WISCONSIN

PLSR

PUBLIC LIBRARY SYSTEM
REDESIGN PROJECT

Technology Workgroup Report

April 2, 2018

This report is part of a larger report presented to the PLSR Steering Committee:
http://www.plsr.info/april2018report

Technology Workgroup

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PROJECT MANAGER INTRODUCTION

The report of the Technology Workgroup is part of a culmination of a larger process to consider how to best provide public library system services in Wisconsin. Building on the work of many, its goal is to develop a plan for implementation of new models of service. The process, led by a Steering Committee, will result in recommendations from the Steering Committee to the Department of Public Instruction (DPI). The workgroup reports are provided to the Steering Committee as an input to their recommendation process.

In order to develop new models of service, the project manager formed workgroups of community members. The PLSR Steering Committee, with the guidance of the project manager, selected workgroup leads and facilitators from a pool of applicants for each service area and assigned liaisons from DPI and the Steering Committee to each group. In March 2016, the facilitators, leads and liaisons to each workgroup reviewed the applications from potential participants to determine the composition of the workgroups.

The following report is the result of the workgroup's consideration of their topic area over the past two years.

ABOUT THIS REPORT

The PLSR process asked each workgroup to answer the following question in the course of their model development: what is the best way to maximize resources, improve services and provide increased equitable access to services? They were not asked to recommend an overall structure for collaborative public library services (i.e. determining if there should be library systems), who might provide the services described or how the services would be funded.

To answer the question posed to them, the workgroup created a model of service, which is included in the following report.

In addition to the service model, the report includes suggestions or recommendations in the following areas. The intent of these recommendations is to provide the Steering Committee with information as they consider overall governance and structure.

STAFFING MODEL

Recommendations include the number of positions and descriptions of the job duties. The staffing numbers account for management of the service area but not overall administrative staffing, as those considerations will be taken up by the Steering Committee.

ESTIMATED BUDGET

Rough figures for what the new model might cost. These are generally presented as a range of costs. Some costs, such as equipment, are service area dependent and are included in the recommendation. There are costs, however, that cannot be included in the service area budgets either because the cost cannot be known until the overarching structure is determined or because there is a philosophical decision that would need to be made by that overarching structure in order to determine costs. The workgroup discussed these costs and details of those discussions can be found in the Project Manager's report.

IMPLEMENTATION

The workgroup has provided recommendations related to implementation that include priorities for implementation, what might be easier to implement within the existing structure and barriers or concerns around implementation. Implementation recommendations are limited; any implementation of service models depends heavily on the structure recommendation from the Steering Committee and the subsequent work of DPI.

GOVERNANCE

The workgroup has provided recommendations for service accountability and service user involvement, including feedback mechanisms.

SOME POINTS TO KEEP IN MIND WHILE READING THE REPORT

THE REPORTS ARE LIMITED TO THE SCOPE OF THE WORKGROUP'S CHARGE

The workgroup was instructed to focus on how best to deliver services and how to deliver the best services. The Steering Committee is responsible for making recommendations related to funding, structure and administration. Therefore, the report does not include answers to questions such as:

- Will there be systems and, if so, how many?
- Who will provide services?
- How will services be funded?
- When will it be implemented?
- What exactly will governance look like?

CONCENTRATING ON STAFFING NUMBERS IS NOT GOING TO GIVE AN ACCURATE PICTURE OF WHAT IS BEING PROPOSED

The workgroup was asked to provide an ideal organizational chart for their service area once the service area was completely up-and-running in the new model. At the same time, many of the workgroups proposed implementation plans that ramp up the services over a period of many years and provide for assessment of staffing levels during that time so that, once fully implemented, the service area is appropriately staffed.

BUDGETS ARE ROUGH, BALLPARK ESTIMATES

Implementation is where costs will be more precisely determined. The costs in this report are ballpark estimates that give a sense of cost to help contextualize the models.

GOVERNANCE RECOMMENDATIONS ARE GENERAL AND LIMITED TO ASSESSMENT WITHIN THE MODEL

Without a clear understanding of structures supporting the service models, the workgroup was unable to offer governance and accountability recommendations beyond the scope of the services. For example, the workgroup could not recommend appointing authorities, though they could recommend oversight bodies for the service.

THE MODELS ARE FUTURE FACING BUT NOT FUTURISTIC

The workgroup was given a service area to consider and was asked to redesign the current service while keeping in mind the future. As they each developed their model, they considered how it would support change and growth in the future, but they were not designing models that focused on (or predicted) future services.

THE REPORTS ARE NOT THE END OF THE PROCESS

While these reports are an important step in the process, they are far from the end. The Steering Committee will work with Core Recommendation Collaborators, Model Development Summit Participants and a facilitator to build their recommendations for DPI. In addition to the workgroup recommendations, many other sources of information will be considered during the Steering Committee's recommendation development process. After the Steering Committee submits their recommendations to DPI, there are a number of steps and processes that DPI may undertake to further vet the recommendations with the library community and others.

For more information about the process and reports, please see the complete Project Manager's Report, linked from http://www.plsr.info/workgroups/workgroupreport/

MODEL OVERVIEW

The Technology Workgroup model proposes a centralized statewide structure providing high-level services, with multiple field offices throughout the state to provide direct support to local libraries. In order to offer high-quality service and access to all libraries regardless of geography, services that can be delivered most effectively at a statewide level will be delivered by centralized staff, and those that require on-site work will be delivered by regional staff. Central and regional staff work closely together to ensure effective delivery of all services.

Regional field offices will be located to service an optimal number of staff and public PCs, as that has been determined to be the largest factor in staff time. This means the location of the offices may correspond with delivery hubs, or may correspond with resource libraries or large regional libraries, or may stand alone.

Services will be offered on a tiered membership model that allows for stable, standardized delivery of technology services and optimal technology staffing. The proposed cradle-to-grave support and services are intended to meet needs of libraries today and to adapt to constantly changing needs and technological advancements.

WORKGROUP MEMBERS

Bruce Gay, Waukesha Public Library (Lead)
Garrett Erickson, Mead Public Library, Sheboygan (Facilitator)
Gus Falkenberg, Indianhead Federated Library System
Marc Gartler, Madison Public Library
Dan Jacobson, South Central Library System
Wendy Rawson, Fitchburg Public Library
Emily Vieyra, Shorewood Public Library

Steering Committee Liaison
Jon Mark Bolthouse, Fond du Lac Public Library

DPI Liaison
Elizabeth Neuman

Past DPI Liaison
Ryan Claringbole

CHARGE OF WORKGROUP

The Technology Workgroup was charged with exploring, analyzing and making recommendations on how Wisconsin public library systems can best discover and implement new technology, facilitate technology infrastructure and provide local technology support.

The goal of these recommendations is to provide all libraries in the state with high-quality technology services to support the needs of their staff and patrons now and into the future. Early in the process, the workgroup determined that to be successful, recommendations must meet the following desired service outcomes:

- Trust: Good communication and high level of trust in both the library technology and the people who support it at every level.
- Software: Up-to-date and useful software for staff and public needs, configured and installed correctly, with effective license management.
- Hardware: Up-to-date hardware, effective at meeting local needs.
- Support: Efficient and effective solutions for technology problems, including technology staff from outside the library installing, configuring and repairing, both remotely and in person.

- Network: Secure, privacy protected, robust network access with sufficient and highly available bandwidth for all library needs.
- Planning: A cost-effective plan, supporting both current and upcoming technologies and recognizing local library needs, is in place for updates and replacements.
- Training: Library staff is well trained on how to use technology and on how to effectively assist the public.
- Flexibility: Libraries have the ability and resources to experiment, either on their own or through the technology structure.
- Advice: The library can access technical expertise to consult and assist with new or ongoing projects and ideas, along with someone to act as a fiduciary consultant to help manage the library's technology assets.
- Scalability: The technology structure fits all sizes of library in the state, both fiscally and practically.

Additionally, the workgroup determined that recommendations for technology services should focus on and be limited to providing service to library staff and not directly to library patrons.

BACKGROUND

The Technology Workgroup recognizes that there are many ways in which the support and provision of technology services and tools are performed throughout the state. Libraries across Wisconsin utilize a combination of technology services from numerous sources including the state, library systems, municipalities, internal IT staff and third-party vendors.

Much of the statewide support for technology comes in the form of Library Services and Technology Act (LSTA) grant funds, distributed through the "Grants to States" program and administered by the Department of Public Instruction's Division for Libraries and Technology. These grants have historically been distributed to systems and libraries to support technology initiatives and in the five-year period from 2012 to2016, $6.25 Million in funds were spent on projects such as:

- MKE Mixers Mobile Makerspace for Libraries in the Milwaukee County Federated Library System;
- Neenah Laptop Project, Making Laptops Available for Employment Interviews, Hands-On Training and Distance Learning; and
- Tinker Studio: a Content Creation MakerSpace at the Walter E. Olson Memorial Library.

