning experience of students at all educational levels, regardless of geographic location. Also connected will be the agencies of the Education Cabinet and their statewide locations. This includes Kentucky Educational Television (KET), the Department of Workforce Development, Kentucky Adult Education, the Department of Library and Archives, the Commission on the Deaf and Hard of Hearing, the Kentucky Environmental Education Council, the Center for School Safety, and the Kentucky Higher Education Assistance Authority. According to KEN’s website, the network will do for the education community what ConnectKentucky is doing for geographic communities across the Commonwealth.


KEN Budget Information

State funding and local agency and district contributions comprise KEN’s budget.

Kentucky’s Public Libraries

There are 116 county library systems in Kentucky (three counties are combined: Ballard/Livingston/Carlisle; two counties have no public library service: McLean and Carter). Kentucky has 79 branch libraries and 88 bookmobiles.

Filtering: State law requires only public school libraries to use filters and school boards to adopt an Internet use policy.

Connection speed:

<table>
<thead>
<tr>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT 769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.10%</td>
<td>9.10%</td>
<td>8.40%</td>
<td>49.90%</td>
<td>23.50%</td>
<td>26.60%</td>
<td>73.40%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Internet2. Kentucky has an Internet2 SPEG, but libraries are not connected.

ORS Survey Data

Libraries primarily connect through Telecommunications Companies. Barriers to connectivity include communication capacity and high costs. Kentucky receives between two and five dollars per line in high-cost support.

FCC Data

Providers of high-speed Lines by Technology
<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wire line</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>270,715</td>
<td>4,592</td>
<td>4,014</td>
<td>306,487</td>
<td>1,683</td>
<td>Data withheld</td>
<td>1,715</td>
<td>Data withheld</td>
<td>0</td>
<td>629,538</td>
</tr>
</tbody>
</table>

High-Speed Lines (Over 200 kbps in at least one direction)

Kentucky has seen a growth in lines available from 23,570 lines in 1999 to 629,538 lines in June 2006.

Universal Service Fund

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>83,600</td>
<td>7,537</td>
<td>26,481</td>
</tr>
</tbody>
</table>

E-RATE - according to data from SLD’s Data Retrieval System, in FY 2002, Kentucky’s public libraries received $1,027,030 in discounts. In FY 2005, libraries received $730,137 in discounts.

Michigan
Profile for ALA-OITP

Library of Michigan

The Library of Michigan is the official state library agency. In October 2001, the Library became part of the Michigan Department of History, Arts and Libraries (HAL).


The Governor, in consultation with the Library of Michigan Board of Trustees, appoints the state librarian, who is charged with the care of all administrative functions of the Library.
The Governor appoints the members of State Library Board of Trustees who represent libraries and users. Members from the legislative and judicial branches are appointed by that body.

**Michigan Cooperative Libraries**

Created by statute and administered by the Library of Michigan, these libraries have separate boards and services. All public libraries meeting certain requirements are eligible to be members in the cooperative library. Funding comes from the state and from participating libraries. Cooperative libraries must consist of one of the following:

Thirteen cooperative libraries serve Michigan residents. The cooperative directors have a separate association:

**MEL (Michigan Electronic Library)**

MEL is the Michigan eLibrary, and contains magazine, newspaper and journal articles, books, and evaluated Web sites. MEL includes specialized resources such as genealogy, health, business, test preparation, careers and education. MEL also provides eBooks and online courses.

The Library of Michigan contracts with the Michigan Library Consortium and collaborates with a number of Michigan organizations and institutions to provide the MEL service. This service is funded in part by the State of Michigan and additional support from LSTA. The cost of MEL is approximately $3.5 million per year.

MEL grew from the combination of several statewide projects. The original projects were the Michigan Electronic Library, a collection of Internet resources selected by librarians and AccessMichigan, a project to provide licensed commercial databases to Michigan’s libraries. MeLCat, a statewide resource-sharing project, was begun in 2005.

MeL.org earned top ranking in the “government-to-citizen” category as part of the Center’s annual “Best of the Web” and Digital Government Achievement Awards competition.

**Video Franchising**

On December 21, 2006, Governor Granholm signed legislation to change video service in the state of Michigan. This legislation is known as Public Act 480, or more commonly known as the “Uniform Video Services Local Franchise Act”. 2006 PA 480 creates a uniformed franchise agreement that is to be used between each franchising entity and video provider in the state of Michigan. The Michigan Public Service Commission (MPSC) has been the designated agency to implement the Act.

**MERIT Network**

Dan Welch, Merit Executive Director (appointed 2006)  
Phone: 734-615-0547  
Email: dwelch@merit.edu
Merit Network is a non-profit corporation owned by 12 of Michigan's four-year public universities. Merit also offers services to higher education, K12, library, government and non-profit organizations in Michigan. Known as Affiliate Members, these organizations fully participate in the Merit community and elect representatives to the Merit Advisory Council. In addition to the twelve members, Merit has over 250 Affiliate Members with over 440 direct network attachments.

Merit network is based on a 10 Gbps core fiber network and including connections to four Tier 1 service providers and over 20 non-transit peers. Merit is Michigan’s Giga-pop with redundant connections to the commodity Internet as well as at major backbone nodes. Reliability is provided 24x7-365 days (including holidays) by Network Operations Center. Merit Network is also the Internet2 connector for educational, including libraries, in the state of Michigan.

**Merit and Public Libraries.** Public libraries can join through the Affiliate Member program, which started in 1992. Services include:

**Internet2.** Merit was one of the first state education networks to receive designation as an Internet2 Sponsored Educational Group Participant (SEGP). Through this program, Merit serves as a conduit to Internet2’s many working groups and initiatives for Michigan institutions. While several Michigan universities are Internet2 members, Merit provides access to nearly 45 other institutions via the SEGP program.

**High-volume bandwidth.** Merit provides each Affiliate Member with a direct "pipe" to peers, Internet2, and multiple commodity Internet links.

**Collaboration.** Merit staff members facilitate collaborations among Affiliate Members and Members.

**WAN Management.** Merit provides a fully managed WAN service for a number of school districts and library systems. Merit supports WAN to the same standards as a backbone.

**E-rate.** Merit is an authorized E-rate Eligible Service Provider, with streamlined processes for E-rate discounts. Discounts from 7/1/2006 through 6/30/07, for Merit Library Affiliate Members participating in Internet Access E-rate funding are:

Total Cost before Discount: $775,219

Total Discount: $532,582

Total invoiced to Merit Affiliate Member Libraries: $242,636.81

Average Discount is approx: 71%

**Training and technical expertise.** Merit staff offer technical meetings, seminars, webinars, training sessions and ad hoc interactions with Merit
engineers; Merit provides avenues for educational organizations to learn and exchange information amongst peers such as Merit Annual Meeting; Merit seminars/workshops; web casts designed to provide technical training; and online discussion groups.

**Affiliate Member relationships.** Merit provides a way for libraries to be involved in the governance of Merit through the Merit Advisory Council (MAC) members. The chair and co-chair of the MAC attend the Merit Board Meetings to bring Affiliate concerns and technology needs to the attention of the Merit Board.

**Support.** Affiliate Members have direct access to a highly trained team of professionals to provide support and assistance to the Library community. Merit has a Library Outreach Coordinator who focuses primarily on the needs of the Michigan Library community. In addition, the Support Team facilitates services for Security Consulting for network design and preventive network attack analysis, MeritMail, streaming media, video Bridging, co-location service, and Web contingency services.

**Merit and Filtering.** Merit does not provide content filtering to members. Merit provides SPAM and Virus protection services as part of Merit's e-mail service offering. For the July 1, 2006 through June 30, 2007 USF funding year, Merit had 19 library entities participate in E-rate funding. These applicants represent 86 libraries.

**Merit Affiliate Committee Library Representatives**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Contact Information</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travis Bussler</td>
<td>Chippewa River District Library Network Administrator</td>
<td><a href="mailto:tbussler@crdl.org">tbussler@crdl.org</a> Phone: 989.773.3242</td>
<td>2007</td>
</tr>
<tr>
<td>Roger Mendel</td>
<td>Mideastern Library Cooperative Director</td>
<td><a href="mailto:rmendel@flint.org">rmendel@flint.org</a> Phone: (810) 232-7119</td>
<td>2008</td>
</tr>
<tr>
<td>Karl Steiner</td>
<td>Valley Library Consortium, Director</td>
<td><a href="mailto:ksteiner@vlc.lib.mi.us">ksteiner@vlc.lib.mi.us</a> Phone: (989) 497-0925</td>
<td>2009</td>
</tr>
</tbody>
</table>

**Other Merit information:**

- As of July 2007, the Detroit Library will no longer be a member of Merit. The library signed a contract for full telecommunications service with ATT.
- In some locales, Merit will build and own lines using dark fiber. Merit builds in anticipation of future needs and cooperates with community partners to design the best connectivity solutions.
• According to Mr. Downing, the non-member library cooperatives may choose not to belong to Merit because of their rural locations and the costs for Merit membership may be higher than those of local ISPs.

**Merit Costs.** Costs vary depending on the location of the library, what incumbent telecommunication provider is in the area (Verizon and ATT). In most ATT areas Merit can use a CLEC provider, which is a telecommunications provider company that competes with other, already established carriers (generally the incumbent local exchange carrier provider), which reduces the access circuit cost for each of the libraries.

Using the following assumptions, the costs for 1.5, 6.0M, or 10M are estimated below:

1) One year contract
2) All libraries will use a traditional telco circuit.
3) Libraries are in the ATT telco provider area.
4) One-time costs include all local necessary equipment, telco install, and Merit install fees.
5) Ongoing costs include bandwidth costs and the estimated pass-through cost of the telco circuit [Merit does not mark-up the telco circuit].

**1.5M Connection:**

Estimated One-time cost: $2,800
Estimated On-going cost: $8,700 <--annually
Bandwidth: $4,500
Telco Pass-through: $4,800

**6.0M Connection:**

Estimated One-time cost: $6,300
Estimated On-going cost: $35,400 <--annually
Bandwidth: $18,000
Telco Pass-through: $17,400 <-- 4 -T1s

**10.5M Connection:**

Estimated One-time cost: $12,700
Estimated On-going cost: $58,800 <--annually
Bandwidth: $31,200
Telco Pass-through: $27,600 <-- delivered on a T3 circuit
Libraries that are connected to Merit as of 3/1/2007

<table>
<thead>
<tr>
<th>Merit Library</th>
<th>Bandwidth Level and Connection Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albion Public Library</td>
<td>[456:4452] 1.5 1.5M</td>
</tr>
<tr>
<td>Ann Arbor District Library</td>
<td>433:2791 6 1G</td>
</tr>
<tr>
<td>Capital Area District Library</td>
<td>[7037:9711] 7.5 4.5M</td>
</tr>
<tr>
<td>Chippewa River District Library</td>
<td>[6864:4478] 1.5 1.5M</td>
</tr>
<tr>
<td>Detroit Public Library</td>
<td>[165:9437] 20 45M</td>
</tr>
<tr>
<td>Flint Public Library</td>
<td>[401:12710] 4.5 4.5M</td>
</tr>
<tr>
<td>Grosse Pointe Public Library</td>
<td>[5106:6170] 1.5 1.5M</td>
</tr>
<tr>
<td>Houghton Lake Public Library</td>
<td>[6961:11830] 1.5 1.5M</td>
</tr>
<tr>
<td>Jackson District Library</td>
<td>[419:10990] 4.5 4.5M</td>
</tr>
<tr>
<td>Library of Michigan</td>
<td>[324:3721] 1.5 1.5M</td>
</tr>
<tr>
<td>Michigan Library Consortium</td>
<td>[280:5790] 1.5 1.5M</td>
</tr>
<tr>
<td>Mideastern Michigan Library Cooperative</td>
<td>[491] 1.5 1.5M</td>
</tr>
<tr>
<td>Monroe County Library System</td>
<td>[262:11133] 3 3M</td>
</tr>
<tr>
<td>Northland Library Cooperative</td>
<td>[205:9690] 3 100M</td>
</tr>
<tr>
<td>Saline District Library</td>
<td>[284:2198] 1.5 1.5M</td>
</tr>
<tr>
<td>Superiorland Library Cooperative</td>
<td>[757:1677] 3 1.5M</td>
</tr>
<tr>
<td>The Library Network</td>
<td>[245:11277] 35 100M</td>
</tr>
<tr>
<td>Valley Library Consortium</td>
<td>[460:12570] 10.5 100M</td>
</tr>
<tr>
<td>Van Buren District Library</td>
<td>[264:9030] 1.5 1.5M</td>
</tr>
<tr>
<td>Willard Public Library</td>
<td>[5110:12734] 4.5 4.5M</td>
</tr>
</tbody>
</table>

The libraries listed above also provide connections to branch libraries. For example, there are 20 libraries listed above and Merit has 148 connections for libraries.

Public Libraries

Michigan has 379 main libraries, 279 branch libraries, and 16 bookmobiles. In FY 2005, Michigan public libraries offered 7,785 Internet computers.

Filtering: The State Library does not track how many public libraries use filters. Sheryl Mase estimated that about 1/3 of all libraries use filters.

