



Newfoundland & Labrador
Public Libraries

Technology Service Delivery Standards

Newfoundland & Labrador Public Libraries
Technology Service Delivery Standards

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The Technology Service Delivery Standards Committee

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Special thanks to Newman George the Director of Information Technology and Information Management for his support of the Technology Service Delivery Standards Committee.

Executive Summary

The committee recommends technology upgrades and pilot projects necessary to align Newfoundland & Labrador Public Libraries with 21st Century expectations. Recommendations are given in four areas: public infrastructure, library services, library infrastructure, and staffing.

Public infrastructure includes internet connectivity, wireless access, public computers, public software, and a number of pilot projects aimed at introducing new technology to the residents of Newfoundland & Labrador.

Library services comprise the library's website (and associated services), online access to library materials, fine payments, and social media outreach. These services allow citizens to interact with our collection in the digital world offering more of our services to our patrons wherever they may be.

Library infrastructure consists of the computers and software needed for staff to provide excellent service to the public. Additionally, recommendations are made regarding technology that can assist in meeting Occupational Health & Safety regulations.

Staffing recommendations consider the totality of the other recommendations and the work needed to accomplish them. The committee does not assume the staffing recommendations will be fulfilled, so the committee provides two different sets of recommendations. The first recommendations are the priorities that should be met given the current budget and staffing levels. These recommendations have an initial cost of \$535,000.00 and a yearly cost of \$273,000.00 (page 27). The second set are the priorities that can be met given the recommended staffing levels. These have an initial cost of \$942,000.00 and a yearly cost of \$513,000.00 (page 28).

Introduction

Libraries prepared for our contemporary society, culture, and economy equip citizens with the awareness, knowledge, and skills needed to thrive in the 21st century. As the people of Newfoundland & Labrador navigate a world that is both physical and digital, Newfoundland & Labrador Public Libraries are a technological sextant helping them to arrive where they intend to travel.

As Newfoundland & Labrador advances into the future, there are challenges that both rural and urban populations bring with them from the 20th century. For instance, the digital divide lowers citizens' digital literacies and hinders our attempts at digital inclusion. "Digital inclusion consists of policies, programs, and actions developed to close the digital divide, promote digital literacy, and ensure digital equity and readiness" (*Public Libraries & Digital Inclusion*). These measures ensure that those currently excluded from digital life have the necessary access to become fully engaged citizens. "Without the ability to acclimate themselves to personal computers and broadband-based applications in their own homes, many of these individuals are lacking in digital literacy, which encompasses the skills and abilities needed to make full, personally advantageous use of digital technologies" (Bertot, Real, and Jaeger 271). Newfoundland & Labrador is better poised to meet future challenges when the vast majority of its citizens are digitally literate and the digital divide is a matter of choice rather than circumstance.

Digital divide research recognizes that a large majority of people in North America have access to the internet and personal computers, but there is still a considerable portion of the public who do not have this access. While it is tempting to consider mobile phones as a solution to this problem, mobile phones are not always adequate to bridge the gap left by the digital divide: according to Mehra et al., "the ability to use and navigate traditional computers is essential to filling out employment applications and government forms or to find a job or advance in many careers" (qtd. In Bertot, Real, and Jaeger 275). However, mobile devices have become common, and the need for personal computers is not as great as it once was. For many, having a mobile device removes their desire to have a desktop computer. To meet the demands created by the rise in mobile technologies, public libraries offer both internet connectivity and public access computers to help mitigate some of the problems caused by the digital divide. The challenges of the digital divide are important to surmount as the Province responds to the changing population levels of the near future.

According to the Harris Centre Regional Analytics Laboratory, the majority of communities in Newfoundland & Labrador with the exception of the North East Avalon and a few areas of Labrador face decreasing populations in the next 20 years (Simms and Ward). In the case of decreasing population levels, our ability to improve digital inclusion will foster economic growth in those regions. For example, in a study of rural libraries in Tennessee, small businesses in the State were aided by access to public wireless internet and public computers (Bishop et al.). In the same manner, Newfoundland & Labrador Public Libraries can ensure that all citizens have access to high quality wireless internet and the public computers necessary to give individuals the impetus needed to start businesses and develop rural economies. In the case of urban populations, "information technology... will pose new challenges for public services to prevent the emergence of a digital underclass" (McConnell 142). Furthermore, "in this digitally savvy age... customers will move from becoming not only Digital Consumers but also Digital Creators" (McConnell 149). Public libraries offer patrons their first looks at creative technologies that can spark cultural development, social participation, and workforce preparedness. When libraries introduce patrons to new technologies, libraries offer the public an opportunity to experience the digital world without having to make any significant investment, and this allows the public to experiment with

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technologies giving them the ability to make wise purchasing decisions that benefit themselves, their community, and the Province as a whole. Shrinking populations will demand that we accomplish more with fewer people in the workforce (Simms and Ward 4), and technology can play a role in making that an achievable goal. Public Libraries act as a bridge across the digital divide in both rural and urban centres ensuring that all people are capable of participating in contemporary culture; thus, our library system will assist the citizens of Newfoundland & Labrador as we strive to be more productive with fewer people.

To achieve these ends, Newfoundland & Labrador Public Libraries have the initial infrastructure needed to reach the people of this Province. Our 94 libraries are spread throughout the Province, and we have the workforce in place to deliver services to the public. The committee recommends that the Government augment our network of libraries by investing in public infrastructure, library services, library infrastructure, and information management staff.

Public infrastructure includes wireless internet services, internet connectivity, public computers, TVs, 3D printers, and emerging technologies. Library services comprise upgrades to our online catalogue and state-of-the-art technologies that integrate our collections with search engines as well as the social media presence needed to promote these offerings. Library infrastructure ranges from the technology necessary for our staff to deliver high quality patron experiences to the tools necessary for managing library business.