Additionally, most Wisconsin libraries utilize statewide services for broadband access. BadgerNet, the Wisconsin state network, is managed by AT&T and provides broadband circuits to schools, libraries and state agencies. Schools and libraries have the option of joining BadgerNet but can also opt to get their internet circuits from other providers. Approximately 350 public libraries had fiber installed in 2013-2014 enhancing the BadgerNet broadband network. The fiber project funding came primarily from the federal E-rate program, provided through a TEACH program E-rate application to support broadband and internet connectivity in schools and public libraries. TEACH, part of the Department of Administration, provides BadgerNet bandwidth to schools and libraries at discounted rates. Currently, from TEACH, one Gbps costs $250/month and smaller amounts cost $100/month.

WiscNet is the internet service provider for most libraries in the state. For an annual fixed fee, they provide unlimited internet transit. WiscNet does not measure bandwidth usage, nor do they set limits or cap the amount of data used. They maintain an extremely high-speed, scalable and robust backbone that provides redundant core routing. WiscNet members can get internet access over BadgerNet by using AT&T's WiscNet on BadgerNet service.

On the regional level, library systems provide libraries with varying levels of technology support. Examples of the sorts of services systems provide their members, to different degrees, may include hardware purchases and support, provision of a network, software purchase and support (Microsoft Office, anti-virus software, etc.), and implementation of the technologies. The level of technology services available to libraries depends on system decisions. In some cases, systems provide the services with member libraries funding part or all of the service provided to them. Other systems may not dedicate resources to technology services and instead, encourage libraries to find services on their own. In some cases, multiple library systems may partner to provide these services to a larger region.
For those libraries finding services on their own, they have the ability to customize their technology support to meet their local needs and resources. In some cases, this means that a library has dedicated technology staff. In other cases, libraries rely on the technology staff at the municipality or third-party vendors who may not have expertise in or understand the unique technology needs of libraries. Some libraries choose to not have any contracted support and handle issues as they arise.

Ultimately, the landscape for technology services in our state varies widely in terms of the level of quality, the effectiveness of the delivery method, who provides the technology service (the system, the municipality, staff or an outside local computer company) and at what cost. Because libraries use various methods to achieve the technology they need to operate, the quality of service differ and some of the current solutions do not work well. For example,

Library A receives Microsoft Office Suite through their system and thus the System purchases, installs and supports the resource. Library B purchases, installs and supports it on their own. Both libraries in this scenario have access to Office, but how they get it - and how effective and costly that method is for the library - varies. In another scenario, Library C, faced with having to purchase and support the software on their own but lacking the expertise and time to do so, chooses not to purchase the software, thereby providing less robust service to their patrons.

The Technology model will allow all Wisconsin libraries and library staff members to make effective, fiscally smart technology decisions in a supportive environment, no matter their level of staffing or staff knowledge; do their jobs well without technological barriers; collaborate with each other regardless of geographical boundaries; serve patrons with seamless, functional and responsive technology offerings; and innovate for their community.

It is impossible to overstate the importance of a strong technology infrastructure that is equitably available to all libraries in the state. A well-managed, robust technology infrastructure provides the backbone for resource sharing, electronic resources and internet access, all of which are critical needs for libraries and citizens of Wisconsin.

PROCESS TO DETERMINE RECOMMENDATIONS

The Technology Workgroup first met via a virtual meeting on May 31, 2016. With few exceptions, the workgroup meetings were held at the Fitchburg Public Library; the group finding that face-to-face meetings were the most effective method of accomplishing the group's goals. Research, analysis and synthesis were performed in between meetings and reviewed with the group during meetings. At times, specific individuals were assigned specific tasks such as the drafting of a map of technology hubs or the creation of documents to be publicly shared. In all cases, the work was brought to the entire workgroup for feedback and approval. In total, the workgroup met 17 times between May 2016 and February 2018.

The workgroup reviewed the information gathered from other states for all workgroups regarding collaborative services. There were no examples of library-specific technology models in other states that aligned well with the goals of the workgroup.

Without existing models in other states, the group relied on their own extensive experience to develop the model. Workgroup members represented a variety of perspectives, from technology experts to system staff to library public service staff. From the first meeting, the focus of the group was on how to provide technology services that resulted in the best experience for patrons and staff.

The workgroup used data from a 2016 survey of all systems that asked how different systems provide technology services to their member libraries and 2014 Annual Report Data showing computers by county and system (see Appendix A: 2014 Annual Report Computers by County and System). This information helped the workgroup develop a tiered approach to services as well as make calculations for placement of field offices.

Members from this workgroup were included on the Defining the Help Center, Regions, Refining and Defining Consulting and Continuing Education and Resource Sharing Topic Teams. The Topic Teams impacted the Technology model in the following ways:

- The Refining and Defining Consulting and CE Topic Team resulted in the determination that the Technology model should account for technology infrastructure recommendations and expert planning assistance for new building/renovations, technology purchase and upgrade information and recommendations, technology planning and budgeting assistance for current and future library technology needs and investigating new technologies. The group also determined that the model should account only for training library staff on using and troubleshooting the software and hardware provided for staff to do their jobs. The workgroup model would not account for training and educating on personal computing technologies or for direct public training.
- The Help Desk Topic Team determined that the Technology service model would be responsible for determining staffing for construction and maintenance of the help center structure and that the structure, in particular, the ticketing system, must be simple enough for community, front-end use, but have a robust backend that will allow for tickets to be passed back and forth and tracked to avoid requests falling through the cracks.
- The Regions Topic Team decided that the workgroups, including the Technology Workgroup, would use the initial delivery map as a starting point for determining how they will develop their map to best provide the services in their model.

FEEDBACK POINTS AND MODEL REFINEMENT

Along with poster and discussion sessions at WLA 2016 and 2017, the workgroup presented at WiscNet Connections 2017 and received feedback from attendees.

The Technology Workgroup's proposed service model was also shared with a Review Panel comprised of selected technology professionals from within and outside the library world.

Panelists included:

- Daren Bauer, University of Wisconsin – Eau Claire
- Tom Carson, W.J. Niederkorn Library
- Kevin Groskreutz, Hospital Sisters Health System
- Kerri Hilbelink, South Central Library System
- Mandy Knapp, Ohio Public Library Information Network
- Dave Lois, WiscNet
- Judith Pinger, Milwaukee Public Library

The panel reviewed the proposed model services and offered critical feedback as well as ideas related to implementation that are beyond this workgroup's charge.

Based on discussion following conference presentations and receiving the review panel feedback, the workgroup refined the model in the following ways:

- **Clarified the audience for technology services:** Several panel members commented on the model's lack of support for patrons and local communities (mobile devices, library as community hub, etc.). The workgroup determined that it must be explicitly stated that the technology services proposed in the model are not intended for direct patron support. The model is devised to provide libraries and library staff the tools they need to provide services to their patrons. Libraries will use the high level of technology services and support they get through the model to shape their own local community in the way that best meets its needs.
- **Reaffirmed PC support levels and ensured model accounts for future changes which may move away from a reliance on PCs:** Several panel members questioned the model's emphasis on PCs versus laptops, tablets, mobile devices, cloud computing and other non-PC technologies. Both technology experts and public service staff in the workgroup reaffirmed that the PC is still the primary technology used by library staff and is still in demand by patrons. Although the workgroup assigned the number of support technicians per region based on the number of staff and public devices that are in each region, both technology experts and public service staff in the workgroup firmly believe that in-library technology support is required for equitable, strong technology services, even in a future that is less PC-centric. The model therefore accounts for the potential of patron devices supplanting the public's reliance on library PCs by supporting more than one model of computer (i.e. laptops, as many libraries already offer these), providing for well-supported Wi-Fi as the backbone to supporting patron devices of all types and

providing support and consulting so libraries can be prepared for future applications of mobile computing and other non-desktop innovations for staff.

- **Determined if level of specificity was accurate for PLSR Steering Committee's desires, technology services needs and the intent of the workgroup:** Panelists were asked to consider what was not in the model that they felt should be. A few panelists mentioned specific equipment and software products by name. The workgroup considered these comments and determined that naming specific tools or products was beyond the scope of the workgroup and would be better considered as part of implementation at a later date.
- **Addressed the possibility of outsourcing as a cost-savings measure:** Several panel comments mentioned areas to outsource (shipping parts, etc.). The workgroup determined that whether or not to outsource, and for what services, is ultimately a matter of future implementation that is beyond the scope of this workgroup. However, based on the review panel's feedback the workgroup determined that it was important to incorporate the firmly-held opinion that library needs are sometimes specific and library technologists know these needs better than outside agencies.
- **Addressed the lack of reference to cloud computing:** In the service model document, the workgroup does not explicitly mention the popular but much misunderstood concept of the cloud. The workgroup acknowledges that there is a misconception that cloud products result in less demand for local staffing particularly for support technicians, thus resulting in cost savings. The use of cloud-based services will not impact the staffing levels recommended by the workgroup. Furthermore, because many cloud-based services are metered, they do not result in efficiencies for libraries which, unlike businesses, experience increased demand for and cost of services without a correlative increase in revenue. Technology experts on the workgroup are certain that the cloud will be leveraged to its best uses (email, collaboration and communication tools and the helpdesk platform) as the technology services will be implemented by highly experienced staff. The model effectively creates a private library cloud via the recommendations for two data centers, which will allow for speed, redundancy, privacy and security for ILSs.
- **Addressed building a technology community:** Both in workgroup meetings and at conference sessions at WLA and WiscNet it became apparent that having an opportunity for discussion between libraries and with others who do the same work is vital. The workgroup determined that implementation, staffing and governance recommendations all needed to integrate building a community around library technology.
- **Addressed costs and funding:** In all opportunities that people had to provide feedback, including the Wisconsin Library Association conferences in 2016 and 2017, the biggest

concern expressed was the potential cost of the service model and how it would be funded. There is not, as of yet, a clear picture of all funding being spent for technology services by libraries in the state. The amount spent by systems will be included in the work of the Funding Subcommittee, but money spent by individual libraries for technology staff, or, more difficult to measure, the time spent by non-technology library staff on tasks that the new model would cover, has not been measured. The workgroup did consider cost, however, and produced a fiscally responsible recommendation that strives for a high level of service achieved through optimized staffing and scalable solutions.

