

Project Title: Laura Bush 21st Century Librarian Program Award RE-00-15-0110-15: Toward Gigabit Libraries.

Description of Project Partners: The project was led by PI Susannah Spellman, Internet2; co-PI James Werle, Internet2; and consultant Carson Block. Susannah resigned from Internet2 in November, 2017 with James assuming PI responsibilities. A team of 20 subject matter experts from higher education, state libraries, and state and regional research and education (R&E) networks was convened to help guide and inform the work of the project. Over 30 state library and R&E network staff were engaged in 12 states (AK, AZ, CT, ID, KS, NE, NM, OK, PA, SD, TX, and WA) where we piloted the use of the broadband toolkit and broadband improvement plan with at least 70 library staff in 58 rural public and tribal libraries.

Overview: In addition to gaps in broadband infrastructure, the technical skills necessary to contribute to IMLS's vision for a [National Digital Platform](#) are currently lacking in many rural and tribal libraries.¹ Without the technical skills in libraries to increase bandwidth and to modify and actively manage data networks, millions of people in rural and tribal communities who rely on free public access technologies and Internet connectivity are at risk of being left behind.

This project focused on the creation and pilot implementation of a hands-on broadband assessment toolkit for rural and tribal libraries. This toolkit was designed to empower practitioners to become more savvy and effective consumers, advocates, and providers of high-quality Internet access and digital services to their communities. The project was designed to scale nationally to all libraries, regardless of their size or geographic location. Based on participant feedback and numbers served, this project exceeded its objectives.

Visit the project website <http://www.internet2.edu/tgl> to download the final versions of the broadband toolkit, broadband improvement plan, and project support documents.

Changes

- In 2017, the project team realized that a hands on, one-on-one approach with the technical advisors for the site visits would be more effective than a one-to-many approach. This approach allowed immediate feedback for improving the toolkit and ensured full engagement of our local technical advisor partners.
- The project team reached out to states beyond the 5 originally proposed in the grant to ensure our goal of visiting 30 libraries was met. In the end, the goal was exceeded and a total of 58 libraries were visited in 12 states.

- The project was granted a six-month no-cost extension from the IMLS (to August 2018) to ensure that it would be able to include at least 30 libraries.
- Re-profiling unused funds from the kick off workshop permitted the project team and technical advisor partners to visit more than the 30 libraries proposed, helped defray higher than average costs for travel to very rural and tribal areas, and funded travel to conferences to provide outreach and promotion of the toolkit and project.
- The project team hosted a wrap-up workshop with state library agencies and R&E network project participants in June 2018 to review project accomplishments, lessons learned, and recommendations for sustainability.

Activities Completed During the Project

2015 - 2017 Project Highlights

- Performed research to further identify and understand library broadband technology issues and needs in rural public and tribal libraries.
- Convened a subject matter expert panel to provide insight and information to help inform toolkit development.
- Drafted detailed/annotated outlines of the pre-pilot intake/assessment survey and broadband improvement plan. Developed a list of criteria for target pilot libraries. Developed an annotated draft of the broadband toolkit.
- Hosted a workshop for 15 subject matter experts and project staff in Chicago on May 19, 2016 to review initial toolkit draft.
- Adjudicated and incorporated feedback from subject matter experts to develop iterative drafts of toolkit content. The use of feedback from all project stakeholders to improve the toolkit continued throughout the pilot.
- Completed the first drafts of key toolkit elements and processes, including training aids to help library workers learn about their library's technology infrastructure. Developed onboarding materials for technical advisors to help acclimate them to the toolkit pilot process. Created pre and post site visit surveys for library pilot participants to solicit feedback and measure satisfaction with the process, the toolkit, and what they learned by participating in the pilot.
- By the end of 2017, the toolkit and site visit process was piloted in 39 libraries in 9 states. Pilot visits lasted between 3-5 hours at each library.
- For the first several pilot visits in each state, a member of the project team attended to help train the technical advisor from the local state library, R&E network, or university.
- Documented feedback from each visit and used it to iteratively improve the toolkit after each set of site visits.
- Collected and sorted broadband improvement plan responses to understand common library broadband and IT issues and potential improvements.
- In 2017, began outreach efforts with presentations to the Quilt Fall Meeting (association of research and education networks and partners in grant), the

Schools, Health, and Library Broadband (SHLB) Coalition spring conference, and the fall conference for the Chief Office of State Library Agencies (COSLA) to help socialize the project and identify new states and partners to pilot the project.

