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The Transforming Public Library Technology Infrastructure

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Abstract

This issue of *Library Technology Reports*, conceived and coordinated by the American Library Association's (ALA) Office for Research and Statistics, focuses on the evolution and current state of public-access technologies in public libraries from the infrastructure, services, and resources perspectives. This issue brings together longitudinal data, key issues, trends, and best practices that will provide library staff with tools for planning, advocacy, and service enhancements.

A number of prominent library professionals contributed their expertise to this issue. Authors and topics include John Carlo Bertot, Paul T. Jaeger, Emily E. Wahl, and Kathryn I. Sigler on Public Libraries and the Internet: An Evolutionary Perspective; Nicole D. Alemanne, Lauren H. Mandel, and Charles R. McClure on The Rural Public Library as Leader in Community Broadband Services; Robert A. Caluori, Jr. on Successfully Planning a Scalable and Effective Patron Wireless Network; Nancy Fredericks on E-Government and Employment Support Services; Larra Clark and Marijke Visser on Digital Literacy; and Stephanie Gerding on Transforming Public Library Patron Technology Training.

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Chapter 1

Introduction

Judy Hoffman

This issue of *Library Technology Reports*, conceived and coordinated by the American Library Association's (ALA) Office for Research and Statistics, presents a detailed portrait of the evolution and current state of public access technologies in public libraries from the infrastructure, services, and resources perspectives. This edition brings together longitudinal data, key issues, trends, and best practices that will provide library staff with tools for planning, advocacy, and service enhancements.

The first article in this issue, "Public Libraries and the Internet: An Evolutionary Perspective," provides data and analysis from the *Public Library Funding and Technology Access* national surveys, the longest-running and largest study of Internet connectivity in public libraries, begun in 1994 by John Carlo Bertot and Charles R. McClure.[1] The history and methodology of the ground-breaking study is discussed in the opening of the article, which includes data from the first year of the survey through the 2010–2011 survey. The current ALA report, *Libraries Connect Communities: Public Library Funding and Technology Access Study 2010–2011*, was released on June 21, 2011.

The analysis of the data and the impact on library services outlined by John Carlo Bertot, Paul T. Jaeger, Emily E. Wahl, and Kathryn I. Sigler in chapter 2 highlights conflicting results: public libraries continue to offer enhanced public-access technology and resources in spite of continued challenges with insufficiencies across the library landscape, including funding, numbers of computers, connectivity speed, staffing, and space. Many of these same challenges emerged in the 2007–2008 study and were outlined in the January 2009 issue of *Library Technology Reports*. Authors Larra Clark and Denise Davis commented, "As libraries introduce more computers and technology-based services, keeping up with patron demand is an ongoing challenge."[2] Yet, as noted then and now, libraries persevere in providing critical services and resources to help individuals, families, and communities through a slow economic recovery.

The other five articles in this issue of *Library Technology Reports* highlight and illuminate selected core services and emerging topics measured over the course of the thirteen surveys conducted since 1994.

Broadband Connectivity

While public library adoption of broadband continues to increase over time, rural libraries lag behind in connectivity capacity and speed. In the 2010–2011 study, 21.8 percent of rural libraries reported having fiber-optic connections, compared to 65.6 percent for urban libraries and 42.8 percent for suburban libraries. And while for the first time more rural libraries reported connectivity speed greater than 1.5 Mbps than less than 1.5 Mbps, nearly 47 percent of rural libraries still reported that their connection speed is insufficient to meet patron needs some or all of the time. As outlined in the article by Nicole D. Alemanne, Lauren H. Mandel, and Charles R. McClure, by taking a leadership role among community broadband anchor institutions, rural libraries have the potential to transform their level of service and the life of the community and its residents.

Wireless Networks

As libraries encounter capacity limits in both broadband and physical space, an effective patron wireless network is an essential consideration for continuity of quality service. In interviews for the 2010–2011

study, library staff consistently noted that with the exponential growth of mobile devices tapping into library wireless networks, expansions and upgrades to the networks were becoming more critical. In this issue, Robert A. Caluori, Jr. reports that the affordable, high-quality wireless equipment libraries need to meet demand is a reality and provides detailed guidance for purchasing decisions and network implementation.

Employment and E-Government Services

Recent news reports on the economy reinforce the role of the public library as a safety net for job seekers, and as government agencies eliminate print forms and close satellite offices, public libraries are increasingly on the front lines, connecting people with essential e-government resources. The increased demand on public libraries in these two areas has brought additional stresses in a number of areas, including staffing levels and computer availability. Author Nancy Fredericks addresses these challenges and presents a wide range of successful practices from her own Pasco County (FL) Library Cooperative and other examples of local, state, and national resources.

Digital Literacy

While almost all (99.3 percent) US public libraries provide free access to computers and the Internet, many citizens are still struggling to gain the skills to adequately access and use online resources. As noted in the article by Larra Clark and Marijke Visser, there is now a "broad recognition that digital literacy is a keystone for civic engagement, educational success, and economic growth and innovation." In their work at the American Library Association Office of Information Technology Policy, Clark and Visser are part of the national effort to provide libraries of all types with the competencies and resources to play a lead role in any community efforts that ensure equity of access and advance digital literacy.

Patron Technology Training

In the pursuit of community digital literacy, according to Stephanie Gerding, patron technology training at public libraries is no longer an optional service. While this absolute can be seen as a challenge for many libraries, Gerding provides in her article the building blocks for the "transformation of the library into a digital literacy oasis." Any size and type of library can adopt and adapt the ideas and resources laid out in four key areas: creation of comprehensive training plans; professional development for library staff; cultivation of partnerships and volunteer relationships; and marketing of training programs.

In an interview for the 2010–2011 study, San Diego County Library Director José Aponte commented that "Technology was formerly a backbone of libraries, and now it's become the front door of public service." This sea change has illuminated the need for a greater understanding of the transformation of our public libraries, propelled by community demands and the critical need for sustained funding to provide the technology services required to advance our nation to full digital literacy.

Notes

1. All survey reports are available at www.plinternetsurvey.org.
2. Larra Clark and Denise Davis, "The State of Funding for Library Technology in Today's Economy," *Library Technology Reports* 45, no. 1 (Jan. 2009): 8.

Chapter 2

Public Libraries and the Internet

An Evolutionary Perspective

John Carlo Bertot, Paul T. Jaeger, Emily E. Wahl, and Kathryn I. Sigler

Abstract

Since 1994, the Public Libraries and the Internet *and* Public Library Funding and Technology Access *national surveys have charted the involvement with and use of the Internet by US public libraries. During that time, thirteen national studies have provided longitudinal data that track trends in the public-access computing and Internet access provided by public libraries to the communities that they serve. This chapter of* The Transforming Public Library Technology Infrastructure *provides an overview and review of selected data from these national studies; identifies key trends and changes in Internet-enabled services and resources provided by public libraries to their communities over the course of the seventeen years of conducting the national surveys; examines key issues that emerge from the data regarding public library Internet use and involvement; and considers selected future issues regarding public library Internet-enabled services, particularly as the public access that libraries provide their communities takes on increasing importance in supporting a range of services such as e-government, jobs and employment, health information, and education.*

Background

Public libraries were early adopters of Internet-based technologies, and the *Public Library Funding and Technology Access* national surveys began in 1994[1] with the purpose of tracking the growth of public library Internet connectivity and uses as a basis for (1) proposing and promoting public library Internet policies at the federal level; (2) maintaining selected longitudinal data as to the connectivity, services, and deployment of the Internet in public libraries; and (3) providing national estimates regarding public library Internet connectivity. Through 2004, the surveys were conducted roughly every two years. Beginning in 2006, the surveys switched to an annual data collection cycle.

Though the survey remains true to its primary goals, it evolved over time and experienced three clear shifts in data collection, methodology, and approach:

- Prior to 1998, the surveys collected data at the system level (i.e., total number of workstations across all library branches, if applicable).[2]
- Between 1998 and 2004, the surveys collected data at the building or outlet level (i.e., number of workstations in a particular branch, speed of connectivity at the branch), as well as system-level data (i.e., E-Rate applications).
- Beginning in 2004, the surveys expanded to collect data at the state and national levels and include both building or outlet level and system-level data.
- Beginning in 2002, the survey offered participants a fully online version of the survey as well as a printed version of the survey to complete. Each year, more surveys were completed online, and in 2009, the survey became an online-only survey.

Throughout these shifts, the survey has maintained core longitudinal questions (e.g., numbers of public-access workstations, bandwidth) but consistently explored a range of emerging topics (e.g., jobs assistance, e-government, emergency roles).

Due to the survey's longevity, longitudinal data, and unique data, data from the surveys have appeared over the years in Congressional testimony, filings with the Federal Communications Commission (FCC),

filings with the National Telecommunications and Information Administration (particularly regarding the recent Broadband Technology Opportunity Program grant program), the Children's Internet Protection Act US Supreme Court decision, US Senate hearings on the E-Government Act, and many other critical policy venues. State librarians have also used the data in state legislative testimony and in a range of state policy documents and initiatives. In short, the data from the surveys are used by a number of stakeholders in a wide range of ways.

This article seeks to provide an evolutionary perspective on public library Internet connectivity. A full list of all the Public Libraries and the Internet and Public Library Funding and Technology Access studies and their findings is included in Appendix A. Unless otherwise noted, all data discussed in the article are from these studies. All of the reports are also available in electronic format at http://plinternetsurvey.org.

Methodology in Brief

The survey's methodology has evolved over time to meet changing survey data goals. As of this writing, the survey provides both national and state estimates to

- provide branch-level national data regarding public library Internet connectivity and use;
- provide state branch-level data (including the District of Columbia) regarding public library Internet connectivity and use;
- provide system (administrative)–level data (including the District of Columbia) regarding E-Rate use and library operating and technology funding and expenditures; and
- include assessment questions for selected public libraries that are recipients of certain Bill & Melinda Gates Foundation (Foundation) grants.

The last objective is beyond the scope of this article.

The survey has additional objectives of obtaining data to conduct analysis using metropolitan status (e.g., urban, suburban, and rural)[3] and poverty (less than 20% [low], 20% to 40% [medium], and greater than 40% [high])[4] variables. Over the years, the poverty variable has not demonstrated any statistical significance in terms of the survey's findings, and thus the poverty variable was removed beginning with the 2009–2010 survey.

The survey uses a stratified "proportionate to size sample" to ensure a proportionate national sample. The sampling approach taken ensured high-quality and generalizable data within the states analyzed, nationally, and across and within the various strata. The study team uses the Institute of Museum and Library Services (IMLS) public library dataset (formerly maintained by the US National Center for Education Statistics) to draw its sample. Foundation grant recipient data are overlaid on the national library dataset. The survey asks respondents to answer questions about specific library branches and about the library system to which each respondent branch belongs.

Respondents typically answer the survey between September and November of each survey year. Changes in technology have fueled not only the evolution of the Internet in libraries, but the evolution of the survey as well. The development of Web-based surveys and more powerful data analysis tools have facilitated the growth of the survey in terms of reach to libraries, ease of completion, complexity of questions, and depth of statistical analysis.[5]

In each year of the survey except for the 2006–2007 survey, the survey response rate is between 70.0 percent and 86.5 percent, and provides between 5,500 and 8,400 survey responses. The data are weighted for both national- and state-level analysis and have a margin of error or +/– 2 or 3.5 percent, depending on survey year. The high survey response rate and representativeness of responses demonstrate the high quality of the survey data and the ability to generalize to the public library population.

Selected Longitudinal and Key Findings

This section provides an overview of selected longitudinal data across the survey years. It is important to note, however, that key survey questions, such as broadband connectivity speeds, have changed substantially over the years to reflect the evolving nature of Internet connectivity. For example, the first surveys asked about dial-up connections and their speeds, versus today's questions that explore fiber-optic and other types of Internet connectivity and corresponding higher speeds. Thus some longitudinal comparisons would not make sense. Finally, the section provides selected findings regarding newer services, particularly as they have an impact on future public library Internet-enabled services.

Infrastructure

The survey asks a number of questions about a public library's public access infrastructure—for example, public access to the Internet, numbers of workstations, wireless (Wi-Fi) access, and connectivity speed. Connectivity is a prerequisite to providing the range of Internet-enabled services and resources to the communities that libraries serve.

As figure 2.1 shows, nearly 100 percent of public libraries are connected to the Internet. Libraries achieved this growth in connectivity quite quickly,

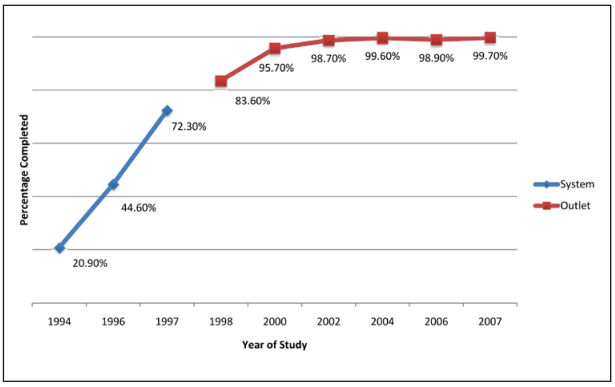

Figure 2.1
Public library Internet connectivity 1994–2007

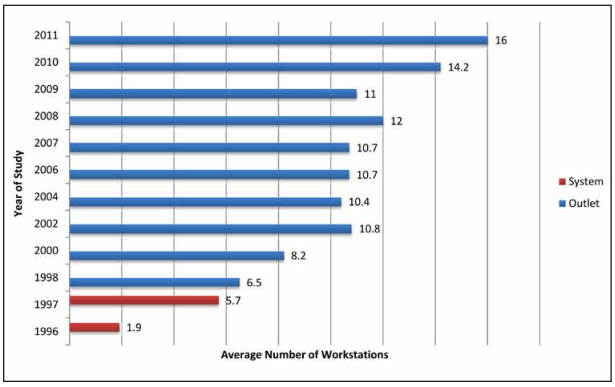

Figure 2.3
Average number of public-access workstations 1996–2011

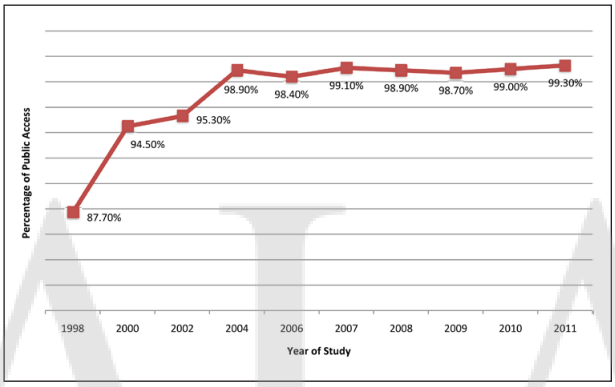

Figure 2.2
Public access to public library Internet connectivity 1998–2011

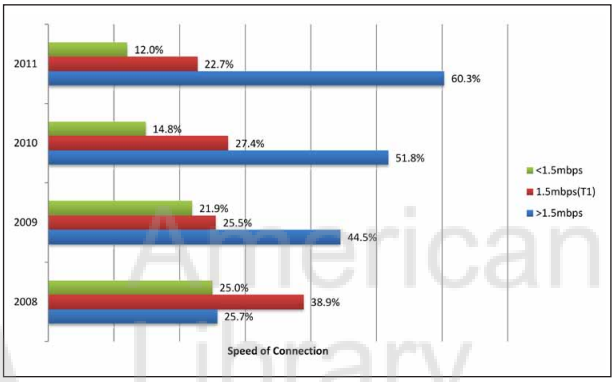

Figure 2.4
Public library outlet maximum speed of public access Internet 2008–2011

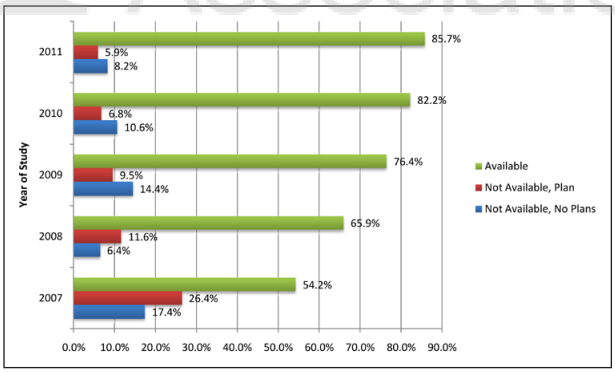

Figure 2.5
Wireless Internet connectivity availability 2007–2011

from 20.9 percent of public library systems connected to the Internet in 1994 to nearly 100 percent by 2002. Indeed, so prevalent is Internet connectivity in public libraries that the survey discontinued asking this question in 2008. And, as figure 2.2 shows, nearly all connected public libraries provide public access to the Internet. Interestingly, nearly all libraries that reported an Internet connection indicated the provision of public access to the Internet—even in 1998, with 87.7 percent of connected libraries providing public access to the Internet.

Along with Internet connectivity, public libraries also rapidly increased the average number of workstations that they provided for public use. Between 1996 and 2011, the average number of workstations grew from 1.9 to 16.0 (see figure 2.3). Of note is that the average number of workstations hovered between 10.0 and 12.0 for seven years before jumping to 14.2 in 2010 and further increasing to 16.0 in 2011. Libraries reported cost, staff, and space issues were impediments to adding more workstations.

Public library adoption of broadband continued to increase over time (see figure 2.4). Libraries continue to enhance their connection speeds annually. Indeed, from 2008 to 2011, public libraries consistently reported increases in connectivity speed, with 60.3 percent of libraries reporting connection speeds of greater than 1.5 Mbps in 2011 as opposed to 25.7 percent in 2008. Libraries reported a corresponding decline in speeds of 1.5 Mbps or less in 2011 as compared to 2008.