SERVICE MODEL RECOMMENDATIONS

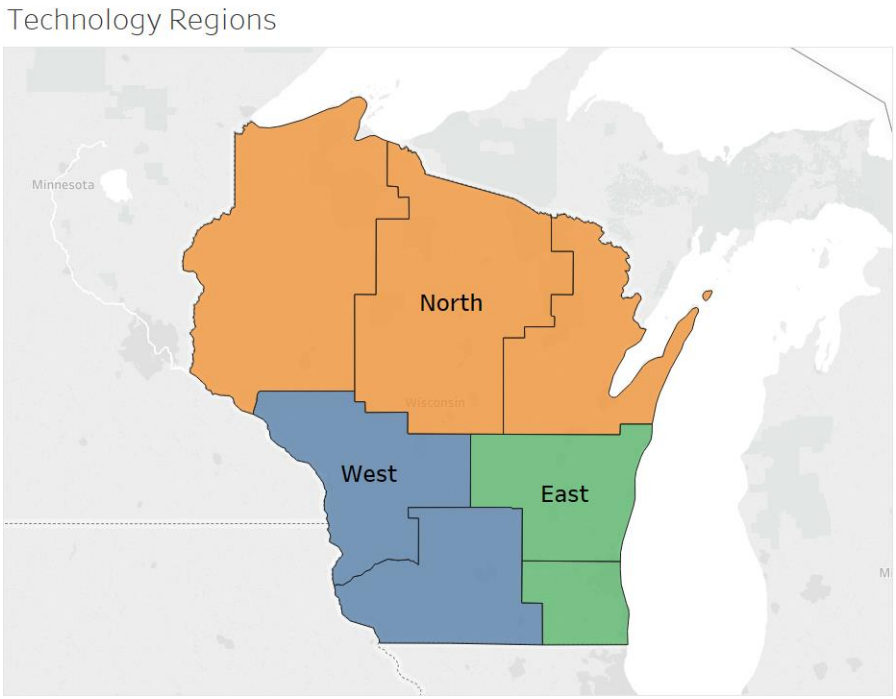
Throughout the development of the service model recommendations, the focus of the workgroup was on what a successful technology environment for libraries and library staff looks like. It is the determination of the workgroup that this model will provide robust technology services to libraries that allow them to provide what their individual communities need.

The following recommendations for the technology service model are not meant to proscribe decisions made by those charged with implementation of the new technology service. The service model presented should be understood as the workgroup's best recommendations possible at this time.

OVERVIEW

- The model proposes a centralized statewide structure providing high-level services with multiple field offices throughout the state to provide direct support to local libraries. The proposed model includes three regions, based on the ideal delivery service region map from the Delivery workgroup and the distribution of expected technology support needs, calculated using the current number of computers in libraries, for staff and the public, as a starting point, and taking geography and population density into consideration. (See map below)
- In order to offer high-quality service and access to all libraries regardless of geography, services that can be delivered most effectively at a statewide level will be delivered by centralized staff. Services that require on-site work will be delivered by regional staff. Central and regional staff work closely together to ensure effective delivery of all services.
- Regional field offices mean that libraries will know where to turn when they need help.
- Regional field offices will be located to service an optimal amount of hardware.

- Services will be offered on a tiered membership model that allows for stable, standardized delivery of technology services, optimal technology staffing and "cradle-to-grave" support.
- Services proposed are intended to meet needs of libraries today and to adapt to constantly changing needs and technological advancements.



Services are divided into three categories:

- Standard: all libraries receive these services as part of membership
- Optional: services libraries can receive if needed
- Additional: services libraries can add for an additional cost on top of standard costs

STANDARD SERVICES

The model proposed by the workgroup includes the following standard services, which are described in detail below:

- Technology planning and consulting services
- PC and local computing services
- Network services
- Help desk services

TECHNOLOGY PLANNING AND CONSULTING SERVICES

The structure will assist local libraries with:

- E-rate support and/or filing
- Technology partnerships on the local/county level
- Support for outside funding/grant efforts
- New building planning
- Local technology planning
    - Consulting on appropriate technology for specific local libraries and implementation planning
    - Budgeting for hardware and software upgrade cycle
- Technology orientation visits for new directors

PC AND LOCAL COMPUTING SERVICES

This service refers to the infrastructure, both software and hardware, that allows library staff to do their jobs and for patrons to use library computers. This may include public and staff laptops and desktops. The infrastructure supporting these computers will be a robust system that will be centrally managed. It will incorporate server redundancy and will be kept up-to-date and backed up. Software and hardware services will follow library PCs throughout their useful lifetime (based on industry standard replacement schedules). PCs will be paid for by libraries, but procured, configured and updated centrally. Standardized software licenses will be managed centrally to take advantage of economies of scale. Additional software may be purchased by individual libraries.

HARDWARE, SOFTWARE AND PERIPHERALS

- Hardware
    - Standardized desktop and laptop computers available with multiple options appropriate for businesses
    - Pro or Education/Enterprise level of the Windows operating system on all PCs
    - Industry standard replacement schedule of five years to ensure a healthy computing environment

- Software
    - Standard applications included in all computer configurations
    - Microsoft Office and antivirus software included on all computers with centrally managed licensing

    - Additional software titles that libraries choose to fund, centrally managed and updated

- Peripherals
    - A standard set of peripheral devices supported. Central staff will work with third-party vendors to support additional options.

PC IMAGING

Computers will be imaged with a set of standard configurations which can be customized during the imaging process to accommodate various specific library needs such as different ILS software. These images will be designed, maintained and updated centrally.

- Staff Configuration Overview
    - Centrally managed device configuration, changes and upgrades. The local library will have the option to obtain local administrative rights on the computers if so desired.
    - PCs will run the latest Microsoft Windows operating system and will include programs and software most frequently used by staff.
- Patron Configuration Overview
    - All device configuration, changes and upgrades will be centrally managed.
    - PCs configured with appropriate software and settings to provide a safe and robust public computing environment protecting patron privacy and library security.
    - Libraries may opt to include time and print management solutions.

PC SERVICE MAINTENANCE

- The operating system and third-party tools will be patched centrally during a nightly maintenance window.
- Software requiring manual intervention and maintenance will be managed during the nightly maintenance window.
- Central support and technicians will work with libraries to keep library-owned software titles updated.

NETWORK SERVICES

The central statewide structure will manage network design, standard equipment, processes and procedures. The hub of the network services will be two data centers which will host the servers necessary to provide statewide services and some regional services, such as ILSs. Having two data centers will allow for redundancy and stability in the network. The workgroup

anticipates using BadgerNet to connect libraries to the data centers wherever possible. Libraries could also continue to use community area networks or other providers for this connection. Connections to internet providers, such as WiscNet, would be provided through the data centers.

NETWORK

Network equipment at the local library will be owned by the central statewide structure. The library will be responsible for any building-related costs required for network services. The central structure will be in full control of the network and make decisions regarding policy and device access.

Routers and Switches

- Libraries will have adequate capacity needed to run their network.
- Support and upgrades on the routers and switches will be centrally managed.
- Equipment will be replaced in accordance with a network hardware replacement policy.
- The central structure will manage all device configuration, changes and upgrades. The local library will not have access to perform administrative tasks.
- Spare network equipment will be available to provide emergency replacement in the event of a failed device.

Network Monitoring and Reporting

A robust monitoring solution provides extensive visibility into the network. Central management should, most of the time, know about a problem before the libraries do.

- Some features of network monitoring
    - Alerts when a site is down and when it comes back up
    - Alerts when an individual piece of equipment fails (router, switch, access point)
    - Bandwidth usage tracking that provides the necessary data TEACH or others need to approve upgraded bandwidth (if using BadgerNet)
    - Ability to track single users to identify and block someone slowing the network down
- Central management will provide network reports to our customers

Network Security

The network will be configured to be secure with the following features:

- State-of-the-art firewall
- Updated software (firmware) on all network equipment

- Routine security audits

Network Service Maintenance

If work will cause downtime, users will know beforehand and work will be scheduled during the least disruptive time possible (nights, weekends).

WIRELESS NETWORK

The wireless service will feature enterprise-class technology and will scale from the smallest library to the largest. As free public Wi-Fi is a critical patron service, it will be designed to protect patron privacy while maintaining library security, allow for filtering and be flexible to accommodate future growth.

