

Technology Access in Public Libraries: Outcomes and Impacts for Ontario Communities

Discussion Paper and Interim Report

June 2017

Prepared by:



For:





Funding for this project has been provided by the Government of Ontario.



Toronto Public Library would like to thank the following Ontario public libraries for their participation in the project:

Innisfil Public Library

Kitchener Public Library

Mattawa Public Library

Naotkamegwanning First Nation Public Library

Perth & District Union Public Library

Wkwemikong First Nation Library

Windsor Public Library

These partner libraries generously provided input during the research and design phases of the project, and will be piloting the resulting Toolkit in their communities.

Contents

Executive Summary	4
1. Introduction	11
1.1 About the Toolkit	12
1.2 About this Report	13
2. Current Landscape of Public Libraries in Ontario	14
3. Approaches to Measurement and Evaluation	17
3.1 The Challenge of Evidence-Based Decision Making	17
3.2 Approaches to Outcome Measurement in Libraries and Beyond	18
4. Key Outcomes of Access to Technology at Public Libraries	21
4.1 Primary Outcomes	22
4.1.1 Digital Inclusion	22
4.1.2 Digital Literacy	26
4.2 Secondary Outcomes	29
4.2.1 Increasing Community, Social and Civic Engagement	30
4.2.2 Fostering Creativity and Innovation	34
4.2.3 Enabling Entrepreneurship and Business Development	37
4.2.4 Developing the Workforce	38
4.3 Summary of Outcome Areas	41
5. Current Evaluation Tools for the Library Sector	42
6. Conclusion	45
Appendix A. Resources Consulted	46
Appendix B. Stakeholders Consulted	48

Key Terms and Definitions

Technology Services: For the purposes of this report, technology services at public libraries include:

- *Connectivity Services* (i.e., on-site and off-site access to Internet);
- *Technology Equipment and Facilities* (e.g., on-site and off-site access to devices, including laptops/tablets and assistive technology equipment, equipment and facilities related to design, publishing, audio-visual production, gaming consoles and virtual reality systems); and,
- *Digital Literacy Training and Support* (i.e., formal one-on-one support and classes).

Digital inclusion refers to individuals' access to a high-speed Internet connection, Internet-enabled devices, software, emerging technologies, and spaces within which to make use of these resources for various purposes.

Digital literacy encompasses the skills needed to take full advantage of both current and emerging technologies. It involves the ability, for people of all ages, to not only find and communicate information, but to effectively use digital tools to meaningfully engage with, and the knowledge to critically evaluate, digital information.

Civic engagement: Citizen participation in the public realm, including through engagement with the electoral process, access to government resources and services, and involvement with non-profit groups and organizations.

Community and social engagement: The sense of belonging to community and/or social networks, as reflected by strong relationships with family and friends, participation in social activities, and connection to communities of shared interests and/or needs¹

Executive Summary

The Objective

The knowledge economy is driven by the wide adoption and use of technology, leading to economic and social change and creating the potential to improve the quality of life for Ontarians. Public libraries across the province contribute to Ontarians' ability to seize the opportunities presented by the digital world as libraries offer free and accessible technology services. For many, public libraries are the primary, if not only, access point for a variety of technology resources.

Access to technology and training enables people to achieve personal and professional goals, including those related to social and community connections, lifelong learning, skills development and entrepreneurship. These goals correspond to public policy priorities such as poverty reduction and workforce development, among others. Furthermore, as government services themselves are increasingly delivered online, the success of initiatives such as Digital Government hinges on inclusive access to technology and digital literacy, which public libraries support.

Public libraries are continuously expanding their service offering to include, in addition to access to the Internet, current and emerging technologies, specialized training and other technology resources. In doing so, they play a critical role in helping people participate in and benefit from the digital economy. Public libraries break down the barriers of awareness, access, affordability and lack of skills in using technology and interacting with digital information.

To help Ontario public libraries expand the reach and effectiveness of the technology services that they deliver to their communities, Toronto Public Library (TPL) and partner libraries set out to develop a suite of resources, informed by research and stakeholder consultations, to enable the assessment of technology services at public libraries. At the heart of the project is the development of a "Toolkit" – that is, a web-based solution for gathering data to inform decision-making on the use and outcomes of technology services offered by public library systems in Ontario.

Implementation of this Toolkit will build the collective capacity of Ontario public libraries to deliver services that are responsive to the rapidly changing technology landscape, as well as the unique needs of their communities. The Toolkit will contribute to a more complete, more accurate picture of how technology services fulfill the mandate of public libraries to deliver effective and efficient service. It will also help libraries understand and demonstrate not only how technology services directly benefit residents of their communities, but how these services align with and support social and economic priorities at multiple levels of government.

About the Project

To achieve the objectives outlined above, TPL engaged Nordicity to develop and pilot the **Technology Services Assessment Toolkit**. The project is ongoing from mid-year 2016 to January 2018. It consists of three primary phases:

- **Phase 1 | Research and Consultation (complete):** The first phase of the project involved secondary research and consultation with policy makers, educators, librarians (including those in First Nations communities) and other library sector experts.
- **Phase 2 | Toolkit Design and Development (complete):** The second phase of the project, informed by the results of Phase 1, encompassed the design, development and internal testing/quality assurance of the Toolkit.

- **Phase 3 | Pilot Implementation:** The third phase of the project, which is currently underway, involves testing and refining the Toolkit through two pilots with a group of public library systems across Ontario.¹

This discussion paper summarizes the findings of the first two phases of the project, and presents the outcome framework and Toolkit structure that are currently being piloted. The aim of the summary is to inform Ontario public libraries and the wider public library sector about progress on this project.

A final report will be available in January 2018, along with a user-tested Toolkit.

Key Contacts

Vickery Bowles, City Librarian, Toronto Public Library | citylibrarian@torontopubliclibrary.ca

Elizabeth Glass, Director of Policy, Planning and Performance Management, Toronto Public Library | eglass@torontopubliclibrary.ca

Carmen Ho, Planning Specialist, Policy, Planning and Performance Management, Toronto Public Library | cho@torontopubliclibrary.ca

Kristian Roberts, Partner, Nordicity | kroberts@nordicity.com

Negin Zebarjad, Manager, Nordicity | nzebarjad@nordicity.com

Funding for this project has been provided by the Government of Ontario.

The Challenge

As discussed above, this project responds to the demands that technology places on both residents and communities across Ontario. In today's world, social and economic participation are highly dependent on the ability to navigate the digital world and interact with digital information and networks. Without access to technology and the skills required to use it, individuals are at a risk of exclusion from activities that are critical to their well-being and ability to achieve success. For example:

- Without the ability to navigate online platforms, people can face barriers in terms of staying connected to friends, family and their communities (e.g., via social media networks), learning about and accessing public services (e.g., via online government resources) and generally staying informed.
- Lack of technology access and skills can limit opportunities to create and engage with information, products and experiences, all of which increasingly exist in the digital realm.
- In the face of increased global competition, a lack of capacity to adopt new digital tools and platforms limits the ability of small businesses and entrepreneurs to access markets and growth opportunities.

¹ The first pilot is in progress at TPL and Innisfil Public Library. The second pilot will be rolled out to the following libraries in summer 2017: Kitchener Public Library, Mattawa Public Library, Naotkamegwaning First Nation Public Library, Perth & District Union Public Library, Wikwemikong First Nation Public Library and Windsor Public Library.

- People at all stages of their educational and professional development are adapting to new skills demands emerging because of technological advancements. Even in non-technical positions, individuals who are not digitally-engaged/competent are at a great disadvantage.

Essentially, *digital inclusion* and *digital literacy* are increasingly basic requirements for active involvement in nearly all aspects of life, be that personal, civic, social or professional.

Digital inclusion refers to individuals' access to a high-speed Internet connection, Internet-enabled devices, software, emerging technologies, and spaces within which to make use of these resources for various purposes. Despite high levels of broadband and mobile penetration, connectivity gaps remain across the province, primarily driven by lack of affordability and choice. These gaps are amplified in rural or remote regions (e.g., First Nations communities), and among low-income populations.

Digital literacy encompasses the skills needed to take full advantage of both current and emerging technologies. It involves the ability, for people of all ages, to not only find and communicate information, but to effectively use digital tools to meaningfully engage with, and the knowledge to critically evaluate, digital information.

As the impact of digital technology on personal and professional development continues to permeate every aspect of life, communities across Ontario need equitable access to connectivity, current and emerging technologies, and training and support, to fully participate in society and the economy.

The Role of Public Libraries in Addressing these Challenges

Public libraries are already at the forefront of providing access to information and skills to people of all ages, abilities and backgrounds, on a highly-localized scale. As such, they are perfectly positioned to contribute to digital inclusion and digital literacy in their communities. Public libraries across the province provide patrons with the opportunity to connect to the Internet and use equipment ranging from desktop computers to 3D printers. As welcoming community hubs for both self-directed discovery and structured learning, libraries also support the development of digital comfort and skills.

In addition to contributing to these basic requirements for participation in the digital world, public libraries support the full spectrum of social and economic applications of current and emerging technologies. From a *social* perspective, the range of technology services at public libraries enables people to connect with friends online or access digital government services. Public libraries also provide both one-on-one support as well as structured classes on how to interact with this information.

From an *economic* perspective, public libraries provide access to cutting-edge technologies such as virtual reality tools, design hardware and software and audio-visual recording equipment, which help to drive competitiveness and innovation. In this way, public libraries encourage both creative expression and entrepreneurial experimentation. Existing businesses can use the range of technology services at libraries to connect with potential customers, partners or investors, or access the information they need to better understand their markets. Individuals, on the other hand, can keep their skills up to date by engaging in lifelong learning through digital learning platforms (e.g., Lynda.com) or through structured technology training courses offered by libraries.

Overall, with their unique mandate and reach, physical and technical infrastructure, staff expertise and local community presence, public libraries play a unique role in addressing the digital divide.

Matching Library Technology Services to (Evolving) Community Needs

Technology services are rapidly becoming more sophisticated and varied, and public libraries continue to adapt to evolving ways of learning, creating and interacting with information. Technology services at public libraries across Ontario have evolved from Internet-connected desktop computers, to include programs that introduce children to robotics and artificial intelligence, classes on a variety of coding languages, and maker labs with a variety of design equipment and software, such as laser cutters and video-editing tools.

At the same time, the needs of each community in Ontario is vastly different. To develop responsive technology services, public libraries must plan services with patron needs in mind, track the delivery and uptake of those services, and consult patrons on their experiences.

Ideally, each step of this service delivery process would be driven by evidence. It is important for libraries to have access to current and actionable data, such as participation rates in technology training programs, or feedback from patrons on the activities they engage in through the available technology services at their local branch. A framework for measurement and evaluation would enable informed decision-making, and easy-to-implement tools would allow public library systems of all sizes and resource capacities to use data and patron feedback to better meet the specific needs of their communities.

A consistent, widely-adopted approach would also have the added benefit of comparability – public library systems would be able to track changes in performance over time, and benchmark their technology services to those delivered by their peers across the province. Finally, access to reliable, timely and relevant data can help demonstrate the value of investments in technology to stakeholders.

The Solution

To support Ontario public libraries' ability to deliver technology services more efficiently and with greater impact, Nordicity has developed a **Technology Services Assessment Toolkit**. The Toolkit is a web-based application for library administrators to capture and analyze performance and outcome data on library systems' technology services.

Each library system that uses the Toolkit has a Library Profile, where the library administrator enters the technology services that are currently offered (by that system). Based on those services, the Toolkit provides the library administrator with customized data gathering tools, enabling measurement of:

- **Availability** – i.e., the volume of technology services offered, such as the number of Internet-enabled Public Work Stations. Availability metrics for each service are entered into the Toolkit by the library administrator, and updated as required.
- **Usage** – i.e., uptake of the technology services by library patrons, such as the number of participants in a technology training program. Usage metrics are entered into the Toolkit by the library administrator on a monthly basis.
- **Outcomes** – i.e., the kinds of activities and results that technology services have enabled for patrons. Outcome metrics are based on a customized survey generated by Toolkit, which is distributed by the library system to patrons that have used technology services. Results are reported on a monthly basis by the Toolkit.

The Toolkit also includes a staff survey that allows the library administrator to gauge how prepared frontline staff are to deliver technology services, such as their ability to answer technical and other questions about the technology services they support.

The usage and outcome metrics are presented in user-friendly dashboards in the Toolkit. The library administrator can view the past month’s usage and outcome results, compare those results with previous months, or see how the library’s performance compares with other Ontario public libraries using the Toolkit.

The Outcome Framework

One of the primary objectives of the research and consultation conducted in the first phase of the project was to determine outcomes that would reflect the range of technology services offered by public libraries across Ontario, and how these services benefit Ontarians.