	Overall		
	Does Not Offer Service	*Offers Service in Library*	*Offers Service from outside the Library (i.e., via the Web)*
Resources			
Digital reference/virtual reference	33.1% (*n* = 4,766)	48.0% (*n* = 6,916)	55.1% (*n* = 7,939)
Licensed databases	0.2% (*n* = 28)	98.1% (*n* = 14,480)	98.6% (*n* = 14,540)
E-books	32.8% (*n* = 4,747)	45.7% (*n* = 6,618)	60.9% (*n* = 8,815)
Web/business conferencing (e.g., Skype, WebEx)	89.6% (*n* = 12,438)	8.9% (*n* = 1,238)	2.9% (*n* = 374)
Online instructional courses/tutorials	41.9% (*n* = 5,987)	48.4% (*n* = 6,925)	40.7% (*n* = 5,819)
Homework help	13.0% (*n* = 1,894)	74.0% (*n* = 10,779)	66.2% (*n* = 9,646)
Audio content (e.g., music, audiobooks, other)	17.2% (*n* = 2,508)	65.6% (*n* = 9,557)	59.5% (*n* = 8,672)
Video content (e.g., streaming video, video clips, other)	38.7% (*n* = 5,557)	52.4% (*n* = 7,515)	36.8% (*n* = 5,278)
Digitized special collections (e.g., letters, postcards, documents, other)	53.9% (*n* = 7,698)	37.9% (*n* = 5,411)	35.8% (*n* = 5,119)
Library social networking (e.g., blogs, Flixster, Goodreads)	39.9% (*n* = 5,749)	48.2% (*n* = 6,936)	43.7% (*n* = 6,292)
Online book clubs	69.4% (*n* = 9,716)	23.1% (*n* = 3,230)	25.3% (*n* = 3,540)
Services			
Allows patrons to access and store content on USB or other portable devices/drives (e.g., iPods, MP3 players, flash drives, other)	6.5% (*n* = 950)	93.4% (*n* = 13,736)	—
Allows patrons to connect digital cameras and manipulate content	33.1% (*n* = 4,807)	66.6% (*n* = 9,664)	—
Allows patrons to burn compact discs/DVDs	44.6% (*n* = 6,462)	55.1% (*n* = 7,980)	—
Provides access to recreational gaming consoles, software, or Web sites	30.6% (*n* = 4,425)	68.7% (*n* = 9,926)	—
Provides access to mobile devices (e.g., e-readers, netbooks)	72.2% (*n* = 8,283)	27.8% (*n* = 3,189)	—

Will not total 100%, as categories are not mutually exclusive

Table 2.1
Services that public library outlets make available to users

Libraries report a substantial increase in the availability of wireless (Wi-Fi) services for public use (see figure 2.5). In 2011, 85.7 percent of public libraries provide public wireless access, as compared to 54.2 percent in 2007. And if libraries that indicate they are planning to provide wireless access within the year do so, the figure will approach just over 90.0 percent. The adoption of Wi-Fi in public libraries has been quite rapid and is likely to become almost as ubiquitous as Internet connectivity in libraries.

Services

Public libraries use their Internet connectivity and public-access computers to provide databases, e-books, digital reference, training, and a number of Internet-enabled services to their users—both from inside and outside of the library's walls. More specifically, as reported in 2011, public libraries

- offer licensed databases (99.8 percent), homework resources (87.0 percent), audio content such as audiobooks (82.8 percent), and digital reference (66.9 percent) (see table 2.1)
- Offer a substantial amount of information technology training (see table 2.2) on a wide range of topics, including general Internet use (93.5 percent), general computer use (92.9 percent), online

	Metropolitan Status			
Technology Training Classes	*Urban*	*Suburban*	*Rural*	*Overall*
General computer skills (e.g., how to use mouse, keyboard, printing)	93.7% (*n* = 1,176)	92.9% (*n* = 1,990)	92.3% (*n* = 1,527)	92.9% (*n* = 4,693)
General software use (e.g., word processing, spreadsheets, presentation)	82.8% (*n* = 1,039)	80.9% (*n* = 1,734)	75.2% (*n* = 1,245)	79.5% (*n* = 4,018)
General Internet use (e.g., set up e-mail, Web browsing)	92.8% (*n* = 1,164)	94.7% (*n* = 2,030)	92.4% (*n* = 1,529)	93.5% (*n* = 4,723)
General online/Web searching (e.g., using Google, Yahoo, others)	81.8% (*n* = 1,026)	82.8% (*n* = 1,775)	80.9% (*n* = 1,339)	81.9% (*n* = 4,140)
Using library's Online Public Access Catalog (OPAC)	49.8% (*n* = 626)	52.9% (*n* = 1,134)	51.7% (*n* = 856)	51.8% (*n* = 2,615)
Using online databases (e.g., commercial databases to search and find content)	56.2% (*n* = 705)	59.7% (*n* = 1,281)	46.4% (*n* = 768)	54.5% (*n* = 2,753)
Safe online practices (e.g., not divulging personal information)	29.2% (*n* = 367)	38.0% (*n* = 815)	37.5% (*n* = 620)	35.6% (*n* = 1,802)
Accessing online government information (e.g., Medicare, taxes, how to complete forms)	28.6% (*n* = 359)	30.5% (*n* = 654)	31.6% (*n* = 522)	30.4% (*n* = 1,535)
Accessing online job-seeking and career-related information	51.4% (*n* = 644)	52.9% (*n* = 1,136)	39.4% (*n* = 652)	48.1% (*n* = 2,432)
Accessing online medical information (e.g., health literacy)	22.4% (*n* = 282)	26.6% (*n* = 571)	25.0% (*n* = 414)	25.1% (*n* = 1,267)
Accessing online investment information	16.4% (*n* = 206)	17.4% (*n* = 372)	9.3% (*n* = 153)	14.5% (*n* = 732)
Accessing genealogy information	31.8% (*n* = 399)	42.5% (*n* = 912)	45.6% (*n* = 754)	40.8% (*n* = 2,065)
Accessing consumer information (e.g., product value, safety, reliability, warranty information)	18.7% (*n* = 234)	24.5% (*n* = 526)	19.0% (*n* = 314)	21.2% (*n* = 1,074)
Digital photography, software, and online applications (e.g., Photoshop, Flickr)	22.6% (*n* = 283)	34.0% (*n* = 730)	31.8% (*n* = 526)	30.4% (*n* = 1,540)
Social networking (e.g., blogging, RSS)	31.5% (*n* = 395)	37.4% (*n* = 308)	35.5% (*n* = 587)	35.3% (*n* = 1,785)
Other technology-based training classes	6.8% (*n* = 85)	5.6% (*n* = 120)	5.9% (*n* = 98)	6.0% (*n* = 303)

Will not total 100%, as categories are not mutually exclusive

Table 2.2
Formal technology training classes offered by public library outlets, by metropolitan status

searching (81.9 percent), and general software use (79.5 percent).
- Provide innovative support services to meet community needs in such areas as e-government by helping users understand and use government Web resources (89.7 percent), apply for government services (80.7 percent), and complete government forms (67.8 percent) (see table 2.3).

There are other services provided by public libraries, but these demonstrate the depth and breadth of public library Internet-enabled services.

If one looks at the survey data over the years, there is a sense that public libraries quickly incorporated public-access technologies into their libraries, made public access a critical service provided to their communities, offered training and instructional programs to facilitate the ability of users to interact with Internet technologies, and responded to community needs such as e-government. Libraries do not provide these services without challenge, however.

Challenges in Public Access Services and Technologies

Increasingly, the public library Internet surveys show conflicting results. This section focuses on these somewhat contradictory results, by way of findings reported in the latest (2010–2011) survey. On the one hand, public libraries continue to offer enhanced public-access computing and Internet access to their communities. As presented above, public libraries

- offer wireless (Wi-Fi) access to the Internet;
- have faster public-access broadband speeds;
- offer technology and Internet training; and
- offer a range of other services such as databases,

E-Government Roles and Services	Metropolitan Status			
	Urban	*Suburban*	*Rural*	*Overall*
Staff provides assistance to patrons applying for or accessing e-government services.	77.5% (n = 1,761)	81.2% (n = 3,991)	81.4% (n = 5,610)	80.7% (n = 11,363)
Staff provides as-needed assistance to patrons in understanding how to access and use e-government websites.	92.2% (n = 2,094)	92.1% (n = 4,525)	87.2% (n = 6,011)	89.7% (n = 12,630)
Staff provides assistance to patrons in understanding government programs and services.	54.7% (n = 1,242)	54.1% (n = 2,661)	45.9% (n = 3,164)	50.2% (n = 7,067)
Staff provides assistance to patrons in completing government forms.	71.7% (n = 1,631)	66.0% (n = 3,246)	67.8% (n = 4,672)	67.8% (n = 9,549)
The library developed guides, tip sheets, or other tools to help patrons use e-government websites and services.	23.9% (n = 542)	20.5% (n = 1,010)	14.2% (n = 978)	18.0% (n = 2,530)
The library offers training classes regarding using government websites, understanding government programs, and completing electronic forms.	20.1% (n = 457)	8.3% (n = 410)	4.6% (n = 320)	8.4% (n = 1,187)
The library offered translation services for forms and services in other languages.	11.7% (n = 266)	10.6% (n = 521)	3.5% (n = 243)	7.3% (n = 1,031)
The library is partnering with government agencies, nonprofit organizations, and others to provide e-government services.	33.4% (n = 760)	25.8% (n = 1,266)	21.2% (n = 1,459)	24.7% (n = 3,485)
The library is working with government agencies (local, state, or federal) to help agencies improve their websites and/or e-government services.	11.7% (n = 253)	8.9% (n = 422)	5.7% (n = 377)	7.8% (n = 1,052)
The library has at least one staff member with significant knowledge and skills in provision of e- government services.	29.4% (n = 669)	19.1% (n = 937)	16.0% (n = 1,105)	19.3% (n = 2,711)
Other	2.8% n = 64)	2.4% (n = 120)	3.0% (n = 208)	2.8% (n = 392)

Will not total 100%, as categories are not mutually exclusive

Table 2.3
E-government roles and services of the public library outlets, by metropolitan status

digital reference, e-books, and e-government.

And, as libraries report, almost 65 percent are the only free public-access computing and Internet centers in their communities (see figure 2.6). Thus, public libraries provide critical public-access computing and Internet services that support their communities in a wide range of areas.

On the other hand, however, public libraries indicate that:

- *Their broadband speeds are inadequate*. 44.9 percent of respondents reported that their connectivity speed is insufficient some or all of the time (see figure 2.7).
- *Their numbers of public-access computers are inadequate*. 76.2 percent of libraries reported that they have insufficient availability of workstations some or all of the time (see figure 2.8).
- *Costs, space, and buildings are real barriers to the public-access environment public libraries can offer*. 78.7 percent of libraries reported that cost factors, 77.2 percent reported space limitations, and 54.4 percent reported that the building infrastructure (e.g., cabling, wiring, electrical outlets) were important factors in their decisions to add, or not add, public-access workstations or laptops (see table 2.4).
- *They rely on nonprofessional IT staff for technology support*. Libraries report that they rely on non-IT public service staff (39.0 percent), library directors (31.7 percent), and sometimes even volunteers (6.7 percent) for support for their technology. The percentage of library directors providing IT support climbs to 47.6 percent for rural libraries and drops to 4.2 percent for urban libraries. 48.1 percent of libraries support their IT with system-level IT staff, but only 32.2 percent of rural libraries have access to such support as compared to 75.5 percent of urban libraries (see table 2.5).

The real significance of these findings is that some libraries continue to face the same challenges *in spite of upgrades to their technology infrastructure*. And, more significantly, libraries continue to offer a significant number of services to the communities that they serve—licensed databases, technology training, e-government, and more—while often being the only free

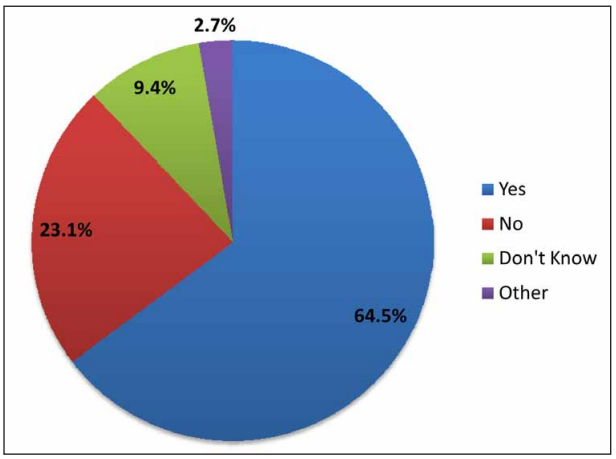

Figure 2.6
Public libraries as only provider of free public Internet access

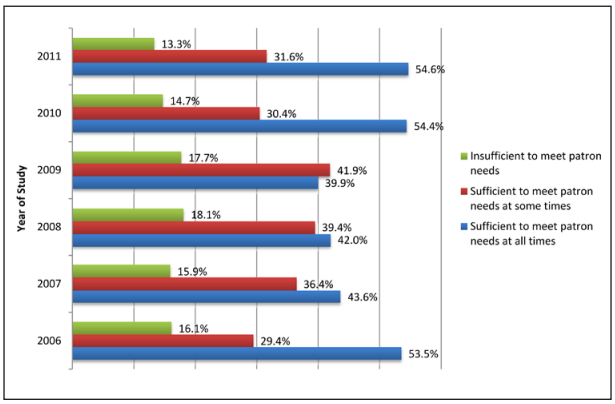

Figure 2.7
Internet connection adequacy

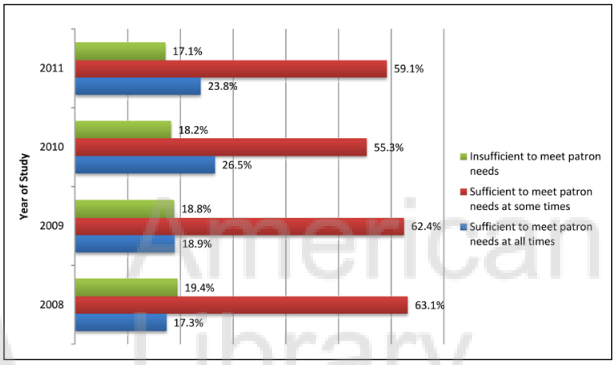

Figure 2.8
Public workstation adequacy

public-access point within their communities.

Thus, public libraries increasingly report that they are unable to meet patron demands for services due to inadequate technology infrastructure, costs associated with operating and maintaining that infrastructure, and bandwidth quality or availability issues—but not for lack of trying to enhance their services. What is unclear is how libraries will maintain their levels of public-access computer and Internet access services, much less extend and augment them, in the current economic downturn. It is in this mixed and paradoxical context that public libraries provide their public-access services.

Future Issues and Considerations

The surveys have demonstrated the enthusiastic embrace and incorporation of the Internet and public-access technologies by public libraries—not just from an infrastructure perspective, but also from a service and resource perspective. On average, public libraries increased the number of public-access workstations by several hundred percent in a period of eight years; substantially increased their Internet speeds; expanded service to include Wi-Fi public access; offer a large range of Internet-enabled services and resources such as databases, digital reference, and e-books or audiobooks; and provide technology and Internet resource training services. But the data also show that libraries are stretched, and increasingly challenged to maintain or enhance their levels of services.

This strain has been ongoing for several years and continues to become more pronounced for several reasons:

- As demonstrated as early as the 2006 survey, many libraries began struggling with an "infrastructure plateau" a number of years ago as they no longer had space, connectivity, and other supports to expand the number or capacity of computers available to patrons[6]
- Public libraries are increasingly the only access point in communities for free Internet and assistance using the Internet.[7]
- The Internet both has served to augment existing library services and to establish new social roles, with e-government and emergency response being two of the most prominent new roles.[8]
- Many other types of outlets for information that the public was able to previously rely on—such as government agencies, academic libraries, and law libraries—have moved their information exclusively online or become more exclusive in their service populations, driving people without other access to the public library to get information previously available elsewhere.[9]
- The sustained economic downturn has exacerbated this demand on libraries.