Wireless Access Points and Antennas

- Wireless equipment will be standardized on a single vendor and offer multiple options from the enterprise-class product line to accommodate different library needs.
- Scheduled and mandatory access point and antenna replacement will ensure a healthy wireless environment.
- The central structure will assume responsibility for all device configuration, changes and upgrades. The local library will not have access to administrative tasks.
- A pool of spare access points will be available to provide emergency replacement in the event of a failed device.

Wireless Access Point Placement in the Library

- Wireless site surveys will be arranged when necessary in order to plan for density, growth, capacity, interference, determination of the most efficient access point model and the placement of each access point.
- The library is responsible for purchasing and/or replacing access points and the central statewide services staff will install them.

Wireless Maintenance

- The wireless system will be regularly patched to ensure the latest technologies are in use.

HELP DESK SERVICE

The Help Desk service answers questions on anything related to the provided services and works with central and regional customer relations management to maintain an inventory of hardware, software and licensing for instant knowledge regarding individual library needs. Libraries can submit tickets or call the Help Desk and be assured that someone will work with

them to resolve any issues in a timely fashion, including sending issues on to other departments or dispatching on-site support.

ON-SITE SUPPORT

If remote support via the Help Desk cannot fix the problem, a regional Support Technician will be dispatched. Support Technicians can and will do any work related to the services provided to the library including:

- Troubleshooting, repairing and installing staff and public PCs, peripherals and wireless network hardware
- Training library staff to use, troubleshoot and do some of their own onsite maintenance of hardware and software as desired

DATA SERVICES AND AUTHENTICATION

Data services will support patron authentication, annual report support, data manipulation to provide reports and a data dashboard with visualizations.

ILS HOSTING AND SUPPORT

Hosting and support for multiple ILS products. Multiple ILS installations within one region mean that the technology staff will be expected to support the infrastructure and local library workstation needs (both in terms of hardware and software) for each ILS, adding to the complexity of the model. ILS support was discussed many times by the workgroup. This workgroup and the ILL/ILS workgroup met to discuss the roles that are included in each workgroup's models. This list can be found in Appendix B: ILS and Technology Tasks.

TRAINING

Technology staff will train library staff on using the technology that is standard in libraries, both for staff and public use. Training of the public will be the responsibility of the local libraries. Training documentation and aids may be developed by technology staff and will live on a central portal to be easily accessible by library staff.

OPTIONAL SERVICES

Optional services are those that local libraries may choose to make use of but are not required to be part of the new organization. The workgroup does not foresee additional costs charged to local libraries for these services, but rather the costs are built into the budget for the technology services as a whole.

- Email and mailing lists and associated domain name management

- Innovation area with resources to facilitate technology and library staff innovation with a goal of creating new services on a large or small scale, investigating and helping local libraries implement new technology ideas and demonstrating and promulgating new technology directly to libraries

ADDITIONAL SERVICES

Additional services are those that local libraries may choose to utilize and would incur an increased cost.

- Children's Internet Protection Act (CIPA) compliant content filtering to help libraries qualify for E-rate
- Electronic payments for printing, ILS online fine payment, donations, in-library credit card transactions and other retail transactions
- Non-regular network service for libraries that have need for non-typical network services to support VOIP from their municipality or HVAC access to the internet
- A platform to host websites and associated domain name management
- Website design and building services
- Combined time and print management solution for public computers

STAFFING MODEL

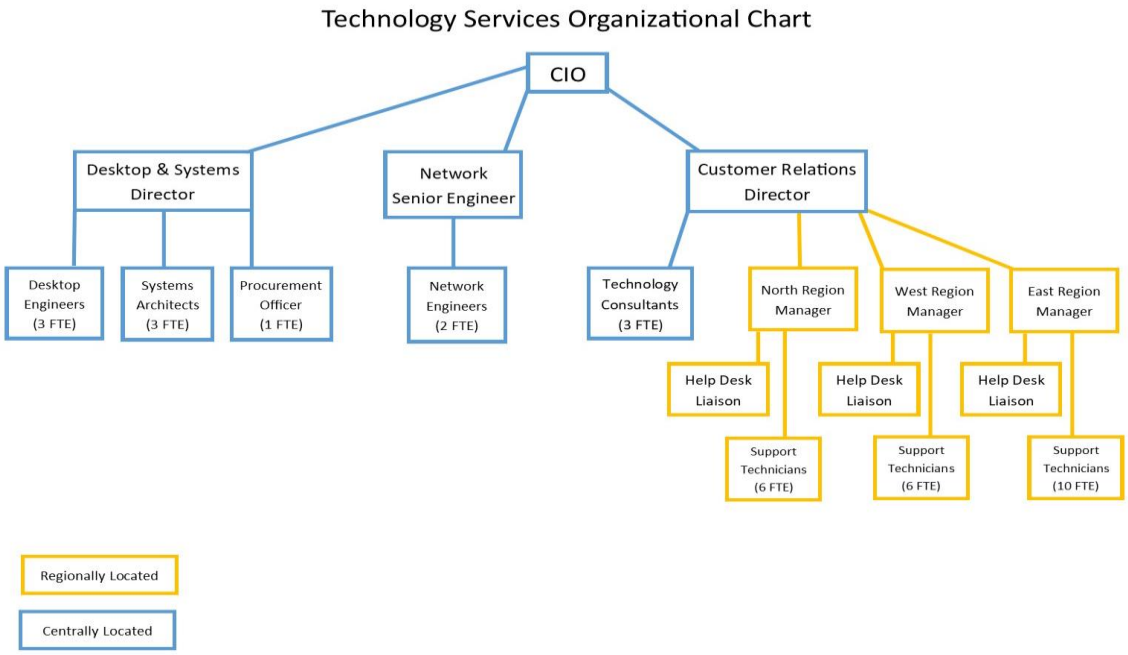
The technology Workgroup envisions a total staff of 44 FTE, some working centrally and others specializing regionally.

Staff who work centrally may be located anywhere. Their work is not location specific, except that it would be most efficient to have an entire department co-located rather than spread around the state. The work may be done remotely with several central staff traveling regularly to work with regional staff.

Staff who work regionally are divided into three regions: North (encompassing the Northeast, North Central and Northwest regions of the ideal service delivery map from the Delivery Workgroup), West (encompassing the West and Southwest regions) and East (encompassing the East and Southeast regions). These regions were delineated based on a distribution of expected technology support needs, using the number of total library PCs as an indicator (North = 3,209, West = 2,783 and East = 4,827), and taking geography and population density into consideration. Regional staff primarily work within their region, as they are the faces of the technology service, building relationships with and working closely to provide service to local libraries. Though assigned regionally, Support Technicians may work between regions in order

to staff the Help Desk consistently and provide stable in-person support to libraries during vacations, major projects and other times of staff imbalance.

With the consideration of location, and the depth and breadth of services proposed, the workgroup recommends the Technology Services staff be organized as follows (*a full description of each job follows the image below*). It is important to note that although the organizational chart is tiered, the intention of the workgroup is that this organization is somewhat fluid; a staff member at any level may work closely with another staff member at any level in order to ensure service provision.



Chief Information Officer—1 FTE

- Oversees and hires all centrally located technology staff
- Coordinates budget
- Develops policy
- Manages and develops strategy and vision, creating and maintaining an organization-wide customer service focus and culture
- Works with other library service areas to ensure Technology Services align with and support other service needs

CUSTOMER RELATIONS DEPARTMENT

Customer Relations Director (1 FTE)

- Manages relationships and customer relations including advocating for local library technology issues, communicating updates and changes and acting as the face of Technology Services
- Supports organization-wide customer focus and culture through communication, internal and external relationship management and working to ensure streamlined connections between local libraries and Technology Services
- Working closely with Desktop and Systems and Network departments, manages data services for local libraries including annual report support, data manipulation to provide reports and a data dashboard with visualizations
- Manages content for Technology Services on web portal

Technology Consultants (3 FTE)

- Bring a variety of skills to help libraries with technology long-term and strategic planning, new buildings/remodels, web design/usability and other technology-focused projects
- Explore new technology innovations in libraries and elsewhere, including via direct request by libraries seeking innovative use of technology

Regional Managers (3 FTE)

- Liaison to all local libraries in region, serving as a technology expert and/or connecting libraries to consultants or other technology services
- Assist with tech partnerships at a local level including community area networks and support for outside funding
- Assist in managing use of services, including coordinating additional service add-ons with necessary technology staff, maintaining replacement schedule and gathering feedback and evaluation of services
- Maintain an inventory of hardware, software and licensing for instant knowledge regarding individual library needs
- Oversee Help Desk liaisons and regional support technicians, ensuring support is given in a timely fashion and adheres to overall customer service vision

Help Desk Liaisons (3 FTE)

- Maintain Help Desk platform
- Answer questions on anything related to the provided services

- Help train library staff on using provided services, including creating and maintaining training documentation

Support Technicians (22 FTE)

- Provide in-person regional technology support for all provided services, working closely with Desktop, Systems and Network Engineers
- Assist in staffing Help Desk
- Assist in training library staff

NETWORKING DEPARTMENT

Networking Senior Engineer (1 FTE)

- Oversees Networking Engineers
- Liaises with other departments

Networking Engineers (2 FTE)