These investments will close the digital divide, increase digital literacy, and promote digital inclusion, which are necessary steps because

“Concern over rising inequality in society and the challenges of creating sustainable communities through access to opportunity, underlie the recent United Nations 2030 Sustainability Goals....Though each nation varies in magnitude and scope, evidence across nations suggests that access to economic and other opportunities is not even, disparities are growing, and that economic and other opportunities are increasingly tied to digital technologies, content, and services” (Bertot 95).

With this in mind, the report begins with an analysis of our public infrastructure. This analysis is done by division. There are four divisions within the Newfoundland and Labrador Public Libraries: The Provincial Resource Library Division representing the St. John’s metropolitan area, Eastern Division, Central Division, and Western Division.

Public Infrastructure

Assessing Public Computer Infrastructure Needs

The committee recommends assigning a basic allotment of public computers to libraries according to the population served by that library and augmenting that allotment by measuring public computer usage at each library. Instead of relying entirely on populations sizes, the committee suggests that allocating resources where they are used will provide the best return on investment for the Province.

There is a note of caution with this approach. In communities where library usage is less than typical for the population size, the removal of infrastructure due to low usage will impede that library's ability to increase its usage: as less resources are available there will be fewer chances of meeting high usage demands, which will increase patron and staff frustration and prolong the location's low usage statistics.

To prevent a downward spiral where lack of investment makes improving library usage impossible, the committee recommends a peak usage level metric that maintains a sensible amount of computers within libraries to meet consistent usage measurements. The measurement of that usage will augment the deployment or removal of resources where appropriate.

The formula for infrastructure investment is calculated as follows:

Mandatory investment based on population served +/- resource usage measurement = total investment.

Our libraries will require an initial investment in five different ranges: rural libraries serving a population of less than 3,000 patrons, neighbourhood libraries serving populations between 3000 and 5,999 patrons, middle libraries serving 6,000 to 19,999 patrons, urban libraries serving 20,000 or more patrons, and our central library in the A.C. Hunter Building in St. John's.

Table 1

Basic Investment Levels	
<= 2,999	Rural
3,000-5,999	Neighbourhood
6,000-19,999	Middle
>= 20,000	Urban
A.C. Hunter	Central (Main)

Public and Children's Computers

Computers available to the public are located at all of our branches. NLPL also provides Children's computers at some of our branches. All of these computers have a three year warranty, and they provide sufficient computing power for five years.

The committee recommends that we replace one fifth of our computers every year. This schedule will keep all computers within a five year cycle giving the people of Newfoundland & Labrador sufficient computer resources to access government services and participate in digital culture.

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Our current allocation of computers can be seen in tables 2 and 3.

Table 2

Public Computers	
PRL	18
Eastern	138
Central	141
Western	143
Total	440

Table 3

Children's Computers	
PRL	3
Eastern	3
Central	0
Western	24
Total	30

The committee's standard for public computer investment levels can be seen in table 4.

Table 4

Public Computer Investment Levels	
Rural	2
Neighbourhood	4
Middle	6
Urban	10
Central (Main)	10

The committee recommends two public computers at our rural branches and four public computers at our neighbourhood branches. In our middle sized branches the recommendation is six computers, in our urban and main branches the committee recommends ten computers. In every case, if statistics show under usage of computers the committee recommends less investment. Conversely, if statistics show considerable usage the committee recommends more investment.

As the popularity of mobile devices increases, fewer people require daily access to a personal computer. For those who do need to use a computer, our public computer systems measures patron computer usage. With this in mind, we recommend a review of our computer usage at every location every six months. If less than 50% of the available computer resources are booked for a one month period for at least four of the six months, we recommend removing public computers to increase the measured computer usage time to approximately 50% for the four highest months of usage. Leaving 50% of

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computer usage available for serendipitous use will provide enough opportunity for patrons to discover our public computer services and encourage them to reserve time for further use.

There are two caveats to this recommendation. First, the case of peak usage, where all public computers are in use at the same time, requires special considerations. If there are 4 instances of peak usage a month in at least four of the six months under review but overall usage of the public is less than 50% in four of the six months, the committee recommends maintaining enough computers to meet peak usage demands. Second, if a library does not have enough space to accommodate the desks and chairs necessary to support the recommended amount of public computers, the library system reserves the right to manage the amount of public computers at a library branch to accommodate reading space, meeting space, program space, and collection space needs.

The committee recommends a total investment in 308 public computers. The recommended allotment of computers is shown in table 5.

Keeping in mind that we need to replace one fifth of our public computers each year, replacing one fifth of 308 public computers every year requires the purchase of 62 computers per year. Using the \$681.43 price of our current standing offer for HP EliteDesk G3 computers, this requires an expenditure of \$42,248.66 per year.

As new computers are purchased each year, locations will be selected for deployment of these computers. Staff will allocate the computers by consulting the figures in Table 4. Older computers at these locations will be phased out as necessary.

Table 5

Public Computers	
PRL	26
Eastern	108
Central	88
Western	86
Total	308
Per Year	62
Yearly Investment	\$42,248.66

Children's Computers

Our children's computers use software that has not been updated recently and have not been allocated in a consistent manner. This lack of children's computers in the majority of our branches and little indication from our staff or the public of a need for such computers in these branches suggests their requirement is limited. The committee recommends that our public computers be used by children as well as adults and that a specific children's web browsing profile be created bookmarking child themed web sites of educational and entertainment varieties.

Wireless Internet (wifi)

In the report *Organizational and Service Review of the Newfoundland and Labrador Public Library System*, the data shows that our wifi sessions have constantly increased from 2011 – 2016 (49). Additionally, among the library systems compared in the report, Newfoundland & Labrador was in the bottom half of systems when measuring total wifi connections (*Organizational and Service Review of the Newfoundland and Labrador Public Library* 50). Our trend of increasing connections and our capacity to increase our performance in relation to other library systems indicates that further investment in wifi will have measurable and meaningful results for the Province.