The last point is critical, and likely will have lasting effects on the public library service environment. As the study shows ongoing reductions to public

Factors	Overall						
	Least Important	*Un-important*	*Neutral*	*Important*	*Most Important*	*Not Applicable*	*Average*
Availability of space	6.0% (*n* = 903)	4.1% (*n* = 665)	11.1% (*n* = 1,670)	21.2% (*n* = 3,198)	56.0% (*n* = 8,454)	1.3% (*n* = 198)	4.2 (*n* = 14,889)
Cost factors	3.1% (*n* = 462)	4.1% (*n* = 625)	12.9% (*n* = 1,951)	19.3% (*n* = 2,912)	59.4% (*n* = 8,946)	1.1% (*n* = 171)	4.3 (*n* = 14,896)
Maintenance, upgrade, and general upkeep	13.7% (*n* = 2,003)	16.0% (*n* = 2,343)	28.5% (*n* = 4,177)	24.0% (*n* = 3,519)	15.4% (*n* = 2,262)	2.3% (*n* = 341)	3.1 (*n* = 14,304)
Availability of public service staff to manage the use of the public-access computers and users	16.4% (*n* = 2,406)	17.6% (*n* = 2,582)	29.3% (*n* = 4,290)	21.7% (*n* = 3,168)	12.0% (*n* = 1,759)	2.9% (*n* = 429)	3.0 (*n* = 14,205)
Availability of technical staff to install, maintain, and update the public-access computers	16.3% (*n* = 2,407)	18.1% (*n* = 2,681)	24.0% (*n* = 3,540)	23.3% (*n* = 3,438)	15.4% (*n* = 2,278)	2.9% (*n* = 429)	3.0 (*n* = 14,344)
Availability of bandwidth to support additional workstations	19.5% (*n* = 2,888)	15.9% (*n* = 2,350)	19.8% (*n* = 2,932)	18.6% (*n* = 2,749)	22.2% (*n* = 3,288)	3.9% (*n* = 583)	3.1 (*n* = 14,207)
Availability of electrical outlets, cabling, or other infrastructure	13.3% (*n* = 1,970)	11.6% (*n* = 1,716)	18.5% (*n* = 2,742)	23.3% (*n* = 3,458)	31.1% (*n* = 4,623)	2.3% (*n* = 354)	3.5 (*n* = 14,509)
Other	8.9% (*n* = 109)	1.3% (*n* = 16)	8.0% (*n* = 98)	2.6% (*n* = 32)	11.5% (*n* = 141)	67.7% (*n* = 832)	3.2 (*n* = 397)

1 = Least Important; 5 = Most Important

Table 2.4
Factors affecting adding workstations or laptops

library budgets and funding, the economic conditions have caused more people need to rely on the library computers out of necessity for looking for assistance and seeking employment, as well as entertainment and communication, as many people can no longer afford their own access, all while most libraries were suffering significant budget cuts.[10] Public libraries have served as "America's first responders to the economic crisis."[11] However, as the usage rates of libraries and the demands on their computers have increased dramatically—in some cases as much as 500 percent in a period of three years—the library staff, computers, and even the most basic infrastructure like carpets have struggled to hold up under the usage and needs.[12]

In light of the ever-increasing demands being placed on the computers, connectivity, and staff of public libraries, public libraries, policy makers, and others need to consider several key issues as public libraries continue to fulfill their role as community-based providers of cost-free public access to the Internet and computing:

- *How much is enough? It's never enough.* A question that the surveys have never been able to adequately address is "How much access (workstations, broadband) is enough?" In fact, as the bar gets higher in terms of service provision, so too does the assessment of how much is needed. Libraries—even the smallest in the most rural areas—are rapidly approaching the need for fiber-optic connections. Nearly half of all libraries report a T1 (1.5 Mbps) connection—something that only a few short years ago was considered robust bandwidth. And yet, a vast majority of libraries report that this increase in bandwidth is inadequate.
- *Better understanding of the relationship between infrastructure and services.* The initial *Public Libraries and the Internet* surveys showed that libraries viewed Internet connectivity as an experimental service—one that had substantial potential, but it was unclear at the time (the Mosaic browser was introduced in 1993, the same year that the first survey went into the field) just how revolutionary the Internet would be to public library service. As Internet-enabled services are a mainstay of the public library, there is a substantial need to better understand which services require what amount of bandwidth. Increasingly, for example, streaming video content is in high-definition format, which consumes substantially more bandwidth than Web browsing.
- *The need for comprehensive capacity planning.* Public-access services and resources require libraries to look across their Internet-enabled services and resources comprehensively. Public-access workstations, broadband, and Wi-Fi are part of a collective public-access technology environment that directly impact the ability of libraries

Source of IT Support	Metropolitan Status			
	Urban	*Suburban*	*Rural*	*Overall*
Public service staff	40.7% (*n* = 1,024)	42.4% (*n* = 2,263)	36.0% (*n* = 2,725)	39.0% (*n* = 6,013)
Library director	4.2% (*n* = 106)	22.1% (*n* = 1,177)	47.6% (*n* = 3,598)	31.7% (*n* = 4,881)
Building-based IT staff (IT specialist)	13.4% (*n* = 336)	16.8% (*n* = 898)	10.5% (*n* = 791)	13.1% (*n* = 2,025)
System-level IT staff	75.5% (*n* = 1,901)	56.4% (*n* = 3,008)	32.2% (*n* = 2,513)	48.1% (*n* = 7,422)
Library consortia or other library organization	5.6% (*n* = 140)	17.3% (*n* = 925)	13.2% (*n* = 997)	13.4% (*n* = 2,062)
County/city IT staff	30.5% (*n* = 767)	20.2% (*n* = 1,130)	11.0% (*n* = 830)	17.7% (*n* = 2,727)
State telecommunications network staff	1.7% (*n* = 42)	4.0% (*n* = 213)	3.8% (*n* = 287)	3.5% (*n* = 541)
State library IT staff	2.3% (*n* = 57)	3.7% (*n* = 197)	8.7% (*n* = 660)	5.9% (*n* = 913)
Outside vendor/contractor	16.2% (*n* = 408)	21.4% (*n* = 1,140)	37.7% (*n* = 2,854)	28.5% (*n* = 4,402)
Volunteer(s)	*	3.4% (*n* = 182)	11.0% (*n* = 834)	6.7% (*n* = 1,031)
Other source	4.0% (*n* = 100)	6.0% (*n* = 323)	6.2% (*n* = 469)	5.8% (*n* = 892)

*Insufficient data to report

Table 2.5
Sources of IT support provided to public library outlets, by metropolitan status

to offer patrons high-quality Internet services and resources—and moreover, high-quality user experiences. A library that has seven public-access workstations and offers Wi-Fi but has a DSL connection ultimately provides a dial-up experience to its users. Capacity planning needs to include not just the last mile, but also internal library infrastructure, including routers, switches, and up-to-date workstations, at the least, to provide quality public-access services.

- *Continual upgrades to technology and staff*. As the surveys demonstrate, public-access computing and Internet infrastructure and services are not a one-time investment. There is a continual need to upgrade computing technology, Internet connectivity, and buildings. Also, the surveys show that, given the demands placed on libraries for training, e-government, education, employment, and other critical service areas, there is a need to continually train library staff on a range of technologies as well as services (such as how to help with applying for government benefits, seeking employment, taking certification exams, and more).
- *Setting service quality benchmarks*. Given increasing demands, and libraries that report the inability to keep up with demand, libraries may need to consider setting levels-of-service-quality benchmarks. Libraries will need to decide whether they will offer as many services at the highest level of quality as possible, or set levels of service quality, realizing that a library may not be able to meet all requests and demands. In some cases, service quality levels may be dictated by, for example, the broadband that is available to a library due to cost and geography. These levels of service may place libraries at odds with their user communities, which may request or desire more services at levels of quality that the library is unable to afford or provide.
- *Public-access technology versus other services*. Internet-enabled services have clearly become essential public library services. It is important to also note that libraries continue to offer and provide significant services such as programs and access to printed materials. Public libraries reside, and have for some time, in both print and electronic environments and this requires libraries to strike a balance between these two contexts, particularly in light of resource constraints.
- *Library physical capacity limitations*. Libraries have consistently identified the limitations of their buildings through the surveys since 2006. Indeed, public library space will remain a critical factor as libraries balance the use of their physical space to house materials, provide public-access technologies, and facilitate public use. The IMLS

public library data show that 25 percent of public libraries are 2,400 square feet or less, with 50 percent of public libraries having 5,700 square feet or less[13]—and one should note that the usable space for collections and services is different from overall space. And though offering wireless access increases public-access technology capacity, the need for differing workspaces to accommodate mobile devices and the power needs of such devices presents an issue for libraries.

- *The library divide*. One factor across all the surveys conducted in the last ten years remains: rural libraries in general have fewer resources, less connectivity, fewer workstations, less access to technology support, and other factors. This does not mean that urban libraries are infinitely better off—in fact, urban libraries often report similar issues in terms of keeping up with demand. But the survey data are clear: rural libraries face substantial challenges in supporting their public-access technology environment, and there is no indication of abatement in this circumstance. Additionally, long-term funding decisions have created notable divides in overall workstations and connectivity between regions of the country.[14]

The above are a selection of issues that will need consideration and resolution if public libraries are to continue their role as critical providers of community public Internet and computing access.

Future *Public Libraries and the Internet* surveys will need to continue exploring the evolving service context of public-access Internet and computing services within public libraries. Public libraries have clearly moved beyond issues of "getting connected" and into critical services provision via the Internet. Indeed, one cannot imagine a public library that is not connected to the Internet, not providing public-access computers, or not offering users a number of online resources such as licensed databases, assistance with using technology or the Internet, or, increasingly, Wi-Fi access. One can no longer separate the public library from public Internet access. The issue is not one of measuring connectivity, but rather of better understanding the nature and roles of public libraries as providers of community-based public access.

Resources

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Notes

1. The studies were the Public Libraries and the Internet Survey series, with various funding sources, until 2006, at which time they became part of the Public Library Funding and Technology Access study (www.ala.org/plinternetfunding), funded by the American Library Association and the Bill & Melinda Gates Foundation.
2. By system we mean the central authority for the library—that is, the entity that makes budget decisions, applies for E-Rate, and makes other management decisions. The survey does not use the term *system* to mean regional cooperatives or other forms of federated libraries.
3. Metropolitan status was determined using the official designations employed by the Census Bureau, the Office of Management and Budget, and other government agencies. These designations are used in the study because they are the official definition employed by the Institute of Museum and Library Services (IMLS), which allows for the mapping of public library outlets in the study.
4. In previous studies, the authors have used the less than 20%, 20%–40%, and greater than 40% poverty breakdowns. The poverty of the population a library outlet serves is calculated using a combination of geocoded library facilities and census data. More information on this technique is available through the authors as well as by reviewing the 1998 and 2000 public library Internet studies (John Carlo Bertot and Charles R. McClure, *The 1998 National Survey of US Public Library Outlet Internet Connectivity: Final Report* [Washington, DC: National Commission on Libraries and Information Science, 1998]; John Carlo Bertot, and Charles R. McClure, *Public Libraries and the Internet 2000: Summary Findings and Tables* [Washington, DC: National Commission on Libraries and Information Science, 2000]; both available at http://plinternetsurvey.org).
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12. Institute of Museum and Library Services, "Fiscal Year 2008 Public Library (Public Use) Data File" (puout08a, last accessed May 30, 2011), 2010, http://harvester.census.gov/imls/data/pls/index.asp#fy2008BridgeStudy.
13. Paul T. Jaeger, John Carlo Bertot, Charles R. McClure, and Miranda Rodriguez, "Public Libraries and Internet Access across the United States: A Comparison by State from 2004 to 2006," *Information Technology and Libraries* 26, no. 2 (June 2007): 4–14.

Appendix A: Public Libraries and the Internet and Public Library Funding and Technology Access Surveys

Year	Title	Authors	Published by
2011	*2010–2011 Public Library Funding and Technology Access Survey: Survey Findings and Report*	Bertot, Sigler, DeCoster, McDermott, Langa, Grimes, & Katz	Information Policy & Access Center, University of Maryland College Park
2010	*2009–2010 Public Library Funding and Technology Access Survey: Survey Findings and Report*	Bertot, Langa, Grimes, Sigler, & Simmons	Center for Library & Information Innovation, University of Maryland College Park
2009	*2008–2009 Public Library Funding and Technology Access Survey: Survey Findings and Report*	Bertot, McClure, Wright, Jensen, & Thomas	Information Institute, Florida State University
2008	*2007–2008 Public Library Funding and Technology Access Survey: Survey Findings and Report*	Bertot, McClure, Wright, Jensen, & Thomas	Information Institute, Florida State University
2007	*2006–2007 Public Library Funding and Technology Access Survey: Survey Findings and Report*	Bertot, McClure, Thomas, Barton, & McGilvray	Information Institute, Florida State University
2006	*2006 Public Libraries and the Internet: Survey and Results*	Bertot, McClure, Jaeger, & Ryan	Information Institute, Florida State University
2004	*2004 Public Libraries and the Internet: Survey and Results*	Bertot, McClure, & Jaeger	Information Institute, Florida State University
2002	*2002 Public Libraries and the Internet: Survey and Results*	Bertot, McClure, & Thompson	Information Institute, Florida State University
2000	*2000 Public Libraries and the Internet: Survey and Results*	Bertot & McClure	Information Institute, Florida State University
1998	*Moving Toward More Effective Public Internet Access: The 1998 National Survey of Public Library Outlet Connectivity*	Bertot & McClure	US National Commission on Libraries & Information Science
1997	*The 1997 National Survey of US Public Libraries and the Internet: Final Report*	Bertot & McClure	US National Commission on Libraries & Information Science and the American Library Association Office for Information Technology & Policy
1996	*The 1996 National Survey of Public Libraries and the Internet: Progress and Issues*	Bertot, McClure, & Zweizig	US National Commission on Libraries & Information Science
1994	*Public Libraries and the Internet: Study Results, Policy Issues, and Recommendations*	McClure, Bertot, & Zweizig	US National Commission on Libraries & Information Science

All survey reports are available at www.plinternetsurvey.org

Chapter 3

The Rural Public Library as Leader in Community Broadband Services

Nicole D. Alemanne, Lauren H. Mandel, and Charles R. McClure

Abstract

This chapter of The Transforming Public Library Technology Infrastructure *proposes a leadership role for rural public libraries as a linchpin among broadband anchor institutions in the community. This chapter utilizes recent research to explore the need for new models of how the rural public library can take a leadership role in utilizing education and training to increase the impact of broadband on the community. In addition, the chapter offers one possible approach for how the public library can take a leadership stance in promoting community-based broadband planning.*

Introduction

Broadband is a community asset. The Federal Communications Commission (FCC), in *Connecting America: The National Broadband Plan*, sets a goal that every US community should have affordable access to at least a 1 gigabit per second (Gbps; 1 Gbps equals 1,000 Mbps and 1,000,000 kbps) connection through its anchor institutions, such as public libraries, schools, community colleges, and health-related organizations.[1] Rural public libraries can and should take very strong leadership positions to leverage and coordinate community broadband resources. The public library clearly is playing a linchpin role in many rural communities already. The public library provides training and information services for a wide range of needs and has staff members who understand technical issues—knowledge that may be at a premium in rural areas that lack countywide or regional IT support for anchor institutions. In addition, the library's user base overlaps with the user bases of other anchor institutions. But the rural public library faces many of the same issues as other rural anchor institutions, such as lack of resources, support from elected officials, and access to affordable high-speed broadband Internet.

Anchor institutions are "sticky capital"[2] because they are assets that stay in their communities, as opposed to businesses that can leave at any time.[3] CEOs for Cities, a national group of urban leaders, notes that anchor institutions can have extended impacts on their communities when they think of their successes as community success. In this way, they can "project ambition" and increase their relevance through leadership roles that address community needs.[4]

This chapter proposes a new service model for the rural public library as the "anchor institution of the anchor institutions." Such an approach to rural public library service will be challenging to implement and maintain, especially in difficult times. However, the current economic situation in which the rural public library and rural communities in general find themselves demands a rethinking of broadband service delivery on a communitywide basis. The public library cannot continue with business as usual, as there simply are too many rural community broadband needs to be met. One way to bring rural communities into the future is for local governments and anchor institutions to work together to deliver high-quality broadband services.

The rural public library, through provision of

information services and support, has accrued credibility and high visibility—the library is a highly trusted institution in the community. In addition, library staff understands how new broadband services and applications can transform the life of the community and its residents. This combination of knowledge, credibility, visibility, and community support means that the rural public library has a great opportunity to take a leadership position to encourage coordination, planning, and leveraging of these new and exciting broadband services and applications. In addition, a role as the "anchor of the anchors" might position the rural library to continue to receive the funding and support needed to sustain service to the community.

Broadband training, planning, and deployment are crucial components in educating and building enthusiasm and awareness among key stakeholders about the value of broadband and associated broadband-enabled services in order to increase access and subscribership to broadband Internet among rural Americans. Such support also will be required to successfully implement the broadband goals outlined in the National Broadband Plan, such as the provision of 100 Mbps broadband Internet to at least 100 million homes, affordable access to robust service for all Americans, and affordable access to a minimum 1 Gbps broadband service to community anchor institutions.[5]

Background: Building a Middle Mile Broadband Infrastructure in Rural Florida

While Florida's large urban areas such as Miami-Dade and Jacksonville may be top of mind to outsiders, large swathes of the state are rural. In fact, about half of Florida's sixty-seven counties are designated rural.[6] High-speed broadband Internet has the potential to affect a wide range of aspects of the rural economy and quality of life, but research is finding that many residents of rural counties in Florida have little or no access to broadband, with little competition among Internet service providers (ISPs). In fact, even in 2011, some communities have residents who are underserved or, in some cases, not served by broadband at all.[7]

The FCC previously defined broadband based on two minimum tiers: "first generation data," from 200 kilobits per second (kbps) to less than 768 kbps in the faster direction, and "basic broadband tier 1," from 768 kbps to less than 1.5 megabits per second (Mbps; 1 Mbps equals 1,000 kbps).[8] However, these standards were extreme minimums—for example, at 200 kpbs, an average movie download would take 8.12 hours; even at 786 kbps that download would take 2.12 hours.[9] In December 2010 the FCC changed the definition of minimum broadband speed to 4 Megabytes per second (Mbps).[10] What this means to users today is that what was considered a high-speed connection a few months ago is now in need of upgrade. The T1 line is now insufficient (a T1 line offers transfer speeds of up to 1.544 Mbps), and combining two T1 lines still falls short of what is now considered to be high-speed Internet.

The American Recovery and Reinvestment Act (ARRA) provided over $7 billion to expand access to broadband services in the United States. As part of this program, the National Telecommunications and Information Administration (NTIA), through its Broadband Technology Opportunities Program (BTOP), has awarded Last Mile, Middle Mile, and Comprehensive Community Infrastructure grants to connect anchor institutions to new or improved broadband Internet facilities.[11]

Two such projects were funded to build out middle mile infrastructure to rural Florida counties: the North Florida Broadband Authority (NFBA) received funding to build a middle mile network in the North Central Rural Areas of Critical Economic Concern (RACEC),[12] and the Florida Rural Broadband Alliance received funding to build a middle mile network in the Northwest and South Central RACECs (figure 3.1). Both the NFBA and FRBA contracted with the Information Use Management and Policy Institute (Information Institute) at the Florida State University College of Communication and Information to conduct broadband needs assessments of rural anchor institutions in Florida's three RACECs.