- Manage all aspects of network specifications, architecture, design, firewall, monitoring and support for both the wide area network connecting libraries and the in-library networks including wireless network configuration and maintenance and inter-server networks at data centers
- Produce and maintain inventory of standard equipment, procedures and processes
- Manage relationship between libraries and ISPs and municipal technology
- Maintain vendor support and software upgrade rights
- Oversee device configuration, changes and upgrades
- Field questions from Help Desk and Support Technicians as required

DESKTOP AND SYSTEMS DEPARTMENT

Director (1 FTE)

- Oversees Desktop Engineers, System Architects and Procurement Officer
- Liaises with other departments

Desktop Engineers (3 FTE)

- Produce and maintain inventory of supported devices (desktops, printers, scanners, etc.), procedures and processes that work in libraries and work with third-party vendors as necessary
- Manage in-library equipment

- Manage Windows deployment infrastructure, create and maintain images including configuring and deploying to regional servers and working with support technicians to deploy in local libraries
- Work with procurement officer to make software and hardware decisions including evaluation of new tools
- Control group policy and settings
- Field questions from Help Desk and Support Technicians as required

SYSTEMS ARCHITECTS (3 FTE)

- Create and manage platform upon which all of our services are created: data centers, including storage, virtual server host and clients, backups and data integrity, non-hosted ILS, file sharing, proxy servers and print and time management services
- Coordinate technology services disaster planning
- Ensure filtering integration

Procurement Officer (1 FTE)

- Manages licensing and procurement of all hardware and software
- Coordinates E-rate

ESTIMATED BUDGET

The Technology Services budget incorporates four elements: staff, Help Desk and inventory software, network costs (including wireless equipment in libraries) and data center costs. Each piece of the budget for Technology Services takes advantage of efficiencies of scale through central service provision while still offering regional staff and services. A summary of the budget is included as Appendix C: Technology Budget Summary.

The budget summary describes both the costs and the reasoning the workgroup used to determine the figures. The workgroup has also created a budget planning spreadsheet that maps how the budget will develop over a planned five-year implementation period and which costs will become predictable annual operating costs. This budget planning spreadsheet includes costs not enumerated within this narrative but which correspond to items described in the implementation plan below and is included as Appendix D: Implementation Budget Plan.

The staffing budget includes the 44 central and regional Technology Services staff, as outlined above, with benefits. Workgroup members used data from the May 2016 Occupational Employment Statistics (OES) from the Wisconsin Department of Workforce Development to estimate salaries for the positions defined above, determining median salaries for comparable

position titles found in the OES data. In some cases, salaries were estimated based on the position's standing in the organizational chart. For example, a unit manager's salary is higher than that of the staff he or she oversees. The salary for the three technology consultants was chosen to be in line with the consultants from other workgroups. The estimate for total salaries annually when the Technology Services are fully operational is $3,461,709. Details of the staff salary calculations can be found in Appendix E: Technology Staff Salary Calculations. The workgroup envisions that staff will be hired over a gradual process of implementation, described in the implementation section below and illustrated in Appendix D: Implementation Budget Plan.

The network costs represent a large range based on the choice of network equipment. Technology Workgroup members used actual costs of a recent series of implementations at local libraries to derive a cost per PC for implementing a new network. It is the opinion of the workgroup that a "cost per PC" is the best estimator of network size and equipment needs to use statewide. The cost per PC from the recent network implementation was approximately $43.62, which represents the low end of the cost spectrum. The workgroup recognizes that an industry-leading network implementation would be up to four times more expensive, but that such an implementation could extend the working life of the equipment from an industry expected five years to seven years or more. Because of the necessity to implement this large statewide network carefully and logically, the full cost, ranging from $450,000 to $1,600,000, would be incurred via an annual cost of $90,000-$320,000 per year for five years. This annual cost would roll into a standard annual network maintenance cost and would thus become relatively predictable. The implementation budget document in Appendix D uses the higher end of this estimated cost. This budget does not include the amount needed for the BadgerNet or other connections between the libraries and the data centers or the cost for the connections to internet providers. It is anticipated that the amount currently spent for these connections should be adequate for the new model.

Another large piece of the budget is the creation of two data centers to provide statewide service and some measure of redundancy. The workgroup estimates each data center will cost $387,000 to build and annual maintenance will cost $168,720 per year once built. The workgroup estimated the cost of a data center by using data from recent implementations in Wisconsin, including South Central Library System, WiscNET and the Chippewa Valley Internetworking Consortium (CINC) Datacenter. The workgroup envisions that only one data center will be needed in the first two years of implementation, depending on how many and which libraries are on-boarded and how quickly, and that a second data center would be built as more libraries are part of the Technology Services system.

Finally, a more minor cost, yet one essential to the achievement of the service model as described above, are two pieces of software: one to run the Help Desk ($9,000 per year) and one to manage hardware and software inventories ($10,000 per year). These costs represent the use of the industry-recommended tools to get the jobs done efficiently and effectively.

The workgroup acknowledges that costs for hardware and software reflect current technology and that technology changes can occur rapidly and affect costs. It should be anticipated that the budget for Technology Services will need to be reevaluated at each phase of implementation.

It is also important to note that, currently, there is a range of different arrangements that systems use to fund part or all of the technology services provided to their members. It was not the purview of the workgroup to discuss funding for technology services. The Steering Committee will determine funding recommendations for services during their recommendation development process.

IMPLEMENTATION RECOMMENDATIONS

As mentioned in the above budget section, the Technology Workgroup suggests a five-year implementation plan for the central and regional technology services outlined in this report. This five-year vision is based on the workgroup's expertise, experience and predictions. However, the workgroup recognizes that it will not be involved in the actual implementation and cannot predict how time will impact the recommendations contained in this report. To accommodate these facts, the implementation recommendations decrease in specificity from year one through year five.

Two important components of this model and those created by other workgroups are a customer-facing portal and Help Desk. Because these components will impact the models of all workgroups, a recommendation for their implementation is included as part of the Project Manager's Report (linked from http://www.plsr.info/workgroups/workgroupreport) and will not be included in this workgroup's implementation plan.

The most important factor in implementing central and regional technology services is that these services will replace services that are currently being offered by library systems and/or that libraries are currently doing on their own. System and library staff who are currently providing these services should be harnessed for their knowledge and experience, rather than made to feel that they are being replaced. Libraries should be able to make informed decisions about their future in as predictable an environment as possible. Thus, the workgroup recommends that the move from the current way in which libraries receive technology services

to the new technology system should be gradual, minimize disruption and take advantage of all existing infrastructure, staff knowledge and relationships throughout the state. The implementation process must be thoughtful, striking a balance between building something new and replacing what exists.

This plan for implementation and budget assumes that all libraries in the state will embrace this new service model. The workgroup designed the model to facilitate widespread adoption. However, the workgroup recognizes that not all libraries may choose to participate and the budget and implementation plan would need to be adjusted accordingly.

YEAR ONE: PLANNING

The workgroup strongly recommends beginning by hiring the Chief Information Officer. This person will set the tone for the Technology Services as a whole and will be responsible for setting up procedures and policies, fostering relationships with libraries and other key entities and hiring the remaining staff over time.

In year one, the CIO should begin to define processes and technology standards for libraries, build an internal stack of technology tools for Technology Services staff including communication tools that would be necessary internally before any libraries come on board and begin planning the network, data centers and servers. Some of this work may be done in the first six months, during which time the CIO will also hire the Senior Network Engineer, Desktop and Systems Director and Customer Relations Director, whose leadership of their respective departments will be crucial to the other year one tasks described below.

The workgroup recommends a gradual, systematic and cooperative method of achieving the tasks of year one that, as mentioned above, takes full advantage of the knowledge and experience of existing system staff, library staff and other entities such as WiscNET and DPI. The CIO and senior staff will need to work during the planning year to determine which libraries will be onboarded and when. This will require significant relationship building, which the workgroup envisions will be supported by the work of other new services, in order to get the most accurate sense of scale and better-determine how the following years of implementation will work.

In particular, the workgroup envisions that the CIO may create a Request for Proposal (RFP) for assistance in the planning stage. This RFP may result in a contract with existing library system staff whereby the new Technology Services would pay a portion of their wages and they would spend a commensurate number of hours of work time planning and building the structure of the new Technology Services under the direction of the senior technology staff. In this way, the new services will be informed by knowledgeable staff who have existing relationships with

libraries. As shown in the implementation budget planning document in Appendix D, the workgroup recommends relying heavily on contracted work (from systems and libraries) in year one.

YEAR TWO: BUILDING AND ONBOARDING

Now that several library systems are ready to join together in harnessing the power of the new Technology Services, the CIO and senior staff will move into an onboarding phase using plans and procedures established in year one.

This team, in addition to contracted technologists obtained via RFP, will work to begin building the statewide network and the first data center, as well as testing the Help Desk and onboarding libraries as capacity allows. The workgroup envisions contracted technologists will again do much of the work in year two.

Because building the network and data center, and onboarding libraries, will require procurement of hardware and an understanding of E-rate and other special provisions, the CIO should hire the Procurement Officer early in year two.

Year Three: Establish Regions

In year three, the staff of the Technology Services expands to include Regional Managers, as well as fleshing out both the Network and Desktop and Systems departments with remaining full-time Engineers.

Regional Managers will work to continue the relationship-building and onboarding processes as conduits for local libraries to get into the new technology system environment.