The framework developed (presented in the table below), is two-tiered. It suggests that providing *digital inclusion* to technology and *digital literacy* skills training are the primary outcomes of the technology services offered by public libraries (as introduced above). These outcomes, in turn, enable a range of secondary outcomes, as illustrated by the following graphic:

Primary Outcomes			
Digital Inclusion		Digital Literacy	
			
Secondary Outcomes			
Community, social and civic engagement	Creativity and innovation	Workforce development	Entrepreneurship and business development
Technology services provided by libraries contribute to increased community cohesion, and social and civic participation among Ontarians.	Technology services provided by libraries enable the development of creative and innovative content among Ontarians, enabling self-expression and engagement in a creative process.	Technology services provided by libraries prepare job-seekers for Ontario’s workforce and connect them with employment and professional development opportunities.	Technology services provided by libraries enable Ontarians to start, manage and grow small businesses, which support employment in the province.

Together, these two primary and four secondary outcomes create a framework to measure and benchmark how technology access in public libraries improves the lives of residents across Ontario while advancing the broader impact of government strategies and programs. This outcome framework serves as the structural basis of the Toolkit, allowing public libraries across Ontario to measure service levels and outcomes in each area in a way that is streamlined and comparable.

Measuring Success

To determine *how* libraries could measure the extent to which each outcome was achieved, one or more indicators were developed for each outcome area. Each indicator was designed to capture a degree of change toward achieving the related outcome. For example, a reported increase in the level of comfort with digital technology was determined to be an indicator of digital literacy.

The indicators related to each primary and secondary outcome area are illustrated in the table below.

Primary Outcomes	Indicators for Primary Outcomes
Digital Inclusion	<ul style="list-style-type: none"> ▪ Access to technology ▪ Use of technology for others
Digital Literacy	<ul style="list-style-type: none"> ▪ Digital comfort ▪ New technology adoption
Secondary Outcomes	<ul style="list-style-type: none"> ▪ Indicators for Secondary Outcomes
Community, social and civic engagement	<ul style="list-style-type: none"> ▪ Civic engagement ▪ Social belonging ▪ Access to eGovernment
Creativity and innovation	<ul style="list-style-type: none"> ▪ Making creative products
Workforce development	<ul style="list-style-type: none"> ▪ Educational activities/lifelong learning ▪ Job search ▪ Employable skills
Entrepreneurship and business development	<ul style="list-style-type: none"> ▪ Businesses supported ▪ Employment supported (i.e., # of people employed by businesses using library technology services for business-related purposes)

Each of the technology services offered by public libraries is related to one or more of the indicators listed above, based on the outcomes supported by the service. In other words, not all indicators apply to all technology services. Similarly, each library system offers a different suite of technology services.

Therefore, the Toolkit generates a *customized* patron survey that reflects each library system’s service offering and is composed of questions designed to measure only the indicators relevant to those services. The survey also limits questions to those related to specific service(s) a respondent has used.

The survey results are then aggregated, and as noted above, displayed in a series of dashboards for the library administrator to view and/or benchmark.

Overall, the **Technology Services Assessment Toolkit** aims to enable public library systems across Ontario to:

- Measure the outputs (i.e., availability and usage) and outcomes of their technology services;
- Identify priorities for technology services based on evidence;
- Benchmark their technology service levels with other public libraries in Ontario; and,
- Understand how prepared frontline staff are to support technology services.

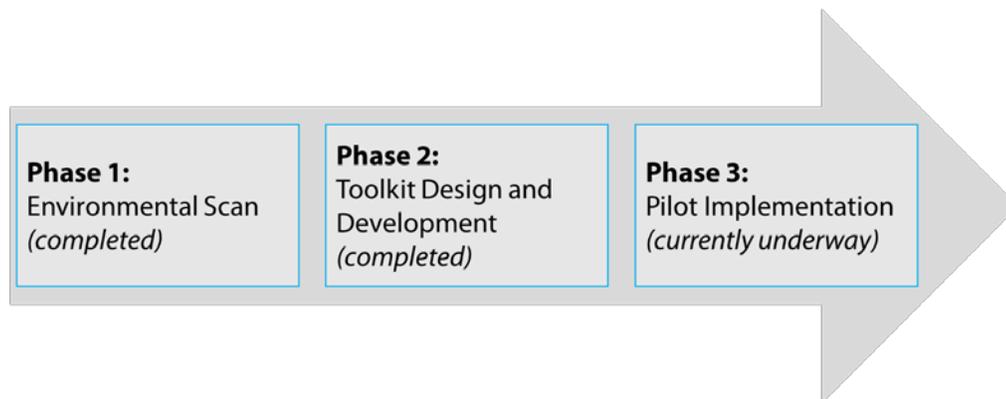
We thank the public libraries participating in the pilot phases of the Toolkit’s development. We hope that the final iteration of the Toolkit will contribute to an increase in the library sector’s collective capacity to deliver responsive and transformative services to their communities efficiently, and better understanding of the outcomes achieved by these services.

1. Introduction

Toronto Public Library (TPL) engaged Nordicity to develop a suite of resources, informed by research and stakeholder consultations, that would support public libraries across Ontario in the provision of technology services. At the heart of the project is the development of a “Toolkit” – a software-based solution for gathering and analyzing data – that helps library administrators assess the need for and measure the impact of technology services. The Toolkit is described in further detail in Section 1.1.

The project is currently in progress. It involves three phases, as illustrated in Figure 1.

Figure 1: Project Phases at a Glance



TPL identified seven public libraries of different sizes, including First Nations libraries, to partner in this project and support the development of the Toolkit. These libraries actively participated in Phases 1 and 3, as described below.

Phase 1: Environmental Scan

The first phase of the project, now complete, drew on data from a variety of secondary sources, including strategic plans, internal reports, scholarly articles and public policy documents. A complete list of resources consulted is provided in Appendix A.

Consultations were also conducted in the form of interviews with policy makers, educators, librarians, and other sector experts. Interviews covered a range of perspectives, including the unique challenges faced by public libraries serving First Nations communities.

This research allowed the project team to map the current landscape of public libraries and understand trends in the provision of technology services. The findings of this first phase also informed the identification of areas where the evolution of technology services at public libraries intersects and aligns with stakeholder priorities and objectives. As a result, this first phase informed the development of an outcome framework, around which the various components of the Toolkit were designed.

Phase 2: Toolkit Design and Development

The second phase of the project involved the design, development and internal testing/quality assurance of the software solution. The frameworks and functionalities incorporated into the Toolkit were directly informed by the research and consultation conducted in Phase 1.

Phase 3: Pilot Implementation

In the third and final phase of the project, currently underway, the Toolkit is being tested with users and refined through two pilot rounds involving a group of public library systems across Ontario. In the first

pilot round, the Toolkit was implemented at TPL and Innisfil Public Library. The Toolkit will be revised based on the feedback from the first pilot, and the next iteration will be rolled out as part of the second pilot round in June 2017. Libraries participating in the second pilot include Kitchener Public Library, Windsor Public Library, Mattawa Public Library, Nautkamegwaning First Nation Public Library, Perth & District Union Public Library, and Wikwemikong First Nation Library.

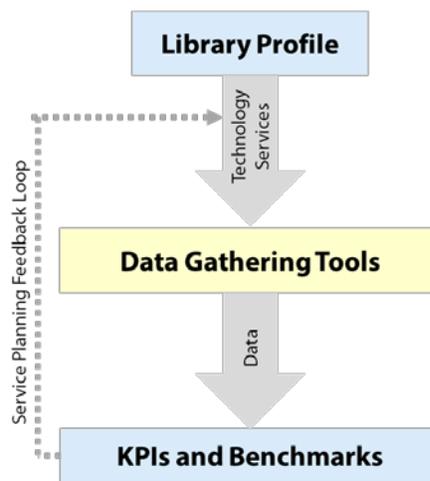
Upon the completion of the second pilot, the Toolkit will once again be revised based on user feedback and delivered to TPL, along with a final report summarizing the project. TPL's objective is to make the final, user-tested solution available to other public library systems across Ontario to support their delivery of technology services.

1.1 About the Toolkit

To support Ontario public libraries' ability to deliver technology services more efficiently and with greater impact, Nordicity has developed a **Technology Services Assessment Toolkit**. The Toolkit is a web-based application for library administrators to capture and analyze performance and outcome data on library systems' technology services.

The main elements of the Toolkit (as of the launch of the first pilot) are illustrated in the figure below.

Figure 2: Technology Assessment Toolkit Elements



Each library system that uses the Toolkit has a **Library Profile**, where the library administrator enters the technology services that are currently offered (by that system). Based on those services, the Toolkit provides the library administrator with customized **data gathering tools**, which will enable measurement of:

- **Availability** – the volume of technology services offered, such as the number of Internet-enabled Public Work Stations. Availability metrics for each service are entered into the Toolkit by the library administrator, and updated as required.
- **Usage** – uptake of the technology services by library patrons, such as the number of participants in a technology training program. Usage metrics are entered into the Toolkit by the library administrator on a monthly basis.

- **Outcomes** – the kinds of activities and results that technology services have enabled for patrons. Outcome metrics are based on a customized survey generated by the Toolkit, which is distributed by the library system to patrons that have used technology services. Results are reported on a monthly basis by the Toolkit.
- **Service delivery** – how prepared frontline staff are to deliver technology services, based on their ability to answer technical and other questions about the technology services they support, and patrons’ reasoning for not using specific technology services, such as lack of awareness and/or interest. Staff preparedness is measured through a customized survey generated by the Toolkit, which staff who are involved in technology service delivery are asked to complete. Results are reported on a monthly basis by the Toolkit. Patron reasons for non-use are gathered through the customized patron survey.

The above information is presented in user-friendly **dashboards**. Using these dashboards, the library administrator can view the past month’s results, compare those results with previous months, or see how the library’s usage and outcome performance compares with other Ontario public libraries using the Toolkit.

1.2 About this Report

This discussion paper and interim report summarizes the findings of the first two phases of the project, and presents the outcome framework and Toolkit structure that are currently being piloted:

- In Section 2, we provide an overview of the **current landscape of public libraries in Ontario**, including changing community needs and the ensuing evolution of public library technology services. These are the trends that, in combination, led TPL and partner libraries to identify the need for improved outcome measurement and evidence-based decision-making tools in Ontario and commissioning this study.
- In Section 3, we review the approaches to **measurement and evaluation** that public libraries and other cultural institutions have adopted as they make decisions and demonstrate the value of their services. In doing so, we present a case for improved outcome measurement and evidence-based decision-making at public libraries.
- In Section 4, we describe the **key outcomes of access to technology at public libraries**, along with the results of the research and consultation that led to the development of the outcome framework.
- Finally, in Section 5, we present a scan of **current evaluation tools available to and used by the library sector**. These findings, alongside the outcome framework, contributed to the design and development of the Toolkit.

The aim of the summary is to inform Ontario public libraries and the wider public library sector about progress on this project. A final report will be available in January 2018, along with a user-tested Toolkit.

2. Current Landscape of Public Libraries in Ontario

The relationship between public libraries and their communities is changing. Libraries continue to evolve and use technology to increase the reach of their services, while guiding residents in adopting and adapting to new technologies to improve their quality of life.

Today's public library strives to meet the demands of a connected, digital world through technology services ranging from providing connectivity and access to technology equipment, to promoting digital literacy and lifelong learning through training and support. Above all, the public library remains a free, welcoming, local, accessible and inclusive space where people from all walks of life can navigate the ever-changing information landscape.

In 2016, the International Federation of Library Associations and Institutions (IFLA) identified trends, challenges and opportunities facing libraries around the world. In North America, much of the discussion continues to revolve around technology advancements, and their impact on the evolving role of the library. Emerging trends in the region, as identified by IFLA, include the opportunities presented by new ways of learning (namely, informal ways enabled by technology), and the provision of equitable access to technology through library services.²

Research by the Aspen Institute has also attempted to unpack the evolution of libraries in the digital age, articulating the key assets around which the 21st century public library is built, namely the library as a community hub, as well as a platform for learning and innovation, increasingly so in virtual as well as physical spaces.³ These same dynamics are reshaping public libraries in Canada and in Ontario. In 2015, the Federation of Ontario Public Libraries (FOPL) conducted a market probe to investigate opinions and usage patterns related to public libraries across the province. In examining the reasons why people visited public libraries in 2015 as compared to 2010, the survey results indicated an increase in only two categories:

- "Use the library's wireless network" – selected by 25% of respondents in 2015, up from 17% in 2010; and,
- "Attend a lecture, program, meeting or training session" – selected by 16% of respondents in 2015, up from 13% in 2010 and only 5% in surveys prior to that year (i.e., 2005 and 2000).⁴

Connectivity, technology access and digital literacy programs have become top priorities for library systems across Ontario. For example, in its 2012-2016 *Strategic Plan*, Innisfil Public Library states that one of its five key Strategic Directions is to "cultivate a 'hacker ethic'" and "enable residents to be comfortable with the tools that allow them to create, collaborate, innovate and pursue their personal and professional objectives." Actions under this Strategic Direction include the integration of technology into service offerings, the facilitation of hands-on learning and innovation through technology equipment, and increasing technology confidence and proficiency among stakeholders.⁵

² International Federation of Library Associations and Institutions (IFLA), [IFLA Trends Report 2016 Update](#).

³ Aspen Institute website (2017), "[People, Place and Platform](#)." Aspen Institute (2014), [Rising to the Challenge: RE-Envisioning Public Libraries](#).

