SEPTEMBER 23-24, 2019

Nicole Umayam
Digital Inclusion Librarian - Arizona State Library, Archives and Public Records

Carson Block
Carson Block Consulting
BROADBAND 101 TOPICS

• Digital Inclusion
• The Toward Gigabit Libraries Toolkit
• Technology Training in Rural Arizona
• Libraries Bridging the Digital Divide
Digital Divide(s)

The economic, educational, and social inequalities between those who have computers and online access and those who do not
LIBRARIES AS DIGITAL INCLUSION CHAMPIONS

• Libraries have been “doing” digital inclusion for a long time

• …but there are aspects of digital inclusion for libraries to consider:
  – Tech confidence and tech competence
  – Ability to define the scope of the problem
  – Information about low-cost options for households
How to use the Toward Gigabit Libraries Toolkit

https://www.youtube.com/watch?v=PXWv3-HYm-I
“Toward Gigabit Libraries” Site Visits (partial listing)
Library Intake Survey--Trends (59 Libraries)

Is the library part of a larger city, county, regional, library system?

59 responses

- No, we are a stand alone library: 88.1%
- Yes, we are part of a library system: 11.9%
How frequently is technical/IT support available in the library?

59 responses:

- Anytime: 62.7%
- Only when problems arise: 20.3%
- Very infrequently / limited: 11.9%
- Never: 5%
Describe your current level of expertise around procuring and delivering access to broadband as a service in your library.

59 responses

- Very Experienced— I’ve been responsible for ordering and setting up our Internet connection and feel I have a good understanding of the process.
- Limited Experience— I’ve had some experience with ordering and setting up our Internet connection, but I don’t feel like an expert.
- No Experience— I’ve had no experience in ordering or setting up our Internet connection.
How would you rate your overall experience with the pilot program?

39 responses

- 0 (0%)
- 1 (2.6%)
- 8 (20.5%)
- 30 (76.9%)
Would you recommend this pilot process to other libraries?

39 responses

100% Yes
What is the Toolkit?

- Educational Workbook
- Self Assessment Tool
- Advocacy Platform
Toolkit Components and Process

- **Technology Inventory**
  - Broadband Connection
  - Wired Network
  - Network Devices
  - Wireless/WiFi Network
  - Computer/End User Devices

- **Broadband Services and Activities**
  - Broadband Technology and Operations Support
  - Broadband Funding
  - Additional Resources and Best Practices

![Diagram](image.png)
Questions are presented first, and additional information and resources follow in text boxes.

5. TECHNOLOGY INVENTORY—YOUR LIBRARY

In this section, you will inventory some of the key pieces of the technology inside your library, including your network, computers, and other important technology components. This inventory will help you understand what sort of equipment you have now, and provides a basis to determine if you need different or additional equipment for the future.

5A. Broadband Connection

If you have more than one broadband connection, i.e., two different types of technologies or service providers, answer the following questions in this “Broadband Connection” question for each connection.

1. What type of internet connection does your library currently have? Choose all that apply.
   - [ ] Digital Subscriber Line (DSL)
   - [ ] Cable Modem
   - [ ] Fiber
   - [ ] Wireless
   - [ ] Satellite
   - [ ] Other [add here]

There are three primary types of broadband—wireline (DSL, cable modem, and fiber), wireless, and satellite. Definitions for the types of Internet connections listed here are available at the FCC website: [https://www.fcc.gov/general/types-broadband-connections](https://www.fcc.gov/general/types-broadband-connections)

<table>
<thead>
<tr>
<th>Speed Ranges by Type of Broadband</th>
<th>Kbps - kilobit, Mbps - megabit, Tbps - terabit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Type</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Fiber</td>
<td>Wireline</td>
</tr>
<tr>
<td>Cable Modem*</td>
<td>Wireline</td>
</tr>
<tr>
<td>DSL*</td>
<td>Wireline</td>
</tr>
<tr>
<td>Fixed Wireless/ Microwave</td>
<td>Wireless</td>
</tr>
</tbody>
</table>
 USING THE TOOLKIT

