OXFORD ECONOMICS

# VALUE STUDY OF GLAMs IN CANADA

## REPORT FOR THE OTTAWA DECLARATION WORKING GROUP

DECEMBER 2019

Ottawa Declaration
la Déclaration d'Ottawa

**Oxford Economics** **December 2019**

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# FOREWORD

Canadian galleries, libraries, archives and museums (GLAMs) form an integral part of the fabric of our nation, enriching the lives of millions of visitors of all ages, backgrounds and regions every year.

Rich repositories of art, information, history and treasure, these precious institutions serve to preserve and promote Canadian heritage at home and abroad, while providing access to resources for education, research, learning and artistic creation.

Collectively known as the GLAM sector, ours is an industry that regularly punches above its weight. Non-profit GLAMs, whether in large cities or small towns across the country, attract world-class exhibits and provide communities with essential educational and research opportunities they may not otherwise be able to access.

For too long, members of the GLAM sector have largely operated in silos. Enter the Ottawa Declaration Working Group, comprised of sector representatives and co-led by Library and Archives Canada (LAC) and the Canadian Museums Association (CMA). We now recognize the importance of working together to increase the understanding of the value of our sector. We believe this first-of-its-kind study goes a long way towards that goal.

An initiative of the Ottawa Declaration Working Group comprised of sector representatives and co-led by the Canadian Museums Association (CMA) and Library and Archives Canada (LAC), the study found that for every dollar invested in non-profit GLAMs, society gets nearly four dollars in benefits. This return is on par with government investments in transportation infrastructure projects.

The study was conducted by Oxford Economics using metrics commonly employed by cultural institutions, as well as the results of a national survey of Canadians. It found users of GLAMs would be willing to pay $4 billion more per year to access them if required – a testament to the intrinsic value of GLAMs to Canadians.

This is a value so great, that even non-users recognize the importance of GLAMS to society at large and to future generations. Non-users said they'd be prepared to contribute $22 per year for museums, $17 for galleries and libraries and $14 for archives as a donation towards the maintenance of these institutions. This amounts to an additional $2.2 billion per year.

In all, 96% of respondents surveyed for the study said that museums contribute to our quality of life. Indeed, the study found that visiting GLAMs can be linked with improved health and wellbeing – equivalent to receiving a monetary bonus of $1,440 a year.

GLAM visits are associated with many other important societal benefits including greater literacy, curiosity, innovation, knowledge and creativity, increased rates of

volunteerism and a better sense of community. These are incredibly important qualities in an increasingly divisive world.

Another way for users to interact directly with GLAMs is through their official websites, online catalogues and social media pages. The study pegged the value of these online visits at $1.6 billion per year.

It also noted GLAMs generate significant educational benefits for Canada, including through school visits which provide children across the country with important learning opportunities. The value of these visits is estimated at $3.1 billion. It was further found that academic libraries contribute an additional $3.4 billion and are associated with higher student wages and income over the working lifetime of students.

In all, it is estimated that society gains nearly $8.6 billion from GLAMs' existence every year. That is no small contribution to Canada's economic and social prosperity. Accordingly, the preservation, promotion and development of GLAMs should be of concern not just to those of us who work in the sector, but to all Canadians.

**Ottawa Declaration Steering Committee**

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# EXECUTIVE SUMMARY

**150 million**

Estimated visits to Canadian galleries, libraries, archives and museums in one year.

*Of these, over 100 million were to public libraries and over 30 million to museums.*

**$4.0bn**

Total annual "consumer surplus" of visitors to GLAMs in Canada.

*This is the sum of the additional amounts these visitors would be willing to pay to visit GLAMs.*

## INTRODUCTION

In 2016, the Canadian Museums Association (CMA), in partnership with Library and Archives Canada, held a summit on the value of galleries, libraries, archives and museums (GLAMs). Oxford Economics participated in the discussion, recommending that "the broad [GLAM] community should consider actively working together to collect data and to carry out horizontal value studies." In late 2018, the CMA, on behalf of the Ottawa Declaration Working Group, commissioned Oxford Economics to undertake a national study looking at the value of GLAMs in Canada.

Canadian GLAMs receive in the region of 150 million visits every year, but they are much more than simply visitor attractions. They preserve and promote Canadian heritage domestically and around the globe, while providing access to resources for education, research, learning and artistic creation. This report aims to capture the fundamental role played by non-profit GLAMs in Canada, using a combination of quantitative value metrics and qualitative assessments of societal values.

## HOW WE ASSESS THE VALUE OF GALLERIES, LIBRARIES, ARCHIVES AND MUSEUMS

This study provides an assessment of the value of GLAMs using cost-benefit analysis (CBA) within an economic welfare framework.[1] It takes a Total Economic Value (TEV) approach, which measures the economic benefits accruing not just to direct beneficiaries such as GLAMs visitors, but to "non-users"—people who value GLAMs' existence even if they have not recently visited one.

While assessing the costs of maintaining and operating GLAMs is relatively simple, quantifying the benefits is more difficult, requiring a range of economic techniques in line with the diversity of activities GLAMs undertake. These include a calculation of their value as visitor attractions—computed from what visitors actually pay to access GLAMs, but also an estimation of what visitors *would have been prepared to pay* over and above the ticket price (known as the "consumer surplus.")

To capture the non-use and broader social value of GLAMs, we undertook a national survey of 2,045 Canadian residents (hereafter referred to as the "national survey.") *Willingness to pay* questions were incorporated in this survey, and quotas were imposed by sex, age, education, language (English/French), and province and territory of residence to ensure a representative sample of the Canadian population.

## VALUE OF GLAMS TO THEIR VISITORS

[1] It is important to distinguish an economic impact study (which measures jobs, GDP and multiplier impacts) from an economic

Based on the most current data, an estimated 150 million visits are made to GLAMs by members of the public each year. Some visits required an entry fee, and hence produced operational revenues for the institution. For many others, such as libraries, entry was free of charge.

**$1.6bn**

Total one-year value of GLAMs' online services.

*The introduction of online services has seen much greater access to GLAMs information in recent years.*

Researchers use a variety of approaches to estimate the value visitors place on GLAMs. The approach adopted for physical visits in this study is the Travel Cost Method (TCM), which estimates consumer surplus based on how demand would change if the costs of admission were to rise from current levels. **This approach suggests a total physical use consumer surplus for GLAMs of $4.0 billion over a one-year timeframe**.[2]

**NON-USE VALUE OF GLAMS**

Beyond visitor benefits, another category of valuation represents the underlying values which Canadians hold for GLAMs whether or not they visit them. This represents the fact that, regardless of whether they visit them, Canadians value these institutions and want them to be supported. This so-called *non-use value* incorporates a number of components, including:

- the value that people attach to the existence of GLAMs whether or not they will ever visit them (existence value);
- the value placed on preserving GLAMs for the benefit of future generations (bequest value); and
- the value of having the option to visit GLAMs at some point in the future (option value).

**$3.1bn**

Total educational benefits to school students.

*This is the value of GLAMs' educational contribution to the students and society as a whole.*

To quantify these intrinsic values, our national survey explored the maximum amount people would pay each year as a donation to maintain all of Canada's non-profit GLAMs. Respondents who did not visit GLAMs over the past 12 months stated they would be willing to contribute $22 per year for museums, $17 for galleries and libraries, and $14 for archives. Taking these values as an underlying non-use value of GLAMs for all Canadians 16 and above, **we estimate a total non-use value of $2.2 billion for the entire GLAM sector in Canada.**

**EDUCATIONAL VALUE OF GLAMS TO STUDENTS**

GLAMs also generate significant educational benefits for Canada, including the learning that school visits provide to children across the country. While estimating returns to education is not straightforward, economists have long recognized and measured such returns as the value that education contributes to future wages. **We adopted this method to calculate a total value for GLAMs' educational benefits (as a result of school visits) of $3.1 billion.**

[2] All amounts are in Canadian dollars, expressed in 2019 prices, unless otherwise specified. This amount does not include the benefits of academic libraries, which are valued separately because of the different nature of the services they provide. The value of academic libraries to students and researchers is described and analysed in Section 4.3.

