

Jackson County Library District Proposed Technology Budget 2020-2021

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Introduction

Jackson County Library District contracted Kress Consulting (hereafter, “Consultant”) to prepare a technology budget for Jackson County Library Services for the fiscal year 2021, in case the District elects to terminate its contract with LS&S, its current library services vendor. The budget was to be based on a review of comparable library systems and nationwide best practices, with the goal of meeting or exceeding OLA and Edge Initiative standards. The budget would include “cost categories and line items with cost estimates for all IT related expenses in 2020, including projected staffing costs.” The accompanying narrative would include “visibility of assumptions, key cost drivers, and any associated areas of risk to be considered.” The budget and narrative would include any trade-offs that should be considered in terms of levels of service or timing of implementation. And finally, the narrative would include risks associated with the transition of operations from LS&S to JCLD, and mitigations to undertake.

LS&S declined to allow its local employees to be interviewed as part of the research process, opting instead for a management-level interview that occurred on May 1, 2017. In addition to covering current hardware and software asset lists, network diagrams, and IT training plan, the interview included a wide-ranging discussion of possible transition issues and a preview of several technological developments that were likely to occur in the next two or three years.

It is important to acknowledge that technology changes rapidly, and solutions and costs that seem reasonable now may be much different in three years, when the transition would actually occur. The corresponding reassurance is that technology tends to get better and cheaper over time, so the most likely eventuality is better solutions and lower costs.

General assumptions

We assume that current technology will be continue to be maintained and upgraded in the next three years, so that our starting point is at least what it would be if the transition occurred today.

We assume that upgrades and capital investments that are currently planned or scheduled take place as expected, especially including:

- Internet bandwidth is upgraded to 1 Gb for the system, and wide area network connections are upgraded to 1 Gb for Medford and Ashland, and 100 Mb or greater for all other branches.
- New telephone systems (Voice over IP) are installed systemwide.
- Envisionware PC Reservation, LPT:One, and Mobile Print is installed at all locations. (Note that LS&S is tentatively planning to migrate to a system that supports virtualization.)

To simplify calculations, we assume that hardware will be normally distributed in its replacement cycle, so that for example one-fourth of computers will be replaced in FY2021, one-fourth in FY2022, and so on. Some vendors will require that initial purchase costs be paid in the first year, while others will spread purchase costs across a multi-year contract. Where applicable, we include first-year (capital) costs and ongoing costs in the item description for greater clarity.

Technology staff salaries are based on similar positions in Jackson County and the City of Medford and are “loaded” with benefits at a ratio of 1.4 times base salary.

All costs are in 2017 dollars.

Budget

The summary budget is as follows (more detailed sub-budgets appear in each section below).

Summary budget		
Category	Annualized Cost	Current Budget
Network and server costs	\$84,256	LS&S
System/enterprise applications	135,000	LS&S
Staff computers and peripherals	77,490	JCLD
Staff software	18,800	JCLD
Public computers and peripherals	106,030	JCLD
Public software	21,280	JCLD
Service stations	34,175	JCLD
Meeting room equipment	23,850	JCLD
Website management	4,000	JCLD
Staffing	449,600	LS&S

General supplies	20,000	LS&S
Total:	\$974,481	
Total currently paid by LS&S	688,856	
Total currently paid by JCLD	285,625	

Optional/Dependent Projects	
AMH/Sorting	\$38,440
Library Document Stations	27,670
Total:	\$66,110

Note: The narrative below includes some optional changes that would save about \$38,500 of the total budget.

Network and server costs

Network costs are largely stable and should continue to be stable, as long as the current vendor, Hunter Communications, Inc., continues to provide service. There is an opportunity to reduce the number of servers and possibly the number of WiFi access points, if the equipment is upgraded to newer and better technology.