Currently, our wifi infrastructure is comprised of access points intended for home use. While these devices function well under normal household usage, they are not ideal for heavy public use. NLPL should upgrade its infrastructure to commercial grade wifi hardware. This will provide reliable connections under heavy usage, allow the proper monitoring of the network, ensure fair usage of library connectivity, and increase patron satisfaction. These changes will allow the library system to realize its potential in wifi connectivity making gains in the reduction of the digital divide and an increase in digital literacy and digital inclusion.

Our current allocation of wifi access points is given in table 6.

Table 6

Wifi Access Points	
PRL	4
Eastern	29
Central	32
Western	30
Total	95

The committee recommends the purchase of a mixture of Ubiquiti AC Lite and AC Pro access points for most locations. To get discounts on large purchases of access points, they are purchased in quantities of five. In order for the Ubiquiti access points to operate, each library will need new networking hardware. A total of 25 16 port switches, 66 24 port switches, and 4 48 port switches will be required. Finally, to manage the network traffic the library system will need 93 Unifi Security Gateways. Replacing a total of 95 access points with a total of 115 commercial grade access points and the associated networking hardware will cost \$85,362.76. Ubiquiti provides network management software with the purchase of its access points that will provide us with the ability to maintain optimal usage of the network.

While the recommended investment in wifi infrastructure is considerably more than current expenditures, we feel that the potential for increased usage by patrons bringing their own devices to the library and the trend of increasing wifi usage statistics warrants this large increase and will ensure that the people of Newfoundland & Labrador have excellent connectivity at our branches giving all residents the ability to participate fully in contemporary Canadian society.

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Table 7

	Unifi AP AC Lite	Unifi AP AC PRO	Ubiquiti 16 Port Switch	Ubiquiti 24 Port Switch	Ubiquiti 48 Port Switch	Ubiquiti Unifi Gateway
PRL	0	10	0	2	1	3
Eastern	17	17	23	6	1	32
Central	28	5	1	30	1	29
Western	23	15	1	28	1	29
Total	68	47	25	66	4	93
Purchase	70	50	25	66	4	93
Costs	\$7,260.26	\$9,176.90	\$9,974.75	\$39,500.34	\$4,575.16	\$14,875.35
Grand Total	\$85,362.76					

Public Kiosks

Public kiosks provide access to our catalogue for patrons without access to computers or mobile devices. These kiosks ensure equitable access to our collections and allow our patrons to search the catalogue independently, which affords them privacy when investigating delicate issues. There are currently 8 kiosks in our system. The committee recommends replacing these kiosks every five years. At a cost of \$681.43 per kiosk, this will require an investment of \$1,090.29 per year. We do not provide public kiosks at most locations because the space is used as public computer space, reading space, meeting space, program space, or collection space.

Table 8

Public Kiosks	
PRL	7
Eastern	1
Central	0
Western	0
Total	8
Yearly Investment	\$1,090.29

In order to add more public kiosks to our library system and use a minimal amount of library space the committee recommends a pilot project using Android Tablets locked to our catalogue and mounted in branches currently without kiosks.

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Table 9

Tablet Kiosk Pilot		
PRL	0	\$0.00
Eastern	4	\$1,424.00
Central	4	\$1,424.00
Western	4	\$1,424.00
Total	12	\$4,272.00

Connectivity

Newfoundland & Labrador Public Libraries have various internet connections. In most cases, our connectivity is stable and reliable. In a few communities the physical infrastructure does not offer us the ability to purchase sufficient bandwidth for our patrons or our staff. The committee cannot set a standard for connectivity due to the variety of internet options in the Province, but, where costs allow, we recommend upgrading to services with the best download and upload rates available.

Table 10

Monthly Connectivity Cost Per Division	
PRL	\$1,420.90
Eastern	\$3,333.94
Central	\$3,957.14
Western	\$3,437.45
Monthly Cost	\$12,149.43

As internet applications increase in complexity and popularity and more patrons bring their own devices to the library, we expect bandwidth requirements to increase. With this in mind and preparing for connectivity price increases, we recommend an annual increase of 5% to our connectivity expenditures.

Software

Public libraries give patrons the opportunity to use current software tools. This experience prepares them for modern education systems and the digital work environment. Additionally, using the library model of sharing resources, patrons gain access to expensive software for cultural creation that they would not be able to afford on an individual basis.

Our patrons receive the greatest benefit when they are using a current Microsoft operating system on public computers, have access to professional office applications, and the ability to use specialized content creation programs. To accomplish these goals we recommend the current version of Microsoft Windows and Microsoft Office be installed on our public computers, and that the Adobe editing suite be installed in larger library branches

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Tables 11 – 14 list the number and costs of the recommended software licenses for our public computers.

Table 11

Public Windows OS		
PRL	26	\$3,900.00
Eastern	108	\$16,200.00
Central	88	\$13,200.00
Western	86	\$12,900.00
Total	308	\$46,200.00

Table 12

Public Kiosks Windows OS		
PRL	7	\$1050.00
Eastern	1	\$150.00
Central	0	\$0.00
Western	0	\$0.00
Total	8	\$1200.00

Table 13

Public Microsoft Office		
PRL	26	\$3,120.00
Eastern	108	\$12,960.00
Central	88	\$10,560.00
Western	86	\$10,320.00
Total	308	\$36,960.00

Table 14

Public Adobe Editing Suite		
PRL	3	\$5,700.00
Eastern	1	\$1,900.00
Central	1	\$1,900.00
Western	1	\$1,900.00
Total	6	\$11,400.00

Additional Services

TVs

Libraries are a trusted source for information, and televisions are useful tools for providing that information. In large branches, with our current TVs and the purchase of additional TVs, we can provide access to emergency news broadcasts, local news coverage, and specialized announcements.

Table 15

TVs		
Main/Urban/Middle branches	16	\$7,200.00

Rise Vision

In order to disseminate information to these TVs, the committee has identified the Rise Vision Intel Compute Stick and its accompanying subscription service used to manage the display of information on the TVs as the recommended option. The Compute Sticks connect to the TVs and the wireless network and allow information to be displayed on the TVs. This information is updated via a subscription service provided by Rise Vision. The subscription service is a web based service, which will give staff the tools necessary to show patrons relevant information.