### THE VALUE OF GLAMS' ONLINE CONTENT

Online visits are another way for users to interact directly with GLAMs, and so constitute another form of consumer surplus that needs to be taken into account in their total valuation. **We estimate GLAMs' online value (i.e. consumer surplus) is equivalent to $1.6 billion per annum.** These results include visits to GLAMs' official websites, catalogues and Facebook, Twitter and Instagram usage, but exclude other social media portals.

**$1,440**

Annual value to the average GLAMs user in improved wellbeing.

*As measured through the health effects of GLAMs.*

### WIDER BENEFITS

Above and beyond the values described so far, GLAMs support wider benefits ("externalities") which may not be captured by a user's consumer surplus or other direct valuation approaches. Some of these wider benefits are difficult to incorporate into a cost-benefit analysis but are nevertheless important to recognize.

One wider benefit that we are able to quantify is the wellbeing effect of GLAMs. Regression modeling of our national survey data made it possible to provide monetary estimates of the equivalent wellbeing benefit conferred by GLAMs usage. **These suggest the annual value to an average GLAM user is equivalent to $1,440 in improved wellbeing (as measured through health effects).** In other words, visiting GLAMs has the same wellbeing effect of receiving a monetary bonus of $1,440 per annum.

### MULTI-CRITERIA ANALYSIS

GLAMs provide intrinsic social values that economic frameworks cannot address. Accordingly, Multi-Criteria Analysis (MCA) was also used to assess the perceived importance and degree of effectiveness of these attributes. Our MCA shows the general public and GLAM stakeholders tending to agree on which objectives matter most for GLAMs: **while archives, galleries and museums play a key role in preserving Canadian heritage, libraries are crucial for access to research resources.**

**BCR 3.9**

For every dollar invested in GLAMs, society gets back nearly four.

*Benefit cost ratio (BCR) of GLAMs.*

### COST-BENEFIT ANALYSIS OF GLAMS

**Combining all value components we were able to quantify as benefits, the total gross value of GLAMs to Canada is $11.7 billion a year** (in 2019 prices). This estimated benefit was derived from annual costs (the operational expenditure needed to run GLAMs) of $3.0 billion. Dividing the $11.7 billion in benefits by the $3.0 billion of costs gives a benefit-cost ratio (BCR) of 3.9. **This means that for every dollar invested in non-profit GLAMs, society gets nearly four dollars in return.** GLAMs perform very favourably when compared to other major social investments, such as transportation infrastructure.

It is also useful to highlight the net benefits of GLAMs; some prefer this approach as it indicates how much better off society is in aggregate. **We estimate that society gains $8.6 billion from GLAMs' existence every year.**

**Fig. 1. Summary of costs and benefits of GLAMs, 2019 prices**

| $million 2019 | Galleries | Libraries | Archives | Museums | All GLAMs |
|---|---|---|---|---|---|
| Revenue | 222 | 31 | 22 | 451 | 727 |
| Non-use value | 536 | 537 | 446 | 693 | 2,212 |
| Use value | 615 | 1,797 | 185 | 1,374 | 3,972 |
| Online usage | 378 | 636 | 353 | 277 | 1,644 |
| Educational value | 435 | 1,361 | 41 | 1,271 | 3,108 |
| **Total benefits** | **2,185** | **4,362** | **1,047** | **4,067** | **11,662** |
| Operating costs | 556 | 955 | 395 | 1,106 | 3,012 |
| **Total costs** | **556** | **955** | **395** | **1,106** | **3,012** |
| *Benefit-Cost Ratio (BCR)* | **3.9** | **4.6** | **2.7** | **3.7** | **3.9** |
| *Net benefits* | **1,629** | **3,408** | **652** | **2,961** | **8,650** |

**GLOSSARY**

| | |
|---|---|
| Academic libraries | Libraries that support the research and learning activities of students and academic researchers; normally attached to higher education institutions. |
| AFA | Alberta Foundation for the Arts. |
| ALC | Americans for Libraries Council. |
| Archives | Institutions that collect, preserve and provide access to records and documents of historical value. |
| BCR | Benefit-cost ratio. The ratio of total benefits divided by total costs. In this case, the ratio effectively represents the return on every dollar invested in GLAMs. |
| CBA | Cost-Benefit Analysis. The process through which the benefits of institutions or initiatives (such as GLAMs) are measured against their costs. |
| CMA | Canadian Museums Association. |
| Consumer surplus | The difference between the maximum amount that consumers are willing to pay to use a good or service (such as accessing GLAMs) and the actual cost of using it. This difference is treated as one measure of consumer benefit. |
| CULC | Canadian Urban Libraries Council. |
| Current users | Those who have used GLAMs within the last 12 months. |
| CV | Contingent Valuation. A survey-based technique used for assessing people's valuation of resources that may not be captured by typical market measures—e.g. the value of GLAMs to those who do not use them. |
| ESDS | UK's Economic and Social Data Service. |
| Formal education | Education that is delivered and/or supervised by trained teachers as part of a school, higher education or university curriculum, as opposed to informal learning. |
| FSA | Forward Sortation Areas. The first three characters of Canadian postal codes used to designate geographical areas. |
| Galleries | Institutions that select and preserve artworks and make them accessible to the public. By organizing exhibitions and programming, galleries advance the knowledge, understanding and appreciation of the arts, and help support research and inspire creativity. |
| GDP | Gross Domestic Product. |
| GLAMs | Galleries, Libraries, Archives and Museums. |

| | |
|---|---|
| ICT | Information and Communication Technology. |
| Informal education | Learning that is undertaken outside of a structured curriculum in an individual's free time, including self-directed learning and/or learning from experience. |
| LAC | Library and Archives Canada. |
| Libraries | Institutions that provide collections of resources, especially books, used for reading and study, in addition to extensive bodies of information resources and services that may also be virtual in nature. |
| MCA | Multi-Criteria Analysis. A qualitative methodology used to provide a more holistic view of benefits. Respondents explicitly evaluate criteria used in decision-making across the key areas of interest. |
| Museums | A non-profit institution, open to the public and in the service of social development, that collects, preserves, interprets, and exhibits to the public objects of cultural, artistic, scientific, and historical value for the purposes of education, research, and enjoyment. |
| Non-users | People who have not used GLAMs within the last 12 months (or have never used them at all.) |
| NPV | Net Present Value. The net value of future benefits, less future costs, with a discount rate applied to translate these figures into today's terms. |
| ODWG | Ottawa Declaration Working Group. |
| OECD | Organisation for Economic Co-Operation and Development. |
| Past users | People who have visited Canadian GLAMs in the past, but not within the last 12 months. |
| Producer surplus | The difference between the revenue received by the producer (in this case GLAMs) and the minimum they would have been able to produce these services for. Roughly speaking, producer surplus equates to the producer's profits. |
| PSQG | British Public Services Quality Group. |
| Public libraries | Public libraries provide free of charge resources and services to all residents of a given community or region. Public libraries are typically funded largely by public sources. |
| R&D | Research and development. |
| Social capital | Refers to the inherent value in communities that have shared and cohesive social norms, values and understandings, which in turn facilitate greater co-operation within or among groups. Social capital may arise from social activities such as community engagement, trust in people and democratic institutions, low levels of criminality and strong civic values. |

| | |
|---|---|
| Spill-over effects | Flow-on effects that occur when the consequences of personal or corporate actions are not fully appreciated by those involved. Positive spillover effects might include more people volunteering or being neighbourly, inspiring others to do so as well. |
| TCM | Travel Cost Method. An economic method used to estimate the value of non-market goods such as arts and culture. The technique generally involves estimating the access costs of visitors to institutions such as GLAMs (e.g. fares, time, and entrance fees) and using this to determine their consumer surplus. |
| TEV | Total Economic Value. A measure of the economic benefits of institutions such as GLAMs to the community, which includes estimation of non-use values (i.e. the value of GLAMs to society regardless of whether individuals use them or not). |
| Wellbeing effects | The broad positive feelings that can be associated with GLAMs and which can manifest themselves in ways such as positive spiritual feelings, health, happiness, inspiration and community engagement. |
| WTP | Willingness to Pay. The maximum amount in dollar terms people would pay (or give up) in order to be able to access institutions such as GLAMs. This is one measure of the value people place on GLAMs based on their personal preferences. |