- Project team members were invited to state and national conferences (Texas Library Association, American Library Association, Internet Librarian) in 2018 to present on the project and discuss impact. These presentations also provided an opportunity to encourage broader use of the toolkit and broadband improvement plan in libraries across the country.

2018 Highlights

- Site visits were performed in New Mexico (Tribal libraries), South Dakota (including one tribal library), and Pennsylvania.
- Conference presentations were given at the Texas Library Association Conference (Dallas, TX), the Computers in Libraries Conference (Washington, D.C.) and the American Library Association Conference (New Orleans).
- Final versions of the toolkit and broadband improvement plan documents and project supporting documents were created and made available nationwide at <https://www.internet2.edu/tql>.
- Of the 58 libraries visited during the project, 11 were tribal libraries.
- A wrap-up workshop was held in June 2018 to review project progress and accomplishments, lessons learned, and recommendations for sustainability. The workshop included 20 participants representing 14 libraries and library stakeholders from 8 states and 4 national/regional organizations. Please see pages 8-9 of this report for select comments from participants.

List of pilot libraries visited as of the report submission date:

Additionally, see the following map of pilot libraries <https://goo.gl/fBwYgY>

	Date Visited	State	Library Name
1	3/7/2017	NE	Wymore Public Library
2	3/8/2017	NE	Valley Public Library
3	3/10/2017	NE	Walthill Public Library
4	3/29/2017	NE	Atkinson Public Library
5	3/31/2017	NE	Gering Public Library
6	4/17/2017	KS	Atchison Public Library
7	4/18/2017	KS	Wellsville Public Library
8	4/20/2017	KS	Linwood Community Library
9	5/2/2017	OK	College of the Muskogee Nation Library
10	5/3/2017	OK	Latimer County Public Library
11	5/4/2017	OK	Guthrie Public Library

12	5/8/2017	ID	Oneida County Library
13	5/9/2017	ID	Glenns Ferry Public Library
14	5/16/2017	ID	Hagerman Public Library
15	5/19/2017	ID	Eastern Owyhee County Library
16	5/23/2017	ID	Holmedale Public Library
17	5/25/2017	ID	Valley of the Tetons Public Library
18	5/28/2017	ID	Leadore Community Library
19	8/22/2017	AK	Craig Public Library
20	8/22/2017	AK	Hollis Public Library
21	8/25/2017	AK	Togiak Public Library and Cultural Center
22	9/12/2017	AK	Aniak Public Library
23	9/14/2017	AK	Kegoayah Kozga Public Library (Nome)
24	9/16/2017	AK	Tok Community Library
25	9/18/2017	CT	Booth and Dimock Library (Coventry)
26	9/19/2017	CT	Babcock Library (Ashford)
27	9/22/2017	CT	Andover Library
28	10/17/2017	WA	Hoh Tribal Library
29	12/4/2017	AZ	San Lucy Library, Tohono O'Odham Nation
30	12/5/2017	AZ	Edward McElwain Memorial Library, Hualapai Tribe
31	12/11/2017	TX	Stamford Carnegie Library
32	12/12/2017	TX	Carnegie Library Of Ballinger Central Library
33	12/13/2017	TX	Coleman Public Library
34	12/14/2017	TX	Harper Public Library
35	12/14/2017	TX	Palacios Library, Inc.
36	12/14/2017	AZ	Fort McDowell Yavapai Nation Library
37	12/15/2017	CT	Cornwall Library
38	12/20/2017	AZ	Whiteriver Tribal Library (White Mountain Apache)
39	12/22/2017	AZ	Venito Garcia Library (Tohono O'Odham)
40	1/8/2018	WA	Roslyn Public Library
41	1/9/2018	WA	Cle Elum Public Library
42	1/10/2018	WA	Pomeroy Public Library
43	3/29/2018	PA	Annie Halenbake Ross Library
44	4/12/2018	NM	Pueblo of San Felipe Community Library
45	4/12/2018	NM	Jemez Pueblo Community Library