Table 16

Rise Vision Intel Compute Stick		
Main/Urban/Middle branches	31	\$7,819.75

Table 17

Rise Vision Advanced Subscription		
Covers all locations	1	\$1,179.25

Pilot Projects

As cutting-edge technologies are introduced to the public, the library is an affordable method for patrons to experience these technologies and consider if they want to pursue personal projects utilizing the new devices. This low-risk environment encourages participation in new economies and stimulates technological cultural expression giving the people of Newfoundland & Labrador the opportunity to engage with the world-wide hi-tech community. We suggest funding be allocated to create pilot programs in each division to introduce communities to things like 3D printing, virtual reality, and other technologies as they are developed.

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Using 3D printing as an example of such a pilot project, we could provide each division with a 3D printer and printer filament. We can recover costs on expendable materials like the filament by charging patrons per usage.

Table 18

Pilot Project Fund		
Device	4	\$4,000.00
Materials	4	\$800.00
Yearly Investment	\$4,800.00	

Mobile Devices

As our selection of digital materials increase, some patrons may be hesitant to purchase devices to read this material without seeing their benefits firsthand. In order to offer communities the ability to try our digital content themselves and become familiar with its conveniences, we recommend the purchase of tablets and mobile phones for rotational use between branches. Having these items available will educate people about using online app stores, provide them with experience using apps, and give them familiarity with contemporary content delivery. Additionally, providing our staff with access to these devices gives them the skills necessary to explain their use to patrons when they are approached for help with using our digital content.

Table 19

Mobile Devices		
Apple iPad	8	\$6,799.92
Samsung Tablet	8	\$4,399.92
iPhone	8	\$7,432.00
Samsung Galaxy	8	\$8,280.00
Initial Investment	32	\$26,911.84

Proloquo2Go

With the Apple iPads, the committee recommends the purchase of the Proloquo2Go app. This app gives people with communication difficulties, such as people who have suffered a stroke or those who have autism, to communicate by selecting pictures in the app and using the iPad as a translator. Providing this app will allow us to give better service to patrons who have trouble communicating and will allow them to experience the joys of communicating when they visit the library.

Table 20

Proloquo2Go		
Apple iPad app	8	\$2,521.12

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Kwikboost Power Hub IK

As patrons increasingly bring their own devices to the library, our ability to offer them easy access to electrical outlets will help improve their library experiences. The Kwikboost Power Hub IK can be installed on a desk or other surface with the addition of a three inch hole and access to an electrical outlet. The Power Hub makes access to electrical sockets convenient obviating the need to crouch or kneel in order to plug in a device. The committee recommends a pilot project in 21 branches to determine the feasibility of this solution for the entire system.

Table 21

Kwikboost Power Hub IK		
PRL	3	\$2,270.07
Eastern	6	\$4,540.14
Central	6	\$4,540.14
Western	6	\$4,540.14
Initial Investment	21	\$15,890.49

Colour Printers

The committee recommends the Information Technology and Information Management Division enact a policy of no colour printers within the organization. If a local board would like a colour printer at their library and they can raise the funds to cover the cost of the printer and the ink used by it, then the committee recommends that the Information Technology and Information Management Division [help with the](#) purchase of these printers for those local boards.

Library Services

Online Catalogue

Our online catalogue is the digital foyer of all our library branches. Through it, access to both our physical content and our eBook collection is possible with the correct technology. Currently, we offer a simple catalogue based on old technology. We are in the process of upgrading to a new catalogue that will feature mobile friendly interfaces. With the purchase of additional modules we can make our digital foyer comparable to digital stores like Indigo.ca or Amazon.ca. These features give patrons reviews and suggestions about material they might enjoy, and they integrate the use of eBooks with physical books, so patrons need only visit one place to conduct all their digital library activities such as renewing items or placing requests.

Table 22

Enterprise Catalogue	
Yearly Subscription Fee	\$10,360.00

eResource Central is a product offered by SirsiDynix, which is the company that produces the software used by our staff in the management of library resources. It allows content from our eBook collection to be searched, borrowed, and requested from the same catalogue as our physical collection. Additionally, eResource Central works with multiple digital content products. As we expand the services we offer, we can upgrade our subscription to eResource Central to give our patrons a single point of access to multiple collections. This reduces the need to use multiple systems and provides a familiar user interface for patrons to navigate.

Table 23

eResource Central	
Yearly Subscription Fee	\$7,200.00

Novelist Select provides additional content for our catalogue. Professional book reviews and additional discovery methods would give our catalogue features comparable to hi-tech consumer websites. These features make the site more pleasing to look at, conform to contemporary user experiences, and increase the visibility of our collections.

Table 24

Novelist Select	
Yearly Subscription Fee	\$8,400.00

BLUEcloud Commerce gives us the ability to offer online payments of fines to our patrons. Currently, with a single exception, Newfoundland & Labrador Public Libraries can only accept cash payments for fines. This lack of payment options is severely outdated and may hinder some people in the prompt

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payment of their fines. In an era when books can be downloaded directly in your own home, requiring patrons to visit a location and pay for the late return of physical items in cash is at best antiquated and at worst anachronistic and most likely deters people from taking full advantage of all our materials.

Table 25

BLUEcloud Commerce	
Yearly Subscription Fee	Quote Pending

Searching online has become a standard method of finding information even at a local level. Where someone would once have checked the yellow pages they now consult Google. Behind the visible World Wide Web there is another web named the Semantic Web. The Semantic Web summarizes the visible web in a syntax that computer systems can process. Search engines like Google use semantic web information to improve search results. SirsiDynix's BLUEcloud Visibility translates out catalogue's information into semantic data that will be seen by all major search engines. This will match patrons' World Wide Web searches for content with our collection further increasing our circulation numbers and making better use of our materials.