E-rate: Discounts received for FY 2005 total $1,546,800. Total discounts for Fiscal Years 03, 04, and 05 total $5,464,412. 116 libraries applied for E-rate discounts in FY 2005.
<table>
<thead>
<tr>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.20%</td>
<td>9.50%</td>
<td>10.20%</td>
<td>11.10%</td>
<td>39.50%</td>
<td>26.60%</td>
<td>1.80%</td>
<td>32.00%</td>
<td>66.10%</td>
</tr>
</tbody>
</table>

**Internet2 SPEGs:** Michigan has an Internet2 SPEG, but libraries are not connected

**FCC Data**

**Providers of high-speed Lines by Technology**

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>533,835</td>
<td>4,059</td>
<td>23,377</td>
<td>888,018</td>
<td>132,473</td>
<td>12,378</td>
<td>2,755</td>
<td>Data withheld</td>
<td>Data withheld</td>
<td>1,786,572</td>
</tr>
</tbody>
</table>

**High-Speed Lines (Over 200 kbps in at least one direction)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>78,184</td>
<td>131,692</td>
<td>389,441</td>
<td>531,524</td>
<td>729,113</td>
<td>946,819</td>
<td>1,088,090</td>
<td>1,336,312</td>
<td>1,558,034</td>
<td>1,786,572</td>
</tr>
</tbody>
</table>

**Universal Service Fund**

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>53,575</td>
<td>11,425</td>
<td>34,722</td>
</tr>
</tbody>
</table>

**Missouri Profile for ALA-OITP**
State Library

The Missouri State Library is a state agency in the Office of the Secretary of State, currently Robin Carnahan. The Secretary of State appoints a state librarian who administers the affairs of the Missouri State Library. The librarian serves at the pleasure of the Secretary. Margaret Conroy is the current State Librarian.

The Secretary of State creates the Council on Library Development to advise her office and the State Library on matters that relate to the state’s libraries and library service to Missouri citizens, to recommend policies and programs relating to libraries in the state, and to communicate the value of libraries.

The Secretary appoints Council members who serve three-year terms on a rotating basis. Members include representatives from the House of Representatives, the State Senate, public, academic, school, and special libraries, trustees, and library users. The Council meets quarterly.

MOREnet

Background: MOREnet was established in 1991 at the University of Missouri, Columbia, and operates as a separate unit within the University of Missouri System. MOREnet encouraged the state’s telecommunications providers to construct an advanced, high-speed, high-bandwidth network throughout Missouri.

A Memorandum of Understanding between the Curators of the University of Missouri, the Missouri Department of Elementary and Secondary Education, the Missouri Department of Higher Education, and the Missouri Secretary of State formed the MOREnet Council (Council) in 2003. The Council consists of representatives from the Secretary of State, Department of Higher Education, Department of Elementary and Secondary Education, the University of Missouri, the Office of Administration, local schools, libraries, and higher education institutions.

MOREnet Contacts:

William “Bill” Mitchell
bill@more.net
Executive Director, MOREnet
Associate Vice President for Telecommunications, University of Missouri System

Bill Giddings
bgiddings@more.net
Director, Education and Library Programs, MOREnet

Funding: In addition to House Bill 3 funding (Missouri’s general appropriations bill) for MOREnet, separate funding from the Secretary of State (House Bill 12) supports public library connections and shared electronic databases. Through collaboration between the MOREnet Council members and the State Library, shared electronic resources funded by House Bill 12 are available to all members of MOREnet.
Services: MOREnet provides Internet connectivity, access to Internet2, technical support, videoconferencing services and training to K-12 schools, colleges and universities, public libraries, health care, state government and other affiliated organizations. In addition to Internet connectivity, MOREnet provides training and technical support, access to online reference resources, technical and topical discussion lists, security education and assistance, and videoconferencing.

MOREnet provides fee-based services at a cost not included in a membership fee and include conferences and special events, Centra e-Conferencing, live video streaming, remote conference management, e-mail virus and spam filtering, Internet content filtering, and remote vulnerability assessment.

Internet2: In 2001, MOREnet became one of the first five state education networks admitted to the Internet2 Sponsored Educational Group Participants Program. This program seeks to introduce the broader educational community to Internet2, an advanced national education and research network, created to avoid the crowded pathways of the current Internet. Previously available only to member universities, Internet2’s high-performance network is available to MOREnet members.

MOREnet’s Backbone: MOREnet has five hub locations: Columbia, Jefferson City, Kansas City, Springfield and St. Louis. The hubs are connected together as a ring with a spoke across the middle. The network backbone is ATM, with one OC12 on each leg. Circuits to Internet providers are Packet-Over-Sonet. Each member is connected to the nearest hub via pure ATM or ATM to Frame Relay interworking.
Core equipment: MOREnet uses Stratacom BPX ATM switches to run the ATM backbone. Each hub has a Cisco 10000-series router to aggregate customer circuits and a Cisco 12000-series router to provide backbone routing. Each hub also has a Sun Solaris server for DNS services.

Local MOREnet equipment: Customer routers range from Cisco 1005 LAN extenders to Cisco 7507 routers depending on requirements.

External Connectivity Providers: MOREnet currently has two Internet providers: Qwest and Sprint, each that provide two OC12s (622Mbps), one in St. Louis and one in Kansas City. Two of the providers offer tiered pricing and MOREnet only uses a part of their circuits at present. MOREnet also has an OC3 to the Great Plains Network through which is available through their Internet2 access.

MOREnet’s Library Program – REAL. The Remote Electronic Access for Libraries (REAL) Program provides Missourians the opportunity to use the Internet at their local libraries. 118 Public Libraries are members of MORENET. REAL is sponsored by the State Library that also funds the online resources available to all MOREnet customers. All libraries using MORENET have a T-I or higher connection to the Internet.

Eligibility Requirements: Any tax-supported public library is eligible to participate in the General Assembly-funded portions of the program. Tax supported libraries also must meet the requirements for state aid. In addition, participants must meet the following qualifications.

- Provide at a minimum two computer workstations. The computer workstations must be at least a Pentium 3 with 128 MB RAM, and have at least 2 GB of available hard disk space. Machines must have Microsoft Windows XP Home Edition or greater.
- The workstations must be connected.
- Commit to providing public access within six months of receiving the connection.
- Designate up to four library staff members as MOREnet contacts. Contacts are designated to request services from MOREnet and are the channel for communications regarding program-related information.
- Adopt a Technology Plan

Application Process: Libraries must complete an application form.

Participation Fees. FY07 (July 1, 2006 - June 30, 2007)

<table>
<thead>
<tr>
<th>Library Tax Revenue</th>
<th>Local Cost Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $24,999</td>
<td>$ 300</td>
</tr>
<tr>
<td>$24,999 - $74,998</td>
<td>$ 600</td>
</tr>
<tr>
<td>$74,999 - $124,998</td>
<td>$ 1,000</td>
</tr>
<tr>
<td>$124,999 - $249,998</td>
<td>$ 2,000</td>
</tr>
<tr>
<td>$249,999 - $399,998</td>
<td>$ 3,500</td>
</tr>
</tbody>
</table>
MOREnet in the 2007 General Assembly

Senate SB 121 would require every state public governmental body, including MOREnet, to begin a migration strategy to the fiber optic network currently owned by Missouri’s Department of Transportation for all telecommunications, video and data services by January 1, 2010. SB 121 is in the Senate Financial and Governmental Organizations and Elections Committee, which has not yet scheduled a hearing on the bill.

This bill is similar to SB 1115, introduced in 2006. This bill was heard in a Senate committee in April 2006, but no other action is recorded.

MOREnet submitted fiscal impact information for both bills. In the note for SB1115, MOREnet estimates an impact of four million dollars in 2009. This year, MORENet also submitted a fiscal note, available at http://www.more.net/about/legislative/.

House/Senate Joint Report on MOREnet Performance Measures. The House Appropriations staff and the Senate Appropriations staff performed a joint review of MOREnet’s performance measures and released their findings on December 1, 2006. This review concluded that “MOREnet has a well developed, targeted, and consistent method of evaluating and measuring its performance. Its inclusive decision-making and policy-setting model appears to be effectively incorporating the wide variety of entities using the service. In addition, its customer service feedback survey provides timely and specific feedback on its performance.” The report is available at http://www.more.net/about/legislative/morenet_performance_measures.pdf.

Funding Requests for 2008. MOREnet requested one-time additional funding for equipment upgrades to the network backbone and recurring funding to increase bandwidth to public K-12 schools and public higher education institutions. The Governor recommended flat funding for MOREnet, but included in his recommendations:

- $2.9 million one-time increase to fund 100 new eMINTS classrooms, (eMINTS is a professional development program for Missouri’s teachers)
- $2.6 million increase in ongoing funding for the Missouri Virtual School,
- $840,000 to continue the Missouri Telehealth Network,
- $150,000 increase to the REAL program to fund additional online resources, and
- $1.5 million one-time funds to purchase equipment upgrades for the Office of Administration’s Next Generation Network.

At the Senate Appropriations Committee on January 29, 2007, Monica Beglau, Director of the eMINTS National Center; Jeanie Gordon, Superintendent of New Franklin R-I school district; and Bill Rogers, Director of Missouri River Regional Library, testified on
behalf of MOREnet and supported the Governor’s budget recommendation, and expressed their concerns over bandwidth issues. The committee asked questions relating to the member fee increases. All witnesses responded that their fees had increased significantly and additional fees would require cutting something else at their organizations.

At the House Appropriations, Education Committee meeting on February 5, 2007, Joyce Herzing and Jim Snider, UM Governmental Relations, testified on behalf of MOREnet, supporting the Governor’s recommendation. Testimony pointed out the current bandwidth growth trends and future concerns over the projected cost to support future bandwidth demands.

**Video Franchising in Missouri.** The General Assembly is considering a video franchising bill that died in the 2006 session, due to the efforts of the state’s dominant cable providers. However, cable firms in Missouri have now embraced Senator John Griesheimer’s latest proposal, S.B. 284, because the bill would let them abrogate their existing contracts to seek statewide deals.


**Public Libraries**

Missouri reports 166 tax-supported, public library jurisdictions and 359 library buildings. 55 public libraries are not tax supported.

Over 90 percent of Missouri residents live in tax-supported public library districts (separate political subdivisions), with fewer than 10 percent of residents living in areas without library service. Although the percentage of people who live outside of tax-supported library districts is relatively small, they equal a population of nearly one-half million located in 32 of Missouri’s 114 counties.

Only four counties have no tax-supported public library service—three in the extreme southern portion of the state, and the fourth located on the state’s east-central border. An additional 28 counties have at least one tax-supported public library, but the library’s taxing district does not encompass the entire county. These counties are located throughout the state, but most are in the northern and southeastern counties.

**E-rate:** Approximately 340 public libraries received E-rate funding during FY2006. Most of these were through the MOREnet application.

**Internet Filtering:** In 2002, the Missouri Assembly passed laws that imposed obligations on public libraries with public access computers to restrict minors from gaining access to material that is pornographic. To comply, libraries may use either filters or adopt polices which establish how the library will restrict such access or both. According to data from the State Library, 12 libraries do not filter, two do not have Internet access, and 135 libraries filter.

**Internet Connections:** All but two of Missouri’s tax-supported public libraries have Internet connections. 118 libraries belong to a statewide network, MOREnet, and have at least a T-1 connection. These libraries serve 5,058,463 Missouri residents.
Non-MOREnet libraries have a variety of connections. Four libraries have DSL lines; seven have 56K connections; one has a free T1 connection; two have 384k connections; and two libraries do not report their connection speed.

When asked some libraries do not belong to MOREnet, Debbie Musselman, State Library Technology Consultant, said that some non-member libraries already have Internet access through another source, either funded by the city or free. Musselman also said that the size of the staff, the number of hours of service, and MOREnet membership responsibilities, such as submitting technology plans, might discourage membership.

<table>
<thead>
<tr>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5Mbps</th>
<th>GT1.5Mbps</th>
<th>DK</th>
<th>LT 769</th>
<th>GT 769</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50%</td>
<td>9.20%</td>
<td>16.40%</td>
<td>47.20%</td>
<td>24.60%</td>
<td>2.20%</td>
<td></td>
<td>26.10%</td>
<td>71.80%</td>
</tr>
</tbody>
</table>

E-rate - Funding Commitments - Total $6,747,932.

Internet2 SPEGs - Missouri has an Internet2 SPEG, and 129 libraries are connected.

Providers of high-speed Lines by Technology

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>468,334</td>
<td>4,754</td>
<td>9,871</td>
<td>400,808</td>
<td>4,219</td>
<td>Data withheld</td>
<td>5,084</td>
<td>Data withheld</td>
<td>1,016,732</td>
</tr>
</tbody>
</table>

High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>44,924</td>
<td>120,863</td>
<td>220,477</td>
<td>362,040</td>
<td>537,343</td>
<td>584,743</td>
<td>704,273</td>
<td>811,811</td>
<td>1,016,732</td>
</tr>
</tbody>
</table>

Universal Service Fund
<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>85,146</td>
<td>5,396</td>
<td>36,291</td>
</tr>
</tbody>
</table>

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**Ohio Profile for ALA-OITP**

**State Library**

Jo Budler was appointed two years ago as the Ohio State Librarian. Before coming to Ohio, Budler was Deputy State Librarian of The Library of Michigan from 2000 to 2004. She served for more than six years in the Nebraska Library Commission as Director of Network Services and NEBASE, the OCLC network for the state of Nebraska.

The State Library is governed by a five-member board that appoints the State Librarian. The State Board of Education appoints the members of the State Library Board and each member serves a five-year term of office.

**Ohio Regional Libraries**

In June 2006, the State Library Board revised the structure of Ohio's Regional Libraries, consolidating seven Regionals into four new Regional Library Systems. The Board also allocated funding to the new Regionals, which cover the entire state of Ohio and include all Ohio libraries as geographic members.

The new Regional Library Systems are **SWON Libraries** (Southwest Ohio and Neighboring Libraries), **NORWELD** (Northwest Regional Library System), **NEO-RLS** (Northeast Ohio Regional Library System) and **SERLS** (Southeast Ohio Regional Library Systems). The Directors held their first meeting on August 2, 2006.

