A Confidence-Building Toolkit

Is it possible for library workers in small, rural, and tribal libraries to understand their technology enough to troubleshoot common problems, make decisions about future technology needs, and even advocate for improvements to their broadband connectivity?

That set of questions was the driving force behind the Toward Gigabit Libraries toolkit. The short answer is yes. The toolkit is a free, open-source technology learning, diagnostic, and advocacy tool designed for public and tribal libraries in the US, but it can be used just about anywhere in the world.

According to the *2014 Digital Inclusion Survey*, "30 percent of American households lack broadband [internet], and this rises to 38 percent for rural households."[1] Libraries help bridge this gap by serving as technology hubs for their community members and providing free internet access. But difficulties arise when it comes time to troubleshoot internet connectivity issues and other technology problems. This is where the Toward Gigabit Libraries toolkit can come in handy. It can be used as a training resource for library workers and also as an assessment tool to further enhance libraries' current broadband infrastructures and information technology (IT) environments.

The initial project was funded via a Laura Bush grant from the Institute of Museum and Library Services (IMLS); a second Laura Bush grant was awarded in 2020 to scale the project for further reach to explore how it could help in "tech deserts" (areas of no or challenged technology access) in urban areas (see figures 1.1 and 1.2). As of the summer of 2021, the program is scaling up to reach more tribal libraries, create stronger partnerships between state library organizations and public technology providers in states, and even reach those in urban technology deserts.

When library workers understand technology, it results in real-world impacts for the communities they serve. If library workers in rural, tribal, and even urban areas do not have the technical skills to

Figure 1.1
The Toward Gigabit Libraries logo; used for the first grant cycle.

Figure 1.2
The Gigabit Libraries and Beyond logo; used for the second grant cycle.

continually increase and manage connectivity speeds, they risk leaving behind millions of people who rely on public access technologies and connectivity. Many libraries without skilled technical staff do not manage their connections with best practices that would maximize the connectivity and better serve their communities.

The original Toward Gigabit Libraries toolkit grant (TGL) during 2015–2018 provided hands-on broadband infrastructure training to rural and tribal librarians, especially those serving small, rural, or tribal libraries with limited technology support, to enhance

Figure 1.3
Three main functions of the toolkit: education, assessment, and advocacy.

Figure 1.4
Screenshot from page 6 of the toolkit, which gives an example of the questions, as well as the guidance provided in case the questions are difficult to answer.

the community digital and broadband-enabled services those libraries provide. TGL piloted the development of technical broadband assessment tools (a toolkit) that gave thorough hands-on training to librarians to advance their understanding of and advocacy for broadband infrastructure in their libraries.

What Is the Toolkit?

Although all library operations rely increasingly on properly functioning technology, many library staff have little knowledge, training, or practice in addressing technological challenges. This problem is faced by libraries of all sizes, but it could be argued that the most acute negative impacts are for small, rural, or tribal libraries with few staff members (sometimes a single person) who endeavor to provide public services, maintain collections, maintain the physical buildings, and more. Rural and tribal libraries generally have less support for technology than larger and urban library systems, yet their communities still expect reliable access to Wi-Fi, the internet, and computing devices.

The Toward Gigabit Libraries toolkit is designed to be a friendly, accessible guide to what is often a black box of technology. The toolkit is structured to give meaning to all of those blinking lights in wiring closets in libraries across the US (and beyond) and create a layperson's path to diagnosing and fixing technology problems. The toolkit is organized by sections designed to build upon each other, starting the technological journey with the awareness brought through self-assessment, followed by direct targets for improvements, and ending with the confidence needed for effective advocacy. As shown in figure 1.3, the toolkit serves these three main functions: education, assessment, and advocacy.
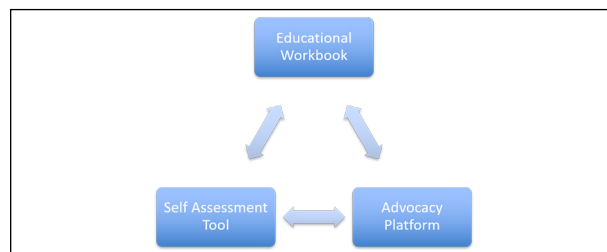
The toolkit guides users through a series of questions about the technology environment of the library and provides all the information needed to answer the questions. The toolkit was piloted with fifty-eight rural and tribal libraries in eleven states to ensure that it is as simple as possible to use.