Table 26

BLUEcloud Visibility	
Yearly Subscription Fee	Quote Pending

Public Library Website

The Newfoundland & Labrador Public Library needs a website that is responsive on mobile devices. Our current site is cumbersome to use on small screens and makes all the information it contains difficult to access. In an age where the majority of surfing the internet is conducted on phones and tablets, the library system should offer an excellent mobile experience. Additionally, we need a streamlined user experience with expressive content that encourages patrons to trust us as a source of information

In 2015 we requested bids for professional website development services, the preferred bid was priced at \$68,037.30. Taking into consideration inflation and the need to offer integration with more digital content, we recommend a budget of \$80,000.00 for the development of a new website.

Table 27

Public Library Website	
Budget Recommendation	\$80,000

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Social Media

Social Media, like Facebook and Twitter, are important aspects of people's information gathering habits. According to the Canadian Internet Registration Authority (CIRA), 71% of Canadians spend at least 3-4 hours on the internet each day (*CIRA Provides a Snapshot of the Canadian Internet through Canada's Internet Factbook*). In order to inform our patrons about our collection, programs, and new initiatives we need to cultivate a following and engage with patrons on social media. This requires a concerted effort between Professional Librarian staff and front line staff that involves social media training, strategizing, and action. To improve our social media outreach, this committee recommends a subscription to Hootsuite. Hootsuite is a social media management application that would provide a staff member the tools needed to manage multiple social media accounts on different social media platforms, which allows our communications to be organized and delivered in a timely manner. Additionally, to coordinate this process, the committee recommends the creation of Librarian 2B position with the title of Social Media Librarian to plan, organize, and direct our social media efforts.

Table 28

Hootsuite	
Yearly Subscription Fee	Quote Pending

Table 29

Social Media Librarian	
Annual Salary	\$69,979.00

Library Infrastructure

Staff Workstations

There is at least one computer for staff use at all of our locations. In busier locations, multiple computers are present to assist more than one patron at a time. Additionally, staff at administrative locations are provided with computers and, in some cases, laptops. In the same manner as our public computers, the committee recommends replacing one fifth of staff computers every year. This requires the library system to operate machines for two years outside of warranty, but experience has shown that this is a reasonable measure to take. However, extending the period beyond five years is not recommended: as maintenance tasks and time needed to replace failing computers increase, too much strain is placed on staff, which adversely affects information management's ability to deliver robust digital services.

Government's standing offer agreement allows the library system to purchase computers for \$681.43 per unit. If NLPL replaces one fifth of its staff workstations every year, we will require \$29,301.49 per year to maintain reasonable workplace efficiency.

Table 30

Staff Workstations	
PRL	35
Eastern	58
Central	46
Western	75
Total	214
Pear Year	43
Yearly Investment	\$29,301.49

Staff and Lab Laptops

For staff who are mobile, laptops are provided for workplace use. There are a total of 35 laptops in the system. Many of the Professional Librarians and staff at headquarters need to travel for work duties. Having access to a laptop ensures the use of office software while traveling. Additionally, we provide laptops for use in computer labs that can be reserved for staff and public use.

We recommend replacing one fifth of our laptops every year. That will require the purchase of 7 new laptops per year. The standing offer cost for laptops is \$862.50. This upgrade cycle will cost \$6,037.50 per year.

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Staff and Lab Laptops	
Eastern	12
Central	4
Western	19
Total	35
Per Year	7
Yearly Investment	\$6,037.50

Data Centre

Coordinating the work of libraries and librarians throughout the province requires considerable computing power. Furthermore, ensuring that we protect the privacy of our patrons necessitates the use of a within-Province data centre. Newfoundland & Labrador Public Libraries maintains a data centre in St. John's and a redundant off-site system in Mount Pearl. This configuration ensures fast recovery from failure of the main data centre; thus, it provides the Province with the assurance that library services will continue to function in the event of hardware failure or prolonged connectivity issues.

While these machines cannot be replaced in a regular yearly cycle, the committee recommends further investment in data centre hardware. For instance, the Dell KACE Patch and Asset Management system is necessary to allow us to maintain software license compliances and deploy computer updates. Investments in products like this as well as upgrading our current infrastructure will ensure new hardware that will keep the data centre reliable while maintaining current performance levels.

Table 32

Data Centre Hardware	
Yearly Investment	\$100,000

Software Licenses

Windows Operating System

Desktop operating systems run the majority of our staff computer infrastructure. Most of our staff computers have Windows 7 installed. The remaining computers use Windows 10. The library should provide staff with the tools necessary to meet job requirements and patron expectations.

With those considerations in mind, the committee recommends operating our staff Windows OS as close to the end of their support cycle as possible and upgrading when there is the ability to train staff.

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Microsoft Office

Our staff have Microsoft Office on their computers. While using the newest version of Microsoft Office ensures access to the latest files, training staff on the use of new interfaces requires a considerable allotment of Information Management staff time, and the library system can afford to use our current version of Microsoft Office until it reaches end-of-life. The committee recommends retaining Microsoft Office 2013 on our staff computers.

Data centre software

The data centre requires specialized software licenses to operate. These manage email, data backups, security, and library services. The current cost of our data centre licensing is approximately \$15,000 per year. The budget needs to accommodate these fees to ensure the continued use of our data centre and off-site recovery solution. Additionally, we need new software licenses to expand our services to patrons and staff. In total, our yearly data centre licensing fees are estimated at \$37,000.00.

Table 33

Data Centre Software	
Yearly Licensing Fees	\$37,000

Unifi Cameras

Our Division Managers, aware of Occupational Health & Safety guidelines, have been tasked with checking in with their employees at regular intervals. Due to the geographic dispersion of our libraries, this poses a challenging problem. A possible solution is the installation of Unifi Cameras at some of our locations. Placing these cameras near the entry way and the staff desk will increase the security of our staff and help ensure their safety. In combination with the Unifi switches and gateways recommended for the wifi infrastructure (see tables 10 – 13) and access to the necessary connectivity, we can remotely monitor the majority of our physical locations giving managers the ability to ensure their staff are safe when working at our libraries.