The State Library of Ohio distributes $250,000 to each Regional to fund director, clerk treasurer, and CE coordinator salaries, facility rent, utilities, and to provide technical support to libraries.

**Services:** The primary function of the regional libraries is to provide and/or host library continuing education.
Membership: All libraries, of all types, are considered “associate” or “core” members of the Regional Library System service area within which it falls geographically. These libraries have access to core services provided by the State Library and delivered through the Regional library service outlets. Any additional library services are available through membership in the regional service outlet.

OPLIN

The Ohio Public Library Information Network was conceived in 1994 through a group effort of Ohio's public libraries and the leadership of the Ohio Library Council, the state association for libraries. Governor George Voinovich endorsed the idea in his 1995 State of the State Address, and the organization was defined in the language of the state's biennial budget in June 1995. OPLIN was officially dedicated by Gov. Voinovich on June 12, 1996.

OPLIN, funded by the Ohio General Assembly, offers Ohio residents fast, free access to the Internet and to subscription databases through Ohio’s local public libraries. The overriding rationale for OPLIN is to ensure that all citizens have equal access to information, regardless of location or format. OPLIN believes that equity of access to information for all must include access to the diverse resources of Ohio’s public libraries; access to federal, state, and regional information resources; and access to electronic information resources. Since 1996, OPLIN has brought almost universal web access to Ohio at over 700 sites in all 88 counties.

Early on, library leaders recognized the importance of OPLIN. In an editorial in June 15, 1997, “Library Journal”, John Berry III wrote, “I saw the future in Ohio. It was only a glimpse, and it left plenty of room for many other new models and styles. Still, if you want to watch academic and public librarians hard at work creating the library of the future, be sure to take a close look at Ohio. If you want to see new ideas about supporting libraries, new ways to adapt libraries to new information technology, and even a new solution to very difficult copyright problems, take a look at the libraries, librarians, legislators, trustees, and citizens of Ohio.”

OPLIN Governance: OPLIN is governed by a board of eleven members selected by the State Library Board from the staff and current and past Boards of Trustees of public libraries. The OPLIN Executive Director and the State Librarian or his/her designee serves as ex-officio Board Members. The Board meets bimonthly.

OPLIN Management: Stephen Hedges, is OPLIN's Executive Director, appointed on April 3, 2006. Currently, there are six other OPLIN staff positions

OPLIN Funding: OPLIN’s governance and budget are defined in separate lines within the State Library’s budget. In addition, OPLIN receives significant administrative support from the State Library. This budget language also specifies that the leaders of Ohio’s government receive a biannual report on OPLIN activities and an assessment of Internet trends in public libraries in the U.S. and globally. The most recent report is available at http://oplin.org/page.php?id=62-4-229-1827&msg=
Most of the funding for OPLIN comes from the General Revenue Fund (GRF). OPLIN also has “spending authority” budgeted through the OPLIN Technology Fund, which allows OPLIN to spend revenue collected from other sources, such as E-rate refunds from telecommunications companies and funds entrusted to OPLIN by public libraries to negotiate group discounts on purchases of electronic information.

**OPLIN Services**

**Network:** There have been three incarnations of the OPLIN core hub since the original design was implemented in 1996, the most recent of which saw the migration of over 700 circuits from the State of Ohio office tower (downtown Columbus) to the State of Ohio Computing Center (Ohio State University’s West Campus). In 2002, all of the network’s IP addresses were consolidated from a variety of different subnets to a single Class B block. Since 2000, Internet access has exploded from 80Mbps to over 300 Mbps of traffic during normal public library business hours. In addition, the OPLIN core infrastructure will continue to evolve in fiscal year 2007 - the process of developing a fourth incarnation is already underway. As part of a recent OPLIN-led Ethernet project, the Central Library Consortium, Westerville Public Library, and Worthington Libraries have increased bandwidth and speed without having to add another circuit (which would have cost over $700 a month).

In an effort to drive down overall circuit costs, OPLIN has also initiated pricing discussions with a number of telecommunications companies, while examining other types of broadband services such as cable, DSL, and wireless that already exist throughout the state. The “star” topology of the network will likely evolve in the coming year as well. Instead of long-hauling all of the OPLIN provided T1 and DS3 circuits back to the core in Columbus, libraries will begin seeing distributed, regionalized connections to a local point of presence (POP), which will then ride a single, larger circuit back to Columbus. This new implementation of an old design may drive down circuit costs for OPLIN as well as library-paid branch connections.

In August 2006, OPLIN released an RFQ for technical management of the network. OPLIN expects to decide between the Ohio Office of Information Technology (the current provider) or a new entity.

**Content:** When OPLIN debuted in 1996, it provided Ohio libraries with six subscription databases. Today, OPLIN provides over 40 different electronic resource collections all with remote access. OPLIN has accumulated the largest collection of links devoted solely to Ohio specific Web sites and online information. OPLIN also hosts OH! Kids and OH! Teens - age-specific web directories for younger children and teenagers, as well as three popular online identification programs: What Tree Is It?, What’s That Snake?, and What’s the Point? OPLIN has also developed the Find an Ohio Public Library tool.

**Other services:** OPLIN Self Service is a Web site that was developed with assistance from the State Library and the Bill and Melinda Gates Foundation. Using the Web site librarians can order services, view and comment on ongoing support issues, obtain information, and communicate with the OPLIN Support Center.
OPLIN provides a free e-mail account to any Ohio public library staff member. OPLIN also provides discussion lists and has started to offer a pod-cast with library and technology updates and news, [http://www.oplin.org/4cast/index.php](http://www.oplin.org/4cast/index.php)

The OPLIN Support Center provides free technical support to members.

**Libraries Connect Ohio (LCO)**

Libraries Connect Ohio (LCO) is a partnership of Ohio libraries and library organizations working together to build and provide a core collection of information resources and library services that will help all Ohioans compete in the global knowledge economy. This collection of resources, called the Ohio Web Library, supports quality education, a skilled workforce, business growth, and lifelong learning in Ohio. By providing resources statewide, LCO can cost-effectively provide necessary information resources to all Ohioans, regardless of their location, age, education or economic status.

**LCO partners**

- Academic Library Association of Ohio
- InfoOhio
- Ohio Educational Library Media Association
- Ohio Library Council
- Ohio Library and Information Network
- OPLIN
- State Library of Ohio

**LCO Vision.** A robust Ohio Web Library will provide all Ohioans with access to the authoritative, educational resources that are necessary for life in the information-intensive 21st century, and ensure that:

- Every school, public, and academic library throughout the state—regardless of size, location or fiscal resources—has equal access to available online materials.
- Ohio students have a consistent set of online resources to use, at home or at school, as they move through primary, secondary and higher education.
- Educators across the state have access to a broad range of online materials to support curricula.
- Ohio business owners, entrepreneurs, government officials, state employees and workers have instantaneous access to the vital information necessary to do their jobs, make decisions and promote economic growth.

**LCO Funding.** The Ohio Web Library is funded by a LSTA Grant through the State Library, which provides an average of $1.16 million per year for five years. The three LCO library networks—INFOhio, OhioLINK and OPLIN—provide an additional $2.9 million in state funds each year from their current budgets. The LSTA grant that helps fund the Ohio Web Library is a temporary funding measure and will expire on June 30, 2008. There is no permanent funding in place to sustain these resources.
OhioLINK

The Ohio Library and Information Network, OhioLINK, is a consortium of Ohio’s college and university libraries and the State Library of Ohio. Serving more than 600,000 students, faculty, and staff at 85 institutions, OhioLINK’s membership includes 17 public universities, 23 community/technical colleges, 44 private colleges and the State Library of Ohio. OhioLINK serves faculty, students, staff and other researchers via campus-based electronic library systems, the OhioLINK central site, and Internet resources.

OhioLINK’s goal is to provide easy access to information and rapid delivery of library materials throughout the state. OhioLINK offers six main electronic services: a library catalog, research databases, a multi-publisher electronic journal center, a digital media center, a growing collection of e-books, and an electronic theses and dissertations center.

OhioLINK Governance. The Ohio Board of Regents has authorized the OhioLINK Governing Board to oversee the OhioLINK program. The governing board approves the strategic directions and financial expenditures of the program. Meeting 6 times per year either in the whole or through the board’s executive committee the board regularly reviews the progress of the program and approves future initiatives and expenditures. The board consists of 13 voting members, nine from universities, 3 from community colleges, and one from independent colleges. Ex-officio members representing technical, library, and board of regents’ perspectives also participate on the board. Ohio Link’s Executive Director is Tom Sanville.

INFOhio

INFOhio, the Information Network For Ohio Schools, is a statewide cooperative project to create an electronic network linking Ohio students, teachers, library/media specialists and others via computer to:

- School libraries in the same district and across the state.
- College and University libraries through cooperative efforts with OhioLINK.
- Public and special libraries through cooperative efforts with OPLIN.
- Electronic databases of government, education and other information.

In addition to the above electronic networks, INFOhio provides library automation software for circulating library materials, uniform cataloging of library materials, searching library collections through online catalogs, and supporting other library and educational operations.

Theresa M. Fredericka was hired as Executive Director of INFOhio in August 1996.
Ohio Public Libraries

Ohio has 251 public libraries jurisdictions with 733 main and branch libraries and 69 mobile units.

**E-rate**: In 2005, 92 public libraries received a total of $2,501,462 in discounts, according to the State Library. The number of libraries applying for E-rate discounts has increased in the past few years.

In the minutes of the December 2006 OPLIN Board meeting, Executive Director Hedges reported that OPLIN’s total funding commitment, just short of $1,219,000 in discounts, was approved. OPLIN will file Form 486 for one refund, rather than periodic reimbursements. OPLIN filed 470s for Internet access, circuit costs, diagnostic lines at the routers, and one other for Cuyahoga County Public Library for Internet access and circuit costs (a local provider asked OPLIN to do this so they could bid on those services).

Dan Farslow is the state E-rate Coordinator and provides applicable training to public libraries. Mr. Farslow is an educational technology consultant employed by [ETech Ohio](http://www.etectohio.org), which was created in July 2005 to merge the technology functions and support provided by the Ohio Educational Telecommunications Network Commission (OET) and the Ohio SchoolNet Commission.

**Filtering**: Public Library filtering is not mandatory in Ohio; however, 150 public libraries systems use filters. Beginning in 2001, the Ohio General Assembly provided $100,000 each fiscal year to help local libraries purchase or maintain filters to screen out obscene and illegal Internet materials, and further specified that, "At least 50 percent of the funds used for these purposes in each fiscal year shall be used for the purchase of filters."

In 2006, OPLIN received requests from public libraries for $138,368 to add, improve, or renew Internet filtering. By adding funds from OPLIN’s General Revenue Funds to the $100,000, OPLIN provided $105,423 to the requesting libraries; of this amount, $66,531 (63%) was spent for the purchase of filters. OPLIN received 41 applications; of those chosen for funding, nine were for new Internet filter installations and 13 were for upgrades to existing filters and/or upgrades to the security of wireless networks in libraries.

**Internet**: In the survey of State Libraries conducted in December 2006, Ohio reported that over 90% of its public libraries have broadband connections and that 25 public libraries are “vulnerable”. All 251 public library jurisdictions belong to OPLIN.

**Internet connection speeds** from the Bertot study are:

<table>
<thead>
<tr>
<th>Speed Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-128kbps</td>
<td>3.20%</td>
</tr>
<tr>
<td>129-256kbps</td>
<td>3.30%</td>
</tr>
<tr>
<td>257-768kbps</td>
<td>4.20%</td>
</tr>
<tr>
<td>769-1.5Mbps</td>
<td>58.90%</td>
</tr>
<tr>
<td>&gt;1.5Mbps</td>
<td>27.90%</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>2.60%</td>
</tr>
<tr>
<td>&lt;769</td>
<td>10.70%</td>
</tr>
<tr>
<td>&gt;769</td>
<td>86.80%</td>
</tr>
</tbody>
</table>
Internet2. Ohio has an Internet2 SPEG, but no libraries are connected.

Providers of high-speed Lines by Technology.

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wire line</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>752,633</td>
<td>5,392</td>
<td>18,693</td>
<td>1,115,618</td>
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<td>11,669</td>
<td>Data withheld</td>
<td>Data withheld</td>
<td>2,392,030</td>
</tr>
</tbody>
</table>

High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>108,027</td>
<td>154,597</td>
<td>354,258</td>
<td>575,756</td>
<td>817,020</td>
<td>1,152,300</td>
<td>1,340,976</td>
<td>1,601,981</td>
<td>1,932,269</td>
<td>2,392,030</td>
<td></td>
</tr>
</tbody>
</table>

Universal Service Fund and E-rate.

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>37,754</td>
<td>35,022</td>
<td>57,444</td>
</tr>
</tbody>
</table>

Florida Profile for ALA-OITP

Florida State Library and Archives

The State Library is within the Florida Department of State. Judith Ring is the Florida State Librarian. A State Library Council is a nine-member group appointed by the Secretary of State to advise the State Library and Archives.

The Florida Library Network Council assists the State Library in developing plans and policies for resource sharing. The Council also advises the State Library on network development and policies for the implementation of the Florida Electronic Library.

FIRN
The Florida Information Resource Network (FIRN) was created in the early 1980s to link Florida’s public education entities to computing resources. FIRN’s purpose was to provide equal access to computing resources for all public education entities, to enable the exchange of information among these entities, and to transmit administrative data to the Florida Department of Education (DOE) in a timely manner. Over the years, FIRN services have expanded from providing a way to transmit administrative and student information to providing electronic mail and connections to the Internet.