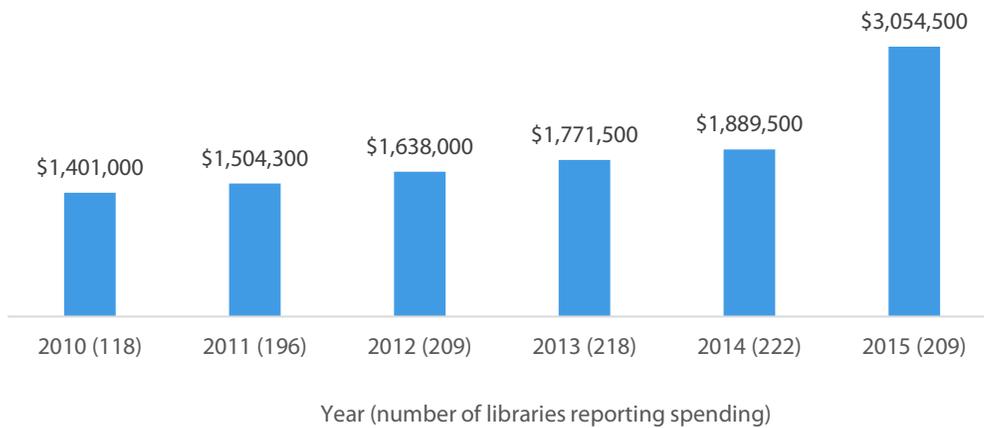
⁴ Federation of Ontario Public Libraries (2015). *Market Probe 2015*.

⁵ Innisfil Public Library (2012), [Strategic Plan \(Consultant's Report\)](#).

Similarly, TPL’s *Strategic Plan 2016-2019* identifies “expanding access to technology and training” as a key priority, including the provision of “access to new and emerging technologies to support innovation, entrepreneurship and creativity” and “increase[ing] access to one-on-one, group and outreach training and learning opportunities”.⁶ TPL’s development of a Digital Strategy as a key enabler of its strategic objectives –along with its on-going commitment to train staff on the provision of technology services – further supports the library’s commitment to ensuring that the library’s infrastructure and partnerships allow for responsiveness in the face of shifting dynamics. Innisfil and Toronto are two examples that demonstrate the extent to which technology services are prioritized by public libraries, and these organizations are certainly not alone.

In 2015, public libraries across Ontario spent a total of **over \$15 million on computer equipment and related expenses** (e.g., computer maintenance contracts, new automated systems, etc.) and **over \$3 million on Internet connectivity** (e.g., wireless, ISDN, dedicated lines). Connectivity spending more than doubled between 2010 and 2015, and increased by 60% from 2014 to 2015 alone, illustrating the accelerating growth in investment by public libraries in this area. Figure 3 shows this growth over the course of six years, as reported by public libraries to the Ontario Ministry of Tourism Culture and Sport.⁷

Figure 3: Dedicated Internet Connectivity Costs (e.g. wireless, ISDN, dedicated lines) for Reporting Public Libraries in Ontario⁸



All public libraries in Ontario offer Public Access Workstations, the vast majority of which (84%) are Internet-enabled. Almost all libraries provide a wireless Internet connection (99%) to their patrons and offer technology, social media and/or computer literacy programs (96%). More advanced services, such as maker spaces and 3D printers, are offered by a smaller proportion of libraries (22% and 16%, respectively).⁹ The prevalence of these categories of technology services among Ontario public libraries is shown in Figure 4.

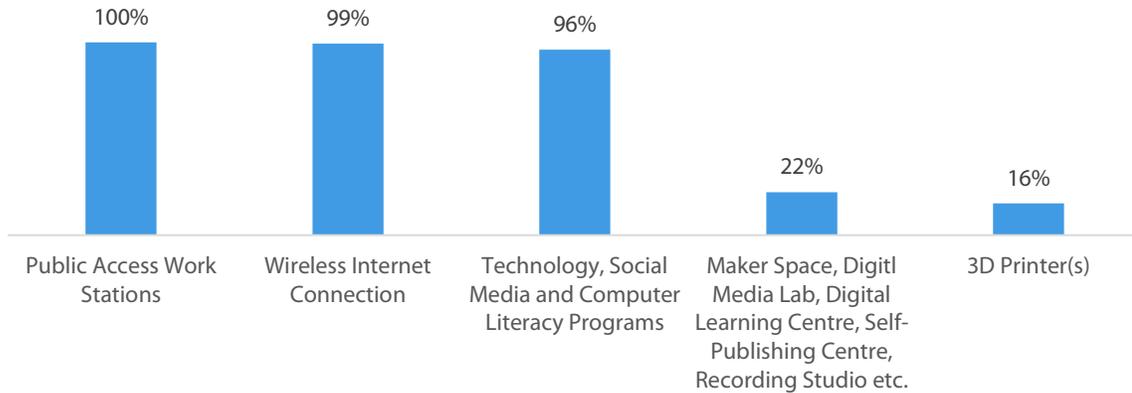
⁶ Toronto Public Library (2016), [Strategic Plan 2016-2019](#).

⁷ Government of Ontario (2017), [Ontario Public Library Statistics](#).

⁸ Ibid.

⁹ Ibid.

Figure 4: Technology Services Provided by Reporting Public Libraries in Ontario (% of libraries offering service, 2015) ¹⁰



Combined, public libraries across Ontario offered the following technology services to their patrons in 2015:

- Nearly **11,700 Public Access Workstations** (including over 9,800 Internet-enabled workstations and nearly 2,300 lending laptops, netbooks and tablets);
- Access to **wireless Internet**, used in **over 18 million sessions**;
- Over **21,200 digital literacy programs**, which attracted over 86,800 participants;
- Over **2,600 programs offered at over 100 maker spaces, digital media labs, and self-publishing**, attended by over 40,000 people.
- Response to over **34,000 support requests** from patrons, related to information communication technology, software and social media.¹¹

As demonstrated above, technology services are a key component of public library services. As more libraries begin to offer advanced technology services and training, in addition to the core offerings of connectivity and computer access, the ways that investment decisions are made and outcomes measured in this area need to evolve, so that public libraries across the province can continue to meet the needs of their communities.

¹⁰ Ibid.

¹¹ Ibid.

3. Approaches to Measurement and Evaluation

As public libraries strive to keep pace with the changing needs of their communities, they continuously look for ways to leverage the (often limited) resources at their disposal to achieve the outcomes they have identified for their services. Simultaneously, as they increase the volume and range of the technology services they offer, they face ongoing pressure to make evidence-based service improvements and demonstrate the value of new and ongoing investments to their stakeholders.

Within this context, this section presents the measurement and evaluation practices, and consequent challenges and opportunities, that are prevalent among public libraries.

3.1 The Challenge of Evidence-Based Decision Making

Libraries are already delivering technology services that respond to the changing behaviour of patrons in a digital era and complement the priorities of key stakeholders. As they do, they plan services with patron needs in mind, deliver those services, consult patrons on their experience and report results to stakeholders. This process is illustrated in Figure 5, below.

Figure 5: The Service Delivery Process



Ideally, each step of this service delivery process would be driven by evidence. However, consultations revealed that public libraries across Ontario do not always have the resources or capabilities to engage in evidence-based decision-making, particularly as related to technology services.

Evidence-based management is not only an important contributor to enabling results-focused planning and continuous improvement, but it is also a priority among policymakers. This fact is most evident in the Ontario Treasury Board Secretariat’s Centre of Excellence for Evidence-Based Decision Making, recently established with the aim of “build[ing] capacity to assess how programs are performing, using

evidence to inform choices and lead change in critical public services.”¹² Beyond the provision of this central resource, many of the public sector policies and plans that were reviewed as part of this study emphasized performance measurement, while our consultations revealed that evaluation of outcomes continues to pose significant challenges.

Overall, our findings suggest that while the measurement and communication of outputs (i.e., the availability and reach of services) pose certain data-related challenges, they are generally more established and common practices. However, the definition and measurement of outcomes (i.e., what those services achieved), pose both conceptual challenges in terms of defining what those outcomes are and practical challenges associated with identifying valid and reliable indicators. These challenges are not unique to public libraries, but shared by funders, policymakers and other stakeholders.

3.2 Approaches to Outcome Measurement in Libraries and Beyond

The impetus to demonstrate outcomes, and measure return-on-investment, is not limited to public libraries either, but is also a priority in the culture sector more broadly, as well as sectors such as healthcare, education, and environmental science, among many others. In the culture sector, a variety of methodologies have been developed to measure social and economic outcomes and returns.

To begin with, there has been an enduring focus on articulating the **value and impact of cultural services (including libraries) in economic terms**, for example:

- In 2013, TPL commissioned The Martin Prosperity Institute (MPI) to conduct an economic impact study – *So Much More: The Economic Impact of the Toronto Public Library on the City of Toronto* outlined the direct spending as well as the direct and indirect tangible benefits of the library on the local economy. The report found that TPL generated more than one billion dollars in total economic impact, or \$5.63 for every dollar spent. In terms of technology services, the report examined use of online databases as well as Internet access more broadly.¹³
- Similarly, the British Library undertook an economic evaluation of its services in 2013 and determined that it generated value for researchers, business, academics, schools and visitors. Specifically, the analysis found that the British Library made efficient use of public money because it delivered £5 for every £1 invested. In terms of technology services, the study looked at how the British Library serves both users who visit the library and users who access resources remotely. The approach focused on the time and money physical users saved by consulting the website and the benefits others derived solely from using the website without visiting the library. Taken together, the analysis indicated that the British Library’s web services were worth £19.5 million a year.¹⁴

¹² Matthews, D.” [Mandate letter progress: Treasury Board Secretariat](#)”

¹³ Martin Prosperity Institute. [So Much More: The Economic Impact of the Toronto Public Library on the City of Toronto](#).

¹⁴ Tessler, A. [Economic valuation of the British Library](#).

- In 2009, Library Research Service conducted an economic evaluation of the impact of library services across geographically, economically and demographically diverse regions in Colorado. *Public Libraries – A Wise Investment* covered eight public libraries in urban, suburban and rural communities and found an average return on investment of \$5 for every dollar spent. However, this figure was even greater in some areas where rural residents took advantage of libraries funded primarily by municipal governments. The research encompassed technology assistance, computer use at libraries, remote access of resources and eBook downloads. In each case, the research found a divide between urban and rural library users with urban residents reporting higher rates of technology instruction, onsite Internet and remote resource access. The report did not draw conclusions as to the source of these discrepancies but nonetheless provides valuable insight into the geographic variation of public library technology services.¹⁵
- The Australia Library and Information Association commissioned a report on the net contribution of public libraries to community welfare and the economic activity induced by public library operations. While the evaluation did not elaborate on the role of technology services, it found that public libraries stimulated over A\$3 billion in economic activity across the country. Interestingly, the analysis indicated that investment in public library services does not display a pattern of diminishing returns. As a result, the report used these findings to justify increased levels of funding for public libraries.¹⁶

In recent years, the scope of measuring return-on-investment has gradually widened to incorporate a more holistic approach, increasingly including the **social, educational and cultural benefits** of investing in arts and culture. Some examples from the broader culture sector include:

- The UK's Arts and Humanities Research Council conducted a study combining original research, critical literature reviews and specialist workshops to investigate the value of arts and culture. The resulting report identifies five components of cultural value: individual reflection, civic engagement, urban regeneration, economic impact and innovation, and health and wellbeing. The report notes the transformative impact of digital technologies but argues that despite these multiple and emerging forms of creative engagement, cultural experiences remain stratified along socioeconomic lines. This finding reinforces the relevance of the digital divide and unequal access to technology that stem from economic disparity.¹⁷

¹⁵ Steffen, N., Lietzau, Z., Curry Lance, K., Rybin, A., and, Molliconi, C., [Public Libraries – A Wise Investment: A Return on Investment Study of Colorado Libraries](#) (2009).

¹⁶ SGS Economics and Planning. [National Welfare and Economic Contributions of Public Libraries](#). A Report Prepared for the Australian Library and Information Association.

¹⁷ Crossick, G. and Kaszynska, P. [Understanding the Value of Arts and Culture: The Arts and Humanities Research Council Cultural Value Project](#).

- Arts Council England commissioned a literature review to examine both how individuals benefit from attending and participating in cultural programs and the capacities of organizations to create positive experiences. Although this study focuses on cultural activities broadly, rather than library services specifically, it provides a useful framework for distinguishing between economic impact, social impact and public impact. Whereas social value recognizes outcomes that cannot easily be measured in monetary terms, public value articulates the worth of services that are provided by public agencies, in this case cultural institutions.¹⁸

At the same time, approaches to **results-based and evidence-driven management** tend to emphasize measuring the degree to which a program, initiative or organization achieved the goals it set out to achieve. In doing so, these approaches allow for a combination of existing methodologies to be applied, while maintaining an objective-driven lens. Often, these approaches begin with a logic model that maps the path between investments in programs and services, to the activities, outputs and outcomes achieved by those services. Not only does results-based performance measurement enable reporting that is inherently linked to program goals, but it also facilitates informed planning, continuous improvement, and decision-making.