• Free, open-source technology learning, diagnostic, and advocacy tool
• Useful for: preparing Erate requests and budget cycles; helping open communication between library staff and tech workers
• Can be used piecemeal to address specific problems in your library
• No techies required!
Technology Inventory – Your Library

In this section, you will inventory some of the key pieces of the technology inside your library, including your network, computers, and other important technology components. This inventory will help you understand what sort of equipment you have now, and provides a basis to determine if you need different or additional equipment for the future.

- Broadband Connection
- Network Devices
- Wired Network and Power
- Wireless Network and Power
- Computer and End User Devices
Broadband Services and Activities

In this section, the types of broadband services and applications are discussed in order to ensure that the library has sufficient bandwidth to support patron and staff use of various devices and applications both today and in the future.

- Bandwidth Needs
- Hot-Spot Lending
- Internet Filtering
- Offered Services
Technology in libraries is more than just a collection of gear. People, including library staff and those who provide technical support, are just as important. In this section you will learn more about the people who help make technology available in your library and determine if there are any areas where you could benefit from additional support.

- Available Technology Support
- Staff Training Resources
- ISP Technical Support
- ISP Service Requests
- ISP Service Guarantees
Broadband Funding

Technology expenses are important budget considerations for all libraries. In this section you will learn about several opportunities available to help provide funding for your library broadband connectivity.

• Price For Connection
• E-rate Funding
• Other Funding Sources
Additional Resources and Best Practices

The topics listed here are designed to provide you even more insight and resources into improving your library’s broadband connectivity and services. You may find these items helpful in gaining a better understanding of your broadband connection, data network, and computers.

- Erate
- Content Filtering
- Additional Broadband 101 Resources
- Free Technology Related Training Opportunities & Resources for Librarians
- Data Backup
- Internet Use Policies
Glossary

**Category (Cat) 5e Cable**
The category 5e specification improves upon the category 5 specification by tightening some crosstalk specifications and introducing new crosstalk specifications that were not present in the original category 5 specification. The bandwidth of category 5 and 5e is the same – 100 MHz. The differences between category 5 and category 5e are in their transmission performance. Category 5e components are most suitable for a high-speed Gigabit Ethernet. While category 5 components may function to some degree in a Gigabit Ethernet, they perform below standard during high-data transfer scenarios.

**Category (Cat) 6 Cable**
A standardized cable for Gigabit Ethernet and other network physical layers that is backward compatible with the Category 5/5e and Category 5 cable standards. Compared with Cat 5 and Cat 5e, Cat 6 features more stringent specifications for crosstalk and system noise. The cable standard provides performance of up to 250 MHz and is suitable for 10B486-T, 100B486-T (Fast Ethernet), 1000B486-T (Gigabit Ethernet) and 1000B486-T (10-Gigabit Ethernet).

**Device Authentication—MAC Address**
Is used to authenticate devices based on their physical media access control (MAC) address. While not the most secure and scalable method, MAC-based authentication implicitly provides additional layer of security authentication devices. MAC-based authentication is often used to authenticate and allow network access through certain devices while denying access to the rest. For example, if clients are allowed access to the network via station A, then one method of authenticating station A is MAC-based. Clients may be required to authenticate themselves using other methods depending on the network privileges required.

**Endpoint**
Anything attached to the network, including PC, laptop, tablet, phone, iPod, etc.

**Ethernet**
A computer network architecture consisting of various specified local-area network protocols, devices, and connection methods.