In 2003, the State Technology Office on behalf of DOE, contracted with Hayes E-Government Resources, Inc. (Hayes) to provide educational network services, including Internet access and data reporting services, to school districts, public post-secondary institutions, and libraries. The services provided by Hayes are referred to as FIRN2 as they replaced the former FIRN network.

DOE purchases FIRN2 services from Hayes on a subscriber basis. Hayes offers these services in bundled and unbundled packages as well as individual optional services. Bundled services include Internet access, bandwidth management, 24-hour technical support, and network equipment maintenance. The unbundled package provides Internet access only; this option is used primarily by universities and community colleges. Optional services include email, data encryption and content filtering. DOE allocates educational entities an amount of bandwidth through FIRN2, but entities can choose to pay for additional bandwidth using the Hayes contract prices or by purchasing from another provider.

Two state entities are involved in administering the FIRN2 contract.

☐ The Department of Education is responsible for issuing service orders on behalf of the entities using FIRN2 and making sure any FIRN2 services added for E-rate eligible entities (see below) will be covered by E-rate. It also is responsible for managing bandwidth distribution among FIRN2 subscribers, auditing billing services and conducting reviews of the service.

☐ The Department of Management Services’ Enterprise Information Technology Services, under a Service Level Agreement with the Department of Education, assists in processing service orders, monitors the performance of Hayes, and provides bandwidth utilization reports.

Funding: The Legislature appropriated approximately $5.6 million in general revenue for FIRN2 services in each of the last four fiscal years. In 2006, Trust Funds added $7.8 million and E-rate discounts totaled $7.39 million.

A recent performance audit of FIRN included the results from a survey of users that showed the majority of members were satisfied with FIRN2. However, some entities reported that FIRN2 did not provide them with enough bandwidth access to meet their needs, and these entities expressed a need to increase the amount of bandwidth available so they could have faster connections to the Internet.

Meeting the increasing demand for bandwidth is a major challenge for the system. DOE staff estimate that school district demand for bandwidth increased by 30% between Fiscal Years 2003-04 and 2004-05, and it expects this growth rate to continue throughout Fiscal Year 2005-06. The increase in demand is attributed to schools increasing the number of computers that access the Internet and related services.
through FIRN2, the use of new voice and video technologies, greater use of online instructional materials and online learning programs, and increased use of online administrative applications that make extensive use of electronic data. Because of this increasing demand, some educational entities are purchasing additional bandwidth using their own funding sources as their needs exceed the levels allocated by DOE through FIRN2.

The survey recommended that DOE develop a strategic plan to address the challenges facing FIRN2 including the increasing demand for services and bandwidth. There are several options that the department and the Legislature could consider for providing educational entities with services currently provided through the FIRN2 system. These options include

- maintaining the system as currently designed;
- providing services through the state’s information network for state agencies;
- requiring educational entities to directly contract with service providers.

Public Libraries and FIRN: Libraries are responsible for bridging the gap from their buildings to the FIRN PoP in the school district building. A number of libraries never used FIRN. Some county or city officials required that libraries use the municipal network; some libraries found other resources. In addition, FIRN uses content filtering and some Florida’s libraries choose not to filter.

Libraries and Filtering: In January 2007, the State Library surveyed public libraries to identify Internet use policies and filtering practices. There are 141 county and municipal public library administrative units and member libraries in Florida’s 67 counties. The survey found that:

- 141 libraries (100 percent) have locally adopted Internet use policies.
- 140 libraries (99 percent) prohibit display of obscene images or images offensive to others.
- 117 libraries (83 percent) are filtering all or some computers.

Libraries and Training: Because of Florida’s state funding woes, the state library could not develop a large consulting service to local libraries. The regional networks in Florida provide support services to local libraries.

Libraries and Bandwidth: Copper line, T1, DSL, cable are the technologies available to libraries. From time to time libraries have bandwidth problems, particularly in the rural areas. Solutions used include refreshing the equipment.

Assistance needs: The Gates Foundation jumpstarted Internet connectivity in Florida. In particular, the last 10% to be connected were located in rural areas where FSL thought the barriers to connectivity could not be solved. The Gates Foundation solved these technological problems and the libraries transformed themselves with a new array of services. Successful Florida libraries now treat their Web assets as another branch of the library.
The E-rate procurement requirements prohibit some Florida libraries from using the fund. Miami used to receive about $1 million in discounts. Because the governing authority signed a long-term contract for services, Miami can no longer participate.

Training is an ongoing need, in which assistance is needed. Support is also a problem for some, especially smaller ones, as they find it difficult to find and pay IT support staff.

**Public Libraries**

<table>
<thead>
<tr>
<th>Line Speed</th>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT 769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.10%</td>
<td>2.60%</td>
<td>4.40%</td>
<td>43.70%</td>
<td>39.90%</td>
<td>6.40%</td>
<td>9.10%</td>
<td>83.60%</td>
<td></td>
</tr>
</tbody>
</table>

**E-rate**: 73% of libraries in Florida receive E-rate discounts.

**Internet2 SPEGs** - Florida has an Internet2 SPEG, but libraries are not connected.

**FCC Data**

**Providers of high-speed Lines by Technology**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>1,722,888</td>
</tr>
<tr>
<td>SDSL</td>
<td>8,784</td>
</tr>
<tr>
<td>Traditional Wireline</td>
<td>33,858</td>
</tr>
<tr>
<td>Cable Modem</td>
<td>1,939,409</td>
</tr>
<tr>
<td>Fiber</td>
<td>48,814</td>
</tr>
<tr>
<td>Satellite</td>
<td>Data withheld</td>
</tr>
<tr>
<td>Fixed Wireless</td>
<td>23,422</td>
</tr>
<tr>
<td>Mobile Wireless</td>
<td>Data withheld</td>
</tr>
<tr>
<td>Power Line and Other</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>4,408,427</td>
</tr>
</tbody>
</table>

**High-Speed Lines by State (Over 200 kbps in at least one direction)**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>182,455</td>
<td>234,807</td>
<td>634,703</td>
<td>1,103,236</td>
<td>1,634,552</td>
<td>2,236,963</td>
<td>2,659,862</td>
<td>2,958,350</td>
<td>3,537,720</td>
<td>4,408,427</td>
</tr>
</tbody>
</table>
### Universal Service Fund

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>91,450</td>
<td>17,761</td>
<td>53,437</td>
</tr>
</tbody>
</table>

### Georgia Profile for ALA-OITP

#### Georgia Public Library Service

The Board of Regents assumed responsibility for the administration of the state’s Office of Public Library Services in July 2000, as a part of education reform legislation. The state library agency changed its name to the Georgia Public Library Service (GPLS) in late 2000. The GPLS department was transferred to the University System of Georgia (USG) from the Department of Technical and Adult Education.

University System of Georgia Chancellor Stephen Portch appointed Dr. J. Lamar Veatch, Jr. as State Library Director and Assistant Vice Chancellor of Library Development and Services in October 2001.

GPLS provides the following services for libraries in addition to the physical network described below:

**The Georgia Public Information Network for Electronic Services (PINES)** is the public library automation and lending network for 265 libraries in 127 counties. PINES creates a statewide “borderless library” that provides equal access to information for all Georgians. There are registered PINES patrons in all 159 counties.

**Georgia Library Learning Online (GALILEO)** GALILEO is the state’s virtual library, providing online access to thousands of periodicals, scholarly journals, books, encyclopedias, business directories and government publications. Citizens can access GALILEO at any public library facility.

**PeachNet**

PeachNet is the statewide communications network supporting all USG, public libraries, and numbers of K-12 and private institutions. Basic service is at no cost to University System entities whose mission and purpose are compatible with that of the University System. State agencies and educational organizations may contract for
PeachNet services based on a fee structure established by the Office of Information and Instructional Technology (OIIT).

In 2004, OIIT acquired fiber assets and leased 1,900 route miles of fiber to connect 26 of the 35 USG institutions. By leasing the fiber directly, OIIT started to move PeachNet services away from commercial telecommunications services.

The state maintains its own network for state agencies over leased lines, excluding the University System. Consolidation of the two systems is not an issue. The two networks are directly connected.

The current GPLS agreements with both public library network vendors started in 2004 and will end in 2009. GPLS staff are already starting to plan the next RFP to solicit services when the current contracts end.

Public Library Network

The GPLS network is a separate network that connects to PeachNet at five LATA ‘peering points’. The GPLS network utilizes the high-capacity backbone provided by PeachNet. "Middle-mile” and “Last-mile broadband facilities are provided by the GPLS network providers.

Speeds to libraries are a minimum of 1.5Mbs (DS1); some libraries are connected at 3.0Mps and 4.5Mps. Three of the four middle-mile connections are currently at 45Mps (DS3); one is at 155Mbs (OC3).

GPLS provides a network to 340 public library buildings each with a T1 line or higher. This effort is funded partly by state funds (29%), but primarily by Universal Service E-rate funds (71%).

The public library network has five points into which all of the T1 lines run, and those are the points at which there is a direct (router-to-router) ‘peering’ connection to PeachNet, which provides public libraries with very high-speed access to GALILEO, PINES, and University System materials. These five ‘peering’ points are based upon LATA boundaries.

Two Georgia county libraries, Cobb and Gwinnett, do not utilize the GPLS network but do have high-speed connections at all library facilities. These libraries do participate in the Galileo program.

GPLS contracts with two providers to supply high-speed network connections to libraries. AT&T provides services in four LATA areas and Georgia Public Web provides services to the fifth LATA area in southern Georgia. GPLS monitors the health of the network and works with providers to maintain reliability and make necessary updates. GPLS also provides libraries with the following services.

Web Access Management: GPLS maintains a centralized web filtering system that enables libraries to comply with the Children's Internet Protection Act. All libraries using GPLS network use filters. Filtering is required under state law.
Email Services: GPLS hosts multiple email domains on a server that is located in a secure data center facility. This is a POP/SMTP service together with web-based email access. Libraries administer their own users’ accounts via a web interface.

Spam Filtering: GPLS-hosted email domains are protected by this service, which scans incoming email messages for Spam and virus infection. GPLS also offers this service to libraries that run their own email servers.

Web Site Hosting: An Apache web server hosts multiple sites for the Georgia public library community. Libraries create and maintain their own web pages on this server, which is also in a secure data center facility.

Technology HelpDesk: In support of these services, GPLS runs a web-based HelpDesk system that enables libraries to get answers to their technology questions and incorporates a searchable knowledgebase.

Governance: The network is governed by the agency. GPLS staff members meet with public library directors three times a year to give reports and receive feedback on network issues. In addition, GPLS staff members frequently call upon public library directors and the technical staffs of the larger libraries for input.

Each participating library can monitor system performance for their library, and the whole system, via centralized network monitoring operated by GPLS. They report problems at any time to GPLS or to the appropriate network provider as necessary.

Funding: Annually, GPLS staff members review the past year’s E-rate discounts and each library’s use of the network. Staff identify libraries that need additional bandwidth and determine if other factors, such as LAN configuration or security issues, are responsible for slowdowns. After this review, staff members create a list of libraries that need additional bandwidth and determine how much, if any, additional state funding is required to meet this need. These increases are added to GPLS’s budget request.

In the next year, GPLS adds these new services to the E-rate discount requests. Planning for the two revenues streams, E-rate and state general fund, begin in November. The state portion of the network’s funding is located in the line item “State grants to public libraries” not in “State Library operations”.

Network establishment” The history of the public library network is closely tied to the establishment of the GALILEO, Georgia’s virtual library.

“GALILEO’s history began in August 1994, when the University System of Georgia’s Chancellor, Stephen Portch, asked his advisory staff to consider how they would spend $20 million. The staff and system librarians suggested that funds be allocated to enhance system wide library services, especially databases offering full-text materials—a complicated idea that librarians had long been pursuing. The Chancellor was excited by the prospect of providing vastly improved, wide-ranging information
services and superior library access to system students, faculty, and staff, and potentially to all Georgia citizens.

The Chancellor and his staff presented A Vision for One Statewide Library to the Georgia legislative committees prior to the Georgia General Assembly session, which convened in January, 1995. Governor Zell Miller and the General Assembly supported and approved the proposal in late February, 1995. GALILEO made its debut on September 21, 1995, just 150 days after funding. University System institution librarians of Georgia eagerly set up workstations and printers purchased expressly for GALILEO, and paper records were converted to electronic format. As with many significant developments, a convergence of ideas, need, and opportunity created GALILEO.

Initial access was for University System of Georgia faculty and its more than 200,000 students. The founders anticipated that in later years other educational entities would want to participate. Because GALILEO was instantly popular, however, within six months some private academic institutions requested to join the GALILEO family. All Georgia citizens now have access to GALILEO from school libraries, public libraries, and home computers.

GALILEO has been hailed as one of the earliest and most comprehensive statewide library systems in existence in the United States today.”

(Excerpted from the New Encyclopedia of Georgia)
http://www.newgeorgiaencyclopedia.org/nge/Article.jsp?id=h-2655

After public librarians started to use Galileo, they became frustrated with the slow speeds of their Internet connection and pressed for a statewide solution to provide equity of access to all Georgia residents regardless of their location. Rural legislators supported the statewide, state-supported network because it would provide rural residents with access to information and serve those not formally enrolled in educational institutions.

Factors of Network Sustainability: E-rate is the most important factor that sustains the network. Georgia might have developed a network without the E-rate support, but the network would probably not be as robust. The current network is integral to library business, both operations and services.

The Gates Foundation grants, which allowed libraries to purchase equipment and receive necessary training, were also a factor in the network’s success. Poor libraries would not have the level of technology and capability to access and use the network if not for this assistance.