Information Use Management and Policy Institute
http://ii.fsu.edu

Florida State University College of Communication and Information
http://cci.fsu.edu

Bringing a broadband connection to an anchor institution's front door, however, is just the first step. Research has found that the speed and quality of many anchor institutions' broadband services at the workstation level are severely compromised by inefficient and poorly designed network configurations; also, many staff members do not know the speed or quality of their front door broadband connections and do not understand the ways in which speed to the workstation can be degraded.[13] LaRose, Strover, Gregg, and Straubhaar report that rural infrastructure grants to build out rural broadband Internet are not sufficient, on their own, to ensure adoption of broadband among rural residents.[14] Rather, LaRose and his colleagues find that "Community education efforts appear to stimulate adoption over and above what is possible through either public or private infrastructure investments alone."[15]

The broadband needs assessments for NFBA and FRBA reached similar conclusions, that is, significant training and awareness-raising efforts need to accompany broadband build-out projects in order to ensure increased use and subscribership. The public library has long been known as an anchor institution that provides technology access and training for the communities, among other Internet service roles,[16] and the National Broadband Plan recognizes that "Local leaders can play an important role by building on existing social programs and partnering with community organizations that non-adopters already rely on as trusted sources of information."[17] The rural public library has an opportunity to expand upon existing Internet service roles to embrace a role that includes serving as an anchor among anchors, that is, serving as a central and critical agency that can coordinate and facilitate community-based broadband planning, deployment, training, and awareness-raising efforts.

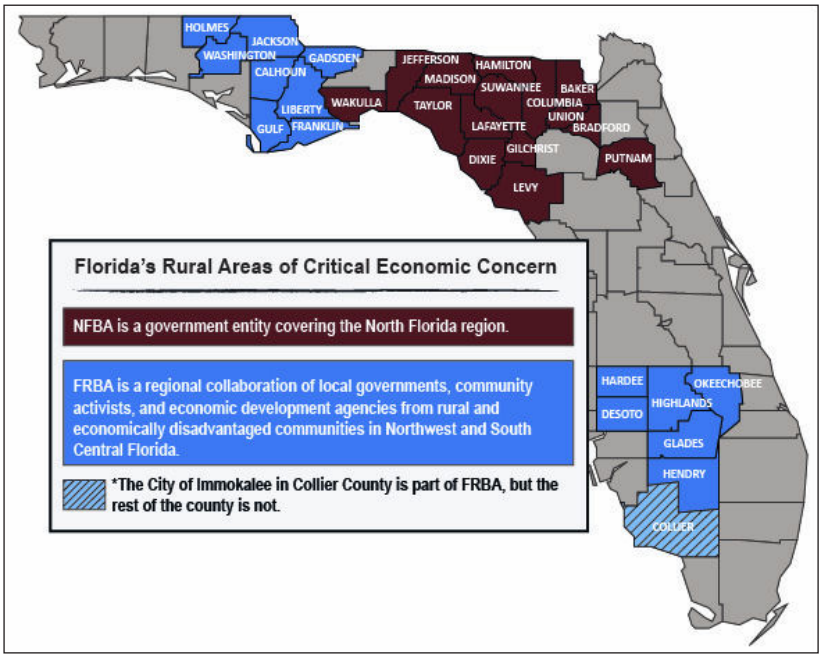

Figure 3.1
NFBA and FRBA coverage areas

This chapter utilizes preliminary data from the NFBA and FRBA needs assessment projects to understand the role of the rural public library as a broadband anchor institution, to explore the need for new models of how the rural public library can collaborate with other broadband anchor institutions, and to propose ways that the rural public library can enhance its success as a provider of free public access to high-speed broadband Internet.

Rural Anchor Institutions and Broadband Internet

The Information Institute developed a multimethod research design for the NFBA and FRBA needs assessments. The design includes:

- a survey to collect baseline data;
- focus groups to follow up on survey results and to help understanding of situational factors affecting anchor institutions' broadband usage and needs; and
- on-site broadband/network diagnostics to collect data on anchor institutions' capacities, policies, and network configurations and to help understanding of the enablers and barriers to their broadband usage and improvement.

Data analysis for the NFBA and FRBA projects are in process. Thus, the data used for this chapter rely on preliminary analysis of existing data and focus on findings related to the public library and its interactions with other community anchor institutions.

Preliminary analysis identifies a number of key broadband-related issues. The issues presented here are those that relate specifically to the library and the needs and roles that the rural public library can fulfill with regard to broadband deployment, training, and awareness building on a communitywide basis. These issues are bound together by one of the main preliminary findings—that the rural public library could be poised to take on a community broadband leadership position to leverage and coordinate community-based broadband services. This changes the paradigm of the library user to that of the community broadband user and the paradigm of the public library as an anchor institution to one of the library as the "anchor of the anchors."

Access to Broadband Internet and Broadband-Enabled Services

There is a clear need to promote the role of the public library as an anchor institution that provides community broadband access, considering that the prevalent attitude is that the Internet has made the library obsolete. The rural public library needs to make a strong case that it is a hub of twenty-first-century technology, which can be accessed freely by the public. Preliminary analysis of the research shows that 94 percent of public

libraries in the study report having dedicated public workstations. As one rural public library director commented, "Access to the Internet is absolutely essential for us to provide broadband services and compete in the digital economy."

In addition to being a source of free public broadband Internet access, the rural public library provides assistance in accessing and using e-government applications via its broadband connection. One focus group participant said, "What I see every day is people struggling to stay alive," and the library is instrumental in people getting unemployment and food stamps and filling out job applications. These library users "don't have computer skills, you are helping them do those things, they need their unemployment, they need a job application online." Survey findings show that public library users engage in a number of e-government and economic-related tasks while accessing the Internet via public library computers, such as job seeking, accessing government information and services, learning about small business development, and finding information about investments (figure 3.2). The training and information access opportunities provided by the rural public library is the reason that it is already, to some extent, a linchpin anchor institution. Through this provision of services that benefit the users of other anchor institutions, the rural public library has taken what may be an unplanned-for leadership role among community anchor institutions.

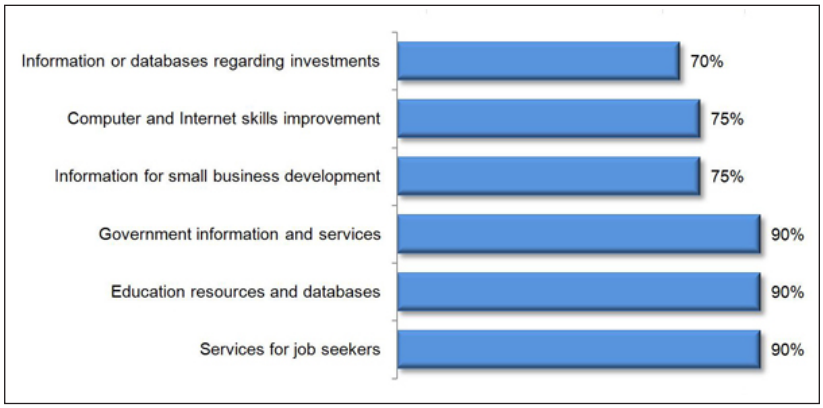

Figure 3.2
Percentage of libraries reporting patron use of public library computers by task

A recurrent theme is that the question that really needs to be asked by local and county government officials is "What new ways can the public be served through broadband and how can local community broadband services be leveraged?" This is an area where the local public library can offer leadership and provide much-needed assistance in identifying broadband-enabled services as well as mechanisms for providing these services. The public library already provides access to and assistance with e-government and emergency or disaster management services that are enabled by the library's broadband connection. The provision of these services came about as a natural extension of the library's role as a trusted source of information; expansion into other broadband-enabled services, such as economic development and job-placement services, needs to continue if the library is to maintain its relevance in the increasingly electronic world.

Technology Training and Education

Focus group participants noted that the greatest challenge in trying to market or promote broadband access and availability is the fact that "there are a lot of people who are disadvantaged for whom Internet and computers are just not in their realm," and who do not understand why they need broadband access. These residents require training and education regarding the value of broadband and what it can do for them and their quality of life.

Such training and education can be provided by the local public library, and many focus group participants commented on the contributions that the public library makes in their counties to provide a range of broadband, workstation, and software training. For some, the public library is the only place in the county where free training and one-on-one assistance for activities such as submitting online job applications can be obtained. In fact, training is a critical need; as one focus group participant noted, "More than anything else we need education."

The local public library is a known and trusted source of that training. In one county, the school district tried providing training classes, but no one attended, effectively quashing the initiative. The library system serving the same county noted that its training class is always full, suggesting that people (1) do know they need technology training and (2) prefer to receive such training at their local public library. However, library staff note they are extremely hard-pressed to maintain such training and that most likely it will be cut back with any additional budget cuts.

Indeed, preliminary survey results show that library training for the public still focuses on basic computer, e-mail, and Internet skills (figure 3.3). The survey inquired about training planned for the next year in the following areas:

- basic computer skills, such as using the mouse
- advanced computer skills, such as choosing and using software packages

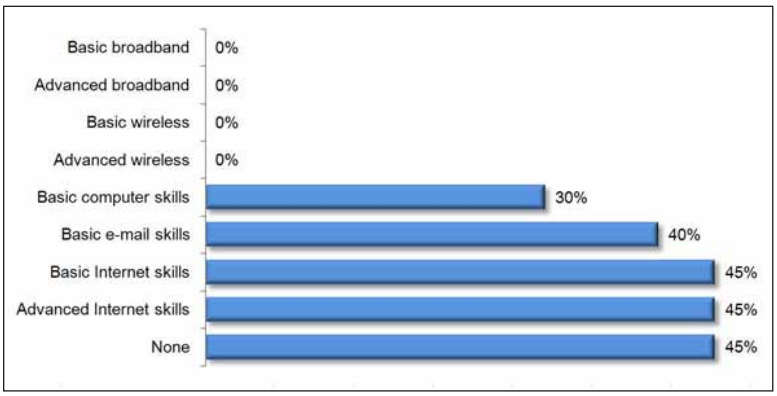

Figure 3.3
Percentage of libraries reporting plans for training by topic. Note: Does not add up to 100% because some libraries offer training on multiple topics.

A critical preliminary finding from the rural anchor institution needs assessment research is that when community members need computer, Internet, and broadband training, the institution to which they turn is the public library. This points to a new paradigm in which library users are understood to be residents of the community at large—and in rural America, these communities are in dire need of training and education. The rural public library could be poised to leverage its knowledge and position of trust to seize a leadership position in community-based broadband planning, education, and implementation.

- basic e-mail skills, such as creating an account and writing and sending e-mail
- basic Internet skills, such as getting online
- advanced Internet skills, such as searching for information and determining information accuracy
- basic broadband, such as what it is and the major uses of it
- advanced broadband, such as configuring an internal network and network security skills
- basic wireless, such as what it is and the major uses of it
- advanced wireless, such as setting up wireless access points

Libraries do report training on advanced Internet skills; this is most likely related to information search training. However, training for other advanced topics is not being provided.

These findings are supported by the *2010–2011 Public Library Funding and Technology Access Survey* report.[18] In that study, 77.3 percent of rural libraries report offering informal point-of-use assistance, and a quarter (25.2 percent) report offering formal training classes. Technology training offered by the public library could include training for staff at other anchor institutions. At an on-site diagnostic for a county health department, the health department staff noted that such training is provided at their local public library, indicating that some libraries already are fulfilling this role. Findings from the on-site diagnostics show that anchor institutions' staff, including IT staff, do not feel in control of their technology options. Many IT staff do not know how to make their networks better or whether attempting to make the network better would do any good. The public library could become a hub of knowledge about broadband deployment and then share that knowledge with other anchor institutions via communitywide anchor institution staff training sessions.

Communitywide Broadband Planning

Most pressing is for anchor institutions, either separately or in collaboration with other county or regional anchor institutions (or with others), to develop broadband plans. When the research team conducted on-site diagnostics at anchor institutions that had technology plans, these institutions generally had better broadband connections and equipment and more technology-savvy staff members than anchor institutions without technology plans. Lacking a technology plan or having only a partial IT plan results in inconsistent performance from the network and confusion among employees and public users about technology policies. Having a dedicated technology plan significantly affects an institution's ability to provide technology-based services.

Technology plans need to succinctly describe and schedule a process for the anchor institution (with others) to take advantage of the coming high-speed broadband that is likely to be offered at significantly reduced rates compared to what is available currently. The plans need to identify strategies related to awareness; education; network, hardware, and software development; collaboration; implementation of new broadband services; organizational impacts from broadband; economic development; and other topics.

A common comment or question arising in focus groups was: "Who do we go to for assistance in educating our staff, who can help us with connecting to the middle mile deployment, how do we use and deploy the broadband successfully in our organization [or governmental agency], and how do we promote our improved broadband to attract new jobs and for overall economic development?" These are areas where the rural public library can step into a vital role—as organizer, facilitator, and planner for other anchor institutions on a communitywide basis.

Technology planning is a key area in which the

public library can utilize its knowledge base to take the lead in developing community broadband and technology resources. Individual people already trust the library as a valued source of information and training about technology; it would not require a large leap for multiple institutions in a community to turn to their local public library as a source of information and training about technology. Stepping into such a role might place a burden on the local public library at first, but serving in the capacity of "anchor to the anchors" also can bring the library greater recognition and support in times of financial difficulties.

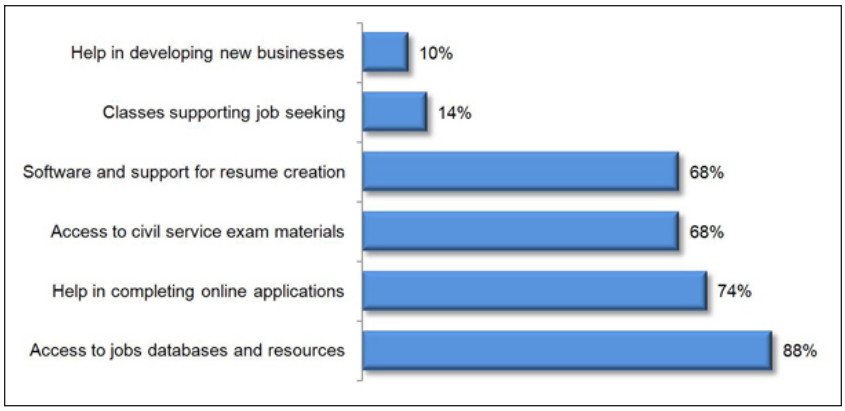

Figure 3.4
Job-seeking services provided by rural public libraries

Rural Public Libraries as Leaders in Broadband Community Services

There are a number of ways in which the rural public library not only can plan for its own broadband future, but also can seek to become a linchpin anchor institution in the regions—or anchor for anchors—thereby providing a public service and enhancing its community profile. In this new model of public library community leadership, the public library can leverage its resources and training expertise to help other community anchor institutions with jobs training and economic development as well as technology planning and training. The Information Institute's research finds that communities have little or no understanding of how to leverage broadband deployment and access to promote economic development. In fact, a number of participants asked, "Who is in charge [of such planning]?" This finding shows a need for communities to understand broadband and broadband-related education and training as essential building blocks for rural economic growth and jobs training.

The Library's Expanding Internet Service Roles

McClure and Jaeger identified key service roles of the public library in the Internet age:[19]

- a place for public access to the Internet
- e-government service provider
- emergency and disaster relief provider
- Internet and technology trainer
- youth educational support provider
- connector of friends, families, and others
- anyplace, anywhere, anytime individualized information provider
- digital library manager
- virtual, seamless, and endless electronic resources provider
- digital workplace/space, and digital ombudsperson

A number of these roles are connected to the idea of the library as the anchor of the anchors within local communities or counties, especially as these roles relate to other anchor institutions' users and staffs as the users of the library.

Libraries provide economic support to communities in numerous ways through the availability of digital resources and technology. For example:

- Market entry costs for new businesses can be reduced when government agencies partner with libraries to provide business development data, workshops and research.
- Libraries' technology training experience have helped local workforce agencies in program outreach.
- Investments in early literacy correlate to long-term economic success.
- Libraries are found to contribute to the stability, safety, and quality of life in neighborhoods.[20]

The *2010–2011 Public Library Funding and Technology Access Survey* report details a number of ways in which rural libraries provide key services for job seekers, especially as the job search goes more and more online (figure 3.4).[21]

In addition to this role as economic support provider, the roles identified by McClure and Jaeger—most particularly those relating to disaster support and recovery; e-government provision and support; technology training; digital management and electronic resources provision; anyplace, anywhere, anytime, individualized information provision; digital technology workplace provision; and virtual information

provision—mean that the public library not only can, but should, take an active leadership role in community broadband development.

Planning for the Future

There are several models for broadband strategic planning: plans developed for individual anchor institutions and community anchor institutions working together, countywide planning, and regional planning. One possible approach to community-wide planning is presented in figure 3.5. This model follows a cyclical approach, such that communitywide broadband planning, adoption, and deployment occur continuously, with expansions of broadband speed and services possible over the course of the cycle. In this approach, anchor institutions and others in the community work together to coordinate and leverage the available broadband. More importantly, they coordinate and leverage the range of broadband services that can be provided within the community. For example, the library can coordinate e-government services with local city and county government or with the local county health department by use of interactive, high-resolution video—where city and county government and the county health department can simultaneously assist a community resident in determining how best to meet that resident's needs.