46	4/13/2018	NM	Poe' Tsawa Community Library
47	5/8/2018	SD	Lake Andes Public Library
48	5/9/2018	SD	Gregory Public Library
49	5/9/2018	SD	Cozard Memorial Library
50	5/16/2018	NM	Santa Clara Pueblo Community Library
51	5/17/2018	SD	AH Brown Memorial Library
52	5/18/2018	SD	Lemmon Public Library
53	6/12/1018	SD	Sisseton Public Library
54	6/14/1018	SD	Hill City Public Library
55	6/18/2018	NM	Zuni Public Library
56	6/18/2018	NM	Laguna Public Library
57	6/18/2018	NM	Acoma Learning Center
58	8/14/2018	SD	Oglala Lakota College Library

Items not completed, per the Project Timeline in project proposal:

- Outreach to target libraries: In the project proposal, we anticipated that identifying pilot libraries (for toolkit visits) would begin in Months 6-8. However, due to input from the subject matter experts, we delayed this activity to create a better toolkit and approach. In the end, the project visited almost twice the number of libraries anticipated.
- Pilot Site Visits: Developing the toolkit and refining it so it was accessible to non-technical librarians took longer than anticipated. The toolkit was ready near the end of 2016, when holidays and scheduling libraries, technical advisors, and project staff for pilot visits proved difficult. In the end, this did not negatively impact the project. The team proposed 30 library visits, but instead were able to accomplish a total of 58 visits by the end of the project in 2018.
- Training for technical advisors: The project team realized that a hands on, one-on-one approach with the technical advisors for initial site visits would be more effective than a one-to-many approach. This approach helped the project team obtain immediate feedback in a more focused manner and ensured the participating technical advisor was fully engaged in the pilot visit process.
- At the end of 2017, the project team estimated that it was about three months behind schedule. The project team reached out to other states, beyond the five initially proposed, to ensure that the target 30 libraries visited was met. In the end, the target number of libraries was exceeded, with a total of 58 libraries visited.

Project Changes

- The project team requested a six-month no-cost extension to the project (which was approved) to ensure that the target number of libraries were visited.
- The project team amended its budget to reallocate funds originally profiled for a series of workshops to support pilot travel and a wrap-up workshop. These funds permitted the project team and technical advisor partners to visit more than the 30 libraries proposed and will also help defray higher than average costs for travel to very rural and tribal areas. The wrap-up workshop provided the opportunity for key project stakeholders to discuss lessons learned and next steps recommendations for the project.
- The project team conducted a wrap-up workshop of state agency and other participants in New Orleans during June 2018 to describe program success, explore lessons learned, and identify new opportunities to assist rural and tribal library technology.

Project Results: Based on both qualitative and quantitative data, the project met or exceeded its primary goals. A **quantitative** view, based on the goals defined in the project abstract and full proposal:

Project Goals and Aspirations	As Performed	Status *
<i>Pilot the use of the broadband assessment toolkit with at least 30-50 library practitioners in at least 30 rural public and tribal libraries across 5-7 states.</i>	The project reached at least 80 library practitioners in 58 rural, public, and tribal libraries across 12 states in the US.	E
<i>Leverage the deep, technical expertise of the research and education community to help develop this library broadband assessment toolkit and pilot its use with library practitioners in at least 30 rural public and tribal libraries across the country.</i>	The project leveraged the expertise of at least 25 advisors in the development of the toolkit, and at least 30 advisors in 12 states to pilot the toolkit in 58 libraries in the US.	E
<i>Library staff involved in the pilot will participate in a pre-assessment to self-identify and assess their knowledge of E-rate, library-networking infrastructure, and other broadband related topics.</i>	All participating libraries completed the pre-assessment process. The form provided a "first step" for self-assessment activities for participants and helped inform the project team members and technical advisors prior to the site visit.	M
<i>A post-assessment survey will quantify the increase in the librarian's knowledge and understanding of the library's broadband environment.</i>	39 participating libraries completed the post-assessment process. Participant feedback results were used to improve the toolkit and pilot process after each visit. With 67% of libraries completing the post-survey, the project team feels this goal was met.	M
<i>Leveraging the findings from the self-assessment, the librarian will be able to</i>	All participating libraries received a broadband improvement plan specifying	M

<p><i>identify technical, operational, financial, and future planning issues related to library broadband provision and develop short and longer term action items. The results of the assessment can also be used to inform discussions with their broadband service provider or other available IT support.</i></p>	<p>specific short-term and long-term/strategic actions to improve their library networks and connectivity. Participants reported leveraging their toolkit experience and new knowledge in discussions with broadband providers, IT support entities, and others.</p>	
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*Status: N = goal or aspiration not met; M = goal or aspiration met; E = goal or aspiration exceeded