Our research and consultations revealed that for public libraries, part of the challenge is also making sense of the results that they arrive at through implementing the various approaches described above. For example, a one-time assessment limits a library's ability to track improvements internally or identify usage trends. Similarly, the lack of "apples-to-apples" comparability of data across the sector limits a library's ability to **benchmark against peers**, which might allow comparison of performance against sector-wide standards or showcasing of areas of strength. Access to comparable data poses a particular challenge for rural and First Nations public libraries that would benefit from seeing how they measure up against peers in similar communities, rather than the sector overall.

Ultimately, the scan of current decision-making and outcome measurement practices in the culture sector as well as other sectors revealed that while there are a variety of approaches currently in use, there is room for improvement in the way that public libraries plan their technology service delivery, and how they demonstrate the value of those services.

¹⁸ Carnwath, J. D., and Brown, A. S. [Understanding the Value and Impacts of Cultural Experiences: A Literature Review Prepared for Arts Council England.](#)

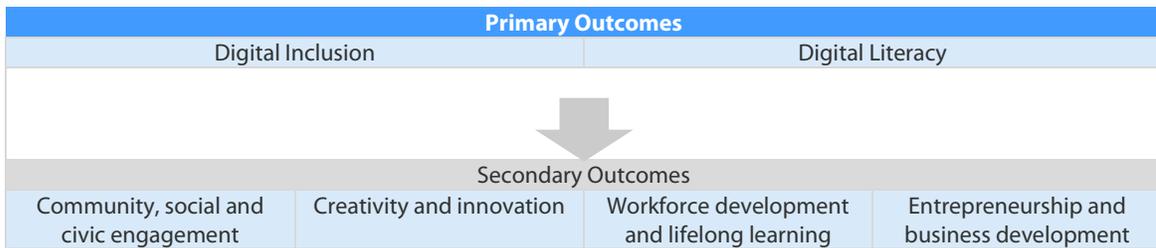
4. Key Outcomes of Access to Technology at Public Libraries

One of the primary objectives of the research and consultation conducted in the first phase of the project was to determine outcomes that would reflect the range of technology services offered by public libraries across Ontario, and how these services benefit Ontarians. The findings indicated that through the provision of technology services, public libraries in Ontario benefit their communities by supporting:

- Digital inclusion;
- Digital literacy (i.e., learning *about* technology);
- Community, social and civic engagement;
- Creativity and innovation;
- Entrepreneurship and business development; and,
- Workforce development (including lifelong learning, i.e., learning *through* technology).

Together, these six outcome areas comprise an **Outcome Framework** (see Figure 6), which serves as the structural basis of the Toolkit, allowing public libraries across Ontario to measure and compare their contributions in each essential area.

Figure 6: Outcome Framework



In fact, it is a two-tiered framework. The first two areas – digital inclusion and digital literacy– can be considered **primary outcomes**. Once these basic requirements for participation in today’s digital world are met, technology services at public libraries unlock opportunities in many other areas, leading to **secondary outcomes** such as increased community, social and civic engagement; creativity and innovation; entrepreneurship and business development; and, workforce development.

Each of these outcome areas is described in further detail in the following sections in terms of:

- The evolving needs of communities in the digital age;
- How public libraries have responded to these changing needs; and,
- The alignment of the outcomes with public policy objectives.

To determine *how* libraries could measure the extent to which each outcome was achieved, one or more indicators were developed for each outcome area (and are presented in each of the following sections). Each indicator was designed to capture a degree of change toward achieving the related outcome.

4.1 Primary Outcomes

Before someone can use digital tools to connect with others, start a business, develop creative content or file their taxes, they need access to an Internet connection, an Internet-enabled device, and the skills required to navigate the online world. Our consultations revealed that public libraries are leaders in providing safe, supportive environments where Ontarians can encounter and take advantage of the full spectrum of possibilities presented by technology. This section summarizes the role of public libraries in achieving the primary outcomes of **digital inclusion** and **digital literacy**.

4.1.1 Digital Inclusion

Evolving Community Needs

An Internet connection is increasingly important to most activities – applying for a job, locating public services, keeping up with world events, and remaining connected to family, friends and acquaintances. Yet, despite high levels of broadband and mobile penetration, not everyone has access to a high-speed Internet or a data plan. This **disparity in connectivity is primarily driven by lack of affordability and choice**, and is most evident in low-income segments of the population and geographically isolated communities:

- From 2014 to 2015, the price of Internet access services in Canada increased by 5%, much higher than the 1.1% inflation rate across the Canadian economy as measured by increases in the Consumer Price Index;
- In 2015, while 76% of adults in Ontario owned a smartphone, only 40% of all mobile subscribers had a data plan;
- In 2014, nearly 86% of Canadian households had a home computer and 85% had Internet access at home – however, when looking at the lowest income quintile, both home computer and Internet access drop to only 64%; and,
- In 2015, the monthly cost of residential broadband (5 Mbps) Internet access service in urban communities in Ontario ranged from \$25 to \$58, while it ranged from \$30 to \$93 in rural communities across the province, with the latter group also having fewer providers to choose from.¹⁹

As noted above, many of these **challenges are amplified in rural and remote regions**, in particular in Northern Ontario and First Nations communities, as was confirmed by our consultations. Interviewees shared that in remote, Northern communities, Internet and computer access are major draws for library patrons, including for many who have no other means of access. The emergence and continued widening of the **digital divide** – that is, the disparity in access to Internet and computers – limits the possibility of full and equitable participation in a 21st century community and economy.

This basic level of digital inclusion is prerequisite to taking advantage of the opportunities presented by more advanced technologies. Whether it is a software license or a piece of equipment, access to emerging technologies can quickly become costly for consumers and small businesses. Furthermore, while technological advancements and growth in manufacturing scale (alongside consumer adoption)

¹⁹ Canadian Radio-television and Telecommunications Commission (CRTC), [Communications Monitoring Report 2016](#).

may result in lower prices for some digital technology equipment, the pace of change requires that users not only stay abreast of new, leading-edge technologies that are relevant to the activities they partake in, but also frequently reinvest in the *latest* technology. At the same time, specialized technology equipment is not often readily available at more general retail points, thereby further reducing accessibility in remote and rural communities. This lack of access has the potential to limit opportunities for individuals create and engage with information, products and experiences, and for entrepreneurs and small businesses to remain competitive.

How Public Libraries have Responded

Technology services at public libraries offer local responses to these global trends, which continue to shape the way that information is created, the way it is accessed, and who reaps the benefits of that access. Public libraries across the province primarily promote digital inclusion by providing Internet and computer access to patrons, including through the provision of:

- **Internet-connected workstations:** Library patrons can connect to the Internet via on-site, connected computer stations. As noted in Section 2, PAWs are the most prevalent technology service in public library systems across Ontario – all of libraries offered PAWs in 2015 and 84% of PAWs were connected to the Internet.²⁰
- **Wireless Internet at the library:** Public libraries allow patrons to connect their own devices to wireless Internet connections at the library. In some cases, the service is also made available outside of operating hours, providing patrons with 24/7 access in the vicinity of the library building. As noted in Section 2, wireless Internet connections, provided by 81% of public libraries across Ontario, were used in over 18 million sessions in 2015.
- **Offsite access to Internet:** Some libraries are also experimenting with lending out Wi-Fi hotspots so that patrons can remain connected offsite. For example, Kitchener Public Library’s “Borrow the Internet” allows patrons to use their library card to borrow a wireless hotspot device for up to two weeks, while TPL’s is piloting “Wi-Fi Hotspots” in priority Toronto neighbourhoods.

These connectivity services are essential for people who do not have Internet access at home or access to mobile data plans. In fact, observations of people from different communities lingering in library parking lots outside of hours of operation demonstrate the demand for free Internet access across the province. In addition, flexible workspaces are available at libraries to support the use of technology while also facilitating individual and collaborative group work.

Interviewees explained that **equity of access looks different for each community**. For example, access to Internet is a significant draw for patrons in First Nations public libraries, where broadband penetration is low. Even so, connectivity limitations continue to present challenges in these communities, and a simple task such as sending an email can still be take a long time to complete even at the library.

As noted in Section 2, computers and Internet access are the most commonly offered technology services at public libraries across Ontario. However, particularly in communities that have a higher penetration of broadband Internet, libraries contribute to a different degree of digital inclusion by providing patrons with access to emerging technologies, such as design and publishing equipment and facilities (e.g., 3D printers, laser cutters, etc.) and specialized software. Additionally, these services are

²⁰ Government of Ontario (2017), [Ontario Public Library Statistics](#).

provided alongside one-on-one support or classroom-based training sessions. Ultimately, the public libraries' unique contribution to digital inclusion revolves around the provision of the technology itself, combined with an inclusive space and supportive staff.

Alignment with Public Policy Objectives

Contribution to inclusive and equitable access through the provision of technology services at public libraries advances public policy goals on many levels. Globally, the International Federation of Library Associations and Institutions (IFLA) emphasizes that **libraries around the world can contribute to the United Nations Sustainable Development Goals**, including:

- The reduction of inequality within and among countries by providing “neutral and welcoming spaces that make learning accessible to all, including marginalized groups” (Goal 10);²¹ and,
- The promotion of strong institutions by supporting “public access to information...[and] training in the skills needed to use and understand this information” (Goal 16).²²

In Canada, the **new service objectives of the Canadian Radio-television and Telecommunications Commission (CRTC)**, announced in December 2016, recognize high-speed broadband Internet as a *basic telecommunications service* and one that “all Canadians are entitled to receive.”²³ In summarizing the rationale behind its decision to acknowledge the essential nature of reliable and high-quality connectivity, the CRTC emphasized the gaps and barriers to adoption that exist across the country, particularly in First Nations, rural and remote communities, as well as among low-income Canadians:

“Broadband is vital, but key gaps in availability and adoption remain. The testimony of First Nations communities demonstrated that these are the most disadvantaged communities in almost all respects, but other Canadians also face significant barriers to broadband Internet access.

Many rural and remote regions of Canada lack the infrastructure needed to make high-quality fixed broadband services available to households and businesses similar to those in urban areas. [...] Perhaps most notably, many low-income Canadians told the CRTC they can afford to pay for broadband service only if they sacrifice other necessities, such as food, clothing, and healthcare.”²⁴

The CRTC’s decision, which highlights the importance of digital inclusion, includes target upload and download speeds and is supported by a five-year, \$750 million fund to help communities, particularly those that are currently underserved, to meet these national connectivity goals.²⁵

²¹ International Federation of Library Associations and Institutions (IFLA), “[Libraries can drive progress across the entire UN 2030 Agenda](#).”

²² Ibid.

²³ Excerpted from a quote by Jean-Pierre Blais, CRTC Chairman and CEO, as cited in CRTC’s news release, “[CRTC Establishes Fund to Attain New High-speed Internet Targets](#)” (2016).

²⁴ Canadian Radio-television and Telecommunications Commission (CRTC) (2016), “[CRTC Submission to the Government of Canada’s Innovation Agenda](#).”

²⁵ Canadian Radio-television and Telecommunications Commission (CRTC) (2016). “[Summary of Key Decision Points: Policy regarding modern telecommunication services for Canada’s digital economy](#).”

The **Province of Ontario is also in the midst of a digital transformation** – its focus on the enhancement of digital delivery of government services is evidenced by its plans to establish a Digital Government Office and the Province’s first-ever Chief Digital Officer position.²⁶ As discussed in further detail in Section 4.2.1, this newly adopted “digital-by-default” approach is dependent on “an inclusive digitally enabled province” – that is, for Ontarians to take advantage of these enhanced online services, they need to be able to connect to the Internet. Thus, digital inclusion (and digital literacy, as outlined below), will continue to become ever more important to civic participation and access to public services and resources.

Given the central role of community hubs such as public libraries in advancing digital inclusion, the Ontario Library Association has proposed increased investment by the Province to strengthen **technology infrastructure throughout public libraries in rural and Indigenous communities**, specifically in Northern Ontario. The project, which is currently up for public voting as part of the 2017 Budget Talks, aims to mitigate the current “funding, staffing and programming limitations of rural, northern and remote libraries in Ontario” and support the integral role of small libraries as technology hubs.²⁷

At the municipal level, an already present **need for connectivity is likely to become amplified as more and more cities transform into “smart cities.”** Emulating the success of the model introduced in the US in 2016,²⁸ municipalities across Canada are exploring ways to enhance planning and service delivery through leveraging digital solutions and technologies. The Federal Government’s 2016 Fall Economic Statement, it was announced that a national Smart Cities Challenge would be launched in 2017, modelled after the US initiative,²⁹ further illustrating a nation-wide shift in this direction.

Policies, plans and investments being made at the international, federal, provincial and local levels all share an acknowledgement of the importance of access to affordable, high-quality connectivity. Public libraries across Ontario, which have always served as welcoming points of access in their communities, play a key role in providing this access through their technology services.