To maintain the camera recordings we recommend the purchase of four computers and network attached storage systems—one for each division at approximately \$2,500 per system. Additionally, for sites with slow internet connections we will need a Unifi Network Video Recorder installed locally. 33 sites will require local video recorders at a cost of \$529.00 per recorder.

We recommend a maximum of three cameras per location at a cost of \$250.00 per camera. To install the cameras will require running wires from the cameras to our computer equipment. The committee estimates that the average installation cost is \$150.00 per camera.

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Table 34

Unifi Cameras		
PRL	7	\$1750.00
Eastern	58	\$14,500.00
Central	64	\$16,000.00
Western	59	\$14,750.00
Total	188	\$47,000.00

Table 35

Divisional Storage/Unifi Recorders		
PRL	1	\$2,500.00
Eastern	7	\$5,674.00
Central	15	\$9906.00
Western	14	\$9,377.00
Total	37	\$27,457.00

Table 36

Unifi Camera and Recorder Installation		
PRL	7	\$1,050.00
Eastern	58	\$8,700.00
Central	64	\$9,600.00
Western	59	\$8,850.00
Total	188	\$28,200.00

LibGuides

LibGuides is a service used by our Early Literacy Program and our Professional Librarians. It allows the library to provide information to the public in an organized and attractive format. The ability to edit and create guides gives our staff the initiative to create and update online information in a manner that does not require special technical skills. This ease of use increases information production and gives the public specialized information that is up-to-date and relevant to their interests.

Table 37

LibGuides	
Yearly Subscription Fee	\$3,500.00

Books in Print

Books in Print provides our selectors detailed information about publication dates, authors, titles, series, and publishers in formats that can be searched or browsed. This curated information is essential for ordering materials and verifying details about our collection.

Table 38

Books in Print	
Yearly Subscription Fee	\$16,135.00

OCLC WorldShare Record Manager

The Online Computer Library Center (OCLC) provides services that allow the library system to retrieve information about books, DVDs, and other library materials, so that information can be added to our catalogue for patrons to find. Currently, NLPL retrieves information about Newfoundland & Labrador items as well as other Canadian items from Library and Archives Canada's AMICUS system. This system is being decommissioned in 2018 and replaced with services from OCLC. Without access to AMICUS, our Technical Services staff will need to generate details about Newfoundland & Labrador material on a case-by-case basis. This will require substantially more time than is currently required. By subscribing to OCLC WorldShare Record Manager, we will ensure that Technical Services continues to add new items to our catalogue in acceptable timeframes allowing our staff to place these items on library shelves and giving patrons access to new items as soon as possible.

Table 39

OCLC WorldShare Record Manager	
Yearly Subscription Fee	\$20,000.00

Information Technology and Information Management Staffing Recommendations

Currently, the Information Technology and Information Management Division consists of the Director of the Division, three LAN Administrators, a Computer Support Specialist, a Systems Librarian, and a Programmer Analyst. These seven individuals would be responsible for maintaining the entirety of the recommendations in this report. In many cases, the LAN Administrators and the Computer Support Specialist must travel to libraries to ensure that physical infrastructure is installed properly and maintained, which expends a considerable amount of their working hours.

The committee recommends the reinstatement of the three Computer Support Specialist positions. The current Computer Support Specialist is assigned to PRL/Eastern Division. These reinstated positions would be assigned to PRL/Eastern, Central, and Western Divisions ensuring that all divisions have a Computer Support Specialist.

By providing a Computer Support Specialist in every division, we will ensure patron and staff infrastructure is given excellent attention. Furthermore, the LAN Administrators can mentor the Computer Support Specialists ensuring continuity in service within the divisions as LAN Administrators retire. This continuity will smooth the transition as new staff are hired to replace retiring employees and ensure that vital Division knowledge is retained within the organization.

Table 40

3 Computer Support Specialists	
Annual Salary	\$148,675.80

Possible Scenarios

The committee proposes two possible scenarios. In the first scenario, we maintain our current staffing levels and in the other scenario the recommended Computer Support Specialists and a Social Media Librarian are hired. With the addition of new staff, we are confident that all the recommendations of the Technology Service Delivery Standards Committee can be achieved. With current staffing levels we will list the recommendations that are necessary and achievable. In both cases, we list the order of importance of all the recommendations.

Current Staff Level Priorities

1. Connectivity (Table 10)
2. Wireless Internet (Table 7)
3. Public Computers (Table 5)
4. Public Windows OS (Table 11Table 11)
5. Public Microsoft Office (Table 13)
6. Public Adobe Editing Suite (Table 14)
7. Staff Workstations (Table 30)
8. Staff and Lab Laptops (Table 31)
9. Data Centre (Table 32)
10. Data Centre Software (Table 33)
11. Public Library Website (Table 27)
12. Enterprise Catalogue (Table 22)
13. BLUEcloud Commerce (Table 25)
14. LibGuides (Table 37)
15. Public Kiosks (Table 8)
16. Public Kiosks Windows OS (Table 12)
17. Books in Print (Table 38)
18. OCLC WorldShare Record Manager (Table 39)

Initial Cost: \$535,000.00

Yearly Cost: \$273,000.00

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Recommended Staff Level Priorities

1. Computer Support Specialists (Table 40)
2. Connectivity (Table 10)
3. Wireless Internet (Table 7)
4. Public Computers (Table 5)
5. Public Windows OS (Table 11)
6. Public Microsoft Office (Table 13)
7. Public Adobe Editing Suite (Table 14)
8. Staff Workstations (Table 30)
9. Staff and Lab Laptops (Table 31Table 31)
10. Data Centre (Table 32)
11. Data Centre Software (Table 33)
12. Public Library Website (Table 27)
13. Enterprise Catalogue (Table 22)
14. BLUEcloud Commerce (Table 25)
15. Unifi Cameras (Table 34, Table 35, and Table 36)
16. eResource Central (Table 23)
17. NovelList Select (Table 24)
18. BLUEcloud Visibility (Table 26)
19. Hootsuite (Table 28)
20. Social Media Librarian (Table 29)
21. LibGuides (Table 37)
22. Kwikboost Power Hub IK (Table 21)
23. Public Kiosks (Table 8)
24. Public Kiosks Windows OS (Table 12)
25. Public Kiosk Tablet Pilot (Table 9)
26. Books in Print (Table 38)
27. Mobile Devices (Table 19)
28. Proloquo2Go (Table 20)
29. Pilot Projects (Table 18)
30. TVs (Table 15)
31. Rise Vision Intel Compute Stick (Table 16 and Table 17)
32. OCLC WorldShare Record Manager (Table 39)