# 1. INTRODUCTION

### 1.1 ABOUT THIS STUDY

In December 2016, the Canadian Museums Association (CMA), in partnership with Library and Archives Canada (LAC), held a summit in Ottawa exploring the value of Libraries, Archives and Museums (*Taking it to the Streets: Summit on the Value of Libraries, Archives and Museums in a Changing World).* The summit culminated with the creation of the Ottawa Declaration Working Group (ODWG), including a mandate to explore and study how Galleries, Libraries, Archives and Museums (GLAMs) bring value to Canadian society. The Summit and Declaration were the result of concerted work by Dr. Guy Berthiaume, Librarian and Chief Archivist of Library and Archives Canada, supported by LAC and CMA staff.

The ODWG was co-chaired by Dr. Berthiaume and Dr. John McAvity, Executive Director and CEO of the CMA. Dr. Berthiaume, Dr. McAvity and the ODWG continued their efforts to explore the value of GLAMs, post-summit. Accordingly, in late 2018, the CMA, on behalf of the ODWG, commissioned Oxford Economics to undertake a national study looking at the value of all Canadian GLAMs. The study was made possible thanks to the financial contributions of Canadian Heritage, the McConnell Foundation and Ms. Rosamund Ivey.

Throughout this report, the term GLAMs refers to the following types of institutions:

- Non-profit, public galleries whose primary purpose is communication rather than selling;
- Non-profit, public libraries in municipalities and regions, Indigenous libraries, academic libraries at Canadian post-secondary institutions, special libraries (for example, in hospitals, museums, galleries, botanical gardens, as well as serving people with disabilities) and provincial, territorial and national libraries;
- Non-profit, public archives in municipalities and regions, Indigenous archives, archives at Canadian post-secondary institutions, and provincial, territorial and national archives; and
- Non-profit, public museums in municipalities and regions, Indigenous museums, and museums at Canadian post-secondary institutions.

### 1.2 BENEFITS OF GLAMS

Canadian GLAMs receive an estimated 150 million visits every year, but they are much more than simply visitor attractions. They preserve and promote Canadian heritage domestically and around the globe, while providing access to resources that support education, research and artistic creation, and play a key role in engaging communities across Canada.

This section reviews existing literature that demonstrates the value and breadth of the social benefits of GLAMs. While there are considerable overlaps across GLAM

types, we present the four institutions separately to better highlight their respective strengths. Additional details on the wider benefits of GLAMs are discussed in Chapter 8, and Appendix 4 and 5 of this report.

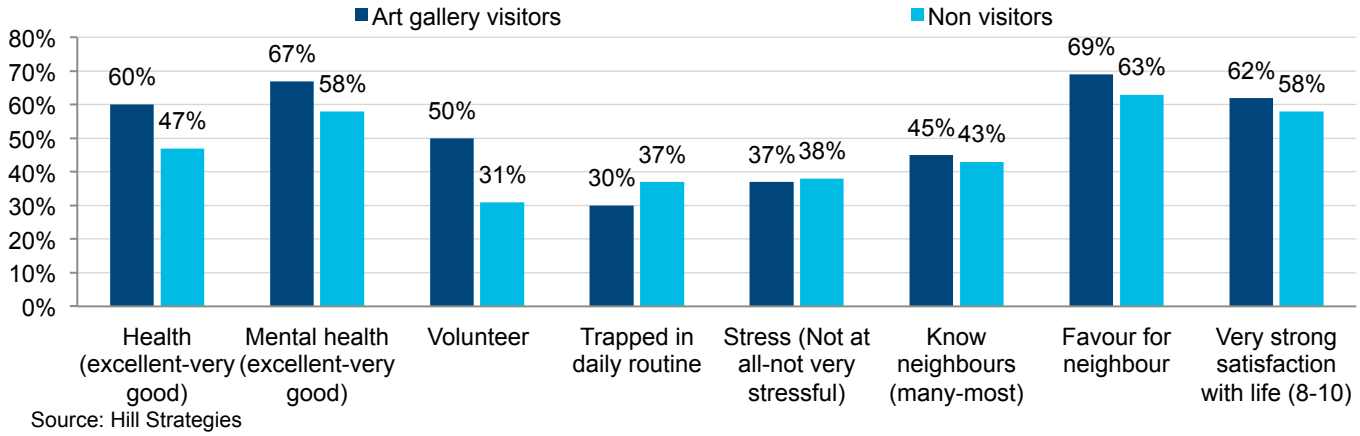
### 1.2.1 Galleries

Galleries select and preserve works and make them accessible to the public. By organizing exhibitions and programming, galleries advance the knowledge, understanding and appreciation of the arts, and help support research and inspire creativity. Furthermore, galleries offer curated content designed to increase public awareness about the role and relevance of art in the past and in today's society.

Viewing art on laptop screens and smartphones has become more and more common over the past decade, with the exponential growth of the Internet and social media. While this can be a useful tool to access artwork in the comfort of one's home, scholars argue that art experienced in person brings about greater social and individual benefits.

Data analysis undertaken by Hill Strategies in Canada shows that art gallery attendance has an apparent connection with several positive social indicators.[3] Fig. 2 compares gallery visitors with those who did not visit an art gallery in 2010 along a number of dimensions. Art gallery visitors were much more likely to report that they have very good or excellent health (both physical and mental) and were much more likely to volunteer.

**Fig. 2. Health, wellbeing and social connections of art gallery visitors in 2010**



Source: Hill Strategies

Nevertheless, these figures did not try to control for the effect of demographic variables. Econometric models (similar to those discussed in Section 8.2 of this report) were created to inspect if gallery attendance had a relationship with individual wellbeing, above and beyond demographic features. The regression models showed that attending art galleries is linked with improved health and

[3] Hill Strategies, "The Arts and Individual Well-Being in Canada", January 2013.

greater volunteer rates, even maintaining other elements unchanged (such as schooling, earnings, age, region, physical activity, etc.). In the health model, gallery visitors have a 35% higher probability of reporting very good/excellent health than non-visitors, even after controlling for other demographic characteristics. Similarly, art gallery visitors have an 89% higher probability of having volunteered in the past 12 months than non-visitors, even accounting for other factors.

More broadly, exposure to art is found to have several societal benefits.[4] Recent studies have found that life satisfaction, quality of life or happiness indicators positively correlate with participating in arts and culture activities.

One study found that participating in the arts or being an audience in the arts community is positively correlated with an increase in mental wellbeing or life satisfaction rates.[5] Earlier work also indicated that community arts programs developed social capital by increasing participants' ability and motivation to be civically engaged.[6] This work noted that community arts programs frequently engage people from disadvantaged backgrounds (youth at risk, minorities, residents of poor neighbourhoods) and are intended for goals such as area aesthetic regeneration or teaching about multiculturalism.

In keeping with this finding, anecdotal evidence from Canada also indicates the relevance of community arts programs for youth at risk. The 2012 Calgary Power of the Arts Forum examined the example of the Calgary Antyx Community Arts, which indicates that youth use arts and culture to achieve social change. The forum included testimonials from program participants from the Calgary Youth Offender Centre and the positive effects the program created for them.[7]

Likewise, a 2011 meta-study reviewed 24 articles (some of which were Canadian) of children between 3 and 16.[8] It found that partaking in organized arts activities and events enhanced secondary school attainment, early literacy skills, cognitive abilities, and transferable skills.