In year three, the workgroup envisions less reliance on contracted technologists in part because the Network and Desktop and Systems Departments would now be fully staffed. Contract technologists will be needed as Help Desk and on-site technical support for onboarded libraries and for their internal library and system knowledge as senior staff continue to facilitate network expansion and maintain the data center.

YEAR FOUR: SUPPORT AND GROWTH

In Year Four, the workgroup envisions that the Technology Services department may expand to include some regional Help Desk Liaisons and Support Technicians, depending on which libraries have been onboarded and where.

Although the workgroup still envisions the need for contract technologists in year four, it is possible that the actual implementation will deviate from this proposed plan and the technology staff may decide to hire remaining internal staff in year four instead of continuing to use contracted work. It is probable that some of those contracted workers will be hired as full-time staff for technology services.

Tasks in year four mostly involve support and maintenance of established services, moving established libraries towards a “fully operational” status in which they are making use of all services described herein and continuing to bring new libraries on board.

YEAR FIVE: TOWARDS FULLY OPERATIONAL

Year five is the most difficult year to predict.

The workgroup envisions that by year five, the Technology Services operation is in place to the extent that contracted work from system and library staff is no longer needed, though as stated above that move may have been made in year four.

At year five, there may still be libraries to bring on board, or all libraries may be part of the statewide Technology Services offering.

GOVERNANCE RECOMMENDATIONS

While a final determination of governance for the proposed changes was not a part of the workgroup's charge, the workgroup has developed the following suggestions for governance of this service area.

Customer service is a key element in managing technology services and the workgroup has created an organizational chart that reflects this. The staff reporting to the Customer Relations Manager will work to ensure libraries voices are heard if they are having issues or if they have ideas for improvement. While a number of these positions are based on regions of the state, the workgroup anticipates staff will work across regions to address issues that arise.

The workgroup believes that a signed agreement or Memorandum of Understanding (MOU) will help clarify accountability from both libraries and Technology Services staff. This document should clearly detail the standards that have been adopted (e.g. five-year replacement schedule for PCs) so that libraries enter the agreement fully aware of their responsibilities and rights.

The workgroup recommends a body that includes formalized representation of groups of libraries determined by region. Having a representative for a group of libraries would provide

an official path for raising questions or bringing ideas forward. This body would provide communication in both directions (libraries to technology service staff and vice versa) and would provide an advisory capacity for the libraries. It would also provide a way for the Technology Services staff to collect feedback and/or get approval for new services/policies.

A more informal user-group meeting annually or semi-annually would also be a helpful tool for staff from different libraries to interact with one another and with technology staff.

The workgroup recommends using an annual satisfaction survey that would allow libraries to officially voice their opinion. An effective resolution process should be in place to address the responses. Long-term planning should be addressed as soon as the new structure is up and running. Encouraging input from libraries will be essential to mapping out new services and/or changes.

The workgroup recognizes that a balance will have to be reached between the need of the Technology Services to implement standardization in order to realize efficiencies of scale and the libraries' desire to customize services to meet the needs of their patrons. By implementing multiple levels of communication and feedback, the hope is that both entities are satisfied and able to function fully.

Finally, a clear process for appealing decisions and policies made by Technology Services staff will be critical to ensure libraries are valued as participants and that their input is important.

PROOF OF SERVICE EQUITY IMPROVEMENT

As stated at the outset of this report, public libraries in Wisconsin today have access to a varied level of technology service for staff and the public through a patchwork of models. Where some libraries receive many technology services through their systems, others receive only some and seek the rest elsewhere. Still other libraries receive no support for technology services through their systems.

The workgroup has spent significant time exploring this model and early on came to the conclusion that to achieve strong service for patrons, libraries need a high level of technology support and need to receive it in as streamlined a way as possible. The patchwork that some libraries are forced to use is far from streamlined. The inequity does not only affect them, it affects their bottom line, their staff makeup and abilities and their patrons and communities. This, in a nutshell, is the current service inequity.

Service inequity in technology is felt primarily by frontline library staff, who are most aware of the technology support they do or do not have to help them do the work their patrons and communities inspire and demand. Libraries of all sizes provide and support computers and networks for staff and the public. Computers and networks require updates, they break when it's least convenient and they require dedicated, often advanced, learning that is not status quo for library staff whether or not they hold an MLS.

To examine how service provision inequity impacts libraries today, the workgroup asked several libraries from different communities and systems to describe their current technology support environment. While there are other inequities across the state (for example in how wireless internet is provided) for the purpose of this report the workgroup chose to focus on how support for hardware and software is achieved at libraries now and how it would be done with the model proposed herein.

Current technology support for three example libraries looks like this:

	On-site Hardware and Software Support: Fix, troubleshoot or update hardware and software on site	**Remote Hardware and Software Support:** Remotely fix, troubleshoot or update hardware and software	**Help Desk:** Library can submit a ticket and get a timely response, monitored by more than one IT specialist
Library A	System staff Library public service staff	System staff	Not available
Library B	System staff Library public service staff	Not available	Not available
Library C	Library IT staff Library public service staff	Not available	Not available

Library A relies on their system to provide a great deal of support and has comparably adequate support for technology in the library. The library director, who works less than 30 hours per week, is the only staff member comfortable with computers and so despite system support does spend time dealing with technology issues, including responding to staff calls or texts to help troubleshoot issues. Library A currently has access to remote support, crucial for this rural library, allowing system technicians to fix problems and install and update software remotely.

Library B also relies on their system to provide technology support. In Library B, however, internal library staff wear many hats to do basic troubleshooting of technology issues, including manually installing updates to keep their public PCs running properly. Computers often go without necessary updates because the staff who have taken on this task have other duties that take priority. Library B feels the repercussions of the lack of remote support, lack of access to more than one technologist and lack of the kind of streamlined services seen in Library A, such as regular automated software updates.

Library C has hired a designated IT staff person, who works 60-75 hours per month and is not a member of their public service staff. However, public service staff are regularly trained on technology services offered at their library and at least one acts as the liaison to the IT staff person. Library C has found a way to surmount their lack of access to technology support through their system by budgeting for a part-time staff member dedicated to technology work.

A system survey completed at the beginning of the PLSR process confirms this qualitative evidence from libraries. For example, while it is likely that most public libraries in the state use Microsoft Office, four systems provide no support for Microsoft Office, nine purchase it for their libraries (unclear on level of support afterward) and 12 provide some level of support for it (installation and updates, for example). Support for hardware, an even more complex undertaking, varies greatly as well; some systems provide basic computer troubleshooting only while others provide the kind of cradle-to-grave PC support recommended in this model.

It is clear that libraries find technology help wherever they can, often resulting in a patchwork of contracts, vendors and costs. Libraries, including those who can ill-afford it due to small staffs and limited budgets, may find themselves reinventing the wheel to find adequate support for the technology their staff and patrons need. In the new model, libraries don't have to wonder where to turn.

	On-site Hardware and Software Support: Fix, troubleshoot, or update hardware and software on site	**Remote Hardware and Software Support:** Remotely fix, troubleshoot or update hardware and software	**Help Desk:** Library can submit a ticket and get a timely response, monitored by more than one IT specialist
Libraries A, B and C	New Technology Services model	New Technology Services model	New Technology Services model

As is clear from this document, adopting a streamlined provision of technology services that takes advantage of all services that can be administered at a statewide level, achieving previously unimaginable efficiencies of scale and administering other services at a regional level that harnesses what is best about today's method of receiving technology services (high touch and strong customer relations), the workgroup hopes that all libraries in Wisconsin will see the benefit of moving to this model.

If that is achieved, all libraries will move to an equitable state of being in terms of the technology they are able to provide for both staff and the public.

EVALUATION OF RECOMMENDATION AFTER IMPLEMENTATION

The Technology Workgroup set out with a clear goal for technology services for Wisconsin's public libraries. Before discussing "how" the workgroup focused on "why." The resulting "desired service outcomes" that the workgroup envisions could serve as the basis of evaluating the effectiveness of the model after implementation.

DESIRED SERVICE OUTCOMES

- *Trust:* Good communication and high level of trust in both the library technology and the people who support it at every level.
- *Software:* Up-to-date and useful software for staff and public needs, configured and installed correctly, with effective license management.
- *Hardware:* Up-to-date hardware, effective at meeting local needs.
- *Support:* Efficient and effective solutions for technology problems, including technology staff from outside the library installing, configuring and repairing, both remotely and in person.
- *Network:* Secure, privacy protected, robust network access with sufficient and highly available bandwidth for all library needs.
- *Planning:* A cost-effective plan, supporting both current and upcoming technologies and recognizing local library needs, is in place for updates and replacements.
- *Training:* Library staff is well trained on how to use technology and on how to effectively assist the public.
- *Flexibility:* Libraries have the ability and resources to experiment, either on their own or through the technology structure.
- *Advice:* The library can access technical expertise to consult and assist with new or ongoing projects and ideas, along with someone to act as a fiduciary consultant to help manage the library's technology assets.

- *Scalability:* The technology structure fits all sizes of library in the state, both fiscally and practically.