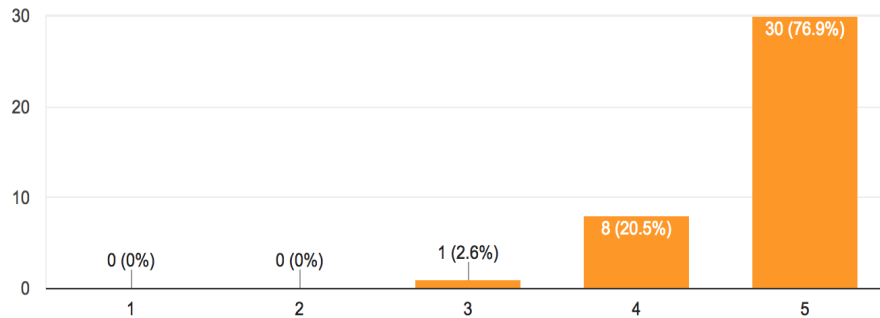
In the process of administering the toolkit, the team noted common issues among many participating libraries, including insufficient bandwidth, insufficient data wiring, inefficient network setups, old and/or obsolete equipment, poor WiFi coverage, and low participation in E-rate.

A post-pilot survey was conducted of participating libraries. As indicated below (with 1 = lowest satisfaction and 5 = highest satisfaction), the process and results received high marks from participants.

How would you rate your overall experience with the pilot program?



39 responses

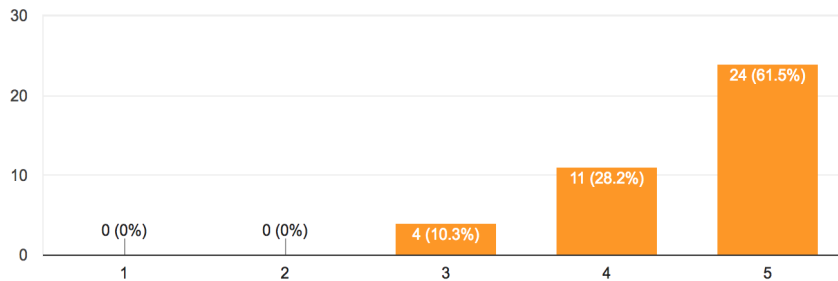


Those surveyed reported an increase in their understanding of technology (with 1 = No Impact and 5 = Big Impact)

How did your participation in the pilot affect your technical understanding of your broadband information technology environment?



39 responses

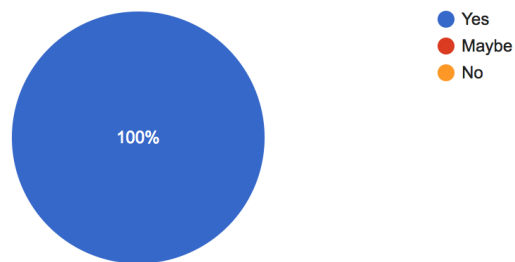


Those surveyed reported improvements in specific areas of knowledge, with nearly 90% citing improvements to their knowledge of their broadband connection, 77% citing improvements in knowledge of their WiFi network, and 61% reporting an increase in their knowledge of broadband funding opportunities.

Finally, libraries were unanimous in their endorsement of the program:

Would you recommend this pilot process to other libraries?

39 responses



In terms of qualitative data, the project collected insights from the complete range of library pilot site visit stakeholders as a part of the project process.

The **project team** of Susannah Spellman, James Werle and Carson Block collected qualitative information and used it in an iterative manner to improve the toolkit and process throughout the project's duration. Feedback received was collected and organized in a spreadsheet. The project team then determined the best course of action for each feedback item. The team feels this iterative process helped create the strongest and most sustainable materials possible.

Pilot participants (workers in libraries) shared information throughout the process, including their hopes and dreams, via the intake survey:

"We want our students to have every opportunity to compete in this global society. We would also like to help bridge the digital divide that many of our students experience. We would like to see every student have access to high speed Internet services. We would also like to see broadband Internet all across Indian country."