Lastly, a 2012 Canadian report produced by the Alberta Foundation for the Arts (AFA) found that arts and culture contribute to flourishing and more animated neighbourhoods.[9] Maintaining a solid arts presence was deemed fundamental to sustain the wellbeing of communities and appealing to both new residents and visitors. Communities with a strong arts presence were also found to be more

[4] Department of Canadian Heritage, "Social Impacts and Benefits of Arts and Culture: A Literature Review ", February 2016.

[5] Fujiwara, Daniel, "Museums and happiness: the value of participating in museums and the arts", April 2013.

[6] Williams, Deidre, *Creating social capital: a study of the long-term benefits from community based arts funding* (Adelaide: Community Arts Network of South Australia, 1997).

[7] Department of Canadian Heritage , "Social Impacts and Benefits of Arts and Culture: A Literature Review ", February 2016.

[8] Trends Business Research and the Cities Institute, "The art of the possible: using secondary data to detect social and economic impacts from investments in culture and sport: a feasibility study", *The Culture and Sport Evidence (CASE) Programme. Department for Culture, Media and Sport (DCMS), UK*, 2011.

[9] Alberta Foundation for the Arts, "Arts impact Alberta: ripple effects from the arts sector", 2012.

connected and engaged, and more likely to build positive interactions among diverse groups.

### 1.2.2 Libraries

Libraries are fundamental cornerstones for local communities. In addition to providing access to a wealth of resources for reading, education, and research, they help people further their skills, find jobs, and experience a strong sense of place, among many other things.

A recent study commissioned by the Arts Council of England reviewed the literature on the social and educational benefits of libraries and looked at five impact areas in detail.[10]

The first impact area concerns children's and young people's education and personal development. Through both their core offer and targeted activities for children and young people, libraries encourage reading,[11] which, in turn, promotes language development, literacy and thus general educational attainment.[12] At the same time, libraries also directly support educational attainment.[13] Better educational attainment, in turn, leads to enhanced employability and improved health and wellbeing for children and young people as they develop.[14] Improved employability then generates economic activity and tax revenues, in turn, as well as public savings through lower welfare benefits and public health expenditure.

The second impact area is adult education, skills and employability. Through the same channels described above, libraries encourage adult reading and learning and assist job seekers.[15] These, in turn, lead to improved adult literacy and talents development, which then bring about increased levels of health, wellbeing and employability. In parallel, job seeking directly improves employability as well.[16] Better employability generates increased economic activity, public savings and increased tax income.

The third impact area has to do with health and wellbeing. By furthering reading levels among children and adults, as well as via targeted health-related activities, libraries can promote mental and physical wellbeing and sustain health service

[10] Arts Council England, "Evidence review of the economic contribution of libraries", June 2014.

[11] Bhatt, R., "The impact of public library use on reading, television, and academic outcomes", *Journal of Urban Economics*, 68 (2010): 148-66.

[12] MacLean, J., "Library preschool storytimes: Developing early literacy skills in children", in *Penn State College of Education* <https://ed.psu.edu/goodling-institute/professional-development/judy-maclean-library-preschool-storytimes> [accessed 3 June 2019]

[13] Bhatt, R., "The impact of public library use on reading, television, and academic outcomes", *Journal of Urban Economics*, 68 (2010): 148-66.

[14] BOP Consulting, "Capturing the Impact of Libraries", Janury 2009

[15] Bhatt, R., "The impact of public library use on reading, television, and academic outcomes", *Journal of Urban Economics*, 68 (2010): 148-66.

[16] Pew Research Center, "Library Services in the Digital Age", 22 January 2013.

partners in supplying their services.[17] Evidence suggests that this furthers the so-called "prevention agenda," for example via the promotion of physical activity, healthier diets, and information on the drivers of ill health.[18] As noted above, this ultimately translates into public savings.

The fourth impact area is community support and cohesion. As neighbourhood hubs, libraries offer a free, open to all and welcoming space for their local communities and service providers, in addition to making local information available for all their visitors.[19] Evidence suggests that this nurtures social capital, through higher levels of social mixing and augmented trust in people and institutions.[20]

The fifth and last impact area is digital provision. Libraries sustain their communities' digital inclusion by granting users basic access to computers connected to the Internet, as well as via targeted ICT (Information and Communication Technology) education programs.[21] This service helps to bridge the digital divide, for example through granting access to online public services and welfare provision, and through giving users the possibility to partake in online-based public and civic life. This can translate into public savings.[22]

### 1.2.3 Archives

Archives play the fundamental role of providing evidence of past activities. Archives preserve records relating to the political, economic and social spheres of life, as well as about achievements in the arts, culture and sports, thereby helping us learn about our history and our society and increasing our sense of identity. Archives allow us to keep governments accountable for their actions, and also often help ensure that justice prevails. However, existing studies addressing the social benefits of archives are rather limited, as detailed in the rest of this section.

Yakel et al. (2012) analyzed data from 23 government archives in Canada, which agreed to administer a survey to every in-person visitor during a two-week period.[23] In the questionnaire, the authors asked respondents to provide their opinion of the social impact of archives based on five dimensions: opportunity for

[17] BOP Consulting, "Capturing the Impact of Libraries", Janury 2009

[18] Parker, R., "Library outreach: overcoming health literacy challenges", *Journal of the Medical Library Association*, 93(4) (2005).

[19] Jared Bryson and Bob Usherwood, "Social Impact Audit for the South West Museums Libraries & Archives Council ", August 2002.

[20] Pew Research Center, "Library Services in the Digital Age", 22 January 2013. Vårheim, A., Steinmo, S. and Ide, E., "Do libraries matter? Public libraries and the creation of social capital", *Journal of Documentation*, 64(6) (2008): 877-92.

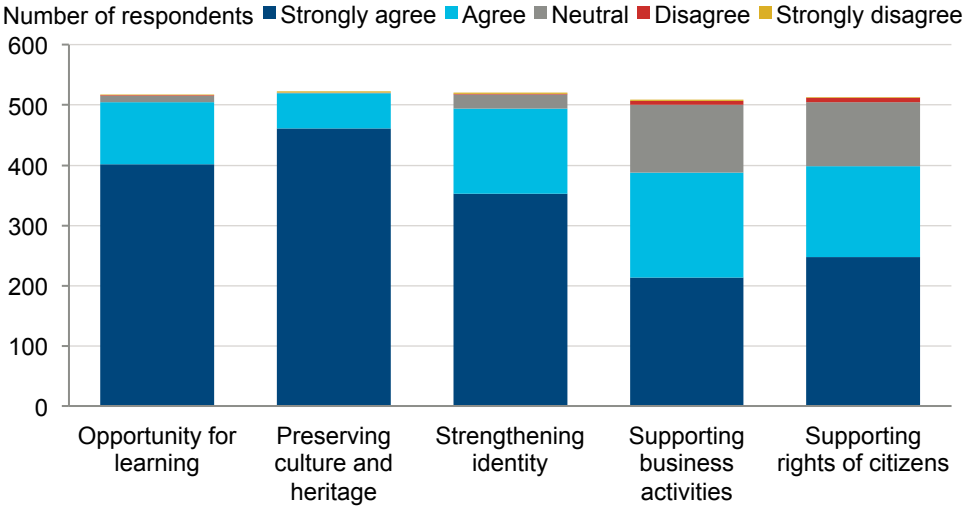
[21] University of Washington Information School, "Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries", March 2010.

[22] Digital Impact Group & Econsult Corporation, "The economic impact of digital exclusion", 2010.