Measuring Digital Inclusion Outcomes

As the above section demonstrates, access to an Internet connection and technology equipment is an essential requirement for participation, be that economic, social or civic. As public libraries contribute to bridging the digital divide through the provision of technology services, **digital inclusion** remains a key desired outcome for them as well as their stakeholders.

The following table presents the Key Performance Indicators (KPIs) and data points that could be used to measure public libraries’ contribution to this essential outcome area.

²⁶ Wynne, K. “[September 2016 Mandate Letter: Digital Government.](#)”

²⁷ Government of Ontario, Budget Talks website, [Expanding connectivity in rural, northern and Indigenous communities](#)

²⁸ The White House, Office of the Press Secretary (2015), “[Fact Sheet: Administration Announces New “Smart Cities” Initiative to Help Communities Tackle Local Challenges and Improve City Services.](#)”

²⁹ Government of Canada (2016), “[Fall Economic Statement: Chapter 2 – Investing in the New Economy.](#)”

Figure 7: KPIs and Data Points – Digital Inclusion

Key Performance Indicator	Data Point
Access to Technology	<ul style="list-style-type: none"> Access to technology by patrons without alternative means of access Reasons for using technology at public library if alternative access point is available (e.g., gaps in or competition for access at home, convenience of location, etc.)
Use for Others	<ul style="list-style-type: none"> Use of technology service(s) by patrons on behalf of someone else (e.g., parents, children, elderly person, etc.)

4.1.2 Digital Literacy

Evolving Community Needs

Access to technology, whether more conventional or emerging, is only meaningful if the skills to use that technology are also present. To take advantage of the opportunities presented by the digital world, people need to be able to use digital technologies, ranging from devices (e.g., computers, smartphones, etc.) to applications (e.g., social media, design software, etc.).

At its core, **digital literacy** is “the ability to use information and communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills.”³⁰ It involves the ability to find information on a variety of platforms and in a range of formats, assess its quality and accuracy, and use it effectively.³¹

The consultations conducted as part of this study highlighted that **digital literacy has different meanings in different contexts** but is equally important for people of all ages. It is also relevant to people of all degrees of digital competency. For one person, increased digital literacy might mean learning to send an email or download a mobile app, while for another it might refer to learning a programming language or how to digitally edit a video. At any level, however, digital literacy enables the use of technology to communicate, collaborate, create, engage and participate in one’s community (discussed in further detail in Section 4.2).

It should be noted that digital literacy, in the context of this outcome framework, relates to learning *about* technology. Learning *through* technology, which covers educational or skills development activities enabled by digital platforms, falls under the lifelong learning component of the “workforce development” outcome area (see Section 4.2.4).

How Public Libraries have Responded

Regardless of each patron’s level of comfort with new technologies, public libraries facilitate the development of digital literacy that is critical to competing in the global knowledge economy. Technology services at public libraries encompass drop-in or scheduled **one-to-one support** as well as

³⁰ American Library Association, ALA Connect Website, “[Digital Literacy Definition](#)” (September 14, 2012).

³¹ Ibid.

classes designed to develop specific skills in a more structured setting. The range of training and support services offered by libraries across Ontario cover the following areas:

- **Basic computer skills and email**, including support related to computer basics, keyboarding, and using web-based email programs;
- **Accessing library resources and services**, including support for using digital platforms such as OverDrive and Zinio, as well as eReaders and other devices that access the library's eCollections;
- **Internet safety**, including support related to safe browsing and digital privacy;
- **Software training**, including support for using Microsoft Office and/or other specialized software;
- **Social media**, including support related to social networking, blogging, and use of platforms such as Facebook, Twitter, and YouTube;
- **Internet resources and subject research**, including support for web-based research, use of online resources (e.g., Wikipedia), storage and collaboration via cloud-based tools (e.g., Google Drive), and accessing digital databases or collections such as genealogy records or maps;
- **Programming and coding**, including sessions on web design, HTML, CSS, and other programming languages;
- **Digital design**, including 3D Printer Certification, 3D design training, and other instructional maker sessions;
- **Job search**, including support for careers, training and job searches using online resources; and,
- **Business skills**, including support for conducting market research, launching your business online, using social media for small business, and using databases to research demographics, market trends and other small business topics.

Interviewees noted that **these activities vary considerably** based on the digital tools available at each public library, and the needs of specific communities. Some libraries focus on providing personalized support rather than structured classes, while others offer an array of digital literacy courses. For example, we heard from our First Nations consultations that patrons in those communities generally prefer one-to-one support, and that structured training classes have experienced lower demand. At the same time, in response to patron needs and community dynamics, one library might promote digital adoption by providing access to 3D printers, while another might coordinate a volunteer program that empowers young "digital natives" to introduce older adults to new equipment and software. The presence of working spaces at libraries further encourages learning and new technology adoption, both individually, and in collaboration with other members of the community.

In many cases, **technology training classes particularly target children and youth**, in support of their science, technology, engineering, arts and math (STEAM) education. Innisfil Public Library, for example, identifies its children's programs with badges, indicating which element(s) of STEAM is reflected in each of the programs, many of which are technology-focused (e.g., KinderCode). Similarly, TPL offers technology programs specifically designed for children and youth, such as Coding Bootcamps or Robotics for Kids, as well as providing tech-enabled environments such as Discovery Zones for children to experiment with new technologies.

Alignment with Public Policy Objectives

The range of approaches to supporting digital literacy at public libraries is aligned with the provincial policy context, including increased emphasis on the development of digital skills in the face of 21st century challenges.

In September 2016, the Ontario Government’s digital government mandate letter announced the development of a **digital literacy strategy** in consultation with the Ministry of Advanced Education and Skills Development.³² In the interim, *Achieving Excellence: A Renewed Vision for Education in Ontario* discusses the role of technology in classrooms, though the strategy does acknowledge that digital tools are currently used inconsistently in educational settings and emphasizes the importance of investing in both technology and training.³³

For children and youth, consultations confirmed that **digital skills are a form of literacy that can reinforce other forms of learning**. From tablets to electronic building kits, teachers use digital tools with a specific outcome in mind. In this way, technology in classrooms serves as a means of supporting broader curriculum goals. New technology is an especially effective tool for young people who have grown up comfortable with a range of devices and thus have a lower fear of failure when learning via online platforms. Despite these advantages, different perceptions of technology across generations present challenges. Consultations indicated that some parents see new devices as distractions and are hesitant to recognize their educational value.

Research being conducted in relation to **21st Century Competencies** by the Ontario Ministry of Education, however, reinforces the link between digital literacy and the degree to which children and youth are prepared “to solve messy, complex problems – including problems we don’t yet know about – associated with living in a competitive, globally connected, and technological intensive world.”³⁴ The Ministry’s review of international discussions around these competencies revealed a shared emphasis in the following four areas:

- **Critical thinking**, which in our knowledge-based and technology-driven world, is increasingly supported by digital resources;
- **Communication**, including the ability to not only effectively engage in exchanges via digital channels, but also to master the unique rhetoric of each platform;
- **Collaboration**, including the ability to “develop collective intelligence and to co-construct meaning” alongside the consumption and creation of content in shared virtual and physical spaces; and,
- **Creativity and innovation**, including the conceptualization and realization of new ways to solve increasingly ambiguous problems.³⁵

³² Wynne, K. “[September 2016 Mandate Letter: Digital Government.](#)”

³³ Ministry of Education. [Achieving Excellence: A Renewed Vision for Education in Ontario.](#)

³⁴ Government of Ontario (2016), [21st Century Competencies: Foundation Document for Discussion.](#)

³⁵ Ibid.

Importantly, these competencies are supported by those that are related to **citizenship and social responsibility**, which increasingly involve participation in digital communities that are infinitely diverse, global, and fluid in their dynamics.³⁶

Access to skills development opportunities, whether for children, youth or adults, particularly for underserved communities, is also at the heart of **poverty reduction strategies** at both the provincial and municipal levels. For example, *Realizing Our Potential: Ontario's Poverty Reduction Strategy (2014-2019)* emphasizes access to education as a key contributor to its broader goal of breaking the cycle of poverty in the province.³⁷ The *Toronto Poverty Reduction Strategy* identifies TPL as a lead partner in "expanding digital access and literacy to ensure residents can effectively access programs and services online."³⁸

Public libraries have served, and been recognized, as leaders in developing technology services to advance the broader public sector priorities described above. Through providing self-directed discovery and structured learning opportunities in a way that is accessible to Ontarians of all ages, abilities and backgrounds, public libraries continue to support digital literacy.

Measuring Digital Literacy Outcomes

Hand in hand with access to technology, the skills associated with the adoption and use of new technologies are requirements to participation and connection in the digital world. Through providing a diverse range of training and support services for patrons at all levels of digital competence, libraries complement more traditional avenues of learning to facilitate **digital literacy**, which is a key primary outcome for them as well as their stakeholders.

The following table presents the KPIs and data points that could be used to measure public libraries' contribution to this essential outcome area.

Figure 8: KPIs and Data Points – Digital Literacy

Key Performance Indicator	Data Point
Digital Comfort	<ul style="list-style-type: none"> Increased comfort with digital technologies as a result of using technology service(s) at the library
New Technology Adoption	<ul style="list-style-type: none"> Introduction to new technology Continued use of new technology

4.2 Secondary Outcomes

Once people have access to technology and the digital skills required to engage with it, they are empowered to seize the full range of opportunities present in the digital world. To that end, technology services at public libraries enable people to **connect, create content, start and grow businesses** and **develop employment skills**.

³⁶ Ibid.

³⁷ Government of Ontario, [Realizing Our Potential: Ontario's Poverty Reduction Strategy \(2014-2019\)](#).

³⁸ City of Toronto, [TO Prosperity: Toronto Poverty Reduction Strategy](#).

This section examines the role of libraries across these secondary outcome areas considering both public expectations of technology services and broader government priorities.

4.2.1 Increasing Community, Social and Civic Engagement

Evolving Community Needs

Today, digital technology and online social platforms are at the core of how people keep in touch with friends and family, remain connected with their communities, learn about public services and generally stay informed. Outcomes related to community, social and civic engagement are key contributors to enhanced quality of life. In many ways reflecting the quality of life domains developed as part of the Canadian Index of Wellbeing,³⁹ these outcomes areas are defined as follows:

- **Community and social engagement:** The sense of belonging to community and/or social networks, as reflected by strong relationships with family and friends, participation in social activities, and connection to communities of shared interests and/or needs⁴⁰
- **Civic engagement:** Citizen participation in the public realm, including through engagement with the electoral process, access to government resources and services, and involvement with non-profit groups and organizations.⁴¹

In particular, for Indigenous peoples, older adults, youth, New Canadians, and vulnerable, remote and/or otherwise marginalized communities, technology access can help with the creation and fostering of community, social and civic ties that can help mitigate the risks associated with isolation and contribute to increased quality of life.

How Public Libraries have Responded

The combination of Internet connectivity, access to devices and digital literacy training and support available at public libraries enables people to establish and maintain meaningful connections, engage socially, contribute to their community and access resources. Activities associated with community, social and civic engagement span the full range of technology services, for example:

- **Access to a high-speed Internet connection** enables social activities such as seamlessly connecting with friends and family (e.g., via Skype);
- **Training to conduct Internet searches and navigate social media networks** enables patrons to stay up to date with current events, access information about health and wellness, learn about community organizations, or access government services online; and,

³⁹ University of Waterloo, [Canadian Index of Wellbeing](#).

⁴⁰ This outcome measure aligns, in part, with the “Community Vitality” quality of life domain as defined by the Canadian Index of Wellbeing, in particular the “social engagement” domain.

⁴¹ This outcome measure aligns, in part, with the “Democratic Engagement” quality of life domain as defined by the Canadian Index of Wellbeing, in particular the “participation” domain.

- **Leveraging technology can enhance existing community-focused programming**, such as using technology as part of storytelling with elders in First Nations communities, bringing a community of data enthusiasts together in hackathons, or activating children and youth drop-in programs with video game competitions.

In fact, in a 2015 survey of patrons, TPL found that “civic engagement” and “social inclusion” were the two highest ranked areas of activity among their public access technology users.⁴² Public libraries not only provide connectivity and equipment, but also offer other relevant supports – consultations reinforced that library staff are also on hand to help people make the most of digital tools for social, community and civic engagement purposes.

Alignment with Public Policy Objectives

Enhanced social, community and civic engagement contributes to public policy objectives at multiple levels of government. As mentioned in Section 4.1.1, the Government of Ontario’s **Digital Government Action Plan** represents a “commitment to improve the online experience for citizens and transform the most important government services.”⁴³ At the same time, Ontario’s **Open Data Directive** makes provincial government data “open by default” and available to the public.⁴⁴ Within this context, digital inclusion and access is bound to become even more thoroughly weaved through the spectrum of government services, and even more of a requirement for the realization of the intended benefits of such initiatives.

In addition to these commitments to digital services, provincial policies also support a more inclusive society, with a focus on many of the priority groups that public libraries already work with on a daily basis, including:

- **Youth: *Stepping Up: A Strategic Framework to Help Ontario’s Youth Succeed***, tracks outcomes and indicators, several of which relate to the technology services that public libraries provide:
 - Acknowledging that “technology continues to change the way young people interact with friends and family”, the strategy aims to **support positive relationships and social skills development for young people**, in part through access to spaces and safe environments such as public libraries.⁴⁵

⁴² Impact Survey, Toronto Public Library Survey Results (December 14, 2015).