Toolkit Format

The toolkit is laid out in a simple-to-follow fashion. Questions relating to the library's broadband connection, infrastructure, and related services and operations are posed in a series of gray boxes. Users may write the answers in the boxes. Help text appears immediately below each question and is designed to assist in answering each question directly or to provide additional guidance, education, detail, information, and resources associated with the topic. Essentially, the questions and the resources to answer them are contained in the same easy-to-follow space, as illustrated in figure 1.4.

Although the toolkit is designed to work as a digital document, many users find it most helpful to print a hard copy and complete the sections by hand. The questions, especially in the first sections of the toolkit, which address a technology inventory and broadband services, often require walking around to technology

components in different locations. A paper toolkit, clipboard, and pen or pencil often constitute the low-tech approach that best facilitates the tech inventory.

Open Licensing

From the beginning, the TGL toolkit was designed to be used, in any manner possible, to help libraries improve their technology. All content in the toolkit was released under a Creative Commons license that allows reusing and remixing for noncommercial uses. See chapter 4 for examples of how library organizations have integrated the toolkit into training programs.

Origins of the Toolkit

Several important factors came together to form the IMLS project that would create the Toward Gigabit Libraries toolkit.

In the field, I and others working with small libraries (notably the Colorado State Library and the Texas State Library and Archives Commission) were responding to needs for improved technology skills, comfort, and mastery among small and rural libraries. At the policy and national levels, Mary Alice Ball (former IMLS senior program officer), other IMLS staff, and technology specialists at the American Library Association were making gains in bridging the digital divide in rural and tribal libraries (with a focus on the "last mile" of connectivity), but they also were noticing a gap in understanding and addressing needs within the "last 100 meters" of library technology systems (the internal wiring and components that connect the devices and Wi-Fi systems in each building to the internet).[2]

To address this gap, the IMLS contacted Internet2, a not-for-profit computer networking consortium, to describe the needs and encouraged Internet2 to create a proposal that would help address these technology gaps for rural and tribal libraries. The team at Internet2 reached out to me (based on my field work in Colorado and Texas, described in chapter 4 of this report), and we collaborated on writing a grant proposal that would lead to the Toward Gigabit Libraries toolkit.

The project team for the original TGL grant was composed of two staff members from Internet2 and the author (Carson Block). Much of the content of the toolkit had origins in each project team member's areas of expertise:

- Susanna Spellman—policy and telecommunications project management experience
- James Werle—digital inclusion work and application of tech via Internet2's Community Anchor Program
- Carson Block—library technology assessments, training, and consulting

While it was a happy accident that brought the original project team together, our complementary skills and working styles turned out to be a powerful catalyst in exploring needs and producing a viable pilot and tangible results. As an existing team at Internet2, Susannah (based in Washington, DC) and James (based in Washington state) had already developed a strong team and fluid online and in-person working style. (This work was pre-COVID, and not everyone was familiar, let alone skilled, with the tools and techniques for successful remote teams.) When I joined James and Susannah, we discovered we had a solid common core of values and work ethics and quickly developed a natural rapport that resulted in taking what could have been an impossible task and turning it into reality.

When Susannah left Internet2 during the final year of the grant, James Werle was promoted to executive director of US Unified Community Anchor Network at Internet2, and Stephanie Stenberg was hired as the program manager. Stenberg is now the director of the program, and she and Block are codirectors of the Gigabit Libraries and Beyond project.