[23] Elizabeth Yakel, Wendy Duff, Helen Tibbo, Adam Kriesberg, and Amber Cushing, "The Economic Impact of Archives: Surveys of Users of Government Archives in Canada and the United States", *The American Archivist*, 75 (2012): 297-325. Note that the published study combined Canadian and US data. The Yakel et al. data referred to in this report are derived from an unpublished extract relating to Canada alone.

learning, preserving culture and heritage, strengthening identity, supporting business activities, and supporting the rights of citizens. The survey provided a scale from 1 (strongly agree) to 5 (strongly disagree); Canadian respondents overwhelmingly agreed with all the dimensions (Fig. 3). Backing for archives as preserving culture and heritage attained the top position with an average score of 1.13, while support for business activities collected bottom place with an average score of 1.84.

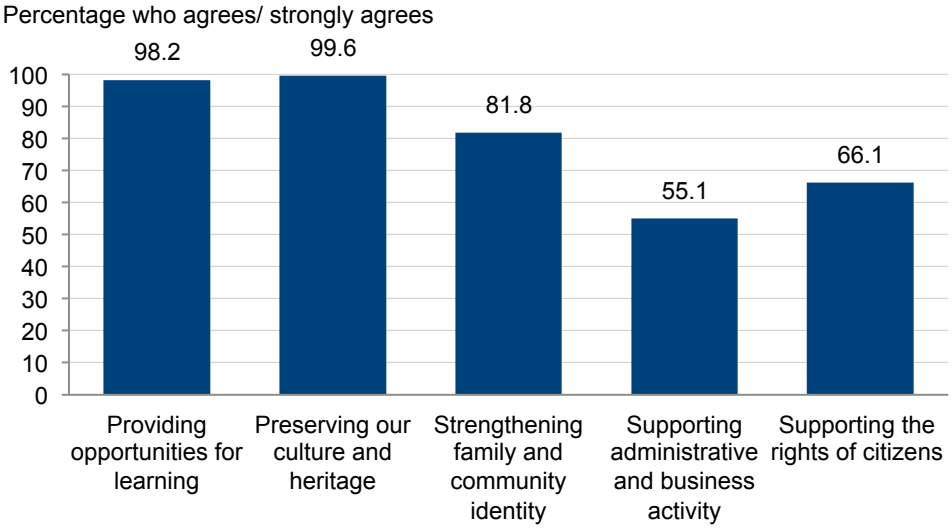
**Fig. 3. Social impacts of archives (Canadian respondents only)**




Source: Yakel et al. (2012)

Similar results are found in the British Public Services Quality Group (PSQG) survey of visitors to archives, which asked respondents to evaluate archives' contribution to society along several similar dimensions (Fig. 4).

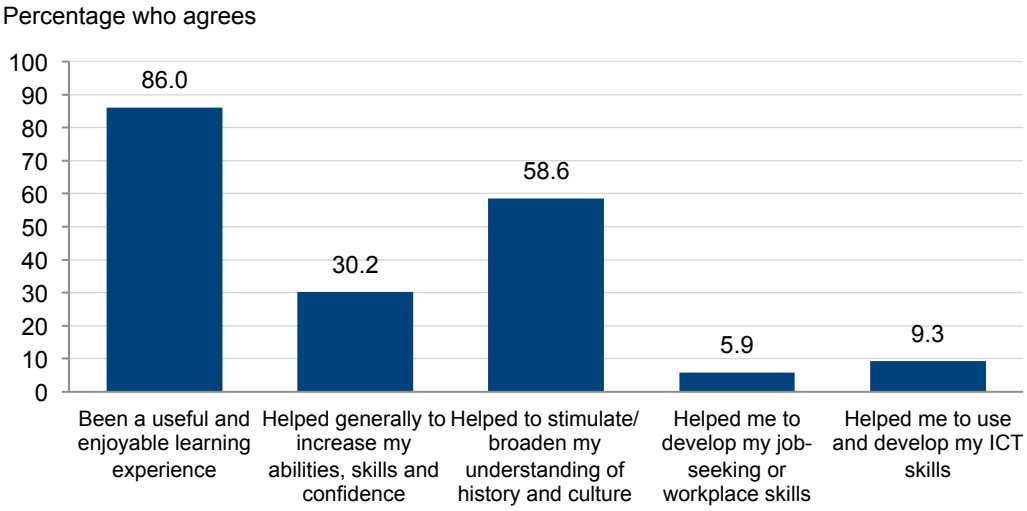
**Fig. 4. Archives contribute to society by…**




Source: 2004 PSQG

In addition to wide-ranging societal impacts, the 2002 PSQG survey provided further information on the perceived personal impacts on archives users (Fig. 5). [24]

**Fig. 5. Users believe archives have…**




Source: 2002 PSQG

Lastly, UK evidence suggests that archives can make a significant contribution to the promotion of social inclusion. This happens through both the development of personal identity (several respondents highlighted the significance of evidence on births, marriages, deaths as means to maturing a sense of identity and self-confidence) and community identity (community engagement with archives can inspire not only a sense of belonging and interest in history but can also work as a promoter to civic participation).

Through their key function as providers of information in the democratic process and exercise of informed citizen's rights, archives can also play a unique part in addressing the government objective of social inclusion.[25] Last but not least, anecdotal evidence from UK focus groups suggests that archives offer newly arrived members of a community the possibility to put down roots.[26]

### 1.2.4 Museums

Museums have the fundamental role of narrating the story of humankind and nature over the centuries.[27] They showcase objects made by nature and by man, holding the cultural wealth of towns, cities and nations. In the early 2000s, a survey

[24] Sarah Horton & Jaqueline Spence , "Scoping the Economic and Social Impact of Archives", March 2006.

[25] The National Council on Archives, "Taking Part: An audit of social inclusion work in archives", April 2001.

[26] Jared Bryson and Bob Usherwood, "Social Impact Audit for the South West Museums Libraries & Archives Council ", August 2002.

[27] Emmanuel N. Arinze, President, Commonwealth Association of Museums, "The Role of the Museum in Society", *Public lecture at the National Museum, Georgetown, Guyana* , 17 May 1999.

of 2,400 Canadians was launched to collect information on people's views of museums.[28] The survey found that the vast majority of respondents thought museums play a valuable role in showcasing and explaining Canada's artistic achievements (94%) and achievements in science and technology (96%). Some 97% believed museums play a valuable role in explaining Canada's natural heritage, and a similar proportion thought museums play a critical role in preserving objects and knowledge of Canada's history. These results are likely to hold true beyond Canada; for example, evidence from the UK suggests that museums hold reminders of common societal events and therefore help in constructing a communal memory.[29]

The presence of original objects in museums also contributes to make them trustworthy in the eyes of their users. In their study, Conrad et al. (2009) investigate how Canadians engage the past in their day-to-day lives. As part of the data collection, they asked survey respondents to reflect on the trustworthiness of sources of information about the past.[30] Museums were rated as the single most trustworthy source by more than 40% of the respondents. Three reasons appeared to justify this choice: the availability of artefacts and primary documents; the conviction of museums' neutrality since they are run by professionals; and the assurance derived from using multiple sources of information.

An astounding 96% of respondents to the Canadian survey on museums also reported believing that museums contribute to quality of life. This positive impact is widely acknowledged in the literature. For example, Silverman (2010) suggests that museums contribute to health and wellbeing through: (I) encouraging relaxation; (II) an instant positive change in physiology and/or feelings; (III) promoting contemplation, which can have positive effects on mental health; (IV) promoting health education; and (V) performing the role of public health advocates and improving health-care environments.[31]

A prominent example of these effects is the recent art therapy program at the Museum of Fine Arts in Montreal, where doctors have started prescribing visits to the museum to people living with either mental health issues, autism or eating disorders, or with difficulties related to learning, living together and social inclusion.

Academic research on psychiatric patients also showed that museum objects might be able "to assist with counselling on issues of illness, death, loss and mourning, and to help restore dignity, respect and a sense of identity."[32] Numerous

[28] TeleResearch Inc., "Canadians and their Museums: A Survey of Canadians and their views about the country's Museums", March 2003.

[29] [29] Jared Bryson and Bob Usherwood, "Social Impact Audit for the South West Museums Libraries & Archives Council ", August 2002.