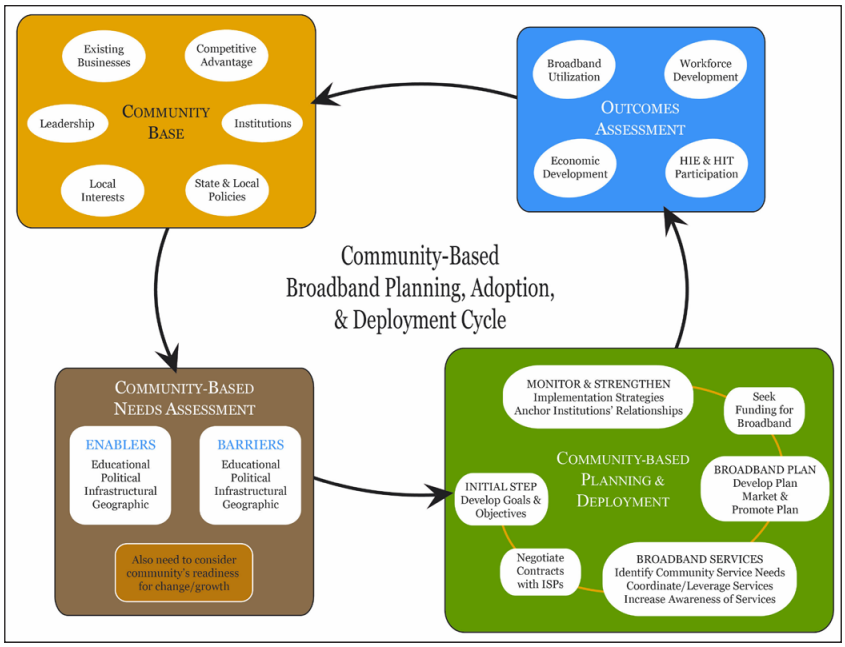

Figure 3.5
Community-based broadband planning model

As indicated in figure 3.5, communitywide broadband planning should be built around the community base, including the mandates of anchor institutions, the needs of their user bases, and existing situational factors at play in individual anchor institutions and the community as a whole. The process should include a detailed needs assessment that evaluates the barriers and enablers to broadband deployment and adoption in the community. It may be that, as a result of the needs assessment, a community finds that it has other needs in addition to the need for broadband deployment. These needs should not be addressed instead of broadband-related needs; rather, the community should work to deploy broadband and address other needs concurrently, seeking to leverage efforts at improving the community's broadband and other services.

The rural broadband needs assessments conducted for the NFBA and FRBA have helped identify a set of enablers that are likely to contribute to broadband success in anchor institutions, and an accompanying set of barriers that can inhibit such success (figure 3.6). The enablers fall into several broad areas:

- broadband and technical knowledge, including employees' individual knowledge of broadband, its use, and how best to deploy it, and an available and trained IT staff
- access to an ISP with inexpensive high-speed broadband connections
- administrative leadership and community support, including the ability to develop a strategic plan to obtain and deploy broadband, and the interest and enthusiasm to experiment with and promote innovative applications of broadband
- existing internal high-quality network within the anchor institution

Many of the identified barriers are connected to a lack of resources, but others involve organizational issues and administrative or political support:

- lack of resources or knowledge about broadband and broadband applications
- inability to contract successfully with ISPs, including lack of the knowledge necessary to conduct a successful negotiation and administrative constraints on ISP contracts such as those that inhibit institutions from choosing particular ISPs
- difficulties in educating patrons on how to use new broadband-based services successfully, which

can be affected by both knowledge and economics as institutions may not have staff available for such training

- lack of support from local elected and appointed officials, which may be impacted by their awareness of the potential for broadband deployment;
- previous failed efforts to upgrade broadband availability or reduce its cost, which can ensure that future attempts will not be made
- resistance to change and organizational inertia
- old and out-of-date network hardware and software because technology issues can not only impede efforts to upgrade, but administrators and staff may not understand the impact of old technology on broadband performance
- inability of various city and county or other anchor institutions to work together on broadband planning and economic development due to individual mandates and goals with little incentive for them to work together

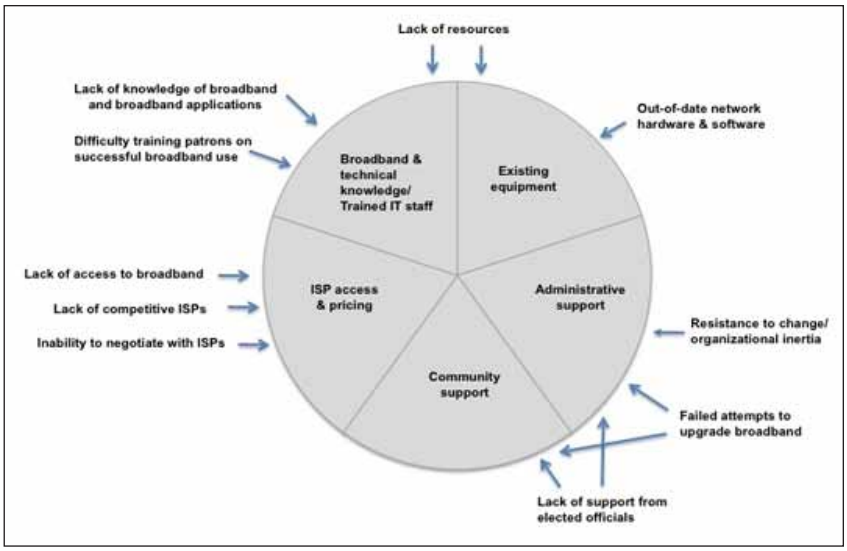

Figure 3.6
Potential broadband enablers and barriers

Although other approaches are possible, such as through the cooperation of two or more community anchor institutions where each institution's enablers and barriers can be balanced against the other institutions' strengths and weaknesses, this chapter proposes a role for the rural public library as the linchpin anchor that can serve as the central, driving force behind communitywide broadband planning. On a broader canvas, countywide and regional planning can allow communities to leverage their full resources toward broadband improvement, and a good plan should seek to maximize enabling factors and minimize barriers to successful broadband deployment. An important component of community-based broadband planning is for the public library to take a leadership role in identifying the anchors and others to participate in the process, to work with the anchors and others to improve overall community broadband services, and to determine additional types of broadband services might be included in the plan (e.g., local economic development).

A rural public library is unlikely to have to begin from scratch with the development of a community-based broadband plan. The approach suggested in figure 3.5 can be built into the library's existing technology plan; there are a number of resources available to help with the development of such a plan.[22] In most instances, a rural public library already will have developed a technology plan as part of the library's E-Rate submission, or perhaps done in conjunction with TechAtlas. It may be less important which type of community-based broadband plan is used than that some type of plan has been developed and is being implemented with the library taking the lead.

Library Technology Planning

Technology Planning
www.usac.org/sl/applicants/step02/technology-planning

Alachua County Library District 2010/2011/2012 Technology Plan
http://dlis.dos.state.fl.us/bld/library_tech/pdfs/AlachuaTechnologyPlan2010.pdf

TechAtlas
www.webjunction.org/techatlas

The Rural Public Library as the Linchpin Broadband Anchor Institution

One of the takeaways from the NFBA and FRBA broadband needs assessment projects is that many anchor institutions are aware of the role that the local public library plays in bringing broadband, broadband-enabled services, and broadband-related training to their communities. However, while the staffs of other institutions may appreciate the "free" training and

programs offered by libraries, librarians know that these services are not "free" at all. In the focus groups, library staff noted that they are extremely hard-pressed to maintain such training and are concerned about the impacts from any additional budget cuts.

One solution to these concerns is a community-wide planning model, such as the one presented in figure 3.5, in which libraries partner with other local anchor institutions to address community broadband needs. Most specifically, communitywide planning can address issues that individual institutions cannot address on their own, such as education to increase awareness of community broadband needs among the public and elected officials. Research has found that community outreach can impact significantly the perceived benefits of broadband.[23] Such awareness campaigns can impact local resource allocation to broadband. In addition, partnerships can address resource and training issues that institutions share.

New Strategies for Community-Based Broadband Services

The new, improved, exciting broadband future is on its way *right now*. Even as the FCC's broadband plan lays out that future, communities are beginning to step up to the plate. In Chattanooga, Tennessee, the community-owned electric utility has installed a fiber-optic network that promises to deliver up to a gigabyte of high-speed Internet for home use. And the network is being promoted not for its hardware—the delivery system or the platform—but for the possibilities that it opens for "mass innovation, accelerated R&D, broad testing and deep creativity."[24] In addition, these gigabyte speeds will become exceedingly inexpensive as the various BTOP initiatives become operational.

As the world moves to gig-level broadband availability, rural communities cannot afford to be left behind. Local rural governments, anchor institutions, and public libraries can no longer go it alone. Rather, they need to work together to leverage available broadband, plan how best to access and deploy that broadband, become more knowledgeable about broadband services, and teach and work with each other to better exploit the new high-speed broadband for improved quality of life, economic development, education, telemedicine, global e-commerce, and e-government.

While it is clear that a number of rural public libraries are hard-pressed by budget concerns and maintaining both traditional and broadband services, new priorities and skills for flourishing in the coming broadband environment will be needed. One priority will be coordinated broadband planning and learning with other community anchor institutions. Another will be setting priorities as to *which* library services can be provided in the new broadband world rather than just adding more services to existing service. Yet another is to increase library staff knowledge and skills related to broadband and network deployment, use, and applications.

By seizing a leadership role for the coming gig-level broadband future, the rural public library can expand its public service role and make the case for itself as an essential community anchor institution. This approach envisions the rural public library leveraging knowledge it possesses to bring communities together through their anchor institutions and, in doing so, opening the possibilities of the new broadband-based economy and future to rural America. In fact, rural communities are a key focus of the NTIA's BTOP and BIP.[25] But, while financing is important, these programs cannot by *themselves* produce growing, vibrant communities. Building new broadband infrastructure is only the first step—"If you build it they will come" may be a good movie tag line, but it is not a plan for the future. Communities as a whole, including residents, elected and appointed officials, businesses, and anchor institution leaders must have the knowledge and training necessary to understand and implement the possibilities enabled by broadband technology. The rural public library can serve as the linchpin anchor institution to ensure that such broadband planning, knowledge, and training are brought to the community.

Acknowledgements

The authors gratefully acknowledge the use of data from the Public Library Funding and Technology Access Survey (American Library Association and the Information Policy and Access Center). The authors also acknowledge support for the Broadband Needs Assessment, Diagnostics, and Benchmarking of Selected Anchor Institutions studies provided by the North Florida Broadband Authority and the Florida Rural Broadband Alliance, LLC.

The authors appreciate the assistance of Jeff Saunders in developing the preliminary design of the Community-Based Broadband Planning, Adoption, and Deployment Cycle Model. The authors also wish to acknowledge the support and input from others at the Information Institute throughout these projects.

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Chapter 4

Successfully Planning a Scalable and Effective Patron Wireless Network

Robert A. Caluori, Jr.

Abstract

Patron wireless networks are considered an essential component of the modern public library, yet the ever-increasing demand for the service presents challenges that seriously impact the ability of a library to meet the needs of the community they serve. This chapter of The Transforming Public Library Technology Infrastructure *provides recommendations for the planning, implementation, and monitoring of an affordable high-availability patron wireless network.*

Retrospective

Wireless technology that could be used to deliver Internet connectivity to consumer-level devices started to enter the market more than ten years ago. Using the IEEE (Institute of Electrical and Electronics Engineers) 802.11b standard, which was released in 1999, libraries that implemented wireless networks to deliver Internet access to their patrons were on the cutting edge of technology. However, business-class equipment was hard to find and very expensive. Many libraries chose to implement this emerging technology using consumer-grade equipment with those trademark blue Linksys access point/routers. Over the years, some may have even upgraded those access point/routers with open source firmware alternatives Tomato or DD-WRT. These oftentimes give the device a second life.

However, if that technology is still in use today, with or without new firmware, those same libraries that were once on the cutting edge now find themselves far behind the curve. Those aging access point/router combinations can no longer handle the volume of users and devices or keep up with the throughput demands of the modern wireless age. In addition, wireless equipment manufacturers have released affordable, high-quality business-class wireless equipment that can make the modern, high-availability wireless network a reality for libraries.

Overview

The patron wireless network is an essential component of the modern public library. In addition to expanding Internet access in the library without adding PCs, a patron wireless network is a vital public service, especially in areas where few people have high-speed Internet access at home. This service is equally as essential in the academic library, especially if the campus does not have a wireless network itself. The library may indeed be the only place where students and faculty can come to access the Internet on their own devices.

Allowing people to bring in and use their own device also adds a level of comfort to the library. Sometimes people are reluctant to use library PCs to access websites that may expose their personal information. Even though the wireless network is a public network, some people feel more at ease when they are using their own device. When word gets out, people will be drawn to the library to use the wireless network.

A key element to take note of is that this is the *patron* wireless network. This is not the network for librarians, support staff, or any library business operation. Keeping this network separate is in the best interests of both the patrons and the staff. It serves the patrons by providing dedicated access so that they don't have to compete with staff for bandwidth and serves staff by keeping the network they use secure. Data traversing a wireless network are easily captured. Performing tasks in the ILS (integrated library system) or any other library business system, especially one

that contains personally identifiable information (PII), should be strictly prohibited on this network.

Planning

There are three important things that one must do before implementing a patron wireless (Wi-Fi) network. Plan. Plan. Plan. Plan for bandwidth requirements. Plan for management, monitoring, and control. Plan for signal coverage and scalability.

Planning all of these elements may seem to be a daunting task, so it's important to take it one step at a time. The best place to start is to answer the simple questions that will help drive the answers to the more complicated ones. How many simultaneous users will this network need to support at its peak usage, and where are these users located when they are using it? Using that information, start at the access points for the network and begin working your way in.

A Note about Wi-Fi

Wi-Fi is neither a standard nor a technical term. Wi-Fi is a term coined by the Wi-Fi Alliance. This group works to help gain use and acceptance of the 802.11 standard through certification programs that focus on interoperability and backward compatibility. The term Wi-Fi has become synonymous with wireless networks and wireless-equipped devices.

Wi-Fi has been integrated into so many different types of technologies that it is safe to plan for every person who will use the wireless network having two or more Wi-Fi devices. Consider all of the Wi-Fi–enabled cell phones, game systems, tablets, and PDAs that walk into the library with patrons. There may even be a laptop once in a while. Even if the patrons aren't using these devices, any or all of them may seek out open networks automatically, connect to the network, and take up wireless bandwidth. If at this point it is known how many people will use the wireless network and where they will be located, double it to compensate for all of these potential nodes on the wireless network.

Access Points

The first consideration in access point (AP) selection is which protocol standard to use. Choosing between 802.11n and 802.11g can leave you in a state of analysis paralysis. The 802.11n standard is clearly superior in range, speed, and susceptibility to interference, but it comes at a significantly higher cost than 802.11g APs. Exploring purchase of a higher quantity of 802.11g APs may prove to be beneficial. It is likely that the amount of Internet bandwidth provided over the network will not exceed the capacity of the APs. Therefore more 802.11g access points will allow the network to have better signal saturation.

Good signal saturation is a valuable element in a wireless network. The business-class access points that will eventually outfit the network will undoubtedly have the capability of reaching the limits of the protocol. However, the patron's devices that the APs interface with do not. Small devices often do not have strong radios because of the power needed to operate them. Therefore, it may prove beneficial to consider lowering the signal strength of the APs to ensure integrity in both directions of the wireless data stream. Some wireless network controllers will also use the access points to sense one another's signal strengths and automatically adjust the strengths and channels to optimize coverage. If this is the case, placing APs closer together and within the manufacture's specifications is recommended.

Wireless Controllers

A wireless controller does just that; it gives the administrators control over the new network. The wireless controller can do everything from pushing out policies, settings, and upgrades to gathering usage statistics and AP status. This centrally managed system will be especially invaluable if the library has multiple branches or campuses or if this network is installed across a library system.

Monitoring and control will have benefits in managing problems. The controller can be configured to send system administrators notifications when an AP is reaching its usage capacity or goes down. Having usage statistics will help in managing the network by giving administrators the information they need to plan AP moves and additions. It is also helpful when justifying the costs associated with the network to decision makers and stakeholders.

Remote management will save time and money. Pushing firmware upgrades, policy changes, and settings remotely will speed up the execution of these changes and reduce travel costs. When justifying the upgrade of the current network to this new network, this is key factor to highlight to decision makers, and it contributes greatly to the return on investment.

How the communication between the APs and the wireless controller is set up can vary. The following are two examples. The first scenario is geared toward multiple locations, where having all APs on the same physical network is not possible; the wireless controller resides on another network such as the staff network. The second scenario outlines a possible configuration where all of the APs as well as the controller reside on the same network.

Scenario 1

In this scenario, the wireless controller is set up on the staff network. The access points are set up on a

network of their own at each branch, campus, or system library (location). A routing firewall can be used to establish a VPN tunnel between the patron wireless networks at each location and the staff network. The tunnel will be used exclusively to send management data back and forth between the APs and the wireless controller while the traffic from the patrons goes directly out to the Internet.

The benefit in this configuration is that it does not require the Internet connections at the multiple locations to have static IP, only on the staff network where the wireless controller resides. This set of requirements permits the use of less expensive Internet connections at the locations. This could be an attractive option if the library is looking to keep control of the recurring costs associated with Internet access.

The routing firewalls initiate the VPN tunnel with the staff network, and the APs send management data for statistics gathering and status monitoring. Settings and policies are passed to the APs when they connect with the wireless controller.

In addition to the reduced Internet costs the wireless controller is on the staff network. This may be more desirable from a security perspective, and the IT department may prefer all of their servers on the staff network.

Scenario 2

In this scenario, all of the APs are on the same network. This may be one physical network or multiple networks connected by VPN tunnels. The variable that makes this scenario different is that the wireless controller resides on the same network as the APs.

However, there are some variables to consider. If it is one physical network, this can reduce the complexity of the configuration. If not, one location will have to act as the main location. The main location will require static IP or minimally an implementation of a dynamic DNS service. This location is where the wireless controller will also reside.

This also changes the administration of this network for the IT folks. Rather than connecting directly to the wireless controller, a connection to the server will have to be established. This can be done through a variety of methods. VPN could provide remote access to the network so that the wireless controller can be reached. Alternatively a remote desktop web service such as LogMeIn or GoToMyPC could be used to access the wireless controller. Depending on the wireless controller used and the platform it runs on, the latter may not be an option unless a host PC is set up on the wireless network.