Initial Cost: \$942,000.00

Yearly Cost: \$513,000.00

Conclusions

Newfoundland & Labrador are served best by their public library system when the Province's libraries can provide citizens the tools to participate in digital culture and discover our varied library materials at multiple access points. Either of the committee's priority lists provide considerable improvements that will help the Province meet the challenges of the digital divide, increase digital inclusion, and promote digital literacy. Furthermore, either list will increase access to our valuable library materials in both physical and digital formats.

In the case of our recommended staffing level priorities, we add an additional 14 priorities. Without the appropriate levels of staff, the necessary attention required to install and maintain these priorities is not manageable. However, with a full staffing complement, we are confident that the additional recommendations will add considerable value and that patron satisfaction will increase measurably.

The addition of extra staff allows us to recommend even more technology services for our patrons including mobile devices, communication apps, content creation applications, cutting edge technology pilot projects, TVs, and a library catalogue that is discoverable through search engines and that offers access to both our physical and electronic resources.

As well, the installation of Unifi cameras at the majority of our library branches is feasible with more staff. These cameras will increase staff sense of security and their physical safety while giving our Division Managers the ability to check in with staff in compliance with Occupational Health & Safety regulations.

With the proper investments, the Newfoundland & Labrador Public Libraries will be well equipped to assist the people of this Province as changes in demographics, inventions of new technologies, and new forms of cultural expression make themselves apparent in the next 20 years.

Works Cited

- Bertot, John Carlo. "Building Digitally Inclusive Communities." *Proceedings of the 9th International Conference on Theory and Practice of Electronic Governance - ICEGOV '15-16*, 2016, pp. 95–102, doi:10.1145/2910019.2910082.
- Bertot, John Carlo, Brian Real, and Paul T. Jaeger. "Public Libraries Building Digital Inclusive Communities: Data and Findings from the 2013 Digital Inclusion Survey." *The Library Quarterly*, vol. 86, no. 3, 2016, pp. 270–89, doi:10.1086/686674.
- Bishop, Bradley Wade, et al. "The Role of Rural Public Libraries in Small Business Development." *Public Library Quarterly*, vol. 35, no. 1, 2016, pp. 37–48, doi:10.1080/01616846.2016.1163971.
- CIRA Provides a Snapshot of the Canadian Internet through Canada's Internet Factbook.
<http://www.newswire.ca/news-releases/cira-provides-a-snapshot-of-the-canadian-internet-through-canadas-internet-factbook-657425623.html>.
- McConnell, Bridget. "Making It Happen in Glasgow: A Vision for Glasgow Libraries." *Public Library Quarterly*, vol. 36, no. 2, 2017, pp. 136–53, doi:10.1080/01616846.2017.1313036.
- Organizational and Service Review of the Newfoundland and Labrador Public Library*. May, 2017, pp. 1–125.
- Public Libraries & Digital Inclusion*. 2015, pp. 1–4,
<http://digitalinclusion.umd.edu/sites/default/files/DigitalInclusionBrief2015.pdf>.
- Simms, Alvin, and Jamie Ward. *Regional Population Projections For Newfoundland And Labrador 2016-2036*. 2017, pp. 1–131,
http://www.mun.ca/harriscentre/PopulationProject/Population_Projections_for_NL.pdf.

Appendixes

Appendix A: Inventory Counts (PRL Division counts are included in Eastern Division Counts)

NLPL Location	Staff Workstations	Public Workstations	Children PC's	Laptops	HIP Kiosk	Other Workstations	Router	WIFI AP	Total WinOS Workstations	Site Total Workstations
Summary Totals										
Totals Eastern	93	156	6	12	8	5	33	34	280	313
Totals Central	46	141	0	4	0	2	32	32	193	225
Totals Western	75	143	24	19	0	2	30	30	253	289
NLPL Total	214	440	30	35	8	9	95	96	726	827
EASTERN										
AC Hunter	1	10	0	9	3	2	1	1	25	26
AC Hunter Children's	0	0	3	0	2	2	0	1	7	7
Arnolds Cove	1	2	0	0	0	0	1	1	3	4
Bay Roberts	3	9	0	0	0	0	1	1	12	13
Bonavista	1	4	0	0	0	0	1	1	5	6
Bell Island	1	4	0	0	0	0	1	1	5	6
Brigus	2	4	0	0	0	0	1	1	6	7
Burin	2	5	0	0	0	0	1	1	7	8
Catalina	1	2	0	0	0	0	1	1	3	4
Carbonear	2	8	1	0	0	0	1	1	11	12
Clarenville	2	4	0	0	0	0	1	1	6	7
Conception Bay South	2	6	0	0	0	0	1	1	8	9
Fortune	1	5	0	0	0	0	1	1	6	7
Fox Harbour	1	4	0	0	0	0	1	1	5	6
Garnish	1	2	0	0	0	0	1	1	3	4
Grand Bank	1	4	0	0	0	0	1	1	5	6
Harbour Grace	2	4	0	0	0	0	1	1	6	7
Holyrood	1	4	0	0	0	1	1	1	6	7
Marystown	1	4	0	0	0	0	1	1	5	6
Marjorie Mews	3	4	0	0	1	0	1	1	8	9
Micheal Donovan	3	4	0	0	1	0	1	1	8	9
Mount Pearl	6	12	2	0	1	0	1	1	21	22
Old Perlican	1	2	0	0	0	0	1	1	3	4
Placentia	2	8	0	0	0	0	1	1	10	11