**Ethernet Port**
An Ethernet port is an opening on computer network equipment that Ethernet cables plug into. Ethernet ports accept cables with RJ-45 connectors, including Cat cables.
Does your tech room look like this? (Actual Site Visit Photos)
Does your internet speed look like this? (Togiak, Alaska)
You can find the Toolkit here:

https://www.internet2.edu/tgl/
PROJECT STAFF

James Werle  
Susanna Spellman  
Carson Block
TOOLKIT USERS – NICOLE UMAYAM

Digital Inclusion Librarian - Arizona State Library, Archives And Public Records
ARIZONA

- 5 libraries visited (December 2017)
  - San Lucy District Library (Tohono O’Odham)
  - Edward McElwain Memorial Library (Hualapai)
  - Whiteriver Public Library (Fort Apache)
  - Fort McDowell Yavapai Tribal Library
  - Venito Garcia Library (Tohono O’Odham)

- At the table:
  - Library staff
  - Internet2 (James Werle)
  - State Library staff (Library Development, E-Rate)
  - Network specialists from ASU and NAU
  - Tribal I.T.
  - Tribal Education directors
ARIZONA: TAKEAWAYS

• Discussion of digital service needs led to discussion of local interests
  – Broadband access in the community
  – Digital skills training
  – Language preservation, digitization projects

• There is power in holding space for multiple stakeholders to gather
  – Increased understanding of library’s role in the community

Next steps
• Using the toolkit to support libraries for Category 2 E-Rate applications
TECH TRAINING IN ARIZONA
SECTION I: COMPUTER HARDWARE & SOFTWARE

In this section Carson talked about the pieces that make up a computer, what the different connections are, and basic maintenance.

Then participants got to pull things apart!
SECTION 2: SOFTWARE AND SECURITY
In this section Carson talked about the basics of software, from building blocks (Operating Systems) to restoring computers to a like-new state and keeping them that way with security.

Then participants put computers back together!
How We See Our Computing Experience

“HIT ANY KEY TO CONTINUE”
Evaluating Software Before Purchase

Key Questions:

• What do you need to accomplish?
• Is there a standard or a “standard?” If yes – use it!
• Is it unique or special?
• What about open source software?
• Do vendors offer discounts?
  For example: TechSoup, governmental & educational
SECTION 3: AZSTRUT HANDING OUT LAPTOPS
SECTION 4: INTRO TO TECHNOLOGY PLANNING
What’s Next: From “Buckets” to Goals and Actions

• Buckets: Ideas that have some similarity & can be grouped together

• Goals: high level statements reflecting the Buckets (as you’ve organized them)

• Actions: Refinement of the ideas in your Buckets. Often you can combine several ideas into one action or similar set of actions.

• Timeframes and responsible parties: Don’t skip this in your actual plan!
Libraries Bridging the Digital Divide
THE INTERNET IS IMPORTANT TO EVERYONE.

Why isn’t everyone using it?

**COST**
“I can’t afford internet service.”

36% find it too costly for the technology and/or internet service.

**RELEVANCE**
“I don’t think the internet is important to my quality of life.”

19% are not aware of the potential uses of the internet and do not see it as relevant to their daily lives.

**LACK OF SKILLS**
“I don’t know how to use a computer.”

22% don’t have the digital skills necessary.

Learn how you can increase access and use of information technology in your community.

Visit: oc.lc/digitalinclusion
What does the digital divide look like?

13% of Arizona’s total population still does not have broadband access
• 63% of those lacking access reside in rural areas

95 percent of the tribal population has no broadband access

Local Trends

Thematic Map of Percent; Estimate; TYPE OF INTERNET SUBSCRIPTIONS - Without an Internet subscription
Geography: by County
Put it all together…

**Poverty Rates in Greenlee County, Arizona in 2013-2017**

- Persons or families affected by poverty
- Children under 18 years
- Persons 65 years and older
- Persons 18 to 64 years

- Poverty rates have decreased over the years.