Network and Server Costs		
Internet connection	1 Gb per system	\$19,500
WAN service	1 Gb (Medford, Ashland), 100 Mb other branches	108,000
Firewall service		5,376
Firewall	2 each, owned by vendor	0
e-rate discount		-106,300
Network routers, switches, and	6 routers, 22 switches, 20 WiFi access points, five-year replacement cycle	18,000

wireless access points		
Some network equipment will be owned and maintained by Hunter Communications. We assume that the Library will own 6 routers and 22 layer-two switches (one per branch, additional at Medford and Ashland) and 20 wireless access points.		
UPS	2 2200V, 13 1000V UPS, five-year replacement cycle	2,880
Domain/file servers	2 domain servers, 3 management servers, 15 file servers (can also run branch apps), five-year replacement cycle	28,800
Application servers	2 ILS servers, 1 mail server, 1 telephony server, five-year replacement cycle	8,000
There is an opportunity for significant cost savings of 20%-30% through server virtualization, if the wide-area network is fast and reliable. Also, see below re replacing the Exchange server with Google Mail.		
Total:		\$84,256

Risk 1: Will the Internet/WAN vendor, Hunter Communications, Inc., transfer its contracts whole to the District? If not, the District will probably need to do a Request for Proposals for Internet and WAN service, and first-year costs will probably be substantially higher.

Mitigation: The District should communicate with Hunter Communications, Inc. at least a year in advance to allow time for an RFP if needed.

Risk 2: Network devices and server authentication details, configurations, and change logs should be documented and transferred to the District when the contract ends.

Mitigation: Make a plan with LS&S to review and monitor the documentation process in the last months of the contract. If possible, arrange that network and server administration staff overlap with any new staff members in order to ensure a problem-free transition.

System and enterprise applications

The integrated library system (ILS) migration is the highest priority and the area where there is most likely to be negative impact to Library functioning.

System/enterprise applications		
Innovative Polaris	Hosted; migration costs averaged out over five years and added to maintenance costs	\$93,000

<p>Note: Innovative was not willing to discuss ballpark migration and hosting costs with the Consultant, instructing that all questions should go through LS&S. These numbers are based on recent contracts signed by other libraries. The Consultant would expect it to be somewhat less, given that migration costs should be lower moving from Polaris to Polaris. Evergreen hosted by Equinix would be substantially cheaper, less than \$50,000 per year, while other solutions like TLC Library.Solution should be in approximately the same ballpark as Polaris.</p>		
Unique Management		0
Collection management software	CollectionHQ, Edelweiss, etc.	15,000
<p>LS&S is investing in Edelweiss, a collection management system, and the Library should begin to see useful analytics before 2020. The Consultant has included a line item for collection management software on the assumption that the Library will continue to want collection analytics. The estimated cost is based on a recent proposal for CollectionHQ at a similarly sized library.</p>		
Envisionware	PC Reservation, LPT:One, Mobile Print	13,000
<p>If Envisionware requires a new contract, the first year cost might be as high as \$20,000. Otherwise, ongoing costs should be about \$3,400 annually. Mobile Print estimated at \$9,000 annually. Note that LS&S is considering migrating to a system that better supports virtualization. If this happens before 2020, costs may be substantially different.</p>		
Faronics Deep Freeze	222 licenses	8,000
Other PC management software	Solarwinds, Antivirus, etc.	6,000
<p>Deep Freeze is a relatively expensive software; the District could investigate lower cost and free solutions. Similarly, there are inexpensive and free versions of some of the network and PC management software LS&S uses.</p>		
Total:		\$135,000

Risk 1: If Innovative or LS&S are not very cooperative and communicative, a poor data migration or a poorly documented Polaris system could result in a significant and long-lasting impact to customer service.

Mitigation: Joint discussions with Innovative and LS&S should begin at least a year prior to the transition. (In the worst-case scenario, a procurement process for a new ILS could easily take two years, so really discussions should begin much sooner.) Ideally, a parallel, dynamically-

updated training server can be provided so that the migration process can be practiced and monitored with real data. LS&S documentation should be reviewed and revised prior to the handover.

Risk 2: Though less serious, the same risks apply to the District's relationship with Envisionware.

Mitigation: Same as above.

Staff computers and peripherals

There is some ambiguity in the documentation available to the Consultant with respect to the current number of staff computers. These numbers can be updated when the actual number is verified.

Staff computers and peripherals		
Computers	120 staff computers including 22" monitors and stands, four-year replacement cycle	\$33,750
Laptops	18 laptop computers, four-year replacement cycle	9,000
Chromebooks	18 chromebook computers, three-year replacement cycle	2,400
<p>Chromebooks are an increasingly viable substitute for conventional laptops. They are fully functional for web research and web-based email, provide access to web-based productivity software such as G Suite. They are cheaper to buy and much cheaper to maintain. Their desktop counterparts, Chromeboxes and Chromebases, may begin to replace staff computers as well.</p>		
Printers/copiers/scanners/fax	20 color/bw multifunction printers, four-year replacement cycle	4,500
Barcode scanners	120 barcode scanners, five-year replacement cycle	4,800
Receipt printers	96 receipt printers, four-year replacement cycle	9,600
Tablets and other handheld devices	30 devices, three-year replacement cycle	4,000
Smartphones	18 devices, with service	8,640
Digital cameras	16 digital cameras, three-year replacement cycle	800
Total:		\$77,490

Risk 1: If LS&S does not document domain and local administrator authentication details, or if the domain configuration is not well-documented, it will be very difficult to take over the existing computer network.