To evaluate the service model once it is implemented, the workgroup recommends focusing on whether or not these service outcomes have been achieved for all public libraries who participate in the Technology Services offering. This can be done by surveying and other methods which measure the success of each outcome, for example asking libraries at every opportunity to rate the customer service they receive to ensure that there is a high level of trust and good communication between libraries and their regional support staff and between libraries and the central staff as applicable.

If the model or desired outcomes change while the services are being implemented, it will be important for the CIO and staff to reflect these changes in any evaluation or assessment.

APPENDIX A: 2014 ANNUAL REPORT COMPUTERS BY COUNTY AND SYSTEM

Counties	Public Use Computers	Resident Population	Libraries	Branches	Locations	FTE	Public Library System	Computers per location	Computers per 1,000 people	Square miles
Ashland.	43	10,216	4		4	10.64	NWLS	10.8	4.21	1045
Barron.	69	19,070	6		6	25.74	IFLS	11.5	3.62	863
Bayfield.	33	5,208	5		5	9.36	NWLS	6.6	6.34	1478
Burnett.	18	1,986	2		2	3.59	NWLS	9.0	9.06	822
Douglas.	30	27,146	1	2	3	19.58	NWLS	10.0	1.11	1304
Iron.	15	2,942	2		2	3.43	NWLS	7.5	5.10	758
Polk.	85	14,669	10		10	26.12	IFLS	8.5	5.79	914
Price.	25	4,678	3		3	11.15	IFLS	8.3	5.34	1254
Rusk.	31	14,790	3		3	7.49	IFLS	10.3	2.10	914
Sawyer.	48	5,765	3		3	9.95	NWLS	16.0	8.33	1257
Taylor.	50	6,877	5		5	11.27	WVLS	10.0	7.27	975
Washburn.	22	4,010	2		2	6.43	NWLS	11.0	5.49	797
Florence.	20	4,450	1		1	1.21	NFLS	20.0	4.49	488
Forest.	19	4,242	3		3	5.37	WVLS	6.3	4.48	1014
Langlade.	24	19,847	1	4	5	10.50	WVLS	4.8	1.21	871
Lincoln.	38	12,971	2		2	19.91	WVLS	19.0	2.93	879
Marinette.	54	41,605	1	6	7	17.30	NFLS	7.7	1.30	1399
Oconto.	54	12,948	6		6	14.64	NFLS	9.0	4.17	998
Oneida.	45	24,617	3		3	23.39	WVLS	15.0	1.83	1113
Vilas.	67	21,523	9		9	14.98	NWLS	7.4	3.11	857
Buffalo.	10	3,577	2		2	3.21	WRLS	5.0	2.80	672
Chippewa.	49	23,749	5		5	22.64	IFLS	9.8	2.06	1008
Clark.	82	13,099	10		10	17.23	WVLS	8.2	6.26	1210
Dunn.	34	18,787	4	1	5	19.26	IFLS	6.8	1.81	850
Eau Claire.	90	77,630	5		5	55.66	IFLS	18.0	1.16	638
Jackson.	19	4,083	2		2	5.54	WRLS	9.5	4.65	988

Counties	Public Use Computers	Resident Population	Libraries	Branches	Locations	FTE	Public Library System	Computers per location	Computers per 1,000 people	Square miles
La Crosse.	180	116,740	2	7	9	82.05	WRLS	20.0	1.54	452
Monroe.	50	21,617	6		6	15.30	WRLS	8.3	2.31	901
Pepin.	13	2,739	2		2	3.28	IFLS	6.5	4.75	232
Pierce.	69	25,384	6		6	24.88	IFLS	11.5	2.72	574
St. Croix.	76	51,042	9		9	36.72	IFLS	8.4	1.49	722
Trempealeau.	54	13,674	9		9	14.48	WRLS	6.0	3.95	733
Vernon.	53	10,712	8		8	14.83	WRLS	6.6	4.95	792
Adams.	22	20,784	2		2	8.23	SCLS	11.0	1.06	646
Green Lake.	47	11,326	5		5	14.58	Winnefox	9.4	4.15	584
Juneau.	59	10,187	5		5	13.47	WRLS	11.8	5.79	767
Marathon.	138	130,690	1	8	9	44.26	WVLS	15.3	1.06	1545
Marquette.	30	5,650	6		6	6.55	Winnefox	5.0	5.31	456
Portage.	70	70,882	2	3	5	28.43	SCLS	14.0	0.99	801
Waushara.	55	10,090	8		8	13.20	Winnefox	6.9	5.45	626
Wood.	96	44,674	6		6	45.49	SCLS	16.0	2.15	793
Brown.	242	255,564	2	9	11	87.85	NFLS	22.0	0.95	530
Calumet.	42	10,306	3		3	12.37	MCLS	14.0	4.08	318
Door.	74	27,976	1	7	8	19.35	NFLS	9.3	2.65	482
Kewaunee.	19	6,084	2		2	8.33	NFLS	9.5	3.12	343
Manitowoc.	77	49,050	3		3	48.24	MCLS	25.7	1.57	589
Outagamie.	128	114,767	7	2	9	87.54	OWLS	14.2	1.12	638
Shawano.	57	41,851	1	5	6	10.65	NFLS	9.5	1.36	893
Waupaca.	96	24,750	9		9	43.64	OWLS	10.7	3.88	748
Winnebago.	128	115,718	5		5	81.23	Winnefox	25.6	1.11	434
Columbia.	101	31,122	9		9	36.13	SCLS	11.2	3.25	766
Crawford.	30	6,951	3		3	5.87	SWLS	10.0	4.32	571
Dane.	674	410,217	20	8	28	360.58	SCLS	24.1	1.64	1197
Grant.	118	30,772	12	1	13	30.37	SWLS	9.1	3.83	1147

Counties	Public Use Computers	Resident Population	Libraries	Branches	Locations	FTE	Public Library System	Computers per location	Computers per 1,000 people	Square miles
Green.	62	24,551	5		5	27.32	SCLS	12.4	2.53	349
Iowa.	44	8,880	4		4	10.96	SWLS	11.0	4.95	763
Lafayette.	47	7,277	6		6	8.62	SWLS	7.8	6.46	634
Richland.	39	6,771	3		3	8.86	SWLS	13.0	5.76	586
Rock.	232	120,079	7		7	94.05	Arrowhead	33.1	1.93	718
Sauk.	104	32,501	9		9	43.31	SCLS	11.6	3.20	831
Dodge.	130	52,745	14		14	47.28	ESLS	9.3	2.46	876
Fond du Lac.	107	60,071	6	1	7	47.71	Winnefox	15.3	1.78	720
Ozaukee.	87	69,585	5		5	49.10	ESLS	17.4	1.25	233
Sheboygan.	141	78,704	8		8	66.55	ESLS	17.6	1.79	511
Washington.	118	74,897	5		5	52.69	ESLS	23.6	1.58	431
Jefferson.	121	72,843	8		8	60.30	Bridges	15.1	1.66	556
Kenosha.	163	126,345	2	6	8	101.36	Kenosha	20.4	1.29	272
Milwaukee.	1,183	945,634	15	12	27	513.20	MCFLS	43.8	1.25	241
Racine.	141	102,955	5		5	68.33	Lakeshores	28.2	1.37	333
Walworth.	120	43,682	10		10	53.80	Lakeshores	12.0	2.75	555
Waukesha.	491	314,867	16		16	234.05	Bridges	30.7	1.56	550
	7,202	**4,214,191**			**464**	**3060.98**		**15.5**	**1.71**	

APPENDIX B: ILS AND TECHNOLOGY TASKS

- Peripheral support: barcode scanners, receipt printers, spine label printers, credit card swipers – things that tie into functionality that the ILS provides.
    - ILL\ILS: Create plan and documentation
    - Technology: Installing, testing and determining of appropriate peripherals with instruction from ILL\ILS
- Bandwidth and network issues: If there are issues with the network slowing down or a connection not set up right with the ILS, the IT staff are involved. Monitoring bandwidth, quality of service on the network to make sure that ILS traffic is prioritized, especially on the staff side. Providing static IP addresses. VPN accounts for off-site events. Monitoring & managing computer names.
    - Technology staff
- Stuff on staff PCs: ILS client, offline circulation, inventory support, tools to interact with ILS\ILL (macroing, MARCedit, OCLC, B&T, RFID, etc.): installation, troubleshooting
    - ILL\ILS: Create plan and documentation
    - Technology: Installing & troubleshooting work
- SIP2 & patron API connectivity: AMH, self-checks, gates, tagging, sorters, authentication, time & print management
    - ILL\ILS: consulting for this area, determining what access needs to be configured, authentication
    - Technology: Time & print management as a service {discussion for technology: is the intent to have one? Or multiple?}, configuring servers to allow access
- Security: firewall management (opening ports), running security audits on ILS server, password policies/best practices, PCI compliance, HTTPs
    - ILL\ILS: develop best practices/password policies, knowing what needs to be opened to inform technology group
    - Technology: secure platform
- Backups & disaster recovery: disaster recovery plan, provide backups
    - ILL\ILS: work with technology on planning
    - Technology: work with ILS on planning, implement
    - Standards would need to be created that would work within budget or budget would need to be increased.
- Server support: maintaining operating system, installing required tools, maintaining appropriate virtualization environment, monitoring performance, upgrading ILS software