Sustainability also derives from user demand. GPLS staff members say, referring to bandwidth, “As much as we put out there, it gets eaten up”. The number of PAC in Georgia has more than tripled in the last five years to approximately 10,000 and the GPLS network receives 34,000,000 uses annually.
Bandwidth Issues: T1 lines are sufficient for well over half of the libraries in the network (approximately 200.) 75 of the libraries could use two T1s; 40 could use three T1s; and the balance (about 25) could use four T1s.

Streaming video and other applications will cause libraries to need more bandwidth. 80 libraries have requested increased bandwidth; 60 of these requests are driven by the demand for streaming video. The demand curve is growing.

Coping with bandwidth problems: Libraries report problems to GPLS staff members, who diagnosis the problem and help libraries solve any local networking problems that may be causing slowdowns.

Some libraries block sites, such as YouTube and MySpace, which require large amounts of bandwidth. Some libraries also, on occasion, shut down PACs during peaks of demand, primarily after school. No more than 10 of the libraries in the GPLS have serious problems with existing bandwidth availability.

Planning issues:

- Develop inexpensive solutions for the expensive “last-mile” backhaul charges.
- Encourage local libraries to improve their LANs to take advantage of available broadband.
- Deploy “quality of service” that give applications, such as circulation, accounting, Galileo, priority over general Internet services.
- Develop Point-to-Point Video capabilities.

Barriers to sustainability: Because Georgia depends on E-rate funding for three-quarters of its network costs, threats to the continuation of the E-rate program threaten the network’s sustainability.

Lack of technically trained library staff also hamper network substantiality. Libraries are dependent on technology, yet some cannot afford to hire or train staff in critical technological skills. Furthermore, GPLS is not staffed at a level to provide local support to mitigate the lack of local staff. GPLS also does not have staff resources to engage in sufficient research and development.

Assistance needs: Previous help from the Gates Foundation increased the number of PACs in libraries and, in turn, increased demand for reliable and adequate connections. The Foundation’s training efforts and the establishment of WebJunction has been beneficial to libraries.

In addition, ALA’s training efforts, such as the “Wireless Institutes” have built library capabilities. Attendees saw the flexibility that wireless offered and benefited from these practical workshops.
Library schools could offer students internships in state library agencies and thereby provide students with a unique experience. Libraries need more technical employees trained in the specific needs of libraries.

**Public Libraries**

59 library jurisdictions and 380 library buildings.

**Public Library Connection Speeds**

No public library has less than a T1 connection. Five percent of Georgia public libraries have speeds over T1. (Note, the table in the wiki is outdated)

**E-rate**

100% of libraries in Georgia receive E-rate discounts. Richard Brock is the E-rate coordinator.

**Internet2 SPEGs**

Georgia has an Internet2 SPEG, and 340 libraries are connected.

**ORS Survey Data**

<table>
<thead>
<tr>
<th>State</th>
<th>% of Libraries w/ Broadband</th>
<th>Regional Telecom Network</th>
<th>Regional Library Network</th>
<th>State Telecom Network</th>
<th>State Library Telecom Network</th>
<th>Other</th>
<th># of Vulnerable Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>100%</td>
<td>x</td>
<td></td>
<td>x</td>
<td>X</td>
<td>0</td>
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</tr>
</tbody>
</table>

**FCC Data**

**Providers of high-speed Lines by Technology (Number of lines, not providers)**

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>22,043</td>
<td>649,583</td>
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<td>503</td>
<td>Data withheld</td>
<td>0</td>
<td>2,054,077</td>
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</table>

124
High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>65,993</td>
<td>118,630</td>
<td>285,637</td>
<td>494,263</td>
<td>748,016</td>
<td>1,039,440</td>
<td>1,205,282</td>
<td>1,328,956</td>
<td>1,610,750</td>
<td>2,054,077</td>
</tr>
</tbody>
</table>

Universal Service Fund

<table>
<thead>
<tr>
<th>State or Jurisdiction</th>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>Georgia</td>
<td>111,693</td>
<td>8,282</td>
<td>50,126</td>
</tr>
</tbody>
</table>

Maine
Profile for ALA-OITP

Maine State Library

The Maine State library is an independent state agency. The Library Commission, a seventeen-member board, is appointed by the Governor and governs the agency.

Maine has 268 public libraries and a Regional Library System. The Regional Library System was created to improve library service for the citizens of Maine. Membership consists of public, school, academic, and special libraries. The Regional Library System is administered by the Maine State Library.

The Maine School and Library Network (MSLN)

The MSLN originated with a rate dispute case involving NYNEX, which was found to have overcharged customers in 1995. The Public Utilities Commission (PUC) settled the case and ordered that up to $4,000,000 a year for five years be dedicated to rates, services or equipment for Maine schools and libraries. Although ratepayers and other entities advocated for other uses of this fund, schools and libraries presented a compelling case for establishing a network. The chair of the PUC was supportive of educational uses of the fund and the MSLN was established. The Maine State Library and Maine Library Association were the lead interveners in the NYNEX rate case and advocated for library needs. The support of the PUC was critical in establishing the network.
MSLN has operated since 1996. Today, MSLN provides Internet access to approximately 950 schools and libraries statewide. MSLN is paid for using a combination of funding from the Federal E-rate program (approximately 60% of the cost) and the Maine Telecommunications Education Access Fund (MTEAF) (approximately 40% of the cost). Funds are generated through an assessment on interstate phone bills for the Federal E-rate portion and on intrastate bills for the MTEAF portion. The Legislature authorized the creation of the MTEAF in 1999.

The MSLN is sustained by the wide statewide support by its members. The E-rate and the MTEAF are critical factors in its support.

There are two other statewide networks including one serving the University System and another serving state government. Consolidation is not an issue because of MSLN’s use of the E-rate for continued support.

**Bandwidth issues:** MSLN is barely keeping up with library and patron demand in its larger town and cities. The largest library in Portland has serious bandwidth issues. Wireless, Web.2, IM, and other bandwidth intensive applications create a demand for bandwidth. Some libraries limit patron time on PACS.

**Network Architecture:** Maine has high-speed circuits in every area of the state. Even Maine’s islands have this access. University of Maine Information Technology Services (ITS) is the MSLN’s ISP provider. All libraries will have at least T1 access by July 1, 2007.

The State Library’s Vision includes instituting a robust planning effort to bring the MSLN into a state of the art network. Vision also includes having rich content available.

**MSLN Technology Support:** MSLN provides support through a program called Circuit Riders. This program provides advice and assistance by phone, email and in person to resolve local technical problems.

The Circuit Riders:

- Focus on the sites with the most serious problems and with fewest local resources to deal with those problems.
- Foster locally sustainable use of MSLN and avoid ongoing technical dependence on Circuit Riders.
- Closely integrate Circuit Rider efforts with those of end user training contractors, MSL and DOE.

Circuit Rider will:

- Evaluate a site’s network environment (NOS version, wiring plant), MSLN connectivity and workstation configuration (OS version, memory, disk storage, processor speed) and make recommendations for optimizing it for MSLN access.
\begin{itemize}
  \item Install, upgrade, configure and/or optimize commonly used Internet client software, as necessary, and in the process instruct local staff in why and how this work is done.
  \item Configure and demonstrate configuration of staff email accounts on the shared MSLN email server.
  \item Configure and demonstrate configuration of mechanisms for posting pages to the shared MSLN web server using WS-FTP and/or Netscape Gold / Composer.
  \item Provide advice on bandwidth optimization techniques as appropriate to a given site, e.g. caching proxy servers.
  \item Review with site staff a checklist of steps that will lead toward local technical self-sufficiency.
  \item Instruct site staff briefly and only as necessary in the basics of client software use and MSLN connection management.
  \item Provide advice on considerations associated with creating local email, file and web servers.
\end{itemize}

Circuit Rider will not:

\begin{itemize}
  \item Install and/or configure a local email, file or web server.
  \item Design Local area networks.
  \item Wire or installation of a local area network.
\end{itemize}

**Assistance needs:** The Gates Foundation efforts to train library staff have been very helpful. WebJunction is also an excellent source of training information. The Maine State Library is becoming a community partner in WebJunction on June 1, 2007. The replacement computer project was incredibly important to Maine’s libraries. The Foundation can help by making the needs of library visible and by helping libraries develop sustainability at local levels. Training needs continue to be particularly important as many Maine’s libraries are staffed by non-degreed librarians who often seek other employment.

**Maine Telecommunications Education Access Fund (MTEAF)**

In 1999, the Public Utilities Commission established the fund (commonly known as a state E-rate) and required all telecommunications carriers offering telecommunications services in the State and any other entities identified by the commission to contribute to the fund. The fund must be available, with any accumulated interest, to qualified libraries, qualified schools and the Raymond H. Fogler Library at the University of Maine to assist in paying the costs of acquiring and using advanced telecommunications technologies.

**Use of fund.** The fund must be used to provide discounts to qualified libraries, qualified schools and the Fogler Library for the following: (the last two items were added to eligible services in 2001)

1. Telecommunication services
2. Internet Access
3. Internet Connections
4. Computers
5. Training and Content

**Fund administration.** The Commission must:

- Limit the amount collected to no more than 0.7% of retail charges for telecommunications services as determined by the commission, excluding interstate tolls or interstate private line services.
- Require explicit identification on customer bills of any charge imposed under this section.
- Require that the funds be collected in a competitively neutral manner.
- Integrate the collection of the charge with any State Universal Service fund developed by the commission.
- Commence any assessment for this fund no earlier than July 1, 2001

**Relationship to Federal E-rate Program - adopted in 2003**

A qualified library is not required to apply for a federal discount if the library determines that satisfying conditions for receiving that discount would substantially compromise the library’s standards or mission. If the qualified library does not receive a federal discount, the commission establishes an enhanced level of discount to ensure the library is not substantially disadvantaged by that determination. The commission establishes a level of discount that mitigates the financial impact on the library resulting from its not receiving the federal discount.

The State Library supported this provision at the PUC and in the legislature. 52 Maine libraries do not apply for the E-rate due to its filtering requirement and therefore fall under this provision.

**MTEAF and MSLN governance:** The PUC is the governing body of the fund and the network and is advised by a Board. On April 1, 2007, the MSLN will have its first Executive Director since the late 1990’s. The PUC and the Board determined that a director was needed to provide the level of telecommunication knowledge to plan MSLN’s future development. Although the MSLN was innovation in its early years, the Board believed that its planning efforts needed to be increased. The Board will also review the advisory board structure; perhaps adding more school and library representatives. Only five members of the Board are voting members; they are the two PUC representatives, the representative from the Office of the Public Advocate; the State Librarian, and the Department of Education representative.

**MTEAF Report**

The legislature in 2005 passed a law requiring the PUC to submit a report to the Joint Standing Committee on Utilities and Energy detailing the status of available services and expenditures, including federal funds, for the Schools and Libraries program supported by the MTEAF. The following are excerpts from the report.

**REVENUES FROM MTEAF ASSESSMENT:** The MTEAF operates on a Fiscal Year basis (July 1 - June 30), the same cycle as the Federal E-rate program. Telecommunications carriers make MTEAF assessment payments quarterly, based on usage in the previous quarter. Total collections for July 1, 2005 through June 30, 2006 is $3.7 million.
**MTEAF EXPENSES:** MTEAF expects that the Federal E-rate program will pay for approximately 60% of network access costs, with MTEAF paying the remaining 40%. Expenses for Internet connections from Verizon and Internet service from the University of Maine System decreased in 2005-2006 due to favorable contract negotiations. Expenses will increase beginning July 1, 2006 when MTEAF will move all 180 schools and libraries that currently have 56 kbps frame relay connections to either DSL or T1 connections. The 56 kbps equipment has become obsolete and the speed inadequate. Total program costs are expected to be $4.2 million in 2006-2007, of which $1,330,284 may be reimbursed by Federal E-rate.

**FEDERAL E-RATE:** In October 2005, MTEAF received Federal E-rate reimbursement for 2002-2003 of $2,516,468. In December 2005, MTEAF received E-rate reimbursement for two months of 2005 of $306,281. MTEAF waited for reimbursement for the additional 10 months of 2004-2005 of $1,532,263.

**CONCLUSION:** Commitments and payment of Federal E-rate funds continue to lag behind (sometimes by years) when services are provided. Therefore, MTEAF must pay vendors 100% of costs and then wait for Federal E-rate funds to reimburse 60% of those upfront payments. This continues to cause cash flow problems. The FCC is currently conducting a rulemaking on possible changes to the E-rate program. Many Commenter’s are urging that the program rules be simplified to ensure more timely payment. However, unless or until changes are made, the wait for funding will likely continue into the near future. Therefore, MTEAF believes the statute should continue to allow the assessment to be up to 0.7%.

**Public Libraries**

**E-rate.** 81% of libraries in Maine receive E-rate discounts.

**Internet2 SPEGs.** Maine has an Internet2 SPEG, and 272 libraries are connected.

**FCC Data**

**Providers of high-speed Lines by Technology**

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>89,964</td>
<td>3,198</td>
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<td>248,440</td>
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</table>
High-Speed Lines by State (Over 200 kbps in at least one direction)

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<tbody>
<tr>
<td>65,993</td>
<td>118,630</td>
<td>285,637</td>
<td>494,263</td>
<td>748,016</td>
<td>1,039,440</td>
<td>1,205,282</td>
<td>1,328,956</td>
<td>1,610,750</td>
<td>2,054,077</td>
<td></td>
</tr>
</tbody>
</table>

Universal Service Fund

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>28,812</td>
<td>8,795</td>
<td>9,099</td>
</tr>
</tbody>
</table>

Maryland
Profile for ALA-OITP

Division of Library Development and Services

The Division of Library Development and Services (DLDS) is located in the Maryland State Department of Education. Irene Padilla is the Assistant State Superintendent for Libraries. The State Board of Education appoints the State Librarian upon the recommendation of the State Superintendent. An Advisory Council assists the Division. The Maryland Advisory Council on Libraries consists of 12 members, seven of who are appointed by the Governor.