⁴³ Government of Ontario. “[Digital Government](#).”

⁴⁴ Government of Ontario. “[Ontario’s Open Data Directive](#).”

⁴⁵ Government of Ontario (2014), [Stepping Up: A Strategic Framework to Help Ontario’s Youth Succeed](#).

- Another outcome of the strategy is that “Ontario youth play a role in informing decisions that affect them,” with outcomes that focus on volunteering to support local organizations.⁴⁶ Public libraries provide **opportunities for youth to volunteer, take on responsibilities and see the impact that their actions have in their communities**, and technology programs present many opportunities in this area. Our consultations revealed that young “digital natives” are uniquely positioned to assist others in learning about and using new tools.
- Finally, *Stepping Up* also aims to ensure that “Ontario youth feel safe at home, at school, online and in their communities.”⁴⁷ Returning to the evolving scope of responsible engagement in online communities (discussed in Section 4.1.2), the library acts as a safe space for youth, especially those who may not have support at home or at school, to be **engaged, active and responsible digital citizens**. In fact, consultations confirmed that public libraries across Ontario are aware of the needs of youth and offer programs to build on their interests and equip them with digital skills for both social and academic contexts.
- **Seniors:** Communities across the province are faced with the challenges of an aging population. *Ontario’s Action Plan for Seniors* emphasizes support for Age-Friendly Communities, which according to the World Health Organization, address **key issues including social participation, respect and social inclusion, civic participation and employment, and communication**, among others. Our consultations confirmed that seniors are particularly vulnerable to social isolation do not demonstrate high levels of digital comfort. The Action Plan also highlights:
 - The **risk of isolation is amplified for low-income seniors**, a growing population in Ontario. According to the *Action Plan*, “the proportion of Ontario seniors living below Statistics Canada’s Low Income Measure line was 8.1 per cent in 2010, up from 1.9 per cent in 1995.”⁴⁸ Public libraries address this challenge by serving as essential access points for seniors who may not have their own devices, while also helping them develop the digital skills to operate computers and take advantage of information available online.
- **Indigenous peoples and communities:** As part of its commitment to reconciliation with Indigenous people, the Government of Ontario will be making a significant investment in programs and actions that support the revitalization of Indigenous culture and address the barriers faced by Indigenous Ontarians. In particular, the 2016 mandate letter to the Minister of Indigenous Relations and Reconciliation highlights the need for improving economic, social and educational outcomes through community-based programs, as well as ongoing initiatives such as the Aboriginal Economic Development Fund (launched in 2014), the Urban Aboriginal Action Plan, and the Aboriginal Children and Youth Strategy.⁴⁹

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Government of Ontario, “[Independence, Activity and Good Health Ontario’s Action Plan for Seniors](#).”

⁴⁹ Government of Ontario, “[September 2016 Mandate letter: Indigenous Relations and Reconciliation](#)” and “[The Journey Together: Ontario’s Commitment to Reconciliation with Indigenous Peoples](#).”

- **New Canadians:** Making community connections and accessing government resources (which as described above, are rapidly moving online), are integral to newcomers. Given their local presence and accessibility in communities across Ontario, public libraries often serve as **key points of access for settlement support**. In fact, Library Settlement Partnerships, a program delivered by libraries in 11 communities in Ontario in partnership with Immigration, Refugees and Citizenship Canada, provides newcomer support services in a variety of languages.

Digital inclusion is also central to the effective delivery of services as **local governments embrace the idea of smart cities** (as discussed in Section 4.1.1). The global Smart Cities movement, also referred to as Intelligent Communities, looks at ways that new technology can be harnessed to connect citizens and leverage the data generated in urban environments to improve everything from transit routes to childcare programs. The municipal model has made its way to Canada and more specifically, Ontario, for example:

- The **City of Kitchener** has developed its first community digital strategy – “Digital Kitchener” – which aims to make the city more “connected, innovative, on-demand, and inclusive.”⁵⁰
- The **City of Pickering** has implemented some of its own smart initiatives, many of which are delivered in partnership with the public library system, including accessible and affordable Internet, digital skills training, support for community-led projects and engagement and education initiatives.⁵¹
- Similarly, in **Toronto**, momentum has started to develop around smart city initiatives, with two summits held in the city in 2016 and 2017, and the creation of a Smart Cities Working Group.⁵²

However, an effective smart city approach is inherently linked to (and in fact, dependent on) ubiquitous connectivity. Public libraries across Ontario continue to be free, safe, accessible and local spaces where Ontarians can access not only this connectivity, but also the devices, skills and data required to take advantage of available resources and remain connected to their communities.

Measuring Community, Social and Civic Engagement Outcomes

As described above, increased **community, social and civic engagement** is a key outcome area for technology services at public libraries. Figure 9 presents the KPIs and data points that could be used to measure public libraries’ contribution to this secondary outcome area.

⁵⁰ City of Kitchener. “[Digital Kitchener](#).”

⁵¹ City of Pickering, “[Smart 21](#).”

⁵² Galang, J. (2016), “[Toronto Region Board of Trade and City of Toronto Launch Smart City Initiative](#).” *Betakit*.

Figure 9: KPIs and Data Points – Community, Social and Civic Engagement

Key Performance Indicator	Data Point
Civic Engagement	<ul style="list-style-type: none"> Increased feeling of civic engagement among patrons Top activities contributing to increase in feelings of civic engagement
Social Belonging	<ul style="list-style-type: none"> Increased feeling of social belonging among patrons Top activities contributing to increase in feelings of social belonging
Access to eGovernment	<ul style="list-style-type: none"> Use of technology service(s) at library to access government resources online Top categories of eGovernment resources accessed

4.2.2 Fostering Creativity and Innovation

Evolving Community Needs

Technology is transforming not only the way people access information but also the ways in which they create new information, products and experiences for others. **Creative production** is an area where this shift has been gradually occurring for many years, with artists increasingly incorporating digital fabrication and design tools into their creative.

In addition to presenting new creative opportunities, digital platforms have reduced barriers to **disseminating cultural products and experiences**. For example, handmade crafts can be easily posted for sale on Etsy, and YouTube can give anyone an opportunity to connect with potential audiences across the globe. Once again, access to technology serves as a prerequisite for taking advantage of the possibilities presented by digital technology.

At the same time, these digital production and dissemination opportunities are accompanied by new challenges, ranging from the high cost of equipment, to discoverability as the public scrolls through an ever-increasing range of choices online. In this context, access to the leading-edge technologies and the skills to navigate emerging platforms play an important role in increasing digital access, capacity and skills among creators while also providing a point of access for audiences to participate in cultural activities.

How Public Libraries have Responded

Public libraries are at the forefront of providing cutting-edge creative tools to amateur and professional creators alike, including:

- **Design and publishing equipment and facilities**, such as 3D printers, laser cutters, and self-publishing stations (i.e., Espresso Machines);
- **Audiovisual production equipment and facilities**, such as music recording studios, photography equipment, self-publishing equipment, and even green screens;
- **Content-editing software**, such as Photoshop and digital video-editing tools; and,
- Other **medium-specific equipment**, including gaming consoles and virtual reality systems.

Consultations highlighted that both digital fabrication and other forms of technology-enabled creative expression are not only made available, but supported by training at public libraries. As such, patrons of all ages have an opportunity to learn how to operate specialized devices and use related software.

Digital tools and supports at public libraries foster creativity and innovation, in part through enabling collaborations and introducing community members to the potential of digital tools in advancing creativity and innovation. In so doing, libraries act as spaces where groups and communities can come together around the innovative possibilities unlocked by technology, for example:

- The **maker movement** is a prime example of a community that relies on technology services at public libraries but also enriches local understandings of digital tools. While public libraries offer access to devices like 3D printers and self-publishing machines, makers bring the possibilities of this technology alive through their work and share passion and expertise at events like maker fairs or ongoing programs such as classes and meetups.
- Introducing children and teens to the concepts of **robotics and artificial intelligence**, Windsor Public Library worked with Hackforge in 2014 to host *Robot Sumo*, an event where children and teens were invited to build a robot and in doing so, learn about the creation and innovation opportunities presented by technology.
- Leveraging the concept of “open data”, some library systems have hosted **hackathons** where innovators come together to develop creative solutions to problems. For example, in 2016, TPL hosted two hackathons – the first focused on leveraging data to enhance library services, and the second centred around poverty-related issues in the city. Similar events have been held by Edmonton Public Library, including an annual hackathon in celebration of International Open Data Day.

Most importantly, these services are provided in truly inclusive and accessible ways. Throughout the province, 45 First Nations public libraries support Indigenous communities while other libraries systems also offer resources to artists and creators living in rural and remote areas.⁵³ Consultations indicated that public libraries are leaders in providing accessible services to persons with disabilities, including through the availability of assistive technologies. In addition, multilingual resources support francophone communities as well as New Canadians.⁵⁴

Alignment with Public Policy Objectives

Leveraging technology to stimulate creativity and innovation is also reflected in public policy. At the provincial level, the **intersection between creativity and innovation** is illustrated in *Seizing Global Opportunities: Ontario's Innovation Agenda*, which embraces a broad definition of innovation as “an openness on the part of people to new ways of thinking and doing that bring about improvements.”⁵⁵ The agenda commits to developing skills in the arts alongside science and engineering, indicating that creativity complements technical expertise, both of which are supported by digital technology. In addition, the agenda highlights “the role of the arts, humanities and culture in fueling creativity and innovation, and encourages partnerships across disciplines to advance social and economic goals.”⁵⁶ This

⁵³ Government of Ontario. [“The Ontario Culture Strategy: Telling our stories, growing our economy.”](#)

⁵⁴ For example, the John Dixon Public Library in Mattawa is one example of a library that coordinates activities and curates information for a Franco-Ontarian community.

⁵⁵ Government of Ontario. [“Seizing Global Opportunities: Ontario's Innovation Agenda.”](#)

⁵⁶ Ibid.

statement establishes the importance of both the arts and partnerships to foster innovation in the province. From this perspective, public libraries are natural partners to encourage creative applications of new tools and provide both the technology access and the digital skill development to enable innovation throughout the province.

Technology services provided by public libraries also play a key role in **advancing cultural engagement**, another priority for the provincial government. Ontario’s *Culture Strategy* focuses on provincial government support to “promote cultural engagement and inclusion” (Goal 1), “strengthen culture in communities” (Goal 2), and, “maximize the contributions of culture and creativity to our knowledge economy” (Goal 3).⁵⁷ Public libraries contribute most directly to the first two goals of the strategy, primarily by providing “engaging educational and intergenerational learning experiences” and serving as “essential spaces for access to cultural experiences.” More indirectly, public libraries also support the creative economy by making available and accessible to all the tools, platforms and skills that continue to drive creativity in the digital world.

The Canada Council for the Arts has identified digital technology as a priority in its strategic plan⁵⁸ and will be supporting this commitment through a new digital fund for both individual artists and arts organizations.⁵⁹

Finally, the Ontario Arts Council (OAC) commits to ensuring **equitable access to the arts** among six priority groups that public libraries already have experience serving. The OAC’s strategic plan commits to extending creative opportunities among: Aboriginals, communities located outside of major cities, people of colour, persons with disabilities, francophones and youth between the ages of 18 and 30.⁶⁰ As noted in the section above, technology services at public libraries enable access to opportunities for creativity and cultural engagement for Ontarians in these priority groups in communities across the province.

Measuring Creativity and Innovation Outcomes

By providing access to technology, public libraries play an essential role in equipping patrons across Ontario to enjoy cultural experiences and engage in the creative process. As such, **creativity and innovation** is a key outcome area for technology services at public libraries. Figure 10 presents the KPIs and data points that could be used to measure public libraries’ contribution to this secondary outcome area.

Figure 10: KPIs and Data Points – Creativity and Innovation

Key Performance Indicator	Data Point
Making Creative Products	<ul style="list-style-type: none"> ▪ Use of technology service(s) to make creative products ▪ Types of creative products made

⁵⁷ Government of Ontario. [“The Ontario Culture Strategy: Telling our stories, growing our economy.”](#)

⁵⁸ Canada Council for the Arts. [“Commitments.”](#)

⁵⁹ Canada Council for the Arts. [“Arts in a Digital World Summit.”](#)

⁶⁰ Ontario Arts Council. [Vital Arts and Public Value: A Blueprint for 2014-2020.](#)

4.2.3 Enabling Entrepreneurship and Business Development

Evolving Community Needs

Technology presents both opportunities and challenges to local economies. Small businesses can instantly connect with customers around the world, but also face increased competition to distinguish their products and attract top talent in an increasingly global market. In this context, digital skills from prototyping to e-marketing are increasingly important. The *Global Entrepreneurship Monitor Ontario Report 2016* reveals that although the province has the highest rate of early-stage entrepreneurial activity compared to other jurisdictions studied, the widespread use of new technology does not translate to commercialization.⁶¹ Moreover, consultations indicated that many small business do not have the internal capacity or resources to take full advantage of emerging tools and struggle to adapt to multiple platforms.