Either method is a viable option, and there are several variables could be introduced to fit the needs of your organization. The key to success is verifying that all of the equipment implemented in the network can and will work together and have all of the functions required to operate the network as designed.

Proof of Concept Testing

Proof of concept (POC) testing is a critical step, especially if the patron wireless network is a large-scale network spanning a dozen or more locations. Prior to investing time and materials in an RFP and spending money on large quantities of hardware, it's best to put together a smaller-scale test to make sure it will do all that it should.

Many vendors have excess spare or rental equipment that can be acquired for POC testing. Take this opportunity to set up the main site and at least one remote site, if applicable. If VPN tunnels are being used, ensure that the equipment will communicate without issue over the tunnel. If stats are being gathered, run sample reports to verify that the data desired can be retrieved and in a format that is acceptable. The POC will present a unique chance to iron out implementation issues before the big day. This will avoid having to push back a go-live date due to configuration issues and will help prove the viability of the project when it is presented to decision makers and stakeholders.

Bandwidth Planning

Bandwidth planning is an important step that is often overlooked when planning a patron wireless network and can be either the cornerstone of its success or the root of its eventual failure. There are two aspects of bandwidth to consider when planning the implementation of a patron wireless network, and they are interdependent. The wireless network is capable of delivery very high-speed connections to the devices connected to it. Therefore, the connection to the Internet is usually the potential bottleneck on the network.

The first aspect to consider is the bandwidth supplied for Internet access. This decision is critical and will eventually determine the overall success of the network when it is deployed. If the network does not have enough Internet bandwidth, it will be too slow. The demand will far exceed the capacity of the Internet connection and will result in what looks similar to a denial of service (DoS) attack during peak usage periods. If patrons are denied access, they will lose patience with waiting and errors and seek other sources of Internet access.

So the key is to make sure that there is a large enough Internet connection to suit the number of patrons. ISPs now offer a wide range of high-speed connections at very affordable prices. In fact, ISPs in some markets are in bandwidth wars to offer the highest speed for the best prices. This is your greatest advantage. When implementing it may also be possible to have multiple Internet connections for bandwidth load balancing and fail-over protection. However, depending on the scale of the network, even the highest speed connections may not completely avoid a bottleneck.

The second aspect of bandwidth planning depends on whether the new wireless network implements quality of service (QoS) that allows for setting the speed of connections to devices (or nodes) on the network. QoS will allow for setting maximum bandwidth to each device in the network. This will ensure that no one user or device takes up all or most of the available Internet bandwidth.

Throughout the planning of this network, the number of devices on the network has been the focal point in determining the scale of the network. The same applies to balancing assigned bandwidth in QoS and selecting an Internet connection. It is important that the Internet connection speed is at least the as high as the peak number of devices planned for multiplied by the maximum bandwidth designated to each in the QoS settings.

It is OK if the Internet connection is close to or smaller than what has been determined to be the peak potential demand. However, if possible, consider limiting the number of devices that connect to the network simultaneously. When the network reaches its maximum allowable devices, new connections will be denied access until there is room. If this measure is taken, it is equally important that the network provide statistics on denied connections. Monitoring this information closely will allow administrators to see how often denials occur, if at all, and determine if additional Internet bandwidth is needed.

Authentication

Another consideration in planning the patron wireless network is authentication. All patron wireless networks should have some level of authentication. Additionally, authentication may not be optional. Academic libraries may need to comply with school policy and public libraries with municipal law or policy. However, authentication should not be confused with requiring credentials. The main question to ask is what credentials, if any, will be required when authenticating users.

If there are no requirements for authentication, then all options are available, including no authentication. However, an authentication process may still prove to be a wise decision. Rather than simply deploying an open network, use an authentication system to present users with an End User License Agreement (EULA) acceptance page. The EULA is a powerful tool that will help announce the network to patrons and give the library some insulation from liabilities should someone choose to engage in unsavory activity on the network or contract malware or a virus while using their device on the network. The user would have to accept the EULA before full access to the network is granted.

There is no shortage of institutions and businesses that offer free Wi-Fi access to the public. Many of them present a EULA, and it may be a good idea to visit some of these places to see their EULA to "borrow" some aspects of it for your own. A good EULA will warn the user about the fact that they are about to enter a public network; that they are responsible for providing adequate protection from viruses, malware, and other malicious software; and that the library is not responsible for damage due to viruses, malware, or other malicious software the user's device is exposed to while connected to the network. Other considerations include stating that illegal activities are prohibited and perhaps specifying not using BitTorrent or other peer-to-peer network to pirate software or media. The library may also want to state that is reserves the right to block access from devices found to be in violation of the terms of the EULA.

Below is a sample EULA to use as a model for your own. However, it is vital that the legal counsel for the library, library system, or academic institution review and approve the EULA before deploying it.

> By accepting this End-User License Agreement (EULA), you, the user, acknowledge the use of this Patron Wireless Network, a free service provided by the Anytown Public Library (APL). By accepting this EULA, you, the user, also acknowledge APL is not responsible for any damages caused by the use of this system or by any software, malware, spyware, viruses, or any other content, program, or code that may be retrieved, compiled, stored, or executed by the use of this system. By accepting this EULA, you, the user, acknowledge and accept all risks associated with use of the public Internet. There is no warranty, express or otherwise.

If it is decided to require credentials to access the network, make the credentials something that is already known or familiar to the user. Users do not like having to remember new passwords, and it will go a long way toward user acceptance of the network not to have to remember another one. This can be easily accomplished if all users already have credentials on an LDAP server. This is usually the case with academic libraries. Even some public libraries may already use an LDAP sever to host their patron accounts or have the ability to synchronize their patron database with an LDAP server.

Another option may be developing a method to query the SIP service on the ILS. Using SIP in the same way database vendors do to authenticate users, the wireless network would collect library card number and PIN credential on the authentication page and pass that to the SIP service to verify them.

If SIP is not available on the ILS, a final option may be using API (application programming interface) code. Using API, it may be possible to script verification of library card number and PIN combinations to facilitate authentication on the wireless network.

Chapter 5

E-Government and Employment Support Services

Addressing Challenges for Public Libraries

Nancy Fredericks

Abstract

As more employers and government agencies provide information exclusively in a digital format, communities rely on public library staff and technology services more than ever. At the same time, libraries are also facing demands due to reduced budgets and staffing. This chapter of The Transforming Public Library Technology Infrastructure *provides data, tools, and best practices to help libraries address and overcome service challenges.*

Major Challenges

According to the *2010–2011 Public Library Funding and Technology Access Survey*, 80.7 percent of public libraries provide patrons assistance in applying for or accessing e-government services.[1] (E-government is defined as "the use of technology, predominantly the Internet, as a means to deliver government services to citizens, businesses, and other entities"). The survey also asked about job-seeking services provided by public libraries. Nearly 91 percent of the libraries surveyed reported providing access to job databases and other job opportunity resources.[2] Two areas, e-government and employment support services, are placing significant demands on public libraries, all while budgets are being cut and staffing levels reduced.

The survey included a wide range of questions regarding e-government and employment services. The following statements on the survey were generally rated as the most challenging for public libraries:

- Library does not have enough staff to effectively help patrons with their e-government/employment seeking needs.
- Library staff does not have the necessary expertise to meet patron e-government/employment seeking needs.
- Library has too few computer workstations to meet patron demand.

Inadequate staffing, topping the list of greatest challenges, was closely followed by lack of staff expertise, particularly relating to e-government assistance. Some libraries stated that they do not have enough workstations to meet the e-government and employment needs of their community. Most libraries, even those without dedicated computers for e-government and employment services, were able to extend the computer workstation times for patrons to complete forms and applications.

While public libraries are experiencing increased demands for e-government and employment support services, they are also facing demands due to reduced budgets and staffing. A number of libraries are developing training resources and creating partnerships to address these challenges. Perhaps public libraries should consider calculating the costs of both technology infrastructure and staffing in providing e-government and employment assistance. After all, public libraries are increasingly taking on the roles of other government agencies.

Dealing with Staff Shortages

Public libraries across the country have been enduring budget reductions resulting in fewer staff to assist patrons. E-government and employment queries often require a significant amount of staff time, particularly when patrons do not possess adequate computer skills to complete online applications. A typical employment transaction often includes teaching the patron how to use a computer; helping the patron complete an online unemployment form; guiding the patron through employment websites; and finally assisting with an online job application. This type of transaction can take an hour or more of staff time.

One technique library staff may use in addressing this type of patron query is to incorporate video tutorials. This reduces the amount of time spent directly addressing the needs of a single patron. Libraries can produce their own videos or use video tutorials created by other agencies. Pasco County Library Cooperative created a Basic Skills Toolbox. A video tutorial, divided into six short chapters (1–4 minutes each), includes links to a mouse tutorial and other computer skills tutorials. Each chapter details a different aspect of using a computer, including using a mouse, opening programs, and typing a Web address in the browser address bar. The library staff member plays this video tutorial on a library computer that looks exactly like the one in the tutorial. While viewing the video, the patron is also looking at the actual computer and its components. This allows the patron to become comfortable with the computer he or she is about to use. The staff member instructs the patron to notify the staff member when each chapter ends; the staff member then advances to the next chapter for the patron. While this patron is viewing the video, the staff member is free to help other patrons. Once the patron views all six chapters of the video, the library staff member suggests that the patron try using the mouse tutorial included in the Toolbox until he or she becomes familiar with operating a mouse. Once the patron is comfortable, the staff member links the patron to the Goodwill Community Foundation website, where a number of tutorials on computer basics, using the Internet, Excel and other programs can be found.

Pasco County Library Basic Skills Toolbox
www.pascolibraries.org/egovtools.shtml

Mousercise! tutorial
www.pbclibrary.org/mousing/mousercise.htm

Goodwill Community Foundation Free Online Learning
www.gcflearnfree.org

Some library staff integrate tutorials produced by other agencies. For example, Florida Agency for Workforce Innovation created a series of videos to help job seekers. In the *Public Library Funding and Technology Access Survey*, most public libraries rated Internet connection speed as well as filters and firewalls as their least important challenges, so it appears most libraries have the technology infrastructure to support accessing and viewing these types of video tutorials.

Agency for Workforce Innovation: Workforce Services Video
www.floridajobs.org/workforce/videos/index.htm

Another technique public libraries are utilizing to manage staff time is scheduling pre-arranged appointments to assist patrons with e-government, employment and other inquires. Staff schedules appointments at times when library activity is slower or when additional staff members are available to help. One library that has implemented an online appointment system is the Skokie Public Library (SPL). SPL matches the patron with a librarian that has expertise in their area of need. Through the use of targeted appointments and video tutorials libraries can efficiently manage staff time while addressing the patrons' needs.

SPL Book a Librarian
www.skokielibrary.info/s_info/book_librarian.asp

Staff Lacking Expertise

The *Public Library Funding and Technology Access Survey* found that another major challenge for public libraries is the library staff lacking the necessary expertise to meet patron e-government and employment-seeking needs. While a lack of expertise in employment seeking was not viewed as being as great a concern as e-government services, both areas were considered challenges. There are a number of ways that library staff can obtain the training they need to improve their skills in these areas. Several agencies provide training sessions for library staff including WebJunction, the American Library Association, and many state libraries. One employment support training initiative is Project Compass, a collaboration between the State Library of North Carolina and WebJunction. This initiative, funded by the Institute of Museum and Library Services, supports public libraries' efforts to meet the urgent and growing needs of the unemployed. Through Project Compass, WebJunction and the State Library of

North Carolina coordinated summits throughout the country and have compiled a comprehensive menu of workforce resources. Additionally, WebJunction has developed a series of online resources to provide public library staff with training in e-government. The American Library Association also offers online training webinars and has created the comprehensive E-Government Toolkit, which includes a list of e-government training programs and services. Through online training programs offered by WebJunction, the American Library Association, and state libraries like the State Library of North Carolina, public library staff can develop the skills and expertise necessary in addressing the needs of patrons with employment support and e-government needs.

Project Compass
www.webjunction.org/project-compass

WebJunction Workforce Resources
www.webjunction.org/workforce-resources

WebJunction Introduction to E-Government
www.webjunction.org/gi21-intro-egovernment?p_p_id=OCLC_ARTICLES&p_p_lifecycle=1&p_p_state=normal

Another important need of library staff is a shared online resource focused on aggregating e-government and employment support information in one place. In Florida, Pasco County Library Cooperative developed a statewide resource—*Get Help Florida*, a web portal that provides links to federal, state, and local government resources as well as links to nonprofit social service agencies. Also provided on the *Get Help Florida* web portal is a link to the Florida statewide virtual reference chat service, Ask a Librarian. This resource allows visitors to chat live with a Florida librarian. Orange County Library System (Florida) is currently developing another statewide database, *The Right Service at the Right Time*, which connects citizens in need with the appropriate services. *The Right Service at the Right Time* is an online tool that asks users a series of questions that result in a list of services that user may be eligible for. It is anticipated that *The Right Service at the Time* and *Get Help Florida* will link together to ensure that Floridians and library staff throughout the state have access to a comprehensive one-stop resource. The New Jersey State Library created a similar resource, *Get Help from the New Jersey State Library,* which provides links to workforce, financial, housing, and health resources and more. Other states could create similar online tools where knowledge and expertise can be shared. Ideally, a federal web portal would be developed linking all state resources.

Get Help Florida
www.gethelpflorida.org

Ask a Librarian
www.askalibrarian.org

The Right Service at the Right Time
www.rightservicefl.org

Get Help from the New Jersey State Library
http://gethelp.njlibraries.org

Another way libraries are gaining expertise is by forming partnerships with government and social service agencies. In the area of employment support services, some libraries have partnered with their local CareerOneStop (OneStop) center. Some public libraries have partnered with OneStop centers to host workshops where representatives from the OneStop help patrons write resumes as well as find and apply for jobs. In some instances, the library supplies the computers and the OneStop staff provides the training. With government funding, a number of OneStop centers have purchased mobile OneStop vehicles. The mobile OneStop is a large RV equipped with computers, using satellite technology to connect to the Internet, and staffed with career professionals. In Pasco County, Florida, the mobile OneStop parks outside the library branches. The library advertises the dates the mobile OneStop visits the library and refers job seekers to OneStop.

Similar types of partnerships are developing between public libraries and government or social service agencies. The Orange County Library System (Florida), for example, has partnered with the US Citizenship and Immigration Service to offer classes and other programs for patrons seeking citizenship. The Alachua County Library District has partnered with a variety of social service agencies to create *The Library Partnership*, which is a unique branch of the Library District located in an impoverished area in the city of Gainesville, Florida. In these types of partnerships, the library staff collaborates with local social service or government agencies in offering programs and services to library patrons. In addition to providing services in the library, such arrangements allow staff members to foster communication with these social service and government agencies, thus making it possible for them to provide referrals for the library patron. An example of how these coordinated services could be provided is the following: library staff members attend community meetings with the local children's services board, community service councils, United Way, or other organization to assess what programs already exist in the area, so that libraries are not duplicating services offered by other agencies.

CareerOneStop
www.careeronestop.org

OCLS Citizenship and Immigration Programs
www.ocls.info/virtual/galleries/topical/citizenship.asp

The Library Partnership
www.aclib.us/library-partnership

Inadequate Number of Workstations

According to the *Public Library Funding and Technology Access Survey*, the third most commonly cited challenge to public libraries, particularly urban libraries, in meeting e-government needs is the lack of an adequate number of computer workstations.[3] Many libraries have no problem extending computer time limits for patrons completing employment forms; however, in some cases this is not possible due to a lack of computer workstations. One option to address the shortage is to purchase or assign laptops for employment or e-government use only. In Pasco County, the library has purchased, with Library Services and Technology Act grant funds, two to four laptop computers per branch that can be used only for job seeking or e-government–related purposes. To prevent their theft, these laptops are equipped with specially designed locks that enable them to be locked to tables. Generally, the laptops are locked to tables near the information desk, enabling the staff to help the patron while still attending to their other duties at the information desk. Additionally, such close proximity affords the patron easy access to the telephone available at the information desk, which can be used to call agencies for more detailed instructions or to call home for missing information. If the patron is completing forms for which privacy or extensive staff help is required, the laptops can be moved to a conference room or other private location. Some libraries allow the patron to check out a laptop for use within the library; the patron can then use the laptop anywhere in the library he or she chooses.

Many patrons have their own laptops, so providing free wireless services in public libraries can help address the problems presented by not having enough workstations or patrons being unable to complete forms due to time constraints. As the *Public Library Funding and Technology Access Survey* revealed, 85.7 percent of public libraries provide wireless service.[4] Ideally, the wireless service in the library will have a reasonable level of security since library patrons are submitting forms that include personal information, such as social security numbers. The Florida Division of Library and Information Services provides an online guide, "Best Practices for Patron Computers," to help libraries assess Internet security on library computers where e-government and employment transactions are taking place. One suggestion included in the guide is to utilize hard drive protection products. "These programs work by tricking Windows into seeing a hard drive that is actually simulated in software. This software hard drive pretends to work normally while Windows is being used, allowing changes as expected. However, these changes are not actually being recorded on the real hard drive; they are instead a part of the simulation. When the computer is rebooted, the simulated changes are discarded, and the computer boots back up to a known good state."[5] By offering free, secure wireless services for personal laptop use and providing dedicated laptops for patron use, public libraries are able to address the challenge of not having enough computer workstations to complete online employment or e-government forms.