James Neal, senior program officer at IMLS, has been instrumental in supporting the further development of the toolkit. Neal said, "IMLS places a great deal of emphasis and importance on open source and shared infrastructures and initiatives for libraries using technology and digital tools to meet community needs. The 'Toward Gigabit Libraries' project is exemplary in this effort as a tool for use by libraries of all sizes across the United States and in particular for rural and tribal libraries."[3]

The Original Toward Gigabit Libraries Project Team

Susannah Spellman served as the executive director of the United States Unified Community Anchor Network (US UCAN) program at Internet2. US UCAN is focused on efforts to support the broadband needs of community anchor institutions nationwide. In addition to Internet2, she has worked in telecommunications for the last twenty years for Booz Allen Hamilton, Detecon, Telcordia Technologies, and IBM and holds a BA in telecommunications from the Pennsylvania State University and an MA in international science and technology policy from George Washington University. Spellman is currently a broadband program team lead at the US Department of Commerce's National Telecommunications and Information Administration. She is working with the Office of Telecommunications and Information Administration to help expand broadband infrastructure and digital inclusion initiatives.

James Werle (deceased) served as the director of the National Internet2 K20 Initiative, which brings together Internet2 member institutions and innovators from public libraries, primary and secondary schools, colleges and universities, and museums to extend advanced broadband-enabled technologies, applications, middleware, and content to all community anchor institutions. He began his career as a Peace Corps volunteer teaching physics and building a library and science lab in the small central African nation of Malawi. He also worked at the University of Washington, where he helped launch the Washington Digital Learning Commons, a statewide K–12 online learning consortium. He held a BA in science education and a master's degree in library and information science from the Ischool at the University of Washington. Posthumously, Werle was given the Richard Rose Award.[4]

Carson Block has led and loved library technology efforts for more than twenty-five years as an IT director and library technology consultant. He's been called a "geek who speaks English" and occasionally compared to Ferris Bueller and Calvin (of *Calvin and Hobbes*). Carson is dead serious about the essential and positive community impacts of libraries and focuses his consulting practice on helping libraries increase their capacity to serve patrons. Carson has served in leadership positions in ALA's former Association of Specialized Government and Cooperative Library Agencies (ASGCLA) group, is a past president of the Colorado division of the Public Library Association, and evangelizes about libraries to SXSW Interactive and other tech communities. Carson is coauthor of *Library Information Systems* (with Joe Matthews; Libraries Unlimited, 2019) and author of *Managing Library Technology: A LITA Guide* (Rowman & Littlefield, 2017).

An Active Advisory Board

A not-so-secret ingredient of the toolkit is the strength of review, feedback, and iteration leading to the final versions. With the goal of making technical information accessible and actionable for lay people, the project team adopted a barrier-free approach to feedback. All feedback from all sources, no matter how difficult it might be to incorporate, was welcomed, considered, and often wrestled with in the effort to make the toolkit a valuable document for all users.

Advisory board members for the TGL and GLB projects were invited based on their subject matter expertise, interest, and willingness to provide thoughtful, thorough, and detailed insight to the toolkit and process.

Toward Gigabit Libraries Advisory Board

(Job titles and organizations were current as of mid-2018.)