Mitigation: As with network/server infrastructure, review and monitor documentation and change logs for the last six months of the contract. If possible, make sure that LS&S staff and District staff work together throughout the transition process.

Staff software

Staff software		
Microsoft Office Professional	120 licenses at \$40	\$4,800
Other creative/productivity software	Microsoft Visio, Adobe Creative	14,000
Total:		\$18,800

Consultant strongly recommends migrating staff from Microsoft Exchange email to Gmail (via G Suite, formerly Google Apps). Gmail is less expensive, generally considered to be easier to use, and closer to what the vast majority of patrons use. Most importantly, migrating to Gmail means not having to maintain an Exchange server.

In addition, G Suite gives access to a number of apps which substitute for the Microsoft Office suite. Continue to purchase a small number of licenses for Microsoft Office for staff who need to create documents in native Microsoft formats, but reduce that number as staff become used to G Suite and its ability to export documents to Microsoft format.

Finally, using G Suite means that some staff can just as functionally use a Chromebook as a laptop, or a Chromebox as a desktop computer. (The current determinant is whether staff need access to a non-web-based Polaris client.) ChromeOS computers are cheaper to buy and much cheaper to maintain.

The following table shows the savings of migrating 80% of staff to ChromeOS devices and G Suite in place of Windows computers and Microsoft Office.

Prospective savings in migrating to G Suite and using ChromeOS devices for 80% of staff computers		
Savings: Exchange server	The cost of the server itself is included here. The even greater cost of managing the server is omitted.	-\$2,000
Savings: Staff computers	Replace 96 staff computers with Chromeboxes	-27,000

Chromeboxes	96 Chromeboxes, four-year replacement cycle	9,600
Savings: Microsoft Office Professional	Replace 96 Microsoft Office licenses with G Suite	-3,840
G Suite licenses	120 licenses	14,400
Note: Google has recently revised pricing for G Suite. The new retail cost is \$120 per user per year. However, if government agencies are still given preferential pricing of \$50 per user, the savings would be almost double what is shown here.		
Total:		-\$8,840

Risk: Records of software licensing compliance are not available or accessible; the District becomes liable for licensing violations.

Mitigation: Discuss software licensing status well before the transition period, and ensure that licenses are “caught up” in advance of transition.

Public computers and peripherals

As with staff computers, there is some ambiguity in the documentation with respect to the number of public computers. We are assuming 222 public computers until the number is verified. It appears that currently there is one set of lab/training laptops for the entire system; we are updating the number of laptops to 24 on the expectation that more trainings and outreach activities will be the eventual result. We are consolidating the functions of public printing, scanning, copying, and faxing into one multipurpose printer.

Public computers and peripherals		
Public Internet computers	157 computers with 22” screens, stands, and security cables, four-year replacement cycle	\$47,100
Public catalog computers	50 computers with 22” screens, stands, and security cables, four-year replacement cycle	15,000
Public adaptive stations	4 computers with 22” screens, stands, security cables, JAWS, ZoomText, and additional adaptive software and peripherals at \$5000 each, four-year replacement cycle; 12 iPads specifically for use for patrons needing accommodations, three-year replacement cycle	6,600
Computer lab laptops	24 laptops, four-year replacement cycle	12,000
Printers/copiers/scanners/fax	18 color/bw multifunction printers, four-year replacement cycle	4,050

Public software	Microsoft Office, Adobe Creative, etc.	21,280
Total:		\$106,030

As with staff computers, replacing public computers with ChromeOS devices can lead to substantial savings. A few patrons will continue to prefer conventional desktop computers with Microsoft Windows and Office, but increasingly patrons - especially young ones - are preferentially using web-based apps and can function just as well on a ChromeOS device. The following table shows possible savings.