Sailor Project

Project History: Planning for The Sailor Project began in 1989 under the leadership of DLDS. At that time, the libraries were looking for a better way to share materials through inter-library loan (ILL). They decided to pursue a centralized, automated solution to replace their manual microfiche/CD-ROM based system. Using a centralized automated system would require data network connectivity between the libraries and the automated system. The most cost effective approach was to build a network based on Internet Protocol to connect the libraries to the ILL system. The data network was named the Sailor Network with a nod toward Maryland’s ties to the sea, and the network operations center was established at Enoch Pratt Free Library. The first libraries to connect to the Sailor Network came online in July 1994. Because the Pratt Library had an existing Internet connection at that time, as libraries came online they automatically received Internet access from the Pratt. In subsequent
years, Sailor funding for Internet connectivity replaced Pratt Library funding for this purpose.

Working cooperatively, pooling federal grant money, the libraries not only met their original objectives, but also established themselves as pioneers in providing Internet access in libraries for library customers just as the Internet was becoming available to the public. By 1997, they would become pioneers providing Internet access to government agencies and schools, too.

According to a former State Librarian, DLDS had access to a pool of LSCA funds available for a large project; these funds had to be spent within a certain timeframe. Public Libraries directors agreed that a network was desirable and these directors and the State Library were ready to take a risk to develop this service. The State Department of Technology expressed a preference that Sailor be delayed until the state adopted a strategic plan for technology. However, the library community persisted in building Sailor.

Another factor in Sailor’s initial success was the presence of only two telecommunication companies in Maryland. Verizon provided the leased lines for the network. An additional success factor was the availability of abundant fiber lines due to the bankruptcy of a large telecommunications company.

In Sailor’s second year of operations, the statewide public opinion poll included a question about Sailor’s use. 14% of the public respondents said they had used Sailor and 100% of government officials that replied reported using Sailor services.

The original DLDS vision statement read, “The Maryland State Library Network will provide the residents of Maryland with rapid, easy access to information, materials, and services from any available information source.”

The early successes of the Sailor Project were acknowledged in March 1995 when the project was awarded the James Madison Award by the Coalition on Government Information, in commemoration of Freedom of Information Day, for innovations in the championship of the public’s right to know.

Sailor’s current vision is, "Sailor is a trusted, customizable resource that anticipates and delivers information to meet the needs of all Maryland residents.”

**Sailor Management:** Project management for the Sailor Project is contracted to Enoch Pratt Free Library, Baltimore, under the terms of the Pratt Library’s contract with the Department of Education to provide the resource. Overall project management was conferred upon EPFL in FY2001 when annual state funding for the Resource Center was increased to provide for the Sailor budget.

**Project oversight** is provided by the Sailor Advisory Committee (SAC), a subcommittee of the State Library Resource Center (SLRC) Oversight Commission. SAC seeks a balance of member representation from all types of libraries. Members serve terms of two to three years. Another group, the Sailor Network Managers Group, provide technical oversight and planning assistance.
**Sailor Planning:** Each year, Sailor stakeholders meet to tell Sailor management what activities should be initiated and which should be stopped, within the context of the current plan. In addition, Sailor has a three-year planning cycle.

**Sailor Funding:** From 1994 through 2000, funding was provided by Federal Library Services and Construction Act (LSCA) and Library Services and Technology Act (LSTA) grant monies with the consent of the Maryland Public Library Directors. Supplemental funding was provided by the State through Information Technology Investment Fund grants and in kind support from the Enoch Pratt Free Library (EPFL).

Beginning July 2001, funding for the Sailor Project was incorporated into the per capita allocation for the State Library Resource Center (SLRC) at EPFL. The Assembly supported Sailor though a per capita funding formula. Currently, this funding is $1.85 per capita. The 2007 legislature is considering a proposal to increase the formula. Additional funding is available from E-rate discounts for eligible services.

Sailor’s annual budget is approximately three million dollars. This covers expenses for staff, subscription databases, equipment, and telecommunications services. Local libraries contribute staff assistance to the Sailor network engineers and physical space for hosting Sailor equipment. This local assistance is not reflected in Sailor’s budget. EPFL staff members develop the annual budget with SAC assistance to present to the Oversight Commission that makes the final recommendation to the Division of Library Development and Services.

**Current Statewide Planning for Library Services:** The Maryland Advisory Council on Libraries (MACL) hosted a Summit II, Advancing Our Shared Vision, in December 2006. Outcomes of the Summit are goal statements along with action plans of how to achieve these goals. The Summit report is available at http://www.maplaonline.org/dlds/adobe/macl06.pdf

**Other Statewide Networks:** The state Office of Information Technology is an organizational unit that resides within a cabinet level department, Department of Budget and Management. Sailor works closely with this office, which administers Network Maryland, the state run network for state government agencies. For example, Pat Wallace, State Library Resource Center, sits on Network Maryland Advisory Group and staff members from the OIT often serve on Sailor’s Advisory Committee. UMATS, University of Maryland’s Advanced Telecommunications System, is the network for academic institutions. Each network has its own mission and constituents and collaborates with each other in any way possible to advance telecommunications, including sharing the backbone and building POPs.

**Operations:** The engineering staff of the Sailor Network Operations Center at EPFL maintain the Sailor Network on a day-to-day basis.

**Role of Regional Libraries:** Technical staff of Maryland’s three regional libraries provide technical support and training to the public libraries in their regions. Regional library technical staff also provide supplementary assistance to the Sailor network engineers on an as needed basis.
Network Architecture Description: Since 2003, the Sailor Network has grown from a low megabit broadband network, to a very high-speed network that transports data at speeds between 45 Mbps and 200 Mbps along the backbone. In the coming year, Sailor Operations Center expects to increase the capacity of some backbone segments to Gigabit Ethernet.

In early 2007, the Sailor Network subscribes to 400 megabits per second (Mbps) of Internet access capacity to support libraries and agencies connecting to Sailor points of presence (POPs) under the Sailor Internet Connection Service (ICS) program. To ensure reliability of service, the Sailor Network design is based on ring architecture and redundancy. The Sailor Network peers with networkMaryland and UMATS at strategic locations around the state.

Network Architecture Description History: The Sailor Network came about because of The Seymour Plan (1992) which proposed a Maryland Public Library network that would be

a. A telecommunications backbone to which the libraries could connect for access to the Internet and information resources on the Sailor network. (Project Backbone).
b. A network to which Maryland residents could dial via modem to access the Internet and the information resources on the Sailor network (Project Linkup).

Construction of that network began in, built around ISDN which featured the ability to disaggregate a T1 (1.544 mbps) into 23 channels that could be assigned for a variety of purposes such as anchoring modems and serving as data transport channels. The first Sailor PoPs to come online in July 1994 were located in Baltimore, Annapolis, and Bel Air.

At build-out of First Generation Sailor in late 1995, Maryland’s public libraries had built the first statewide, public library managed and operated, public network in the United States. At that time, Sailor PoPs in the 23 counties and Baltimore had been established, offering access to the Internet for all Maryland citizens whether using a computer in a public library, or toll-free Sailor dial-up access over a modem connection. First Generation Sailor provided the only access to the Internet for many parts of Maryland, including parts of Western Maryland, Eastern Shore and Southern Maryland. By providing these services at that time Maryland Public Libraries were among the very first builders of bridges across the digital divide. All of this was accomplished over 18 months and was celebrated in November 1995 with a symbolic “Golden Spike” ceremony at Montgomery County Department of Public Libraries attended by Governor Parris Glendening and State Superintendent of Education Nancy Grasmick.

In 1997-98, Second Generation Sailor was created by supplementing the ISDN lines with Frame Relay transport to increase bandwidth to all Maryland Public Libraries on the network and make more ISDN channels available for more dial-up modem connections.

By January 2002, Sailor was migrating to its third generation of network services development. The goal this time was to break T1 barrier at each Sailor PoP. The first
generation network had an aggregate intra-state capacity of 44.5 Mbps, with a 4 Mbps connection to the Internet. Third generation Sailor consisted of an aggregate 342 Mbps intra-state, with 90 Mbps connectivity to the Internet in June 2002. Under 2002-03 Sailor Network contracts the network could be scaled to intra-state capacity of 2,117 Mbps, and 310 Mbps Internet access.

In 2003, Sailor Operations Center contracted to construct point-to-point microwave (also called wireless) backbone infrastructure to replace lower speed leased lines in regions of the state where leased services are relatively expensive. Installations began in late 2003 on the Eastern Shore, and continued on the Lower Eastern Shore, the Western Shore and Southern Maryland 2007. The resulting regional wireless backbones are being built around licensed radio frequencies to avoid interference from other wireless networks. They feature redundant paths for increased network reliability. Maximum transmission rates with current equipment are in the range of 200 to 400 mbps.

Sailor Operations Center introduced a service-of-convenience, called the Internet Connection Service (ICS), in 1997 at the request of the library directors. Through this program, the public libraries are able to share their data network bandwidth resources with local and state government and K-12 education. Participation in the ICS program is restricted to Maryland state and local government agencies and K-12s. Participating agencies are responsible for the cost of the telecommunications services and equipment that carry their traffic to and from the Sailor Network. Sailor Operations Center does not charge to transport their traffic across the network, to and from the Internet. Current ICS participants include several county public school systems, several county governments and two community colleges. Sailor Operations Center is not responsible for connecting library branches to the Sailor Network. Each local library develops its own wide area networking solution and taps into the Sailor Network PoP most convenient for that library.

**Barriers to Broadband Penetration:** Sailor tries to stay ahead of the libraries’ needs. Sailor staff members regularly monitor capacity. Current use does not exceed 50% of the network’s capacity. The problem with penetration is in the lack of affordable connections between the library building and the POP. Commercial carriers are not interested unless they can profit from building a presence in the community.

Sailor staff provides consulting services for libraries that desire to improve local infrastructure. This consulting service is not limited to libraries, but can include other local governments and community organizations.

**Funding:** The funding for Sailor has stayed flat. Both houses in this year’s General Assembly are considering bills that would allow funding for the State Library’ Resource Center to receive $2.10 per capita in 2007 increasing to $2.50 in 2012. Because Maryland is facing a structural budget deficit, the future of these proposals is uncertain.

**Assistance suggestions:** Research results from national studies are helpful in developing advocacy plans for Sailor support. Foundations and other interested organizations can also help by offering matching grants for developing technologies. The Gates Foundation’s grants to purchase PACs for local libraries have been
beneficial to Maryland’s libraries. Other beneficial grants would be those that help keep Maryland’s libraries at the forefront of providing technology to their communities. These grants would help libraries take the “next step” forward in deploying services.

**Other Sailor Services**

*Sailor Subscription Databases:* Purchase of databases is the result of cooperative effort on the part of key decision-makers at DLDS and in the Libraries. The Maryland Public Electronic Resource Librarians Group (MPERL) was established in 2001 as forum in which the Libraries can express their needs and preferences during the cooperative selection process. Contract negotiation is managed at the Sailor Operations Center by the Collection Management Department at the Enoch Pratt Free Library.

*Sailor Video Network:* The first phase of this service was launched in the fall of 2002 with federal grant funding to place videoconferencing facilities on the Sailor Network at five locations. This videoconferencing capability is a milestone in Maryland Public Libraries' leveraging high technology for to facilitate communications among Maryland's public libraries. Committee meetings, distance learning, continuing education events, cultural events, and children's programming are just a few of the opportunities to bypass the barriers of geography in Maryland through videoconferencing.

*Sailor Web site Hosting Service (WSHS):* In 1995, Sailor initiated this complimentary Web site hosting service for government agencies as outreach to State Agencies among Sailor’s first “customers” were the State Department of Budget and Management, the Maryland State Archives, the Maryland Electronic Capital and the Maryland State Lottery.

*Additional services:* include DNS for the State of Maryland’s state.md.us domain, and support of the Sailor Internet Connection Service (ICS), and outreach in the form of “beyond the Sailor router” technical consulting for libraries and ICS participants.

**Public libraries**

Maryland has 24 public library jurisdictions (180 buildings) and three regional library systems.

**Public Library and Filtering**

State law requires that libraries adopt and implement policies and procedures to prevent minors from obtaining access to obscene or child pornography through the library. Libraries must submit the policies and procedures required under the law to the State Superintendent for review.
Public Libraries and the Internet

The following grid shows building level data and does not reflect the broadband available through Sailor.