    - ILL\ILS: determining requirements of software if hosting own, ILS software upgrades, procedures for bringing server down/up
    - Technology: managing non-ILS software on servers, procedures for bringing server down/up
- Scripting: pulling ILS data out of the system to use in different ways – improving software, annual reports, custom reporting
    - Own group that would go beyond ILL\ILS data
    - Would need to be aware of the capacity and power needed to do that.
- OPAC: Designing the web interface, proxy server for in-house OPACs to limit where they can go.
    - ILS: web interface
    - Tech: proxy server in consultation with ILS to know what is allowed where
- Help desk and after-hours support
    - ILS and tech staff would both be staffing this.
    - {Need to define after-hours support: down system support}: would likely be the technology staff as first line for this, though dependent on the consortium.
- Email notices: facilitating and dealing with bounces
    - ILS: setting up notices
    - Technology: dealing with SMTP server, DNS management
    - Scripting: dealing with bounces, spam blocking in automated fashion
- Tele-notice product support: setting up phone lines, supporting.
    - ILS: ongoing maintenance and working with the system
    - Technology: initial setup
- Kits for tagging/offsite registration
    - ILS: determine what they want, manage once it works
    - Technology: purchase and setup,VPN access
- Z39.50 and NCIP support for ILL
    - ILL\ILS: knowing what needs to be done to inform technology group
    - Technology: implementing
- Reporting software/servers: Crystal reports
    - ILL\ILS: Running reports, working with the software
    - Technology: maintaining platform

APPENDIX C: TECHNOLOGY BUDGET SUMMARY

Category of Expense	How it was determined	Amount
Annual Staff Salaries	Used data from the May 2016 Occupational Employment Statistics (OES) from the Wisconsin Department of Workforce Development to estimate salaries for most positions, determining median salaries for comparable position titles found in the OES data. In some cases, salaries were estimated based on the position's standing in the organizational chart. Includes 28% benefits as recommended by the HR Subcommittee	$3,461,709
Network equipment in libraries **(Cost to replace network equipment in libraries to get to standard)**	Used actual costs of a recent series of implementations at local libraries to derive a cost per PC of $43.62. This represents the low end of cost spectrum. The workgroup recognizes that an industry-leading network implementation would be up to four times more expensive.	$450,000 - $1,600,000 over the cost of 5 years
Datacenters (2 proposed)	Estimated by using data from real implementations in Wisconsin, including South Central Library System, WiscNET and the Chippewa Valley Internetworking Consortium (CINC) Datacenter.	Upfront costs: $387,000 per center Annual costs: $168,720 per center
Help desk & inventory software	Actual costs of industry standard tools.	$19,000 annually

APPENDIX D: IMPLEMENTATION BUDGET PLAN

YEAR ONE

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Hire CIO	$152,422	Becomes annual operating cost in budget	Administration
Hire Network, Systems and Customer Relations senior staff (6 months in)	$176,659	Full cost ($353,318) becomes part of annual operating budget	CIO
RFP for contract work for Year One planning	$200,000	Fees for services provided by contract technologists (existing system and/or library staff)	CIO
Work closely with existing systems and libraries to communicate planning	(no additional cost)		Technology services staff working with contract technologists
Define processes for system & network architecture	(no additional cost)		Technology services staff working with contract technologists
Determine onboarding process	(no additional cost)		Technology services staff working with contract technologists
Determine technology service standards for libraries	(no additional cost)		Technology services staff working with contract technologists
Plan physical servers	(no additional cost)		Technology services staff working with contract technologists
Plan data centers	(no additional cost)		Technology services staff working with contract technologists

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Plan network	(no additional cost)		Technology services staff working with contract technologists
Build helpdesk	$9,000	Software contract; becomes part of annual operating budget	
Work with administration to build portal and populate with content	(administrative cost)		
Work with administration to build internal communications platform	(administrative cost)		
TOTAL:	**$538,081**		

YEAR TWO

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Senior staff (CIO, Sr. Network Engineer, Desktop & Systems Director, Customer Relations Director)	$507,740	Annual operating cost	
RFP for contract for Year Two implementation	$200,000	Fees for services provided by contract technologists (existing system and/or library staff)	Technology services staff
Hire Procurement Officer	$96,000	Becomes part of staff line in annual operating cost	Technology services staff
Develop procurement plan, processes and contracts	(no additional cost)		Technology services staff working with contract technologists
Begin building network	$320,000	Becomes annual operating cost in budget to continue building and maintenance	Technology services staff working with contract technologists

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Build data center	$387,000	Upfront build cost; annual maintenance cost of $168,720 becomes part of annual operating budget	Technology services staff working with contract technologists
Maintain and test help desk internally	$9,000	Annual operating cost	Technology services staff working with contract technologists
Begin onboarding libraries	(no additional cost)		Technology services staff working with contract technologists
TOTAL:	**$1,519,740**		

YEAR THREE

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Staff	$603,740	Annual operating cost	
Hire remaining network and systems staff, and regional managers	$1,006,374	Becomes annual operating cost in budget	Technology services staff
RFP for contract for Year Three implementation	$200,000	Fees for services provided by contract technologists	Technology services staff
Desktop & Systems planning	(no additional cost)		Technology services staff
Continue onboarding libraries	(no additional cost)		Technology services staff working with contract technologists
Establish regional centers	(no additional cost)	Office costs will be covered by administration	Technology services staff
Provide tech support for onboarded libraries	$9,000	Annual operating cost; help desk software	Technology services staff working with contract technologists

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Maintain and continue to build network	$320,000	Onboarding and maintenance cost	Technology services staff working with contract technologists
Maintain data center one	$168,720	Annual operating cost	Technology services staff working with contract technologists
Purchase inventory software	$10,000	Software contract; becomes part of annual operating budget	Technology services staff
TOTAL:	**$2,317,834**		

YEAR FOUR

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Staff costs	$1,610,114	Annual operating cost	
Hire consultants	$249,600	Becomes annual operating cost in budget	Technology services staff
Begin hiring help desk liaisons and support technicians	$500,000	Becomes annual operating cost in budget; Dependent on regional implementation and needs	Technology services staff
RFP for contract for Year Four implementation	$200,000	Fees for services provided by contract technologists; Could cease contracting and hire more internal staff	Technology services staff
Continue onboarding libraries	(no additional costs)		Technology services staff working with contract technologists
Provide tech support for onboarded libraries	$9,000	Annual operating cost; help desk software	Technology services staff working with contract technologists

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Work with onboarded libraries for planning, maintenance, implementation of additional tech services beyond network	(no additional costs)		Technology services staff working with contract technologists
Maintain and continue to build network	$320,000	Onboarding and maintenance cost	Technology services staff
Maintain data center one	$168,720	Annual maintenance cost	Technology services staff
Inventory software	$10,000	Annual maintenance cost	Technology services staff
TOTAL:	**$3,067,434**		

YEAR FIVE

Implementation Task	Cost	Details if applicable	Responsibility if applicable
Staff costs	$2,359,714	Annual operating cost	
Hire remaining help desk liaisons and support technicians	$1,103,994	Becomes annual operating cost in budget	Technology services staff
Continue onboarding libraries	(no additional cost)		Technology services staff
Full roll out of all services from model for all onboarded libraries	(no additional cost)		Technology services staff
Provide tech support for onboarded libraries	$9,000	Annual maintenance cost	
Maintain and continue to build network	$320,000	Onboarding and maintenance cost	Technology services staff
Maintain data center one	$168,720	Annual maintenance cost	Technology services staff
Inventory software	$10,000	Annual maintenance cost	
TOTAL:	**$3,971,428**		

APPENDIX E: TECHNOLOGY STAFF SALARY CALCULATIONS

Position Title	Quantity	Equivalency	Salary, based	Total	With 28% benefits
Chief Information Officer	1	Computer and Information Systems Manager (11-3021)	$119,080	$119,080	$152,422
Procurement, E-Rate, Licensing Officer	1	N/A: Internal	$75,000	$75,000	$96,000
Desktop and Systems Director	1	{Scale based on positions in unit}	$95,000	$95,000	$121,600
Senior Desktop Engineer	1	{Scale based on positions in unit}	$75,000	$75,000	$96,000
Desktop Engineer	2	{No equivalent}	$71,240	$142,480	$182,374
Systems Architects	3	Computer Systems Analysts (15-1121)	$77,090	$231,270	$296,026
Senior Network Engineer	1	Computer Network Architect (15-1143)	$91,030	$91,030	$116,518
Network Engineer	2	Network and Computer Systems Administrators (15-1142)	$71,240	$142,480	$182,374
Customer Relations Director	1	N/A: Internal	$90,000	$90,000	$115,200
Technology Consultants	3	N/A: Internal	$65,000	$195,000	$249,600
Regional Managers	3	{Scale based on positions in unit}	$65,000	$195,000	$249,600
Field Office Liaisons	3	{Scale based on positions in unit}	$55,000	$165,000	$211,200
Technology Field Staff	22	Computer User Support Specialists (15-1151)	$49,460	$1,088,120	$1,392,794
	44		**TOTAL**	**$2,704,460**	**$3,461,709**

Note: Additional details about the OES data used to compile these salaries can be found at http://www.plsr.info/workgroups/resources-consulted/