Prospective savings in using ChromeOS devices for 80% of public computers		
Savings: Computers	Replace 127 public internet computers and 50 public catalog computers with Chromebase computers with security cables, four-year replacement cycle	-\$39,975
Chrome management console licenses	127 licenses @ \$150	6,350
LibData Time/Print/Waiting List Management	Fifteen-site license, one-time fee for Chromebook/Chromebox management	9,000
Savings: Microsoft Office licenses	127 licenses	-5,080
Total savings:		-\$29,705

Risk 1: Along with staff computers, software licensing compliance on public computers is important to confirm and document.

Risk 2: It appears that adaptive public computers have not been deployed, or at least not across the system. This creates a liability under the Americans with Disabilities Act and should be rectified as soon as possible.

Mitigation: Work with LS&S to fund and deploy an adaptive public computer at every location.

Service stations

We include self-check stations, PC reservation and print release stations, card/bill/coin towers, microfilm scanners, and digital signage screens in this category. The Consultant proposes to bump the number of self-check stations up slightly and to ensure that every location has reservation and print management capabilities.

Service stations		
Self-check stations	18 computers with barcode scanners and receipt printers, four-year replacement cycle	\$8,100
PC reservation stations	15 computers, four-year replacement cycle	4,500
Print release stations	15 computers, four-year replacement cycle	4,500
Card/bill/coin acceptors	15 stations, five-year replacement cycle	7,200
Microfilm stations	4 readers and computers, five-year replacement cycle	8,000
Digital signage	15 digital signage systems, four-year replacement cycle	1,875
Total:		\$34,175

Other than the previously mentioned need for good documentation, there are no particular risks in this category.

Meeting room equipment

We use the words “meeting room” loosely to connote any space available for group events or activities, such that we include portable gaming consoles and web-conferencing equipment in this category.

Meeting room equipment		
Projectors with DVD	14 projectors, four-year replacement cycle	\$3,500
Mobile lab projectors	2 projectors, four-year replacement cycle	400
Sound systems	14 systems, including two large-scale system at \$5,000 each for Medford and Ashland; twelve basic systems at \$1,000 for other branches; ten-year replacement cycle	2,200
Web-conferencing pedestal	15 Chrome for Meetings pedestals or similar, four-year replacement cycle	8,250
Wii/Xbox/PSP	15 game consoles, three-year replacement cycle	2,000
Miscellaneous	Video games, arduino kits, etc.	7,500
Total:		\$23,850

Other than documentation quality and availability, there are no particular risks in this category.

Website management

The Library currently uses Springshare LibGuides as its web hosting and content management system (CMS). The Consultant’s assumption is that the Library will continue to use Springshare unless it becomes dissatisfied with the service, in which some additional expertise will be required to host the Library’s website through WordPress or a comparable CMS.

Website management		
Website costs	Hosting, administration, and content management	\$4,000
Total:		\$4,000

Risk: Transferring websites can lead to loss of files, resulting in broken links or images that might not be discovered or communicated for weeks or months.

Mitigation: If the current hosting provider is satisfactory and willing to continue hosting the website, the website can be left alone.

Staffing

We envision five IT staff members, consisting of the following:

- The IT Manager supervises other IT staff; is responsible for planning, budgeting, and reporting to the Library Director and Board; and provides backup network, server, and applications support.
- The Network Administrator is also the Server Administrator and provides tier-two support on helpdesk/desktop issues.
- The System Administrator is the primary applications administrator for Polaris, Envisionware, and other enterprise applications. Should have strong database skills and may be responsible for technology training.
- The Desktop/helpdesk technicians provide general support and may be heavily involved in implementation projects, documentation and knowledgebase management, and staff training.

Due to the need for backup staffing in case of vacations and illnesses, this is already fairly minimal staffing. It is likely that support needs will be greater in the first few years of transition, as staff become familiar with new systems and policies. Also, the District will want to invest in more technology training than has happened in the past, and IT staff will bear the brunt of designing and delivering that training. So it is likely that some additional staffing - or contracted

services - will be needed in FY2021 and possibly beyond. The “Contracted Services” category is intended to meet that need.

(For comparison, Deschutes Public Library, which is smaller in size but busier in its application of technology, has a staff of four full-time staff people.)