<table>
<thead>
<tr>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.30%</td>
<td>4.20%</td>
<td>2.10%</td>
<td>38.80%</td>
<td>49.60%</td>
<td></td>
<td></td>
<td>11.60%</td>
<td>88.40%</td>
</tr>
</tbody>
</table>

**E-rate:** Total E-rate discounts received for the Sailor Network for Funding Year 2005 are $767,866 to date.

**Internet2 SPEGs:** Maryland has an Internet2 SPEC and 20 out of a possible 24 public libraries are connected.

**FCC Data**

**High Speed Lines by Technology**

<table>
<thead>
<tr>
<th>DSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>450,019</td>
<td>7,202</td>
<td>11,003</td>
<td>637,405</td>
<td>Data withheld to maintain firm confidentiality</td>
<td>Data withheld</td>
<td>Data withheld</td>
<td>Data withheld</td>
<td>0</td>
<td>1,492,484</td>
</tr>
</tbody>
</table>

**High-Speed Lines by State (Over 200 kbps in at least one direction)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>46,847</td>
<td>64,130</td>
<td>171,423</td>
<td>306,504</td>
<td>458,128</td>
<td>655,588</td>
<td>782,757</td>
<td>899,640</td>
<td>1,120,826</td>
<td>1,492,484</td>
</tr>
</tbody>
</table>

**Universal Service Fund**

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Low-Income Support</td>
<td>Schools &amp; Libraries</td>
</tr>
<tr>
<td>4,327</td>
<td>502</td>
<td>12,644</td>
</tr>
</tbody>
</table>
New Jersey
Profile for ALA-OITP

New Jersey State Library

Thomas Edison State College is responsible for the administration of the State Library. Statutes establish a State Library Advisory Council, which consists of eight members. The President of Thomas Edison State College or the designee serves as a member ex officio. The other seven members are appointed by the Governor with the advice and consent of the Senate.

Norma Blake has been the New Jersey State Librarian since 2001. Ms. Blake had over 25 years experience in New Jersey libraries including the directorship of both the Burlington County and Gloucester County Library Systems.

Jerseyconnect - Statewide Internet Network

History: In 1998, Bell Atlantic committed $3.5 million for networking equipment to public libraries in New Jersey. A $5 million state bond issue supported by Governor Whitman was approved. Federal funds through the LSTA and state grants were also used to support this project. 340 libraries participated in the network, then known as the Hub Libraries Program (Hub).

The Hub consisted of 14 separate networks geographically dispersed throughout the state offering ISDN 56kbs to frame relay or ATM T1 connections and e-mail. Use of the services was free to local libraries but libraries paid for the local loop connection between library and the nearest Hub network. There were only two principal providers in New Jersey: Sprint and Verizon.

Each library connected to one of the 14 networks via Verizon Access NJ using a three-year renewable contract at an average rate of between $100 and $300 per month. At this time, a T1 Hub equivalent service would have cost on average $1800 per month. NJSL spent approximately $800,000 annually to maintain the Hub.

From the inception of Hub, NJSL’s ISP role was based on public library demand for the service from NJSL. Public libraries participated in the program largely due to lower cost, familiarity and trust, and extensive, quality, technical support not offered by commercial providers.

Hub Network Changes: NJSL found that, while the existing configuration was effective in delivering core services, it did not do so in the most stable, practical or cost effective manner. Further, the existing Hub did not position NJSL and libraries for future growth or to strategically take advantage of current opportunities or emerging technologies. Commercial alternatives to Hub had developed. In 2004, NJSL decided to revisit their ISP role and asked New Jersey library leaders and Hub participants if they should continue Hub or migrate members to commercial providers.
Adopting the later option would mean that NJSL would provide funding for each library to purchase its broadband connection from commercial providers. The public library managers were assured that whatever option was chosen each public library’s existing Hub service would be continued until any changes were made and complete. NJSL’s position was neutral.

The group strongly advised NJSL to continue its ISP role. NJSL believes that the persuader was that local libraries did not want to lose the extensive technical support that NJSL provides not available through commercial providers.

**Hub or Jerseyconnect today**

In June 2005, the NJSL received a $1.75 million grant from Verizon to upgrade the network. The grant was provided through Verizon’s Access New Jersey program. Through Access New Jersey, Verizon has committed more than $150 million to bring high-speed communications technology for voice, data and video to over 2,500 classrooms and libraries.

The changes to the Hub libraries network, now called Jerseyconnect, were completed in 2006. The change included a redesigned infrastructure, expanded services, and more options for library connectivity.

The former network configuration comprised of 14 separate networks geographically dispersed throughout the state, served public libraries since 1999. The new infrastructure design features a fully redundant and scalable network, including three Points of Presence (POPs), one in each of the three New Jersey LATAs. Two of the three POPs are service centers, from which technology services such as e-mail, Web site hosting and technical support are delivered. Three separate ISPs serve the network, if one ISP has problems on their network, traffic is automatically routed to the other ISP. The current providers are Verizon/MCI, LevelIII communication, and Mamia.

Every part of the network is built for redundancy and contains many fail-safe provisions. The network is also modular by design so that parts may be added or deleted within impact to the overall network integrity.

The network expects 100% network uptime. The new infrastructure is scaleable in both directions -- it can be expanded if demand for service increases or reduced if interest in these services decline. Jerseyconnect has a mission subtly, but profoundly different from the old - ensuring connectivity is not enough. Jerseyconnect creates a statewide library network remarkably like one that might exist at a well-run statewide corporation. Jerseyconnect now provides a platform to launch new statewide electronic resources and services, initiated by the state library, the regional libraries or an individual library. Jerseyconnect provides the underpinning for the introduction of new content and services to better serve New Jersey.
Troubleshooting: Jerseyconnect staff provides these services to the members. If the problem is with the underlying Verizon circuit, the Jerseyconnect monitoring system automatically notifies staff and a Verizon ticket is opened on behalf of the library.

Governance: The State Librarian is the final decision maker. The State Library plans to initiate an advisory board within the next year.

Funding: Funding is through a line item in the state budget.

Planning: Jerseyconnect staff holds four membership meetings a year. These meetings provide staff with a time to give needed updates and to ask members for suggestions. Most public libraries participate in the network but the regional library cooperatives do not, although they do offer communication venues.

NJSL realizes that new technology developments will change the network services. Network services may focus on content provision if libraries can easy and more affordability use commercial providers.

Filtering: The NJSL does not offer content filtering through Jerseyconnect services. Filtering is a local decision and many libraries think that the E-rate program is too time consuming and does not offer the funding to compensate for the effort.

Services: Core services included Internet access, Web site hosting, an initial eight public IP addresses, mail hosting, anti-virus protection and technical support.

Expanded core services include anti-spam protection, domain name services, router maintenance/insurance and firewall/intrusion protection, help desk, network Management and reporting, domain registration, dial-up access, data storage and backup, disaster recovery, technology consulting and project management.

Libraries can choose from a menu of services. Most of these services are independent and a direct connection to the POP is not necessary for most. For example, a library may get free cable Internet access cheaper and faster than connecting through the. If the library decides to connect via a third-party provider instead of directly to the Hub, the library may still take advantage of most of the new service offerings, such as email and Web site hosting, anti-virus and anti-spam protection, and paid services like technology consulting. A local public library may choose what works best for the particular library.

Broadband sufficiency: Jerseyconnect receives approximately three to four calls a week from members concerned about sufficient bandwidth. Staff investigates and many times find that a local device is causing congestion, such as a PAC downloading games. Staff can isolate the problem most of the time. Staff can install quality of service (QOS) on local routers to priority applications.

Libraries are asking for more bandwidth. Some are using the free cable modem provide by Comcast or Cablevision to support wireless access in their libraries. More than one-half of NJ libraries are talking advance of this free service from Comcast and Cablevision. Jerseyconnect will integrate these services into the router and share bandwidth.
Libraries can buy more capacity through Verizon contract but the costs increase sharply after 1.5 mbps. Verizon has initiated a program in which they build fiber to the premise, but the program is starting in wealthier areas followed by statewide implementation.

Broadband is currently sufficient at Access NJ. The network is at 40% of capacity and if it reaches 70%, then Jerseyconnect will add more circuits.

**Assistance Suggestions:** The NJSL cannot provide all the assistance necessary to network participants. In particular, small libraries do not have a dedicated IT staff membership. A method of insuring technical assistance is needed. In New Jersey, such a service could be centered at the State Library.

**Costs for Verizon’s Access NJ:** Installation costs are included in the rates. A minimum three-year contract is required.

<table>
<thead>
<tr>
<th>Service</th>
<th>Bandwidth</th>
<th>ANJ Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISDN up to 300 hrs (over 300 hrs standard usage rates apply)</td>
<td>128 kbps</td>
<td>Tariff Rates Apply</td>
</tr>
<tr>
<td>Frame Relay</td>
<td>56 kbps</td>
<td>$100</td>
</tr>
<tr>
<td></td>
<td>1.5 mbps</td>
<td>$300</td>
</tr>
<tr>
<td></td>
<td>4 mbps</td>
<td>$1,325</td>
</tr>
<tr>
<td></td>
<td>6 mbps</td>
<td>$1,425</td>
</tr>
<tr>
<td></td>
<td>22 mbps</td>
<td>$1,625</td>
</tr>
<tr>
<td></td>
<td>45 mbps</td>
<td>$1,825</td>
</tr>
<tr>
<td>ATM</td>
<td>1.5 mbps</td>
<td>$400</td>
</tr>
<tr>
<td></td>
<td>10 mbps</td>
<td>$1,800</td>
</tr>
<tr>
<td></td>
<td>45 mbps</td>
<td>$2,500</td>
</tr>
<tr>
<td></td>
<td>OC3c-DF</td>
<td>$3,000</td>
</tr>
<tr>
<td></td>
<td>OC3c-SON</td>
<td>$4,000</td>
</tr>
</tbody>
</table>
Other statewide services

JerseyCat, a statewide virtual catalog and interlibrary loan system. The first statewide electronic interlibrary loan system in the nation allows New Jersey's residents to search and request books, DVDs and CDs and other items found in over 500 libraries in New Jersey.

JerseyConnect offers high speed, redundant Internet services and related technology services to library customers statewide.

Q and A NJ, is a 24/7 information resource that uses the Internet to connect an individual with a librarian.

JerseyClicks. Over 30 full-text databases

New Jersey Knowledge Initiative (NJKI) supports N.J. economic development by providing the state’s entrepreneurs, small business owners, researchers and students free, convenient access to twelve high-end science, technology, medicine, and business databases.

Public Libraries

New Jersey has 306 central libraries, 147 branch libraries, and 14 bookmobiles, a total of 467 service outlets.

E-rate: The number of NJ libraries applying has declined each year, partly because of the amount of paperwork, especially for smaller libraries; and partly because the Access New Jersey program, which started about the same time, was much easier to navigate. Until 2001, participants in Access New Jersey were not permitted to file for E-rate for services for which they signed an ANJ contract.

Although the number of libraries has decreased, the total amount received by New Jersey libraries each year has stayed constant, as the larger, urban libraries increased the size and number of their requests.

<table>
<thead>
<tr>
<th>Table 1: E-rate Funding Applicants and Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding Year</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Year 1</td>
</tr>
<tr>
<td>Year 2</td>
</tr>
<tr>
<td>Year 3</td>
</tr>
<tr>
<td>Year 4</td>
</tr>
<tr>
<td>Year 5</td>
</tr>
<tr>
<td>Year 6</td>
</tr>
<tr>
<td>Year 7</td>
</tr>
<tr>
<td>Year 8</td>
</tr>
</tbody>
</table>
### Public Libraries and Connectivity Speeds

<table>
<thead>
<tr>
<th>Technology</th>
<th>LT56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5kbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT769</th>
<th>GT769</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.80%</td>
<td>4.90%</td>
<td>14.20%</td>
<td>46.30%</td>
<td>26.30%</td>
<td>4.90%</td>
<td>21.90%</td>
<td>72.60%</td>
<td></td>
</tr>
</tbody>
</table>

**Internet2 SPEGs**: New Jersey has an Internet2 SPEG, but libraries are not connected.

### FCC Data

#### Providers of high-speed Lines by Technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>638,293</td>
<td>7,636</td>
<td>17,419</td>
<td>1,312,433</td>
<td>20,032</td>
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<td>2,654,674</td>
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### High-Speed Lines by State (Over 200 kbps in at least one direction)

<table>
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<tr>
<td></td>
<td>83,047</td>
<td>120,549</td>
<td>394,198</td>
<td>654,235</td>
<td>924,835</td>
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<td>1,423,698</td>
<td>1,605,301</td>
<td>1,989,803</td>
<td>2,654,674</td>
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### Universal Service Fund

<table>
<thead>
<tr>
<th>Payments from USF to Service Providers</th>
<th>Estimated Contributions</th>
<th>Estimated Net Dollar Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost Support</td>
<td>Total Amount</td>
<td>% of Total</td>
</tr>
<tr>
<td>Low-Income Support</td>
<td>1,332</td>
<td>14,530</td>
</tr>
<tr>
<td>Schools &amp; Libraries</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Rural Health Care</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1,332</td>
<td>14,530</td>
</tr>
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</table>
Wisconsin
Profile for ALA-OITP

State Library Agency

The Division for Libraries, Technology, and Community Learning, the state library agency, is located in Wisconsin’s Department of Public Instruction. The Assistant State Superintendent in charge of the Division is Richard Grobschmidt, richard.grobschmidt@dpi.state.wi.us.

The Division is advised by a State Superintendent’s Library Information Technology Advisory Committee to:

- Periodically review the Wisconsin Library Technology Strategic Plan
- Assist and advise the division in developing priorities on the use of federal LSTA funds for technology-related grant categories and projects
- Assist and advise the division in developing priorities and proposals for state funding requests related to technology
- Work in subcommittees to provide advice and assistance on specific division projects and programs
- Work in cooperation with library constituencies and organizations that may have their own technology planning processes
- Work to promote awareness of and support for technology-related programs and initiatives among the library community, key stakeholders and the public
- Members serve as liaisons to report back to their constituents on technology plans and programs of the division and of other library constituencies and organizations

BadgerNet

Almost all of Wisconsin’s public libraries and all library systems are members of the state operated network called BadgerNet. Wisconsin’s Department of Administration (DOA) is responsible for managing BadgerNet. A BadgerNet converged network (BCN) Advisory Council advises the department and the service provider (Wisconsin BadgerNet Access Alliance (WBAA) on customer issues relating to the network contract, the operation of the network, and the process for developing timely solutions to services provided under the network contract.