**Types of Computers in Greenlee County, Arizona in 2013-2017**

- Desktop or laptop: 69.9%
- Smartphone: 76.1%
- Tablet or other portable wireless computer: 50.5%
- Other computer: 2.2%

**Types of Internet Subscriptions in Greenlee County, Arizona in 2013-2017**

- Cellular data plan: 46.6%
- Broadband such as cable, fiber optic, or DSL: 56.7%
- Satellite: 8.6%
- Dial-up alone: 0.0%
- Other service alone: 0.3%

---

**American Community Survey**

U.S. Census Bureau
Community Access Surveys

How do you access the Internet at home?
- Cable modem
- Fiber to the home
- DSL through the phone company
- Dial Up (must connect via phone dial)
- Cellular service
- Satellite service
- Other (Please Specify)

For what other activities do you use your device?
- Social media (e.g., Twitter, Instagram, Snapchat, etc.)
- Games
- Music
- Movies
- Digital Art
- Media (e.g., online magazines, TV shows, etc.)
- Other (Please Specify)

Do you use the Internet to complete your schoolwork outside of school?
- Never
- Sometimes
- Often
- Always

How many other members of the household share the device you primarily use for schoolwork?
- 1
- 2
- 3
- 4
- 5+

Do you use your personal device for schoolwork while at school?
- Yes

What other places in your community do you visit to access the Internet?
- Library
- Commercial establishments (e.g., coffee shop, restaurants, etc.)
- A friend’s house
- A family member’s house
- Place of worship
- Other (Please Specify)

What is the connection speed that you need, to engage in anywhere, anytime learning?
- Moderate: Enough to get online, check in, and comfortably browse the web
- Fast: Enough to smoothly stream video, quickly download large files, etc.
- Lightning speed: Fastest possible connection for all sorts of projects.

How capable do you feel of doing the following things, with 1 being not at all capable and 5 being fully capable?

1: Not at all capable  2  3  4  5: Fully capable

- Turning on a computer, logging on, doing basic tasks
- Uploading content like photos to social media sites
- Blocking spam
- Managing IDs & passwords for online accounts
- Adjusting privacy settings online
- Bookmarking a website or adding it to your favorites
- Comparing sites to check the accuracy of information
- Creating and managing a profile on social media
- Creating your own personal website
- Downloading an app on your cell phone
Wi-fi hotspot user surveys

Q4 Does your household currently pay for Internet service?

Answered: 547  Skipped: 2

<table>
<thead>
<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>19.01%</td>
</tr>
<tr>
<td>No</td>
<td>80.99%</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
</tbody>
</table>
Wi-fi hotspot user surveys

Q4 Does your household currently pay for Internet service?

- Q1: Copper Queen Public Library
- Q1: Douglas Public Library
- Q1: Fort McDowell Yavapai Tribal...
- Q1: Huachuca City Public Library
- Q1: Page Public Library
- Q1: Prescott Valley Public...

Green bar: Yes
Blue bar: No
Wi-fi hotspot user surveys

Q8 Without the mobile hotspot, where do you access the Internet?

Answered: 521  Skipped: 28

<table>
<thead>
<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>I pay for internet at home</td>
<td>16.51%</td>
</tr>
<tr>
<td>At school</td>
<td>9.02%</td>
</tr>
<tr>
<td>At the library</td>
<td>64.11%</td>
</tr>
<tr>
<td>At a business (Starbucks, McDonald's)</td>
<td>35.12%</td>
</tr>
<tr>
<td>At a friend or relative's home</td>
<td>22.07%</td>
</tr>
<tr>
<td>At work</td>
<td>9.40%</td>
</tr>
<tr>
<td>N/A</td>
<td>6.72%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>11.32%</td>
</tr>
<tr>
<td>Total Respondents: 521</td>
<td></td>
</tr>
</tbody>
</table>
Internet providers & prices
Low-cost Internet for individuals
Low-cost devices

For libraries & non-profits
- techsoup
- AZStRUT

For individuals
- connectall
- pcsforpeople
- REFRBIT.ORG

Mesa, AZ

Yuma, AZ
Questions or Comments?

Nicole Umayam  
Digital Inclusion Librarian - Arizona State Library, Archives and Public Records

Carson Block  
Carson Block Consulting