EGovFlorida: Best Practices for Patron Computers
http://egovflorida.pbworks.com/w/page/26078233/Best-Practices-for-Patron-Computers

EGovFlorida: Hard Drive Protection Programs
http://egovflorida.pbworks.com/w/page/26078558/Hard-Drive-Protection-Programs

Calculating the Costs

Clearly, public libraries are investing a considerable amount of staff time and technology resources in providing patrons access to and assistance with e-government and employment services. Public libraries have taken on the roles of CareerOneStop centers and a variety of government agencies such as the Internal Revenue Service, the US Citizenship and Immigration Service, and the Social Security Administration, among others. Some libraries are gathering statistics and other data in an attempt to determine the types of e-government and employment queries library staff are dealing with; the length of time library staff spends assisting patrons with e-government and employment transactions; and the technology costs associated with fulfilling the roles of these government agencies.

In Florida, the Pasco County Library Cooperative (PCLC) has partnered with the Florida State University Information Use Management and Policy Institute (Information Institute) in developing a method of recording e-government statistics. The Information Institute and PCLC developed reference query logs (librarian logs) to track the length of time staff members spend assisting library patrons with e-government

or employment queries; the length of time the library patron spends using a dedicated laptop for e-government or employment purposes; and the type of e-government or employment query. PCLC has revised the librarian logs several times. Most of the revisions resulted from library staff making suggestions on how to decrease the amount of time spent compiling statistics. Implementing these suggestions has increased efficiency about 50 percent. These statistics help PCLC determine what types of e-government programs to offer; which types of agencies would be the most beneficial partners; what type of additional staff training is needed; and the costs of providing e-government and employment services. PCLC staff compiles this data monthly and posts the information on the website. For example, in March 2011 the majority of e-government queries were related to taxes, compared to January 2011, when the majority of queries were related to helping patrons find employment. PCLC staff members also record on their time sheets the amount of time they spend assisting library patrons with e-government and employment queries. The library's accounting staff multiples the number of hours spent by staff helping patrons with e-government and employment queries by the employee's hourly rate plus benefits to determine the library's costs associated with e-government. Additionally, PCLC keeps a record of all purchases relating to e-government and employment such as the costs of the dedicated laptops, wireless services, and associated software. For the 2010–2011 fiscal year, PCLC will spend more than $200,000 in staff time and computer resources in support of e-government and employment assistance to library patrons. A full national study determining the staffing and technology costs incurred by public libraries in the provision of e-government and employment support activities is warranted. These results could be used in advocating for more library funding.

Information Institute/FSU
www.ii.fsu.edu

Pasco County Library Cooperative-E-Government Tools
www.pascolibraries.org/egovtools.shtml

Notes

1. John Carlo Bertot, Kathryn Sigler, Elizabeth DeCoster, Abigail McDermott, Sarah M. Katz, Lesley A. Langa, and Justin M. Grimes, *2010–2011 Public Library Funding and Technology Access Survey: Survey Findings and Results* (College Park, MD: Information Policy and Access Center, 2011), 1, www.ala.org/ala/research/initiatives/plftas/2010_2011/index.cfm.
2. Ibid., 46.
3. Ibid., 42.
4. Ibid., 29.
5. Florida Division of Library and Information Services, "Hard Drive Protection Programs," *EGovFlorida* wiki, http://egovflorida.pbworks.com/w/page/26078558/Hard-Drive-Protection-Programs (accessed May 28, 2011).

Chapter 6

Digital Literacy Takes Center Stage

Larra Clark and Marijke Visser

Abstract

The 2010 release of the National Broadband Plan brought national attention to digital literacy as a keystone for civic engagement, educational success, and economic growth and innovation. This chapter of The Transforming Public Library Technology Infrastructure *examines the need for libraries to position themselves as digital literacy experts, support staff competencies to maintain the level of expertise required in the digital landscape, and explore opportunities to expand digital literacy initiatives.*

From their inception, libraries of all kinds have had the development, promotion, and advancement of literacy at the core of their mission. Dramatic shifts in how information is disseminated and communications are enabled via the Internet demand an expanded vision of literacy to ensure all people in the United States, regardless of age, native language, or income, are able to fully participate in the digital age. Libraries, at the root of providing people with access to information in all formats—print, digital, multimedia—must re-evaluate and expand their roles in light of the accelerating trend of digital information. They should be a significant player in the evolving information ecosystem.

An Emerging Issue

The March 2010 release of the National Broadband Plan (NBP)[1] brought national attention to digital literacy as an essential element in ensuring all people in the United States can benefit from opportunities afforded by broadband access.

While conceding "there is no standard definition" of the term, the Federal Communications Commission (FCC) continues

> . . . digital literacy generally refers to a variety of skills associated with using ICT (information and communication technologies) to find, evaluate, create and communicate information. It is the sum of the technical skills and cognitive skills people employ to use computers to retrieve information, interpret what they find and judge the quality of that information. It also includes the ability to communicate and collaborate using the Internet—through blogs, self-published documents and presentations and collaborative social networking platforms.[2]

This definition effectively encompasses the information literacy skills historically defined by libraries,[3] as well as much of the more broadly expressed standards for the twenty-first century learner.[4]

According to the NBP, about one-third of the population does not have a broadband Internet connection at home. Digital literacy–related issues were identified as key barriers to adoption, in addition to access and cost.[5] Goal three (of six) in the plan addresses this concern directly: "Every American should have affordable access to robust broadband service, *and the means and skills to subscribe* if they so choose"[6] (emphasis added). The plan supports an American Library Association (ALA) principle that physical access to the Internet does not guarantee an individual will be able to access and use online resources. To promote digital literacy skills, the NBP states, "We need to ensure every American has access to relevant, age-appropriate digital literacy education for free, in whatever language they speak, and we need to create a Digital Literacy Corps."[7]

There is now broad recognition that digital literacy is a keystone for civic engagement, educational success, and economic growth and innovation. This is evidenced at the FCC, at the Department of Commerce through numerous federal Broadband Technology Opportunities Program (BTOP) awards, by the Knight Commission on the Information Needs of Communities in its recent study *Informing Communities: Sustaining Democracy in the Digital Age*,[8] and in individual states such as California's Information and Communication Technology Leadership Council Action Plan Report, *Digital Literacy Pathways in California*,[9] and the New York Library Association's *Information Literacy Standards for the Digital Learners of New York*.[10]

The Knight Commission report makes a bold suggestion, "that we take as national policy the strengthening of the capacity of individuals to engage with [that] information. Access is the beginning; education and training, public engagement and government transparency logically follow."[11]

Our nation's school, public, and higher education libraries are an essential part of the solution. ALA reaffirms its position that developing the literacy capacity—including digital literacy—of the public is essential for the current investment in broadband to have any meaningful or sustainable impact. Additionally, ALA recognizes that today's investment in infrastructure is not necessarily the focus of tomorrow's technological advancement. The technological infrastructure—connectivity, hardware, software—is but one piece of the equation and alone is merely the means to an end. Libraries must be part of an evolving national dialogue about how we marry robust access to technology resources with the twenty-first-century literacy skills necessary to ensure digital opportunity for all.

Digital Literacy in US Public Libraries

While information literacy has been well defined over the past two decades in our school[12] and academic libraries,[13] public libraries are newer to formal instruction in this arena. For many public libraries, teaching basic computers skills—in classes or as needed—has become a requirement as critical interactions with employers and government agencies demand it from those seeking resources and opportunities and as these individuals come to the library to access such resources. With computer skill classes now a regular part of the library landscape, it is time to raise the bar and expand patrons' digital fluency and evaluation skills.

A seminal work in this arena is the 2009 *Museums, Libraries, and 21st Century Skills* report from the Institute of Museum and Library Services (IMLS).[14] Through a self-assessment tool, case studies, and policy analysis, the report establishes the essential role that libraries and museums play in creating an engaged citizenry and competitive workforce. The report highlights the ways in which these institutions support information, communications, and technology literacy; creativity and problem solving; civic literacy; global awareness; and other twenty-first-century skills.

While there are no national data available that definitively tell us the level of engagement that currently exists in public libraries around digital literacy, the *Public Library Funding and Technology Access Study* provides some insight.[15] This year's data tell us that, of responding libraries

- 79 percent provide informal, point-of-use assistance to patrons
- 38 percent offer formal classes
- 30 percent offer online tutorials and training
- 28 percent offer one-on-one assistance by appointment
- 13 percent do not offer any technology training

(Percentages will not equal 100 percent, as the categories are not mutually exclusive. A library may, for instance, offer classes, online tutorials *and* informal assistance.)

Of those libraries that offer classes (38 percent), basic training is the most common:

- 94 percent offer general Internet use (e.g., setting up e-mail; Web browsing).
- 93 percent offer general computers skills training (e.g., using a mouse and keyboard, Internet search skills).
- 82 percent teach online/Web search skills and basic office software.
- 80 percent teach general software use (e.g., word processing, spreadsheets).
- More than half of libraries also teach how to use the library's OPAC and online databases.

Nearly half (48 percent) of all public libraries now provide formal classes on how to access online job-seeking and career-related information, up from 27 percent in 2009.

Urban libraries (59 percent) are far more likely to offer formal classes than their suburban (47 percent) and rural counterparts (25 percent), likely due to the availability of dedicated space (often computer labs) and more specialized staffing. Urban libraries were also the most likely to report they have seen increased use of patron technology classes over the past year—41 percent, compared with 32 percent for suburban libraries and 19 percent for rural libraries.[16] A 2010 study from the University of Washington confirms widespread need for and use of public library

technology training and assistance. Fifty-two million people got help using computers from a librarian or volunteer, and 16 million participated in public library computer classes in 2009.[17]

With funding and support from BTOP, more public libraries are expanding Internet access and digital literacy training. As part of the Broadbandexpress@yourlibrary BTOP grant to the New York State Department of Education, for example, approximately 860 computers will be deployed in thirty libraries and five mobile training centers in forty-one counties across the state.[18]

"E-mobile" training vans with high-speed broadband services are being deployed in rural locations and underserved communities around the state, offering classes ranging from basic word processing to writing a cover letter to understanding social networking sites such as LinkedIn. Most libraries are also partnering with others in the community to develop and deliver digital literacy training. For example, the Clinton-Essex-Franklin Library System partnered with Adirondack Community Action Programs and OneWorkSource on its new Mobile Broadband Library InternetXpress service.[19]

Digital literacy also is a cornerstone of the BTOP-funded Fast Forward New Mexico (FFNM) initiative, which is helping predominantly rural, Hispanic, and Native American communities across the state better prepare for economic and educational opportunities.[20] More than 1,200 people have received Internet skills training to date.[21] FFNM and its partner, the Global Center for Cultural Entrepreneurship, were honored by the Rural Economic Development Forum in May 2011 for their Small Business Success class curriculum.[22]

Underlying all of this, of course, are human resources. Librarians, library staff, or volunteers must be available to help on the fly or by appointment or lead a class. As the gap grows between early adopters of cutting-edge technologies and those at the other end of the spectrum, library staff skills and competencies must continue to evolve and grow to meet our mission of ensuring everyone can access digital opportunity.

One useful set of competencies, another BTOP-funded project, emerged from the Colorado State Library. These competencies outline the skills and knowledge necessary for library staff to be effective technology trainers. The competencies span technology skills to creating an adult learning environment to instructional delivery and design skills.

Technology Trainer Competencies, Colorado State Library
http://coloradovirtuallibrary.org/btop/content/technology-trainer-competencies

A Glimpse at the Not-So-Distant Future

Beyond supporting the development of basic and intermediate digital literacy skills that respond to a specific need, there are efforts to capture the next iteration of digital literacy: the ability not only to navigate and evaluate digital tools, but to use those tools to create resonant, meaningful content. In order for libraries to remain a vibrant player, it will be important to be ready to embrace the quickly changing digital landscape. Innovative practices already are underway that immerse young people in multimedia content creation.

YOUmedia is a stellar example of work that engages young adults with information in a creative and dynamic ways through a partnership with the Chicago Public Library and the Digital Youth Network with support from the John D. and Catherine T. MacArthur Foundation. The YOUmedia program highlights the type of learning possible when technologies are incorporated effectively in a multimedia approach to the mastery of skills. Participants do not just consume information; they interact with it and create new content that is readily shared. Young adults in the YOUmedia program have access to a variety of multimedia creation tools and software such as flip cameras to create video remix of books, photography-editing software, and a recording studio. Most importantly, the learning that occurs is outside a traditional classroom, underscoring a growing role for the public library.

YOUmedia
http://youmediachicago.org

The achievements of Chicago's YOUmedia have been so successful that in the fall of 2010, the MacArthur Foundation and IMLS announced plans to create thirty new learning labs based on the YOUmedia model.[23] These labs will be housed in museums and libraries across the country. This and other future initiatives give libraries an ideal opportunity to experiment with innovative ideas that help patrons develop the real skills that will need to be commonplace if our nation is to remain competitive in the global information economy.

Another likely area for increased attention is digital fluencies in a mobile world, particularly as more and more people reach for their smartphones to access the Web. This trend disproportionately impacts young adults and people of color. A July 2010 Pew poll found that 51 percent of Hispanics and 46 percent of African Americans use their phones to access the Internet, compared with 33 percent of whites.[24] A March 2011 Pew found that nearly half of all American adults (47 percent) report that they get at least

some local news and information on their cellphone or tablet computer.[25] Two international events in October 2011 demonstrate this expanding concern: The First International Conference on Mobile Services, Resources, and Users, to be held in Barcelona, Spain, and MobilityShifts: An International Future of Learning Summit in New York City.

Next Steps

Collecting existing materials and examples of effective programs is an important first step in digital literacy work, one that crosses many disciplines and organizations. Many individual libraries are responding in an ad hoc manner: as the need arises, librarians develop curricula, design webinars, coordinate with faculty, and reach out to community organizations for specific expertise. There is not, however, a concerted effort or strategy applied across the library profession. The impact and scope of individual efforts are likely limited to a specific population within a specific community. Effective programs that could be replicated or adapted in other communities are not necessarily shared across library type or across the profession as a whole. For example, online learning modules are commonplace in many academic libraries, but practices such as these may not be widely known in other types of libraries, thus creating a loss of opportunity for libraries in different settings to learn from the effective strategies for developing digital literacy skills used by other practitioners.

At the 2011 Midwinter conference, the ALA Office for Information Technology Policy (OITP) established a Digital Literacy Task Force composed of members from across ALA units that have begun to address some of these issues, promote crossdivisional sharing and communication, and create and share resources that will strengthen all libraries' abilities to support digital literacy at all ages and stages. The task force will begin its work with an environmental scan to develop a comprehensive understanding of what types of activities already are in place related to digital literacy, where there might be gaps, and how to prepare the association for the changing landscape of digital literacy. Beyond ALA, the task force seeks to elevate the profile of libraries on a state and national level so that libraries are firmly associated with digital literacy and included in initiatives that support a digitally literate population.

One resource for addressing the need to share resources among—and beyond—libraries is DigitalLiteracy.gov, a new online portal that brings together online learning tools, curriculum, job skills training, and a host of other resources. ALA and the IMLS are working with the National Telecommunications and Information Administration (NTIA) to increase awareness and inclusion of library resources in the portal. Libraries' contributions to this portal can help other agencies and organizations see the existing commitment and efforts of libraries.

Another collective effort spearheaded by the IMLS is a new Framework for Digitally Inclusive Communities, which has digital literacy as one of its foundational principles.[26] The framework outlines eleven principles core to fulfilling the vision of digital inclusion and recommends local convenings to develop a shared community understanding of digital inclusion and to create and implement an action plan. Libraries can and should play a lead role in any such community efforts.

Conclusion

For ALA and its members, the heart of digital literacy work is rooted in the library principles of ensuring equity of access to information. In the age of broadband-enabled resources, it is even more apparent that access denied is opportunity denied. As the quantity of online resources continues to grow at unprecedented rates, there is a growing amount of information that is no longer captured in print or offline format. The individual and societal costs of digital exclusion continue to grow. Libraries of all types need to position themselves as the digital literacy experts they are, support staff competencies to maintain the level of expertise required in the digital landscape, and explore opportunities to expand digital literacy projects and initiatives.

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Chapter 7

Transforming Public Library Patron Technology Training

Stephanie Gerding

Abstract

In pursuit of community digital literacy, patron technology training at public libraries is no longer an optional service. While this absolute can be seen as a challenge for many libraries, this chapter of The Transforming Public Library Technology Infrastructure *provides an extensive portfolio of resources and recommendations to guide libraries in the development of relevant, diverse, and purposeful technology training programs.*

Overview

Libraries are community centers, touching the hearts and minds of our residents. We now support the vital need for digital literacy, often being the only place with free public computer and Internet access and, moreover, free technology training. It's not an optional service anymore; libraries have computers, patrons need to use them and have questions related to that use. Whether the training is one-on-one or in a more formalized workshop setting, technology training is happening in every library across the country. The need for technology proficiency is found in every segment of our society and is required to function successfully in work, education, government, politics, cultural, and social arenas. Providing library technology training may appear to be a role shift; however, technology training supports a fundamental library purpose of connecting people and knowledge.

There are four key elements necessary to circumvent current struggles and fully complete the transformation of the library into a digital literacy oasis. To flourish we must:

1. Create purposeful comprehensive training plans and individual workshop plans.
2. Empower library training staff through professional development and support.
3. Cultivate partnerships, volunteer relationships, and material sharing.
4. Advocate and communicate the value of library technology training.

Creating Purposeful Training and Workshop Plans

There is a Buddhist saying, "We have very little time; therefore, we must proceed very slowly." This is an important lesson in relation to library technology training. Thoughtful planning and support of the resources needed for quality training are important foundational elements. Often technology training has developed out of necessity and is not seen as an independent core service. Taking the opportunity to plan how your library provides technology training can save time, create a more balanced program, provide a better service to community members, and, in fact, position the library for success.

Training program plans will vary according to the individual library and the needs of staff and community members. Basic elements of common training plans include:

- training mission or purpose statement
- needs assessments
- goals and objectives
- needed resources
- evaluation
- policies and procedures

The library's vision and strategic plan should be the foundation for technology training plans that will

help guide the purpose behind the training program. A training plan should identify who needs training, who will lead the training, topics that will be covered, a training budget, and a schedule for training. What needs to be done to get from where you are now to where you need to be, and how will you evaluate to measure success? Basic policies and procedures will help alleviate confusion and create order.