History: In 1993, then Governor Tommy Thompson established a Blue Ribbon Commission to investigate the establishment of a statewide network for education institutions and government agencies. At that time, Wisconsin had a fiber network for distance earning purposes used by about 60% of the state’s 426 school districts. The State Library advocated early on for the inclusion of libraries and libraries are included in the statutes that govern the network. The first BadgerNet data network was establishing in 1995.
In preparation for expiration of the first BadgerNet data and video network contracts in 2005, Wisconsin proposed a plan in 2001 to replace its separate data and video networks with a single, converged network—the BadgerNet converged network (BCN). The objective of this project was to provide dynamic, scalable bandwidth on a vendor-managed network to approximately 2,000 data and/or video sites including state agencies, schools, universities/colleges, and other authorized users with the option for customers to request an increase in bandwidth when they needed it.

Following a competitive bid process, in March 2005 the DOA contracted the services of the WBAA, with AT&T as the prime contractor, to provide services for an enterprise network designed to converge data and video onto one IP MPLS (Multi-Protocol Label Switching) network with video communications.

Conversion began with pilot sites during September 2005 and was completed on time and on budget on September 1, 2006. For public libraries, most of the migration work was coordinated by the Division working directly with BCN staff and networking staff in the 17 regional public library systems. Between January and September 2005, 411 library circuits were converted to the BCN.

**BadgerNet Funding.** The state general fund supports the network at approximately $16 annually. In addition, the state collects about 6.5 million dollars from the Federal E-rate program. Thus, the total annual cost is about $22.5 million.

**BadgerNet Governance:** As stated above, an advisory committee assists the DOA’s Chief Information Officer. Representative from libraries are allocated two seats on this committee. One of the library seats is reserved for state library division staff.

**BadgerNet Vendor:** AT&T supplies the circuits for the network in most urban areas with local phone companies providing circuits in rural areas. The DOA negotiates with the vendor and AT&T is responsible for overall network operation. The state’s current contract with AT&T expires September 1, 2111.

**Network description:** The network covers all areas of the state. In addition, BadgerNet provides a backbone, the middle, and last mile connections. Wisconsin has no problem with providing lines to its most rural areas. When AmeriTech received the first state contract in 1995 to build a state network, the state required AmeriTech to build in rural areas as well as urban.

**Broadband sufficiency:** Each library has a 512 circuit or higher. 22% or 90 libraries report a broadband problem. The installment of wireless and the development of video streaming and other broadband intensive applications have caused increased demands. There is more than enough capacity on BadgerNet. The question is who will pay for additional library bandwidth. As explained below, the state’s TEACH program that subsidizes K-12 and public library bandwidth has not had a budget increase for the past six years.

To solve bandwidth issues, some libraries use package shaping software and post requests for users not to download large videos. As part of the current state budget process, the state Department of Administration is requesting additional funds to provide more library subsidies for additional bandwidth via the TEACH program (see
If the legislature approves this funding request, more bandwidth will be available in fall 2007.

**TEACH (Technology for Educational Achievement)**

The objective of the TEACH Data Line Program is to provide a basic level of affordable high-speed Internet access to K-12 schools and public libraries. The program supports over 95% public school districts and public libraries with high-speed BadgerNet circuits. TEACH is a part of the Department of Administration.

Under the Data Line program, applicants may request up to a T1 Data Line for $100 per month or $1,200 per year. Applicants can request a larger Data Line (up to DS3/45 Mbps) for a monthly cost of $250.

TEACH data circuits for almost all libraries are connected directly to the library system headquarters to form a system wide WAN. An aggregated circuit then goes from the system headquarters to a BadgerNet router and then out to the public Internet. The regional library system WANS are also used for shared Integrated Library Systems (ILS). However it is important to understand that the primary mission of TEACH is to support patron Internet access. Most libraries use WiscNet for their Internet Service Provider (ISP) (see below) but about 25% of libraries have another ISP.

**TEACH funding:** Teach is supported by the E-rate (see below). Necessary, additional funds derive from Wisconsin's State Universal Service fund. This fund collects about $26 million annually of which 3.1 million dollars is used to subsidize library BadgerNet circuits. A part of this fund is used to pay technology assistance staff in public library systems. This fund was created in 1996 and is collected by the State Public Service Commission. The $3.1 million in library subsidies has not increased in the past six years. Thus as library bandwidth needs have increased, TEACH has not always been able to offer the same level of subsidy. Libraries then face the choice of living with inadequate bandwidth or paying more out of their local budgets. As noted above, an increase in TEACH funding has been requested in the next state budget that starts July 1, 2007. The TEACH program does not require discounts recipients to use filters.

**TEACH and E-RATE:** TEACH files a Wisconsin statewide consortium E-rate application. This process requires considerable cooperation from each applicant involved. Each year, the Department of Public Instruction collects basic data needed for E-rate applications (number of students, school lunch figures, etc.) from every school that will be part of the statewide TEACH E-rate consortium application. These data are then shared with TEACH staff. Approximately 811 schools and libraries on the TEACH E-rate application. The state library division works with TEACH on issues related to the provision of data lines and the parallel development of library system wide area networks. Over 95% of the state’s public libraries are part of regional library system WANS. The WANS are used primarily for Internet access and to connect libraries that are part of regional shared integrated library systems.
WiscNet

WiscNet is a non-profit, membership-based association of public and private organizations that provides access to worldwide information and computing resources with primary emphasis on education, research, and public service. WiscNet is part of the University of Wisconsin - Madison but is governed by its own member institutions through a Board of Directors. Division staff also serve on the WiscNet board, as over 70% of the state's public libraries and school districts get their Internet access and other services through WiscNet.

WiscNet aggregates Internet traffic into faster, more cost-effective circuits. It takes advantage of educational discounts. It shares server computers and shares technical expertise, reducing local support costs. WiscNet is large enough to directly interconnect with multiple national and international networks in multiple locations, thus avoiding payments to third parties to carry Inter-network traffic.

Other models could have been chosen to provide Internet access to educational institutions and libraries in Wisconsin. In some states, for example, a state agency provides the access. In others, Internet access is provided to individual institutions directly by the private sector. WiscNet members believe that the current model is superior, because it fits the cooperative and reflects Wisconsin's progressive grassroots heritage. By controlling their own network, members have the flexibility to evolve it dynamically to meet their specific needs as they occur. Indeed, the governance structure, network designs, fees and services have all changed markedly, some several times, in the short history of the organization. For the typical member-institution, associating with members with similar needs and with technology leaders such as the research universities maximizes opportunities for sharing and technology transfer.

WiscNet’s Partnership with State Government: WiscNet was created in 1988 to serve colleges and universities at a time when Wisconsin was just beginning to install the necessary underlying technology to provide Internet-communications among its agencies. As a result, it made sense for the state to use WiscNet for Internet access, and later for WiscNet to collaborate with the state's Department of Administration to provide Internet access over the state’s BadgerNet network.

This partnership works very well: the state uses its size and communications volume to contract for economical circuits (e.g., BadgerNet), and WiscNet uses its Internet expertise and that of its members to benefit state agencies, schools and libraries.

When public policy initiatives at the state level (TEACH) and national level (E-rate) brought opportunities to schools and libraries, most selected WiscNet for their ISP to make effective use of their subsidized access circuits.

Fees and Membership: For 2006-07, the average fee for WiscNet membership is $450.00/annually per library. Most of Wisconsin’s regional public library systems pay this annual fee for their member libraries, which means for most libraries that their Internet access is provided at no direct cost.

WiscNet members include the State of Wisconsin, virtually all of Wisconsin's colleges and universities, more than 75 percent of the state's K12 school districts, most library
systems, many local and municipal governments, and several nonprofit affiliated organizations.

**BadgerLink**

BadgerLink provides access to quality online information resources for Wisconsin residents in cooperation with the state's public, school, academic, and special libraries.

The Department of Public Instruction currently contracts with five vendors (EBSCO, ProQuest, Thomson Gale, NewspaperARCHIVE, and TeachingBooks) to provide access to articles from thousands of newspaper and periodical titles, image files, and other specialized reference materials and websites. BadgerLink also connects users to WISCAT (the online catalog of Wisconsin library holdings) OCLC WorldCat, directories of libraries, access to library-digitized collections, and other information. BadgerLink’s database are available to every Wisconsin resident from their local library or home at no cost.

BadgerLink services began in July 1998. The project is funded through the state’s Universal Service Fund and costs approximately $2.8 million annually.

**Glossary of Major Programs**

The following brief definitions are provided to better explain the relationships between the various programs that are directly impact the sustainability of public library Internet access in Wisconsin.

**BadgerNet:** State telecommunications network providing circuits to higher education, public and private K-12 schools, public libraries and government agencies at all levels. The state’s Department of Administration (DOA) has contracted with AT&T to provide most of the BadgerNet circuits and to manage the overall network. A BadgerNet Advisory Council advises the DOA and the prime contractor. Libraries and the state library division have representation on the advisory council.

**BadgerLink:** Provides access to content via contracts with vendors for periodicals and other resources via the Web. Resources are available free of charge to all state residents from their local library, work location or home.

**TEACH:** A state Department of Administration program that provides steep discounts for K-12 schools and public libraries to purchase bandwidth on BadgerNet. Discounts are funded via the state’s universal service program and the federal E-rate program.

**WiscNet:** The state’s not-for-profit Internet provider that provides Internet access to higher education, and most K-12 schools and public libraries. WiscNet is a University of Wisconsin entity that works closely with BadgerNet staff to ensure overall network stability and access.
**Assistance Needs:**

Wisconsin’s vision is that library users find all the information that they need at their library, whether in print though resource sharing, or in digital form. Sufficient connectivity is necessary to insure this vision.

Many of Wisconsin’s libraries do not have the staff resources necessary to become independent in technology support. The regional library systems’ role is very important in making sure that connectivity is sustained at the local library.

Regarding states that do not have networks, the Gates Foundation could assist by promoting and supporting model projects based on the particular needs and context of each state that participates. State libraries need to be involved in developing and implementing these projects, as they are key to insuring their success.

**Public Libraries**

Wisconsin has 17 regional system libraries and 388 public libraries, which are mostly city libraries. To address the limitations of relying solely on local support and local coordination of library service, the Wisconsin legislature passed legislation in 1971 enabling the creation of regional public library systems. No county or public library is required to be a member of a library system; yet all of Wisconsin’s 72 counties and 388 public libraries are library system members.

The Regional Library Systems receive $16 million annually in state funding. The systems have several statutory obligations they must meet to retain state funding. One obligation is to assist their member libraries in the area of technology. In this regard, they play an important role in Wisconsin’s library Internet connectively. They provide technological support for member libraries that depend on the system staff as the first point of contact in case of network problems. All 17 systems have wide area networks (WANS) that their member libraries use for Internet access and for shared Integrated Library Systems (ILS). The WANS are part of BadgerNet, the state’s telecommunications network.

**Filtering:** The number of libraries filtering all workstations has remained consistently low, although there was a marked increase from 2% in 2004 to 5% in 2005. The 2005 figure of 5% represents nineteen of the state’s 388 public libraries.

**Public Library Connection Speeds**

<table>
<thead>
<tr>
<th>LT 56kbps</th>
<th>56-128kbps</th>
<th>129-256kbps</th>
<th>257-768kbps</th>
<th>769-1.5mbps</th>
<th>GT1.5mbps</th>
<th>DK</th>
<th>LT 769</th>
<th>GT 769</th>
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</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>56%</td>
<td>39.00%</td>
<td>5%</td>
<td>13.60%</td>
<td>56.10%</td>
<td>44.00%</td>
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</tr>
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</table>

**E-rate:** 95% of libraries in Wisconsin receive E-rate discounts. Most of the libraries are part of the large statewide consortium E-rate application filed by the TEACH staff
(see above). The following chart includes Wisconsin’s schools. (Several large 2006 applications are still outstanding.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
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<tbody>
<tr>
<td>1998</td>
<td>$38,222,352.41</td>
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<tr>
<td>1999</td>
<td>$26,787,987.39</td>
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<tr>
<td>2000</td>
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<td>$31,789,353.96</td>
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<td>$21,206,379.18</td>
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<td>2004</td>
<td>$24,925,000.00</td>
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<td>$26,325,328.20</td>
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<tr>
<td>2006</td>
<td>$16,034,000.00</td>
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</table>

Internet2 SPEGs: Wisconsin has an Internet2 SPEG through WiscNet, and 301 libraries are connected.

FCC Data

Providers of high-speed Lines by Technology

<table>
<thead>
<tr>
<th>ADSL</th>
<th>SDSL</th>
<th>Traditional Wireline</th>
<th>Cable Modem</th>
<th>Fiber</th>
<th>Satellite</th>
<th>Fixed Wireless</th>
<th>Mobile Wireless</th>
<th>Power Line and Other</th>
<th>Total</th>
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<tbody>
<tr>
<td>359,530</td>
<td>7,725</td>
<td>15,252</td>
<td>542,881</td>
<td>Data withheld</td>
<td>Data withheld</td>
<td>4,078</td>
<td>Data withheld</td>
<td>0</td>
<td>1,034,646</td>
</tr>
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</table>

High-Speed Lines by State (Over 200 kbps in at least one direction)

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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>18,599</td>
<td>34,262</td>
<td>127,172</td>
<td>256,735</td>
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<td>564,670</td>
<td>649,091</td>
<td>731,934</td>
<td>859,114</td>
<td>1,034,646</td>
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Universal Service Fund

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<td>8,829</td>
<td>21,021</td>
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