How Public Libraries have Responded

Consultations revealed that public libraries across the province are responding to the demands that digital enterprise places on local businesses. As discussed above, digital literacy is foundational to participation in the knowledge economy. However, the public library's role in supporting entrepreneurship extends beyond basic digital skills training. Much support is available at libraries, where staff direct patrons to appropriate resources and help people navigate regulatory requirements online. Some libraries also run programs that target business skills, many of which incorporate technology services, including:

- **Onsite business resources:** for example, TPL offers courses in social media for small businesses and online market research; and,
- **Virtual business resources:** for example, Windsor Public Library maintains the Building Better Business Website, which provides resources for businesses at every stage of development, from conception, research and planning through to launch. Similarly, Kitchener Public Library curates a selection of online databases that are particularly relevant to small businesses.

In addition to providing access to technology for businesses, public libraries also provide access to work spaces, which have the potential to spark networking and collaborations among the small businesses and entrepreneurs that use library services to start, manage or expand their businesses.

Alignment with Public Policy Objectives

The use of technology services to support entrepreneurship and business development advances and complements public sector priorities and programs. Namely, Ontario's support **for economic development through business growth** includes a \$400 million investment to "fast-track Ontario's knowledge-based economy by tapping into the creativity, education and skills of our people."⁶² Growing business and creating an innovation-driven economy are two key priorities in the Province's *Business Growth Initiative*, with the government specifically making a commitment to "the commercialization and

⁶¹ Haber, S., Lo, M., and, Davis, C. [Global Entrepreneurship Monitor Ontario Report 2016](#).

⁶² Government of Ontario. "[Business Growth Initiative](#)."

adoption of new technologies.”⁶³ This focus on bringing new, innovative ideas to market directly relates to business-focused technology services at public libraries.

Leveraging digital tools to **support small businesses** is also a key priority at the municipal level. For instance, the City of Toronto’s *Digital Main Street* program helps small business identify and become comfortable with digital tools. The program includes an assessment of technology needs, access to service providers in areas from social media to mobile websites and ongoing service support and education opportunities at events. Conducting the assessment, implementing the recommendations, and connecting with providers all require a basic level of digital readiness that businesses can achieve through the connectivity, equipment and training provided at public libraries.

Measuring Entrepreneurship and Business Development Outcomes

Whether it is through facilitating market research, accessing information about how to open a business, or growing a business through connecting with potential customers, investors and partners, technology services at public libraries play a key role in helping business grow. As a result, **entrepreneurship and business development** is a key outcome area for technology services at public libraries. The following table presents the KPIs and data points that could be used to measure public libraries’ contribution to this outcome area.

Figure 11: KPIs and Data Points – Entrepreneurship and Business Development

Key Performance Indicator	Data Point
Business Outcomes	<ul style="list-style-type: none"> Business activities undertaken using technology service(s) at the library (e.g., starting a business, connecting with potential customers, etc.)
Employment Supported	<ul style="list-style-type: none"> Number of people employed by businesses using technology service(s) at the library for business-related purposes

4.2.4 Developing the Workforce

Evolving Community Needs

From high school students planning their future careers, to older adults looking to retrain or switch jobs, people at all stages of their professional and educational development are adapting to new skills demands emerging in response to technological advancements. The global knowledge economy requires individuals to be digitally-engaged and competent, even in non-technical positions. Basic professional requirements often range from maintaining an online presence (either personally, or on behalf of a business/employer), to interacting with clients and colleagues via virtual channels and promoting products and services online.

As skills needs continue to evolve, **lifelong learning is essential to ongoing professional success**. In fact, the Ontario Literacy Coalition’s report, *Menial No More*, posits that the pervasive use of digital technology in workplaces means that there is no such thing as low-skills jobs in the contemporary

⁶³ Ibid.

economy.⁶⁴ Similarly, in its January 14, 2017 special report on lifelong learning, *The Economist* declared that “lifelong learning is becoming an economic imperative” as it pointed to the prevalence (and demand for) technical skills beyond the tech sector, the need for continuous acquisition of skills and technical competencies throughout the career lifecycle, and the rise of modular, open-access training and education models.⁶⁵ Yet, access to these new modes of learning is limited by barriers – primarily technology access but in many cases, also the high cost of registration/subscription. Regardless, in the absence of equitable access to new and emerging upskilling opportunities and learning networks, professionals face the challenge of remaining competitive in the workplace both as they enter the job market, and throughout the course of their careers.

How Public Libraries have Responded

In addition to providing opportunities for patrons to learn *about* technology (which is discussed in Section 4.1.1 Digital Literacy), public libraries allow patrons to learn *through* technology. Technology services at public libraries assist people of all ages in upskilling, finding work and excelling in a connected world. Consultations revealed the extent to which public libraries contribute to workforce development, as libraries facilitate access to education and lifelong learning; the development of employable skills; and, resources supporting the various stages of the job search process.

In terms of more traditional educational pursuits, youth considering post-secondary programs can use library services to learn more about their options, including programs and the financial or other resources they may require for enrolment. More informal learning and professional development opportunities are also supported at public libraries, including **e-learning platforms**, such as Lynda.com, Mango Languages courses, and similar services, which leverage digital technology to support lifelong learning and the development of **employable skills**. In fact, these platforms can be used to develop skills that increase competitiveness in the job market, including technical (e.g., coding, social media, etc.) and non-technical (e.g., marketing, management, languages, etc.) skills. These programs and services align with the rise of popularity in informal, shorter-term, online learning opportunities, such as Massive Open Online Courses (MOOCs) and micro-credentials. The education-related outcomes of technology services at public libraries are further discussed in Section 4.2.4, in particular as they relate to workforce development.

In addition, libraries provide access to the technology resources as well as training and support related to the **job search process** – i.e., developing resumes, interviewing and other aspects of the application process (many of which happen online). These services are particularly important to young people who are navigating educational and career options, adults who may be pursuing a second career, and older adults who may not have an online presence or familiarity with the role that digital tools play in today’s job market.

⁶⁴ Ontario Literacy Coalition. [Menial No More](#).

⁶⁵ The Economist, Special Report: Lifelong Learning, “Lifelong learning is becoming an economic imperative,” and “Established education providers v new contenders” (January 14, 2017).

Alignment with Public Policy Objectives

Workforce development supported by technology services at public libraries aligns with broader public policy priorities and initiatives. In *Building the Workforce of Tomorrow: A Shared Responsibility*, a report summarizing recommendations from the Ontario Premier’s Highly Skilled Workforce Expert Panel,⁶⁶ there is a focus on priority areas of action that respond to the **needs of the global knowledge economy** and in many ways, relate to the desired outcomes of technology access at public libraries:

- Development of **new skills and competencies**, a key theme covered in the report, addresses the real and perceived skills gaps that can be mitigated through a better understanding of what the job market needs, as well as better articulation of a candidate’s value to prospective employers
- The promotion of **multiple career pathways**, in recognition of the fact that “a fast-changing economy means constantly evolving jobs and careers”, further reinforces the importance of lifelong learning and skills development and promotes exposure to technology among children and youth.

In combination, the economy’s demand for new and constantly changing skillsets requires a self-directed and less structured approach to learning that extends beyond traditional educational institutions and continues throughout one’s professional career.

As discussed above, encouraging the consistent and appropriate use of technology in formal educational settings is also a priority of the Ministry of Education’s *Achieving Excellence: A Renewed Vision for Education in Ontario*.⁶⁷ Undoubtedly, Ontario’s forthcoming Digital Literacy Strategy will further reinforce the importance of technology access and skill development in the future.⁶⁸

Libraries, in their role as contributors to workforce development through technology access, enable ongoing and accessible upskilling through informal and structured learning opportunities for patrons, as well as support them in their communication of their skills throughout the (often electronic) job search process.

Measuring Workforce Development Outcomes

Overall, the range of technology services that encourage education and employment demonstrate that public libraries prepare job-seekers and emerging professionals for the workforce and connect them with employment and professional development opportunities. As a result, **workforce development** is a key outcome area for technology services at public libraries. Figure 12 presents the KPIs and data points that could be used to measure public libraries’ contribution to this outcome area.

⁶⁶ The Premier’s Highly Skilled Workforce Expert Panel. [Building the Workforce of Tomorrow: A Shared Responsibility](#).

⁶⁷ Ministry of Education. [Achieving Excellence: A Renewed Vision for Education in Ontario](#).

⁶⁸ Wynne, K. [“September 2016 Mandate Letter: Digital Government.”](#)

Figure 12: KPIs and Data Points – Workforce Development

Key Performance Indicator	Data Point
Educational Activities/Lifelong Learning	<ul style="list-style-type: none"> Use of technology service(s) for educational activities (e.g., applying to enroll in a degree or certificate program, taking an online class or workshop) Top educational activities enabled by technology services
Employment Skills	<ul style="list-style-type: none"> Use of technology service(s) to develop employment skills (e.g., management skills, administrative skills, technical skills, etc.) Top employment skills developed as a result of technology services
Job Outcomes	<ul style="list-style-type: none"> Use of technology service(s) to develop skills related to finding a job (e.g., accessing job boards, building a resume, preparing for an interview, etc.) Patron success in finding a job

4.3 Summary of Outcome Areas

In the preceding sections, we described the emerging resources and skills required by Ontarians as they engage with their communities and the broader economy in the 21st century, along with the technology services offered in response by public libraries across Ontario and the ways that those services align with public policy priorities.

In combination, these findings enable the mapping of technology services to overarching, tiered outcome areas. The resulting **Outcome Framework**, which was introduced at the beginning of Section 4, is presented again in Figure 13, along with the related KPIs.

Figure 13: Outcome Framework

Primary Outcomes	Indicators for Primary Outcomes
Digital Inclusion	<ul style="list-style-type: none"> Access to technology Use of technology for others
Digital Literacy	<ul style="list-style-type: none"> Digital comfort New technology adoption
Secondary Outcomes	Indicators for Secondary Outcomes
Community, social and civic engagement	<ul style="list-style-type: none"> Civic engagement Social belonging Access to eGovernment
Creativity and innovation	<ul style="list-style-type: none"> Making creative products
Workforce development	<ul style="list-style-type: none"> Educational activities/lifelong learning Job search outcomes Employable skills
Entrepreneurship and business development	<ul style="list-style-type: none"> Business outcomes Employment supported

As described in Section 4, this framework will serve as an organizing principle throughout the development of the various elements of the Toolkit. Alongside the design and functionality of the software, this framework will be tested with public libraries through the two pilot rounds in Phase 3 (see Section 1 for an overview of the project phases).

5. Current Evaluation Tools for the Library Sector

The design of the Technology Services Assessment Toolkit took into account the range of existing tools and resources that are currently available to public libraries in support of their measurement and evaluation goals. The Toolkit incorporates and builds on relevant aspects of each of these existing tools to provide library administrators with a data gathering and analysis resource that is scalable, comparable, and uniquely developed for the Ontario context. This section presents an overview of these tools and resources.

At the national level, libraries have access **to statistics published by the Canadian Urban Libraries Council (CULC)**,⁶⁹ which also inform CULC's Analysis of Public Library Trends.⁷⁰ Although this information goes back for several decades, the focus on urban libraries does not meet the needs of all communities in Ontario.

Provincially, **the Federation of Ontario Public Libraries conducts research on user trends and other issues affecting libraries**, some of which was discussed in Section 2 of this report.⁷¹ The Ministry of Tourism, Culture and Sport (MTCS) also compiles information about library services through the **Ontario Public Library Statistics program**, elements of which were also presented in Section 2.⁷² MTCS' Ontario Public Library Statistics are a key source of insight into trends in public library services, zeroing in on the Ontario context. The statistics are based on a survey which asks library administrators about topics ranging from their library budget and collection size to costs of technology and participation in programming. Information is collected annually from all public libraries and participation in the survey is a condition of renewed funding from the Ministry. At the local level, public libraries are one of the areas of focus of the **Municipal Benchmarking Network Canada**. However, as with the CULC data, this research does not cover all the libraries in the province.⁷³

Most relevant to this project, however, are three tools that have been made available to library systems to conduct evaluations of their programs and services, and in some cases, to benchmark their performance against that of their peers. At the time of writing this report, these tools included:

- **Project Outcome:** In 2013, the Public Library Association established a Performance Measurement Task Force to investigate consistent metrics for public libraries. The resultant tool, Project Outcome, examines seven core service areas: civic/community engagement, digital inclusion, early childhood literacy, economic development, education and lifelong learning, job skills, summer reading.⁷⁴ Library users evaluate each core service area by responding to short surveys and results are presented as interactive data dashboards.

⁶⁹ Marriott, J. [Canadian Public Library Statistics](#).

⁷⁰ Lumos Research Inc. [An Analysis of Public Library Trends Prepared for the Canadian Urban Libraries Council](#).

⁷¹ Federation of Ontario Public Libraries. "Market Probe 2015."