Investigate the current planning in place by your local government to see if the library can support any of the goals through technology training. This can help your library with community support and local funding.

Training Needs Assessments

Conduct a needs assessment to determine the training topics and content areas your community members most need to develop their skills and knowledge. You can interview a few key community leaders, facilitate focus groups, distribute questionnaires, ask questions on training evaluation forms, and track requests for information (reference questions). There are free online survey tools (Zoomerang, SurveyMonkey, forms in Google Docs) to e-mail survey links or embed in a webpage with easily tabulated results available for download.

Zoomerang
www.zoomerang.com

SurveyMonkey
www.surveymonkey.com

Examine what is going on in your community and think about what people need to know to be relevant in the job market, succeed in the educational arena, master the basics, and keep up with the new technologies. Do people need jobs and need to know how to find jobs online, create resumes, and submit online applications? Do teens need activities and a safe place to complete homework? What knowledge do people need for digital literacy? Do families need to be able to contact loved ones deployed in the military?

When to Offer Training

It is best if you can schedule training at different times throughout the day to accommodate different work schedules and lifestyles. Think about the possibilities of offering training:

- before or after the library opens
- evenings (to reach students, traditional workers)
- daytime (stay-at-home parents, retired, business people, unemployed)
- 30-minute quick sessions throughout the day or during lunchtime
- appointments for one-on-one training (using teens or senior volunteer trainers)
- periodically on a rotating basis

Types of Training and Locations

Technology training in the library doesn't always take place in a classroom or formal setting. Learning may happen as a result of answering a few questions or sharing tips.

- Offer computer lab workshops and open lab free time.
- Offer individual appointments or "learning partners"—teen/senior, senior/senior, etc.
- Offer self-paced online tutorials or lesson plans.
- Create a learning blog or wiki (can be separate for staff and public).
- Provide bibliographies with how-to books and quick guides or tips and tricks.
- Share a website or database of the week.
- Borrow a mobile lab or laptops from a state library, regional system, or local organization.
- Use contests or learning games.
- Conduct training outside of the library.
- Have participants bring their own laptops.

Topics

Many libraries have been offering technology training for over ten years, yet the most requested topics have not deviated from the basics. General computer topics, including word processing, e-mail, and Internet use, remain the leading classes. Libraries are still teaching people how to use the mouse and how to search on the Internet. While the basics are still important and needed, new community needs are being met through classes that focus on job-related training, homework help, educational resources, online government information, and by offering services as testing sites for educational and civil service exams. Some libraries also offer classes on social networking, online safety, e-books, and digital photography.

A number of libraries offer training on a rotating basis, such as e-mail basics every three months. Another trend is offering classes in a series, for instance, Word Processing (Parts 1–3). Subject-specific classes keep topics fresh and interesting for both the patrons and the trainers, for example, focusing on online gardening sites, eBay for beginners, or online hobby-related sites. Another successful idea is a weekly course focused on free websites or social technologies.

There are excellent examples of library training programs that can serve as models for designing

innovative workshops and planning training. Some of these were devised for staff training but could be easily adapted for public training, or vice versa.

Staff and Public Technology Training Programs
http://techsoupforlibraries.org/blog/staff-and-public-technology-training-programs

Planning Technology Workshops

Designing a workshop need not be complicated. An outline is needed to determine how the workshop should flow—how the main concepts logically fit together and combine for the big picture. Training scripts aren't needed as they can often be limiting (and boring!). Identifying learning objectives and breaking content into modules through the use of a workshop plan helps ensure participants have an optimal learning experience.

Workshop Plans

A workshop plan helps prioritize and organize training. Workshop plans should be flexible as every training experience should vary based on the specific people present. Once learning objectives are selected, determine the best techniques to use and estimate timing to best achieve the intended outcomes. An example plan that I created for an "Accidental Technology Trainer" workshop is available for download.

The Accidental Technology Trainer workshop plan template
www.techsoupforlibraries.org/files/WorkshopPlanTemplateTATT.pdf

Some libraries include sufficient details so that library trainers can share workshop plans. A standardized curriculum isn't really needed, as all trainers incorporate their own strengths, knowledge, and skills, but sharing outlines and materials is a great way to learn and save time creating resources from scratch.

Learning Objectives

The most important step in designing a workshop is establishing learning objectives. Good learning objectives assist in planning, focusing the content, organizing the modules, estimating the length of the workshop, and evaluating whether results were achieved. Creating objectives is as easy as determining the top three things participants should learn during the training. Think about the knowledge, skills, abilities, capacities, or attitudes participants should acquire or change in the workshop. For example, if you are teaching a one-hour introduction to the Internet, do you want participants to walk away knowing how to type a URL in the address bar and perform a Goggle search? Then plan activities and instruction around accomplishing those tasks. There is always more to be taught than can be covered, and learning objectives help focus on what is most important.

Learning objectives are also helpful for marketing the workshops. The participants then know the expectations and they can self-select if there are different levels of classes offered. Technology training can be a lot like a reference interview in that often the participants are not sure what they need when they sign up for a class or ask a seemingly simple question. They don't know what they don't know. The objectives should be reviewed at the beginning of the workshop and trainers should get input from the participants to see if there is anything really important that should also be included.

Modules

By segmenting workshop time into manageable sections, trainers can organize the time available and also increase flexibility and learning. Psychological principles attest that learning occurs most effectively when instruction is delivered in small segments, with time to process and practice; when links are made between new ideas and previous experience; and when students are actively engaged with the material and with each other. To accomplish technology training in support of these objectives:

- set small goals
- develop small portions of content (modules)
- use participant-centered activities
- include as many hands-on and experiential opportunities as possible
- be flexible and allow participants to achieve their own goals

A series of fifteen-to-twenty-minute modules that include participant-centered exercises for deeper processing of new content will result in more opportunities for better learning, especially better recall and retention. Participants learn more when offered smaller amounts of material thoroughly.

Each module should be designed based on the learning objectives, incorporating appropriate learning materials and methods. Each module should be a separate component that can be taught, measured and evaluated, or interchanged with other modules to accommodate specific learners. Focusing on one concept at

a time and including opportunities for participants to analyze and apply the concept will ensure success.

Tips to Increase Learning

Creating a learning environment and implementing interactive training strategies allows participants to be actively engaged and results in successful learning experiences and retention. It is important to develop an open, friendly, and low-stress atmosphere and to encourage participants to learn and explore, asking questions and practicing on their own.

To keep attention, vary class pace and use different types of exercises. Each module of fifteen-to-twenty-minute segments can add different experiences, such as a question-and-answer portion, a practice exercise, a group activity, or a guided demonstration and time for independent work. This not only provides variability, but also accommodates different learning styles.

If a training experience is personalized, it will be more memorable. Find out particular interests in the topic by using a beginning activity to discover the learners' personal motivations. By incorporating those motives into the workshop, their specific needs are addressed, and you tap into their motivations for learning.

Then help participants see the relevance of the topic to their work, their interests, and their goals. Provide compelling, personally motivating reasons for using the technology. What are the benefits of the technology? Will the training help them on their jobs or in their personal lives? Will it make their work easier, more effective or efficient? Will it solve a problem or provide opportunities for them? Stories and real-life examples help learners understand how they will apply what they learn to their own needs. Let them see immediate benefits by sharing applicable experiences.

Incorporating learning games, activities, or even a fun theme can help raise learners' enthusiasm—and the trainer's! The best way to learn is by doing. If participants are able to demonstrate what they've learned in their own words or by doing it themselves, it is much more likely to be retained in long-term memory. Activities can transform training, increasing the odds of success for participants. Opening activities or icebreakers can

- alleviate tension and break preoccupation
- let everyone speak (which makes it easier to speak again)
- set a tone of engagement and begin group connections
- introduce topical concepts

After the icebreaker, participants might work individually or in small groups for brief periods of time to answer questions, fill in steps from a handout, complete exercises, or brainstorm questions about the material just covered. Some of my favorite activities are described in a blog post on TechSoup.org (including: Pair Share, Action Plans, Snowball Fight, World Café, Polling, Quotations, and Chocolate Hugs and Kisses). By having independence during training, participants are empowered and are able to develop themselves while promoting a sense of achievement and confidence.

Workshop Activities to Increase Learning and Retention
http://techsoupforlibraries.org/blog/workshop-activities-to-increase-learning-and-retention-part-1

Evaluation

Effective evaluation begins before the training even starts, as part of library training plans and as part of planning individual training sessions. Five reasons for evaluating training are to

- improve the training
- promote personal growth and self-evaluation (of both trainer and learner)
- assess the degree of demonstrated achievement
- determine future learning needs
- prove whether the service is of value.

There are quantitative outcomes such as the number of people trained, cost, and the number of training hours delivered, and there are qualitative outcomes, such as outcome-based evaluation, which focuses on whether participants learned what they needed to learn, whether there was a change in a participant's knowledge, skill, attitude, behavior, or life condition.

If the workshop is not successful, don't automatically jump to conclusions. Some libraries determine that lack of success was due to the topic or the trainer when it might be the time of day, not enough publicity, or some other factor. The only person who can really know if someone learned something is the learner. And what if the person already knew it? Sometimes the only fault in the training is in the evaluation itself.

Marketing

No matter how well a workshop is planned, if no one knows about it, no one will show up! Creating interest through promotion and marketing is crucial to training success. Here are some ideas for where to publicize training:

- library website/blog, online event calendar
- library newsletter

- local newspapers, community weeklies, neighborhood associations
- direct mail (Some public utilities will include notices for free with bills.)
- posters in public areas, such as restaurants, churches, community centers
- flyers given at store checkouts
- schools
- press releases and public service announcements
- signs on the library book shelves and flyers placed in books at checkout

A great marketing idea was implemented at a rural library in Parker, Arizona. The director received a grant for a wireless laptop lab to provide computer training to the public. She asked the local café owners if the library could provide their normal paper placemats. On 11 × 17 paper, she printed the class calendar and listed the workshop descriptions every month, creating a low-cost way to get the word out to the entire community, including many people who don't regularly use the library.

Empowering Library Training Staff

Library technology training is often just one duty of library staff, who also have other responsibilities, such as reference work or technical support. Many library technology trainers find themselves in their role accidentally and are perplexed at how to get started performing this important service. Often they have no background in training and the only models they rely on stem from traditional educational lecture-based methods. Giving trainers a foundation in adult learning and basic instructional methods can be a time saver and confidence booster.

All library staff who perform training duties should have access to some type of foundational training. Provide them with time to learn the basics, whether through self-study, shadowing experienced library staff members at their own library or nearby libraries, attending conferences, or webinars or other online courses. It will save time in the long run to make this initial investment and ensure that new trainers aren't spending time reinventing the wheel without knowing of free resources available, such as lesson plans and handouts. Connecting with other trainers is empowering and necessary for development.

Some of the knowledge areas that should be covered for training trainers include basic public speaking skills; how people learn best, including learning principles and learning styles; the importance of incorporating interactive training techniques; basic technology competencies; methods for organizing, designing, and planning training; and learning how to be a training guide instead of an academic lecturer. Successful technology training has less to do with technical knowledge than with other abilities, such as patience, listening skills, enthusiasm, and empathy toward learners struggling with new technologies. Knowing how to train, and how to keep the training easy to understand and relevant, is more important than just having technical expertise.

There are great sources available for technology training competencies, including these two, which focus on the skills needed to teach technology in a library setting:

- The Colorado State Library developed a set of competencies for technology trainers as a part of the Colorado Public Computer Centers program (funded by the Broadband Technology Opportunity Program).
- WebJunction.org created the Public Access Computing Technology Competencies. WebJunction's competencies are divided into three sections—two of which address technical skills and knowledge and a third that addresses the management of public-access computing programs.

Colorado State Library Technology Trainer Competencies
http://coloradovirtuallibrary.org/btop/content/technology-trainer-competencies

Broadband Technology Opportunity Program
http://www2.ntia.doc.gov

Public Access Computing Technology Competencies
www.webjunction.org/competencies/-/articles/content/446662

Many new trainers struggle with how to deal with challenging people and difficult training situations. Knowing easy methods for addressing specific behaviors often seen in technology training classes can be helpful. Sometimes people seem challenging, but they might just need attention or to have a certain issue addressed. Often they just need their expertise acknowledged or their energy redirected.

Cultivating Partnerships, Volunteer Relationships, and Material Sharing

While some libraries have designated technology trainers, many more have found great success in using volunteers. Whether the volunteers serve as the primary trainers or are a support to library staff, they are an extremely useful resource. Partnering with

organizations and individuals strengthens training programs and develops library advocates at the same time.

Contacting community members, businesses, and nonprofits in your area is a great method to develop partnerships and opportunities for library technology workshops. Find out their needs and the services they provide to see if you can create win-win relationships through technology training. For example, genealogy groups can provide help with online resources, accountants can provide information on online tax filing, and the county employment office can give advice on online job hunting, while also making their own services known. Here are some examples of where libraries find partners and volunteers for technology training:

- high school students (who may have a community service component to fulfill)
- community college, university, or vo-tech students, interns, faculty, any type of teacher or professional trainer
- local electronics/computer vendor to showcase new technologies (Best Buy, Radio Shack, and Computer City all offer free programs in libraries.)
- chambers of commerce, economic development departments, small business development centers, community recreation department or other city departments
- current and new volunteers (Nationalservice.org, AmeriCorps, Senior Corps, SCORE)
- nearby libraries that can trade trainers and topics
- employment assistance programs or other job-training programs
- literacy councils, women's clubs, neighborhood associations, senior centers
- service organizations (Kiwanis, Rotary, Junior League, Lions, Salvation Army, United Way)

Nationalservice.org
www.nationalservice.org

AmeriCorps
www.americorps.gov

Senior Corps
www.seniorcorps.org

SCORE
www.score.org

With any partnership or volunteer relationship, use a letter of agreement or Memorandum of Understanding to put into writing the agreed upon responsibilities, benefits and obligations of both parties and any dates and events scheduled. This ensures that everyone is on the same page.

Free Lesson Plans and Workshop Materials

A number of libraries and organizations have developed noteworthy technology training programs for the public, and their materials are available to other libraries and nonprofits through their websites.

In technology training, handouts are an important tool. You don't need exact instructions that take hours to design. But you may need to provide basic information that learners can refer to later. Otherwise some learners will struggle to write down all the instructions and will fall behind. Knowing they have a guide for future use makes them more comfortable. And if they are visual learners, they can read the instructions later and get information through charts, screen captures, and other visuals. Examples of free sites for materials are listed in the gray box.

Sites for Free Materials

WebJunction
www.webjunction.org/technology-training

TechSoup for Libraries
http://techsoupforlibraries.org/blog/fabulous-free-public-technology-training-materials

Alliance Library System (ALS)—Illinois
http://technologytrainingwheels.pbworks.com

Hennepin County Library—Minnesota
http://ow.ly/5sqRp

Milwaukee Public Library—Wisconsin
www.mpl.org/file/computer_curriculums.htm

Community Technology Network
www.ctnbayarea.org/resources

Infopeople—California State Library
www.infopeople.org

Common Craft Videos
www.commoncraft.com

Custom Guide
www.customguide.com

Advocating and Communicating the Value of Free Public Library Training Programs

Garnering support for funding library technology training is often still an issue. In any public library,

it is assured that there are many people in the community who greatly benefit from the provision of public-access computers and other technology services. We know that library staff enhance the technology by providing support and training, but sometimes it is difficult to demonstrate this impact with funders, the media, and local decision makers. Now more than ever, we need to advocate for our libraries and make sure that everyone knows the difference libraries make in the lives of our community members.

The University of Washington Information School, with support from the Institute of Museum and Library Services and the Bill & Melinda Gates Foundation, conducted the US IMPACT Study, the first national research study targeted at documenting, describing, and analyzing the use and results of technology in libraries. The first report from the study, *Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries,* was released in 2010.

Opportunity for All
http://tascha.washington.edu/usimpact/documents/OPP4ALL_FinalReport.pdf

This project created many tools to easily communicate library value in providing technology-related services. The Public Library Toolbox contains information about the research and sample documents that can be customized to communicate the need for library funding and support to your local community and to show the role libraries play in making technology available to all people. In addition to an overview of the research (perfect for sharing with funders), there is a sample op-ed, letters to the editors, article templates, handouts, and a downloadable PowerPoint presentation (with a script!) to customize with your own local stories for presentations to library boards, policy makers, and funders.

Public Library Toolbox
http://cis.washington.edu/usimpact/toolbox.html

Another great resource is Turning the Page 2.0, a free public library advocacy training course developed and presented by the Public Library Association (PLA) with generous support from the Bill & Melinda Gates Foundation. In this six-week, facilitated online course, library staff and supporters learn how to create and tell their library's story, deliver effective presentations, develop a compelling case for library support with a focus on technology, and build and sustain partnerships along the way. Participants are encouraged to come with a specific, self-determined advocacy goal for their library and develop an advocacy work plan to guide their efforts. It is interactive and personalized and makes advocacy training an enjoyable experience. Board members, volunteers, other library supporters, and all levels of library staff can participate through 2012. The online course dates are on the registration page.

Turning the Page 2.0
www.ala.org/ala/mgrps/divs/pla/education/turningthepage/index.cfm

Conclusion

Our libraries can each truly become a digital literacy oasis through planning, empowering our staff, creating partnerships, and continuously advocating the value of library technology training. An oasis provides sustenance, visibility, and security. Libraries are a refuge for learning, upholding the traditions of the past while supporting future learning needs. Technology has changed our expectations of what an educated person must know and be able to do in order to effectively participate in society. By providing quality technology training, we can sustain our place as vital community centers while ensuring that we are visible to our funders and supporters and are providing security to our twenty-first-century visitors as they advance their technological literacy.

About the Authors

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