Pilot participants also shared their assessment of the process, toolkit, and broadband improvement plan, such as this quote from a post-visit survey:

"I thought it was very effective. I most appreciated the visual diagram which pictured how Internet service works, and the different steps it goes through before it gets to a computer."

"I found the process to be very educational and helpful. I feel I learned a huge amount about our broadband (and local network) in going through the process, and I expect to learn even more as I read through the materials you left with me. I also really appreciate having the physical printouts and sheets to refer back to and use as a reference."

"Going through the toolkit helped me understand my library's broadband infrastructure better and feel more confident talking about it with others."

As well as appreciation, participants offered suggestions for improvement. All suggestions, such as the one below, were incorporated by the team in iterative improvements to the toolkit throughout the project.

"This was so much more than I expected! Learned a lot and appreciate the time spent. I think there needs to be a few questions in the toolkit about electrical situation of building and possible updating as many libraries are housed in old buildings."

Technical advisors from each state also contributed their assessment of the process and offered suggestions for improvement:

"The Technical Database Librarian at the Commission and I receive many calls, mainly from our rural public libraries, related to issues accessing online database resources. Almost always the issue relates to a static IP address problem. I wonder if this topic could be added to the broadband toolkit?"

Finally, the project helped strengthen community partnerships, collaborations, and resulted in additional funding opportunities.

- The project brought together the Nebraska Library Commission and the Nebraska Office of the Chief Information Officer resulting in a Sparks Grant from the Institute of Museums and Library Services, National Leadership Grant in the amount of \$25,000. The grant entitled "[Nebraska Schools and Libraries-- Breaking the Ice and Igniting Internet Relationships](#)" involves five Nebraska communities; Bancroft, Bayard, Genoa, Imperial, Verdigre, and Wymore. Using fixed wireless technology, the public library will offer the school district's students and staff the ability to access the school district's network within the public library. The project began June 1, 2018 and will conclude on May 31, 2019.
- Building on the success of the "Toward Gigabit Libraries" grant, Internet2 partnered with Simmons College and the New American Foundation to receive an Institute of Museum and Library Services FY2018 National Leadership Grants for Libraries award. The 24-month research project, "[Measuring Library Broadband Networks for the National Digital Platform](#) (LG-71-18-0110-18)," will examine how advanced broadband measurement capabilities can support the infrastructure and services needed to respond to the digital demands of public library users across the U.S.

- New library participation in E-rate as a result of visits in several states.
- At the close-out workshop in June 2018, project participants also reported the following:
 - Participating library staff gained confidence and mastery in technology topics;
 - The toolkit process promoted better communication and collaboration between library staff and those assisting them with technology;
 - The process promoted stronger grass-roots advocacy for improved technology among participating libraries;
 - State library and R&E staff gained a better understanding of the challenges faced in the field by rural and tribal libraries;
 - The toolkit process promoted cross-agency collaboration (often between the State Library and the R&E Network in the state); and
 - The toolkit formed a basis for one state's efforts to publish "best practices" for rural and small libraries.

What's Next: Sustainable and scalable use of the project deliverables were built into the project process. The Toward Gigabit Libraries toolkit and broadband improvement plan documents are licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License and hosted by Internet2 at <https://www.internet2.edu/tql>. Web resources cited in the toolkit are subject to change, but the team took care to select those with the best chance of enduring over time.

Clearly, there is more to explore. Potential future developments include:

- **Deeper Engagement of Tribes.** Native American libraries were consistently engaged throughout the project, but the numbers of tribal libraries reached were still fewer than publics (11 of 58). Tribes may require different and/or specialized approaches, such as allowing for a longer period of time to build relationships and increased project flexibility to create the best opportunities for engagement.
- **A Stronger Stand-Alone Toolkit.** The project team hoped the toolkit and broadband improvement plan would serve as stand-alone resources. Best efforts were made to achieve that goal through iterative refinements. However, the toolkit process was greatly enhanced when members of the project team, state library staff, R&E partner, or other technology experts participated. This is an area of potential future development for the toolkit and process.
- **The Internet2 Community's continued collaboration with libraries and IMLS.** Internet2, through its [Community Anchor Program](#) (CAP), will continue its efforts to ensure all community anchor institutions have the high-quality and high-capacity bandwidth they need to thrive in the 21st century. The "Toward Gigabit Libraries" project is part of the larger umbrella of ongoing and sustainable community-based activities and partnerships aimed at achieving this critical national goal.