⁷² Government of Ontario. "[Ontario Public Library Statistics](#)."

⁷³ Municipal Benchmarking Network Canada. [2014 Performance Measurement Report – Libraries](#).

⁷⁴ Project Outcome. "[About Project Outcome](#)."

- **Edge Assessment:** In 2011, the Urban Libraries Council, in collaboration with a coalition of American library and government organizations, launched the Edge Initiative – an evaluation framework specifically for technology services at public libraries.⁷⁵ The framework consists of indicators across the three areas of community value, engaging the community and decision makers and organizational management, measured through internal data gathered by the library. TPL conducted Edge evaluations in 2014 and 2016. The 2016 evaluation yielded 25 recommendations about technology-based services ranging from how the library should manage their technology resources to maximize quality to the ability of frontline to answer questions about technology.
- **Impact Survey:** An online tool developed by the University of Washington Information School, Impact Survey aims to assist public libraries in understanding how communities use technology services.⁷⁶ Impact Survey was deployed at TPL in 2015 and received 908 responses. The results provided insights into the ways people accessed technology services, both at the library and outside the library. For instance, 83% of respondents accessed library resources using computers in the library, and 40% of respondents did so at least once a week. Moreover, 66% connected to TPL wireless on their own computer and 52% accessed library resources using a mobile device. Survey results also suggested that the TPL is unique in providing technology services because only 29% of respondents were aware of another location in the community with free access to computers and the internet.

In the figure below, these three tools are compared based on the scope of services they cover, the outcomes they measure, and their benchmarking capabilities.

Figure 14: Comparison of Library Evaluation and Benchmarking Tools

			
Scope of services covered	All services	Technology services	Technology services
Patron Survey	YES	YES	NO
Outcomes Measured	<ul style="list-style-type: none"> ▪ Civic/community engagement ▪ Digital learning ▪ Economic development ▪ Education ▪ Early childhood literacy ▪ Job skills ▪ Summer reading 	<ul style="list-style-type: none"> ▪ Use of technology ▪ Public computer use by activity area (e.g., education, eBusiness, employment, civic engagement, social inclusion, eGov, etc.) ▪ Patron satisfaction ▪ Patron demographics 	<ul style="list-style-type: none"> ▪ Community value (e.g., digital literacy) Engaging the community (e.g., partnerships) ▪ Organizational management (e.g., planning and policies)
Benchmarks	YES	NO	YES

⁷⁵ Edge Initiative. (2016) "[Edge: where people connect, communities achieve.](#)"

⁷⁶ Impact Survey. "[About Us.](#)"



As demonstrated above, each of these tools provide different benefits to public libraries, and present approaches to data gathering, analysis and comparative data to support measurement, evaluation and benchmarking. With the Technology Services Assessment Toolkit, Ontario public library administrators have an opportunity to use **one tool** to measure usage and outcomes that are relevant to the community and policy landscape in which they operate, and compare their service delivery with peers across the province. Going forward, the Technology Services Assessment Toolkit contributes to common benchmarks and outcomes to avoid duplication, and positions the public library sector to successfully assess technology services.

6. Conclusion

As described in Section 2, the landscape of public library services is shifting to accommodate new forms of accessing and interacting with information, namely through technology. These shifts have led to a need for enhanced decision-making and outcome measurement capabilities. This study, and the Toolkit being developed as part of it, were commissioned in response to these dynamics.

Through research and consultations, the project team has been able to answer two key questions that inherently inform the design and development of the Toolkit:

1. **What outcomes should the Toolkit Measure?**

The Outcome Framework outlines two primary and four secondary outcome areas to be measured by public libraries across Ontario as they evaluate their technology services:

- Primary Outcomes:
 - Digital inclusion
 - Digital literacy
- Secondary Outcomes:
 - Community, social and civic engagement
 - Creativity and innovation
 - Entrepreneurship and business development
 - Workforce development

2. **How should the Toolkit measure these outcomes?**

The functionalities of the Toolkit build on the current landscape of measurement and evaluation, drawing on existing tools and resources to provide Ontario public libraries with a solution that meets their unique needs and reflects the specific landscape within which they operate (i.e., the Ontario context).

As public libraries across the province continue to serve their patrons and communities through the delivery of technology services, and aim to expand the relevance and reach of these services, this Toolkit aims to help them do so more effectively by improving their ability to make informed, evidence-based decisions and understand how their services are being used. Implementation of this Toolkit will build the collective capacity of Ontario public libraries to deliver services that are responsive to the rapidly changing technology landscape, as well as the unique needs of their communities.

The Toolkit will contribute to a more complete, more accurate picture of how technology services fulfill the mandate of public libraries to deliver effective and efficient service. It will also help libraries understand and demonstrate not only how technology services directly benefit residents of their communities, but how these services align with and support social and economic priorities at multiple levels of government.

As we near the half-way point of the project, we look forward to collaborating with TPL and its partners, including the participating library systems, other prospective users, and the provincial and municipal governments, to validate our research and refine the answers to the above questions so that we can deliver a practical and relevant solution and contribute to capacity building and advancement in the sector.

Appendix A. Resources Consulted

Aspen Institute -

[Rising to the Challenge: Re-Envisioning Public Libraries](#) (2014),

Website, "[People, Place and Platform.](#)"

Canada Council for the Arts -

Website, "[Arts in a Digital World Summit.](#)"

Website, "[Commitments.](#)"

Canadian Radio-television and Telecommunications Commission (CRTC) –

[Communications Monitoring Report 2016.](#)

News, backgrounders, "[CRTC Submission to the Government of Canada's Innovation Agenda](#)" (2016).

Carnwath, J. D., and Brown, A. S., [Understanding the Value and Impacts of Cultural Experiences: A Literature Review](#), prepared for Arts Council England (2014).

City of Kitchener, [Digital Kitchener.](#)

City of Pickering, website, "[Smart 21.](#)"

Crossick, G. and Kaszynska, P., [Understanding the Value of Arts and Culture: The AHRC Cultural Value Project](#), prepared for the Arts & Humanities Research Council (2016).

Edge Initiative, website, "[Edge: where people connect, communities achieve.](#)"

Federation of Ontario Public Libraries, *Market Probe 2015.*

Galang, J., *Betakit: Canadian Startup News & Tech Innovation*, "Toronto Region Board of Trade and City of Toronto Launch Smart City Initiative" (May 27, 2016).

Government of Canada –

News Releases, "[CRTC establishes fund to attain new high-speed Internet targets](#)" (December 21, 2016),

Fall Economic Statement, "[Chapter 2 – Investing in the New Economy.](#)"

Government of Ontario -

[21st Century Competencies: Foundation Document for Discussion](#) (Winter 2016 Edition),

[Achieving Excellence: A Renewed Vision for Education in Ontario](#) (2014),

"[Business Growth Initiative](#)" (2016).

[Community hubs in Ontario: A Strategic Framework and Action Plan](#) (2016)

Data catalogue, "[Ontario Public Library Statistics](#)" (2017).

"[Digital Government](#)" (2017).

[Independence, Activity and Good Health Ontario's Action Plan for Seniors](#) (2013)

"[Mandate letter progress: Treasury Board Secretariat](#)" (2016).

"[Ontario's Open Data Directive](#)" (2016).

[Realizing Our Potential: Ontario's Poverty Reduction Strategy \(2014-2019\)](#).

["September 2016 Mandate Letter: Digital Government"](#) (2016).

["September 2016 Mandate letter: Indigenous Relations and Reconciliation"](#) (2016).

[Stepping Up: A Strategic Framework to Help Ontario's Youth Succeed](#) (2014).

[The Journey Together: Ontario's Commitment to Reconciliation with Indigenous Peoples](#) (2016).

[The Ontario Culture Strategy: Telling our Stories, Growing our Economy](#) (2016).

The Premier's Highly Skilled Workforce Expert Panel, [Summary of Recommendations - Building the Workforce of Tomorrow: A Shared Responsibility](#) (2016)

Haber, S., Lo, M., and, Davis, C., [Driving Wealth Creation and Social Development in Ontario: 2015 GEM Ontario Report](#), prepared for Global Entrepreneurship Monitor (2016)

Hilbert, M., "Technological information inequality as an incessantly moving target: The redistribution of information and communication capacities between 1986 and 2010," *Journal of the Association for Information Science and Technology*. 65 (4) 821-835 (2011).

Impact Survey, website, ["Impact Survey: Advancing libraries through community insight."](#)

Innisfil Public Library, [Strategic Plan \(Consultant's Report\)](#) (2012).

International Federation of Library Associations and Institutions (IFLA)

[IFLA Trends Report 2016 Update](#)

[Access and Opportunity for All: How Libraries Contribute to the United Nations 2030 Agenda](#) (2015)

Lumos Research Inc., [An Analysis of Public Library Trends](#), prepared for the Canadian Urban Libraries Council (2011,

Martin Prosperity Institute, [So Much More: The Economic Impact of the Toronto Public Library on the City of Toronto](#) (2013).

Marriott, J., [2014 Canadian Public Library Statistics](#), prepared for the Canadian Urban Libraries Council (CULC).

Municipal Benchmarking Network, [2014 Performance Measurement Report - Libraries](#).

Ontario Arts Council. [Vital Arts and Public Value: A Blueprint for 2014-2020](#).

Project Outcome, website, ["Outcome Measurement Made Easy: Resources and Tools to Plan Surveys and Analyze Data at Your Library."](#)

SGS Economics and Planning, [National Welfare and Economic Contributions of Public Libraries](#), prepared for the Australian Library and Information Association (2013).

Steffen, N., Lietzau, Z., Curry Lance, K., Rybin, A., and, Molliconi, C., [Public Libraries – A Wise Investment: A Return on Investment Study of Colorado Libraries](#) (2009).

Tessler, A., [Economic valuation of the British Library](#) (2013).

The White House, Office of the Press Secretary (2015), ["Fact Sheet: Administration Announces New "Smart Cities" Initiative to Help Communities Tackle Local Challenges and Improve City Services."](#)

Toronto Public Library, [Strategic Plan 2016-2019](#).

University of Waterloo, [Canadian Index of Wellbeing](#).

Appendix B. Stakeholders Consulted

Partner Libraries

Name	Position	Library System
Aaron DeVries	Manager, Creative Making and Discovery (former)	Innisfil Public Library
Danielle Recollet-Saikkonen	Information Services Programmer	Wikwemikong First Nation Library
Debra Mann	Librarian, Creative Making & Discovery	Innisfil Public Library
Natalie Durette	Librarian	Naotkamegwaning First Nation Public Library
Erika Heesen	CEO	Perth and District Union Public Library
Lesa Balch	Director, Technologies and Content	Kitchener Public Library
Lise Moore Asselin	CEO	Mattawa Public Library
Sue Perry	Self-Publishing Facilitator	Windsor Public Library

The project and an early iteration of the Technology Services Assessment Toolkit was presented at the **2017 OLA Super Conference**, where session attendees were encouraged to provide feedback.

Other Stakeholders

Name	Position	Organization
Ab Velasco	Manager, Innovation	Toronto Public Library
Adam Haviaras	Library Services Advisor	Ontario Ministry of Tourism, Culture and Sport
Alex Hocevar	Director, Digital Services & Emerging Technologies	Toronto Public Library
Alex Mihailidis	Associate Professor	University of Toronto
Andrea Austen	Lead, Toronto Seniors Strategy	City of Toronto
Brenda Sherry	Education Officer - 21st Century Learning Unit	Ontario Ministry of Education
Dan Keon	Director, Human Resources	Toronto Public Library
Dan Rosen	Senior Policy Advisor, Economic Development and Culture	City of Toronto
Francis Ngo	Teacher-Librarian	Forest Hill Jr/Sr Public School
Greg McLeod	21st Century Learning Unit	Ontario Ministry of Education
Harvey Low	Manager, Social Research and Analysis Unit, Social Development Finance and Administration	City of Toronto
Jefferson Gilbert	Executive Director	Canadian Urban Libraries Council
Joe Mazzei	Senior Advisor, Technology Sector	City of Toronto
Leanne Clendening	CEO	Ontario Library Service - North
Linda Hazzan	Director, Communications, Programming and Customer Engagement	Toronto Public Library

Name	Position	Organization
Moe Hosseini-Ara	Director, Branch Operations & Customer Experience	Toronto Public Library
Nirvana Champion	Economic Development Officer, Digital Main Street	City of Toronto
Olivia Cimo	21st Century Learning Unit	Ontario Ministry of Education
Pam Ryan	Director, Service Development & Innovation	Toronto Public Library
Ricardo Tranjan	Policy Lead, Poverty Reduction	City of Toronto
Rod Sawyer	Library Services Advisor	Ontario Ministry of Tourism, Culture and Sport
Sandra Gornall	Manager, Policy, Planning and Performance Management	Toronto Public Library
Sarah Simpkin	President	Ontario Library and Information Technology Association (OLITA)
Stephen Abram	Executive Director	Federation of Ontario Public Libraries
Vickery Bowles	City Librarian	Toronto Public Library
Ziyaad Vahed	21st Century Learning Unit	Ontario Ministry of Education