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PRL Staff	35	0	0	1	0	0	1	0	36	37
Eastern Division Office	4	0	0	0	0	0	0	0	4	4
Eastern IT Office	3	0	0	2	0	0	0	1	5	5
Pouch Cove	1	3	0	0	0	0	1	1	4	5
St. Brides	1	6	0	0	0	0	1	1	7	8
St. Lawrence	1	8	0	0	0	0	1	1	9	10
Southern Harbour	1	6	0	0	0	0	1	1	7	8
Torbay	2	4	0	0	0	0	1	1	6	7
Trepassey	1	4	0	0	0	0	1	1	5	6
Victoria	1	2	0	0	0	0	1	1	3	4
Whitbourne	1	5	0	0	0	0	1	1	6	7
Winterton	1	3	0	0	0	0	1	1	4	5

Totals Eastern	93	156	6	12	8	5	33	34	280	313
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CENTRAL

Baie Verte	1	5	0	0	0	0	1	1	6	7
Bishops Falls	1	6	0	0	0	0	1	1	7	8
Botwood	1	8	0	0	0	0	1	1	9	10
Buchans	1	4	0	0	0	0	1	1	5	6
Carmanville	2	6	0	0	0	0	1	1	8	9
Central IT Office	2	0	0	4	0	0	0	0	6	6
Centreville	1	2	0	0	0	0	1	1	3	4
Change Islands	1	2	0	0	0	0	1	1	3	4
Fogo Island	1	4	0	0	0	0	1	1	5	6
Gambo	1	5	0	0	0	0	1	1	6	7
Gander	5	8	0	0	0	1	1	1	14	15
Gander HQ	3	0	0	0	0	0	0	0	3	3
Gaultios	1	2	0	0	0	0	1	1	3	4
Glenwood	1	4	0	0	0	0	1	1	5	6
Glovertown	1	4	0	0	0	0	1	1	5	6
Grand Falls - Windsor	4	8	0	0	0	1	1	1	13	14
Greenspond	1	4	0	0	0	0	1	1	5	6
Harbour Breton	1	4	0	0	0	0	1	1	5	6
Hare Bay	1	4	0	0	0	0	1	1	5	6
Harry's Harbour	1	2	0	0	0	0	1	1	3	4
Hermitage	1	2	0	0	0	0	1	1	3	4
King's Point	1	5	0	0	0	0	1	1	6	7
La Scie	1	4	0	0	0	0	1	1	5	6
Lewisporte	1	6	0	0	0	0	1	1	7	8
Lumsden	1	4	0	0	0	0	1	1	5	6
Musgrave Harbour	1	4	0	0	0	0	1	1	5	6
Norris Arm	1	4	0	0	0	0	1	1	5	6
Point Leamington	1	4	0	0	0	0	1	1	5	6
Roberts Arm	1	4	0	0	0	0	1	1	5	6

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Seal Cove	1	2	0	0	0	0	1	1	3	4
Springdale	1	6	0	0	0	0	1	1	7	8
St. Albans	1	4	0	0	0	0	1	1	5	6
Summerford	1	4	0	0	0	0	1	1	5	6
Twillingate	1	6	0	0	0	0	1	1	7	8
Wesleyville	1	0	0	0	0	0	0	0	1	1

Totals Central	46	141	0	4	0	2	32	32	193	225
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WESTERN

Bay St George South * (WSF)	1	5	0	0	0	0	1	1	6	7
Burgeo * (WBO)	1	5	0	0	0	0	1	1	6	7
Cape St. George * (WCS)	1	6	1	0	0	0	1	1	8	9
Cartwright * (LCT)	1	4	0	0	0	0	1	1	5	6
Codroy Valley* (WCV)	1	5	0	0	0	0	1	1	6	7
Cormack (WCM)	1	4	1	0	0	0	1	1	6	7
Corner Brook (WCB)	7	9	2	0	0	2	1	1	18	21
Cow Head (WCH)	1	5	1	0	0	0	1	1	7	8
Daniels Harbour (WDH)	1	3	0	0	0	0	1	1	4	5
Deer Lake (WDL)	3	8	2	0	0	0	1	1	13	14
Happy Valley (LHV)	1	6	1	0	0	0	1	1	8	9
Labrador South (NLP)	1	4	1	0	0	0	1	1	6	7
Labrador City (LLC)	3	7	2	1	0	0	1	1	13	14
Lark Harbour* (WLH)	1	4	1	0	0	0	1	1	6	7
Lourdes* (WLR)	1	3	0	0	0	0	1	1	4	5
Norris Point* (WNP)	1	4	1	0	0	0	1	1	6	7
Pasadena (WPA)	1	5	1	0	0	0	1	1	7	8
Port au Port * (WPE)	1	4	1	0	0	0	1	1	6	7
Port aux Basques (WPB)	2	6	1	0	0	0	1	1	9	10
Port Saunders (NPS)	1	4	1	0	0	0	1	1	6	7
Ramea * (WMP)	1	3	0	0	0	0	1	0	4	5
Rocky Harbour * (WRH)	1	4	1	0	0	0	1	1	6	7
St Anthony (NSA)	1	4	1	0	0	0	1	1	6	7
St Georges (WSG)	1	4	1	0	0	0	1	1	6	7
Sop's Arm * (WSM)	1	3	0	0	0	0	0	1	4	4
Stephenville (WST)	4	10	2	1	0	0	1	1	17	18
Stephenville Xing (WSX)	1	5	1	0	0	0	1	1	7	8
Wabush (LWH)	2	4	1	0	0	0	1	1	7	8
Woody Point (WWP)	1	5	0	0	0	0	1	1	6	7
West NL-Lab Div. (WWR)	3	0	0	1	0	0	1	1	4	5
West NL-LAB IT Office	2	0	0	6	0	0	1	0	0	9
HEADQUARTERS - Stephenville	25	0	0	7	0	0	Sonicwall	1	32	32
Early Literacy Project	1	0	0	3	0	0	0	0	4	0

Totals Western	75	143	24	19	0	2	30	30	253	289
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