[30] Margaret Conrad, Jocelyn Létourneau and David Northrup, "Canadians and Their Pasts: An Exploration in Historical Consciousness", *The Public Historian*, 31(1) (2009): 15-34.

[31] Silverman L.H., *The social work of museums* (London: Routledge, 2010), 51.

[32] Chatterjee HJ, Vreeland S, Noble G, "Museopathy: Exploring the healing potential of handling museum objects", *Museum and Society*, 7 (2009): 164-77.

articles also find that museum interventions have positive effects on emotional wellbeing, with reported outcomes including a sense of connection, and belonging, skills improvement, optimism, a sense of hope, and self-esteem, among others.[33] Some authors, on the other hand, have focused on museums' role as agents to boost social inclusion and diminish socially excluding habits across communities, by offering environments and practices to re-examine conduct, manners and opinions.[34]

Last, but not least, museums play a fundamental educational role for adults and children alike. Some 68% of respondents to the above survey on Canadian museums reported seeing these institutions as offering both an educational and recreational experience, in addition to the 15% who see such trips as purely educational.

Around 92% of all respondents believe it is important for children to be exposed to museums. A recent literature review found increasing proof that museum exhibitions, when supported with facilitating activities, can positively affect children's science attitudes, teamwork, communication skills, as well as critical thinking skills in history, science, arts and humanities.[35]

For instance, Burchenal and Grohe (2007) study the impact of adopting Visual Thinking Strategies (VTS), an approach used in both classroom and museum settings to promote the development of critical thinking.[36] By focusing on informal communication between a museum educator and students, VTS begin with questioning children, urging them to present supporting arguments in favour of their ideas. By carefully studying and debating artistic objects, children had the chance to relate previous experiences and knowledge to make sense of artwork on their own terms. The authors showed that the VTS method was effective at supporting the development of children's critical thinking.

### 1.3 QUANTIFYING THE BENEFITS OF GLAMS

The aim of this study is to quantify the benefits of GLAMs to society, and to set these benefits in context by comparing them to the sector's operating costs. While the costs are readily available from Canadian Heritage and Canadian Public Library statistics, quantifying the full value of all the benefits the sector generates is less straightforward.[37] To estimate them, we therefore need to deploy sophisticated analytical techniques, as explained below.

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[33] Wood C., *Museums of the Mind: Mental Health, Emotional Well-Being, and Museums.* (Bude: Culture Unlimited, 2007).

[34] Paul M Camic and Helen J Chatterjee, "Museums and art galleries as partners for public health interventions", *Perspectives in Public Health*, 133 (2013): 66-71.

[35] Lucija Andre, Tracy Durksen, Monique L. Volman, "Museums as avenues of learning for children: a decade of research", *Learning Environments Research*, 20(1) (2017): 47–76.

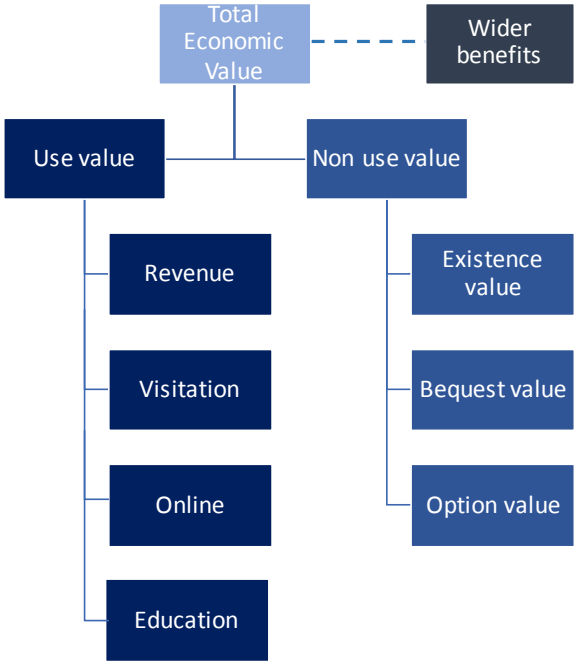
[36] Burchenal, M., & Grohe, M., "Thinking through art: Transforming museum curriculum", *Journal of Museum Education*, 32(2) (2007): 111-22.

[37] Canadian Heritage, "Government of Canada Survey of Heritage Institutions: 2017", 2018. CULC "2017 Canadian Public Library Statistics".

In many cases, the economic benefits or value of a company or institution can be measured in terms of market metrics such as their contributions to "Gross Domestic Product" (GDP) and employment. But while these metrics are well recognized and understood, they represent only a part of the value generated by some types of economic activity—particularly in the case of museums and other cultural institutions. Many cultural institutions employ only small numbers of people, and their contribution to national GDP may also be small. However, their social value often far outweighs this "direct" contribution, highlighting the need for a better method of capturing the value they produce, both for society and the people who visit them.

A "Total Economic Value" (TEV) assessment is the ideal approach for this goal.[38] Set within **a framework of economic welfare** (rather than a national accounts approach, which forms the basis of GDP), TEV assessments are a form of cost-benefit analysis that seeks to establish and aggregate the different values accorded to an institution or a sector by society. In the case of GLAMs, the benefits fall into two main types: direct use value and non-use value (Fig. 6). We will now consider each of these in turn.

**Fig. 6. Total Economic Value framework for GLAMs**




[38] For a description of TEV assessments please see: OECD, "Cost-Benefit Analysis and the Environment", Recent Developments, 2006. http://www.oecd.org/env/tools-evaluation/cost-benefitanalysisandtheenvironmentrecentdevelopments2006.htm

### 1.3.1 Direct use value

Direct use value is the value placed on GLAMs by the people who use them. This value is calculated based on a combination of information about the users of the services provided by GLAMs, as well as on data about the revenue generated by GLAMs from fees paid by users.

A major component of direct use value is physical use value. Conceptually, this represents the sum of visitors' "willingness to pay" to visit GLAMs. In practice, visitors' willingness to pay is calculated by adding together:

- the cost people actually pay for a ticket to enter GLAMs (if applicable); and
- the difference between that cost and the maximum amount visitors would have been willing to pay to visit the GLAM. This difference is known as their "consumer surplus."

This approach is based on the assumption that people's individual valuations of their visits typically exceed the costs they face in making them. It is thus very different from simply taking market prices as a guide to an institution's value.

If visitors to GLAMs placed a value on their visit that was exactly equal to the cost of entry, then what they gave and received from each visit would be equivalent, and they would be indifferent between visiting or not visiting. In reality, they visit because they feel they get value from the experience that exceeds the pure cost of the visit, making the visit worthwhile. In economic welfare, this additional value is measured as the consumer surplus.

For example, a visitor may pay the $10 entry fee to visit the New Brunswick Museum in Saint John but enjoy it so much that he/she would have been prepared to visit even if the ticket price had been $15. The consumer surplus for such a person would be $5. If a second visitor is only willing to pay $12 to visit, his/her consumer surplus would be $2. In this way, consumers capture benefits over and above the prices they pay to visit GLAMs.

By calculating the visitors' consumer surplus and adding this to the price they pay for a ticket to enter the GLAM, we can estimate the "direct use value" that visitors place on the institution.

A variety of other methods are used to calculate other aspects of direct use value such as revenue, online value and educational value, as detailed in later chapters of this study.

### 1.3.2 Non-use value

Non-use value accrues to people who do not visit GLAMs, but who nonetheless obtain value from it. We consider three types of non-use value:

- "existence value"—capturing the fact that many people will value the very fact that GLAMs exist, and will be willing to contribute to their maintenance, even if they have no intention of visiting them;

- "bequest value"—which captures the importance people place on the institutions as repositories of art, scientific production, historic heritage and literature for the benefit of future generations; and
- "option value"—which captures the value people place on having the option of visiting GLAMs, even if they have not visited them yet.

To a large extent, these non-use value sentiments overlap and cohere for many citizens and are therefore best considered as a group.