- Cindy Aden—state librarian of Washington
- Stephanie Bailey-White—deputy state librarian, Idaho Commission for Libraries
- Dylan Baker—broadband consultant, Idaho Commission for Libraries
- Maria Bernier—Connecticut State Library
- Carson Block—library technology consultant
- Daniel Cornwall—internet and technology consultant, Alaska State Library
- Adam Day—Twin Falls Public Library, Idaho
- James Deaton—executive director of the Great Plains Network (Oklahoma)
- Susan Feller—president/CEO of the Association of Tribal Archives, Libraries, and Museums
- Ann Joslyn—state librarian of Idaho
- Susan McVey—state librarian of Oklahoma
- Carolyn Petersen—"connector": works with rural and tribal libraries in Washington State Library
- Tom Rolfes—education IT manager, Nebraska Information Technology Commission
- Mark Smith— director and librarian, Texas State Library and Archives Commission
- Stephanie Stenberg—Internet2
- Henry Stokes— library technology consultant and state E-rate coordinator for libraries, Texas State Library and Archives Commission
- Sharon Strover—professor, University of Texas at Austin
- Nicole Umayam—digital inclusion library consultant, Arizona State Library, Archives, and Public Records James Werle—Internet2
- Holly Woldt—senior IT infrastructure support analyst, Nebraska Library Commission

Gigabit Libraries and Beyond Advisory Board

- Stacey Aldrich—state librarian, Hawaii State Public Library
- Dylan Baker—broadband consultant, Idaho Commission for Libraries
- Jeff Baldwin—Association for Rural and Small Libraries and Noble Public Library
- Mary Alice Ball—dean of library and academic technology, Washington College
- Alivia Blount—data scientist, technical program manager, Microsoft
- Daria Bossman—state librarian, South Dakota State Library
- Mike Buschman—LSTA coordinator, Washington State Library
- Lauren Comito—chair, Urban Librarians Unite
- Daniel Cornwall—internet and technology consultant, Alaska State Library
- James Deaton—executive director of the Great Plains Network (Oklahoma)
- Susan Feller—president/CEO of the Association of Tribal Archives, Libraries, and Museums
- Dr. Jon Gant—dean and professor, School of Library and Information Sciences, North Carolina Central University
- Amber Gregory—E-rate consultant, Arkansas State Library
- Hillary Kolos—director of digital learning, DreamYard
- Dr. Marcia Mardis—professor and associate dean; associate director, Information Policy, Management and Use; institute research faculty, Institute for Digital Information and Scientific Communication (iDigInfo), iSchool@Florida State University
- Jennifer Oxenford—director, member services and NYC Dark Fiber Program, NYSERNet
- Matthew Rantanen—director, TDVNet, Tribal Digital Village; director of technology, Southern California Tribal Chairmen's Association
- Suzanne Reymer—consultant, Montana State Library
- Colin Rhinesmith—associate professor and director, Community Informatics Lab, Simmons University
- Chris Ritzo—mLab
- Tom Rolfes—education IT manager, Nebraska Information Technology Commission
- Mark Smith—director and librarian, Texas State Library and Archives Commission
- Henry Stokes—library technology consultant and state E-rate coordinator for libraries, Texas State Library and Archives Commission
- Dr. Sharon Strover—professor, University of Texas at Austin
- Matt Turner—strategic advisor and technologist
- Nicole Umayam—digital inclusion library consultant, Arizona State Library, Archives, and Public Records
- Jameka Williams—director of member engagement, Merit
- Holly Woldt—senior IT infrastructure support analyst, Nebraska Library Commission
- Christian Zabriskie—executive director, Urban Librarians Unite

Notes

1. John Carlo Bertot, Brian Real, Jean Lee, Abigail J. McDermott, and Paul T. Jaeger, *2014 Digital Inclusion Survey: Survey Findings and Results* (College Park, MD: Information Policy & Access Center, University of Maryland College Park, 2015), x, https://digitalinclusion.umd.edu/sites/default/files/uploads/2014DigitalInclusionSurveyFinalRelease.pdf.
2. Wikipedia, "Last Mile," last updated July 5, 2021, 13:11, https://en.wikipedia.org/wiki/Last_mile.
3. James Neal, conversation with author.
4. "Internet2 Honors Late James Werle with 2019 Richard Rose Award," Business Wire, February 28, 2019, https://www.businesswire.com/news/home/20190228005020/en/Internet2-Honors-Late-James-Werle-With-2019-Richard-Rose-Award.