Staff salaries		Base salary	Loaded salary
	IT Manager (1 FTE)	\$64,000	\$89,600
	Network/Server Administrator (1 FTE)	64,000	89,600
	System Administrator (1 FTE)	56,000	78,400
	Desktop/Helpdesk Technicians (2 FTE)	80,000	112,000
	Contracted Services		\$80,000
Total:			\$449,600

Risk: The pool of jobseekers with both IT and Library experience can be small, but it is especially important to recruit high quality, resilient, and creative personnel because this transition is likely to require those attributes.

Mitigations: Actively recruit LS&S staff (within the bounds of the contract) and staff at nearby libraries. Seek the assistance of a qualified technology services firm. Emphasize the importance of documentation and communication throughout the transition process.

General Supplies

General supplies and miscellaneous expenses		
Supplies and expenses		\$20,000
Total:		\$20,000

There are no particular risks in this category.

Additional Projects

The following projects are optional and/or subject to funding availability.

AMH/Sorting

LS&S's current recommendation is to implement Automated Materials Handling (AMH) based on barcodes rather than RFID. While the Consultant generally believes that RFID continues to be a good investment for many libraries, several considerations for JCLD make barcode-based materials handling a viable option:

- Due to space considerations, AMH is only viable at several branches, so the cost of converting the entire floating collection to RFID is not necessarily justified.
- Branches generally do not have a significant backlog of checked-in materials, which reduces the need for faster, RFID-based materials handling.
- A barcode-based implementation is significantly cheaper than an RFID-based implementation, and barcode-based systems can generally be converted to RFID at a later date at a reasonable implementation cost.
- RFID conversion would require a very substantial weeding process as the cost of converting "dusty" material is prohibitive.

It is important to note, however, that several advantages of RFID will be postponed if the Library chooses a barcode-based system:

- Check-in and check-out are slower with barcode scanning than with RFID scanning.
- Error rates are generally higher.
- Depending on how consistently barcodes are placed on materials, there may be more staff intervention for check-in and check-out.
- RFID-enabled security gates are "smarter" and do not require additional processing of materials (e.g. adding magnetic strips).

AMH Implementation		
AMH seven-bin sorters	2 ea. (Medford and Ashland) with option to expand number of bins, ten-year replacement cycle.	\$33,440
Installation cost can vary a great deal depending on the facilities; a site study must be completed in order to get an accurate estimate. Here we are assuming seven-bin sorters with initial purchase and installation costs of \$88,000 each, for a total capital cost of \$176,000, and annual maintenance fees of \$8,800 each over nine years, for a total ongoing cost of \$158,400. The total ten-year cost is \$334,400, or \$33,440 per year for ten years.		
Material remediation	Replace damaged or misplaced barcode labels, labor and materials	\$5,000
Total:		\$38,440

Risks: Facility constraints could make the initial cost considerably higher, for example if material needs to be conveyed a longer distance than expected or if additional remodeling is needed to accommodate the sorting equipment.

Mitigation: Conduct a thorough site study before committing to a project.

Library Document Stations

Envisionware's Library Document Stations (and comparable products from other vendors) provide all-in-one printing, copying, scanning, and faxing services in a compact, user-friendly station. The Library has already implemented five document stations at Medford, Ashland, Rogue River, and Central Point. Adding stations at the remaining libraries would standardize and improve customer experience. If paired with Mobile Print for wireless printing, it would allow patrons to print from personal as well as library devices.

Library Document Stations		
Envisionware LDS	11 each, including document feeder, coin/bill acceptor; four year replacement cycle	\$30,820
Initial cost, 11 x \$9,200. Annual maintenance 15% for 16 stations.		
Savings	Savings: replace 14 of 18 public printers	-3,150
Total:		\$27,670

Conclusion

A few, relatively small adjustments will significantly improve this Library's performance in terms of the OLA standards and the Edge Initiative - updating network equipment and computers to recent models, ensuring that technology is more evenly distributed throughout the system, deploying adaptive technology computers, and improving meeting room equipment, for example. Optional upgrades such as adding automated materials handling will increase efficiency and customer service levels.

The most important technology improvement, however, is only indirectly addressed in this budget. Raising the level of technology expertise and confidence among all staff will require designing a comprehensive training plan, providing time and resources for current staff to learn through their preferred methods, and recruiting new staff with advanced technical skills.

Given sufficient staffing and resources, the Library should consider adding some popular technology-support services and programs - for example, a discovery layer, a makerspace, and a "library of things" initiative. A separate report will use the results of the customer survey and interviews with District and LS&S staff to identify services and programs that will meet customer needs while remaining within the constraints of budget and staff.