### 1.3.3 Wider benefits

As well as direct and non-use values, another category of value may be classified as wider benefits. These are values which—while potentially quantifiable—are not incorporated into the TEV for various methodological or conceptual reasons. Nonetheless their importance should be noted, and these are considered in a later chapter of this report.

### 1.3.4 Cost-benefit analysis

Once we have quantified all the aspects of value described above, we are able to set the social valuation of GLAMs against the costs of operating them. This process is known as cost benefit analysis (CBA). Dividing benefits by costs allows us to establish a "benefit-cost ratio" (BCR) for the sector, and for individual types of institutions. Put simply, a BCR above 1.0 indicates that the benefits of an investment in an initiative or institution (such as GLAMs) outweighs the costs to society. This may also be thought of as a form of return on investment (RoI) to society.[39] We can also deduct costs from benefits over time to estimate Net Present Value (NPV).

[39] As indicated, the BCR is simply benefits divided by costs. However, the term RoI is used differently by different studies, so it is important to be clear about its usage. The usage of RoI in the finance literature typically refers to net profits divided by costs. However, many studies diverge from this definition and the term is often used loosely. In this study the term RoI is used interchangeably with BCR and simply refers to dividing benefits by costs.

### A NOTE ON ECONOMIC WELFARE AND ECONOMIC IMPACT APPROACHES

As indicated above, a TEV follows an economic welfare approach and includes both market and non-market impacts. This is different from an economic impact approach, which measures market-based factors such as GDP and employment and employs economic multipliers. The two overlap in some areas but start from different assumptions and measure different things.

Economic welfare is focused on returns (i.e. BCR or RoI) on a given social investment (usually the amount spent on operating costs and capital but sometimes items such as time costs) and can include market and non-market values, such as non-use value. It asks how a given initiative or institution improves economic efficiency (productivity), but also what the impact is as measured by people's welfare in terms of things that are not always traded in markets (e.g. non-use value). So, it allows for a "decision rule" about whether a social investment is worthwhile or not (i.e. a BCR and/or NPV).[40]

Impact analysis is focused on market measures such as jobs and GDP which might be of particular interest in some policy contexts. While there is some overlap, some items included in an economic welfare approach are excluded from impact analysis and vice versa. Put another way, economic impact studies measure economic activity in terms of contributions to the economy as a whole, or the *share* of the "economic pie" accounted for by institutions such as GLAMs. By comparison, economic welfare studies measure how society is better off in terms of net benefits (benefits less costs), i.e. how institutions such as GLAMs *grow* the "economic pie". Neither is "better" than the other; they measure different things. Appendix 1 provides further details on the economic welfare approach adopted in this study.

**Fig. 7. Typology of benefits**

| | Included as benefit in economic welfare study? | Included as benefit in economic impact study? | Comment |
|---|---|---|---|
| Producer surplus (profit) | Yes | Yes | Part of GDP. |
| Consumer surplus | Yes | No | Not traded in a market. |
| Long term productivity effects (e.g. education) | Yes, where quantifiable | No | Impact assumes constant productivity. |
| Non-use value | Yes | No | Not traded in a market. |
| GDP | No | Yes | GDP is a key impact metric. |
| Employment | No | Yes | Employment is generally treated as part of (operating) costs under a welfare approach. |
| Provides a decision rule | Yes | No | A BCR above 1.0 indicates benefits of investment outweigh costs. |

[40] Of course, this is still essentially an economic perspective even when we monetize things such as non-use values. BCRs provide us with a powerful and structured tool but should not be seen as "the be all and end all" when making policy decisions. For example, equity issues and impacts on disadvantaged groups may be a concern (though BCRs are sometimes weighted to reflect such issues). More broadly, some may feel there is simply more to be captured than covered by an economic approach, however broad. The discussions below, particularly in terms of the chapter dealing with the MCA, explore some of these issues.

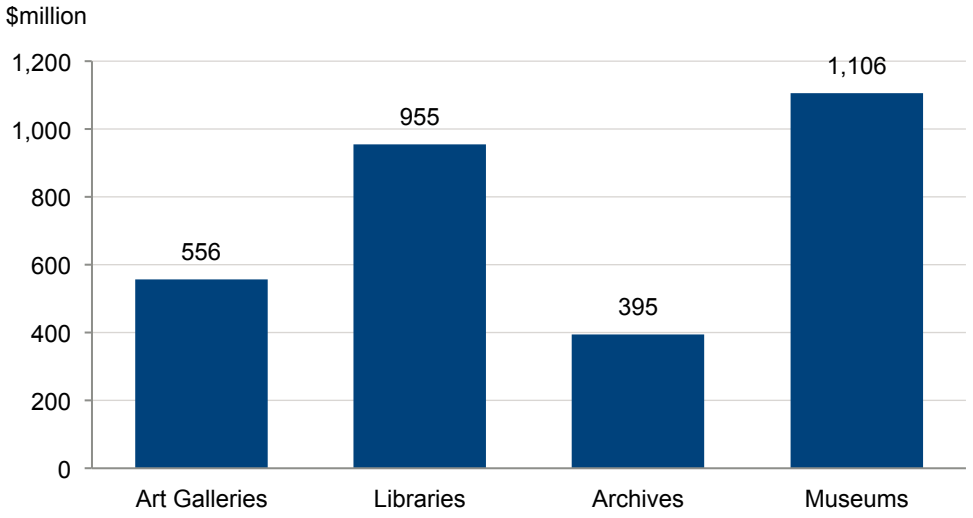
Source: Oxford Economics

# 2. OPERATING COSTS OF GLAMS

To deliver their services and programs, and to operate their facilities, GLAMs incur substantial operational and maintenance costs. These costs are paid for by public bodies (through taxes), private companies (through sponsorship), and the ticket revenues of visitors.

We estimate the GLAMs sector incurred operating expenses of $3.0 billion in 2019. More than a third of this total related to the cost of running museums, almost another third related to libraries (Fig. 8). The cost of running art galleries and archives together contributed a further third of the sector's expenses.

**Fig. 8. Estimated operating expenses for GLAMs, 2019 prices**

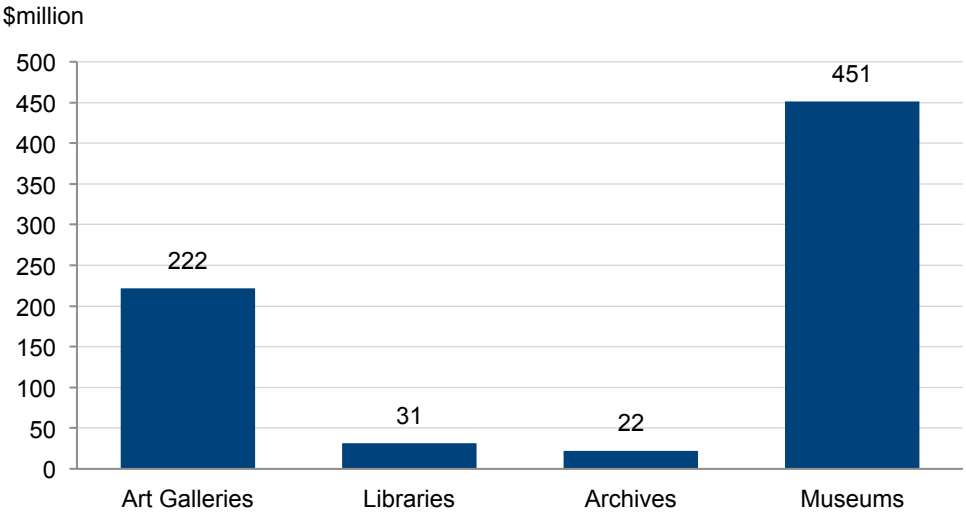



Source: Canadian Heritage, Canadian Urban Libraries Council, Oxford Economics

# 3. OPERATING REVENUES OF GLAMS

The most obvious component of value created by GLAMs is the element of visitor value claimed in the form of entry and membership fees. We estimate these revenues equated to $725 million in 2019, of which the vast majority (93%) can be attributed to museums and galleries, as one would expect.

**Fig. 9. Estimated revenues for GLAMs, 2019 prices**




Source: Canadian Heritage, Canadian Urban Libraries Council, Oxford Economics

# 4. VALUE TO GLAMS' PHYSICAL VISITORS

### 4.1 BACKGROUND

This chapter explores the valuation of GLAMs using an approach known as the travel cost method (TCM). The TCM has been widely applied to the study of cultural and environmental sites across the world.

Note that the value of academic libraries is estimated separately (in Section 4.3) as a number of unique considerations apply to those institutions.

### 4.2 TRAVEL COST MODELS

A number of techniques have been used in the academic literature to estimate the "direct use" value of visitors to a cultural attraction—including simply surveying visitors, to establish how much they say they are willing to pay to visit the attraction. However, a potential drawback to this approach is that people may understate their true valuation and may think the survey foreshadows increases in ticket prices by the institution.

A well-established alternative approach is to examine visitors' actions for clues about the value they place on the cultural institution. Methods that follow this approach are known as "revealed preference" techniques.

One such technique is to develop a "travel cost model" (TCM). Visitors to GLAMs come from all over Canada (and the world), and the further they travel to visit the institution, the greater the travel costs they will have incurred. A TCM uses econometric analysis to exploit these patterns to understand how people's propensity to visit GLAMs falls away as the travel costs involved increase. From this analysis, it is possible to estimate a visitor's consumer surplus. This can then be added to the cost of a ticket to the GLAM, to calculate the visitor's true valuation of the institution. This is the approach we have used in this study.

To develop travel cost models for GLAMs, we required information on the origins of their visitors. Several institutions collect information on visitors' places of residence when they purchase a ticket or access a service.

A TCM is based on the insight that travelling to visit an attraction, such as a museum or a gallery, involves costs other than the formal entry fee. A visitor driving to a GLAM would face costs in terms of fuel consumption, other vehicle costs, parking costs, and the "opportunity cost" of their time spent travelling. The net value from a visit to the GLAM which remains after travel costs have been taken into account will therefore be substantially greater for someone who lives five kilometres away than for a similar person living 100 kilometres away. In our analysis, we can use these variations in travel costs as a proxy for different entry fees to GLAMs.

The degree to which visitors living further from GLAMs become more scarce allows us to infer how sensitive the typical visitor is to changes in the cost of visiting the institution. Once we understand the magnitude of this sensitivity (technically known as the "price elasticity of demand" or often just "elasticity,") we can calculate the maximum amount that visitors would have been willing to pay to visit the GLAM. The difference between the maximum visitors would have been willing to pay and the actual access price to enter the GLAM is known as their "consumer surplus."

For this project, we developed bespoke "Zonal Travel Cost" models for a variety of institutions.[41] A zonal model divides the country into concentric zones around the GLAM and, by observing the place of residence of visitors, determines the visit rate per number of inhabitants in each zone.[42] For example, if 200,000 visitors to the museum live in a zone defined as between 10-20 kilometres driving distance to a GLAM, and the total population in this zone is one million, then the visit rate per thousand of population is 200. The zone between 50-70 kilometres might be home to 50,000 and have a population of three million, yielding a visit rate of 17 per thousand of population. In this example, the zone that is further away exhibits a lower visit rate due to the higher costs associated with reaching the site, in line with what we would expect to see.

Based on individual GLAMs' data on Canadian visitors' places of origin, we were able to estimate the number of visitors coming to each institution from hundreds of Forward Sortation Areas (FSA) around Canada. Drawing on Statistics Canada data, we were then able to identify the population living in each area, and therefore calculate visit rates. Finally, using a Google mapping algorithm, we established the travel time (and distance) from each FSA to the GLAM under consideration. To do this, we made the following simplifying assumptions:

[41] For museums and galleries, we developed TCMs for the following institutions, also visually represented on a map at this link: MA, musée d'art, Art Gallery of Ontario, New Brunswick Museum, Royal BC Museum, The Rooms, Canada Agriculture and Food Museum, Canada Science and Technology Museum, Canada Aviation and Space Museum, Canadian Museum of History, National Gallery of Canada, Canadian War Museum, and Bank of Canada Museum. For libraries, we developed a TCM for: Kitchener Public Library, Vancouver Public Library - Central Library, Regina Public Library - Central and Children's Branch, and Hamilton Public Library - Central Library. Lastly, for archives, data from visitation at: University of New Brunswick: Archives & Special Collections and Ontario Archives were used. However, as indicated below, this was supplemented by data drawn from our national survey of GLAMs visitors and work undertaken by Professor Duff at University of Toronto using material collected in Yakel et al. (2012). The latter source incorporated material from: Port Hope Archives, City Of Toronto Archives, Calgary Archives, Provincial Archives of New Brunswick, the Public Archives and Records Office (Prince Edward Island), Nova Scotia Archives, Rooms Provincial Archives, Wetaskiwin Civic Building, University of Saskatchewan Archives, Provincial Archives of Saskatchewan - Management Offices, Yukon Archives, City of Vancouver Archives, Archives of Manitoba, BAnQ Sept-Îles, BAnQ Sherbrooke, Archives Nationales du Quebec Centre Regional Mauricie / Bois-Francs, BAnQ Rimouski, Gatineau Archives, BAnQ Saguenay, BAnQ Québec, BAnQ Vieux-Montréal, Archives de la Ville de Quebec. Oxford Economics gratefully acknowledges the data contribution of all the above institutions.

[42] While in all models, we modelled ten concentric zones around the institution, the data provided to us by individual institutions was much richer. For example, the AGO provided us with a count of visitors from over 40,000 postal codes, which we then allocated to the concentric rings. Other institutions provided us with visitors' origin data by Forward Sortation Area: for example, the Hamilton Public Library provided visitor origins from over 100 FSAs around Canada.

- While all visitors to GLAMs were included in the analysis, for the purposes of assigning travel and time costs, a "day trip" cost boundary of 250 kilometres from the relevant institution was set. Trips originating within this boundary were assigned to zones as described above. Trips originating from outside the boundary were assumed to have a similar pattern of trips to those inside it and assigned to zones within the boundary accordingly.[43]
- Visitors who traveled less than 2.5 kilometres walk to the GLAM.
- Visitors living further than 2.5 kilometres away can choose between driving and transit and they base their decision on the difference in travel time between these two modes of transport (if the difference is over 25 minutes, they will select driving).

These assumptions were created to mimic as closely as possible the transport mode patterns found in our national survey of the Canadian population.

For each individual GLAM, we were then able to group FSAs, visitors, and population into 10 zones for which visit rates were determined. For each zone, we estimated the total per-person travel costs, comprising:

- **Direct travel costs**—including fuel, maintenance, tires and parking costs of driving to GLAMs, based on information published by the Canadian Automobile Association and Parkopedia.[44] For visitors who use public transport instead, we calculated the local average fare using single ticket cash fares for adults, youth and seniors and weighting the fee based on population age patterns. Lastly, no direct travel cost is associated with walking to GLAMs.
- **The value of time needed for the journey**—based on standard values of time from Statistics Canada.[45] For museums and galleries, we assumed the value of time is equivalent to half the hourly salary, to reflect the leisurely nature of the activity. For libraries and archives instead, we used Canada-specific assumptions on the proportion of users who visit the

[43] As indicated, all visitors to GLAMs, regardless of location of origin, were included in the analysis. The setting of this day trip boundary recognizes that some visitors travelling long distances are also more likely to have multiple purposes for their trip. For example, a resident of Vancouver visiting Ottawa may be there to visit family and friends, but also visit GLAMs as an effective side trip during one day of their stay. Assigning the total cost of the trip from Vancouver to Ottawa to GLAMs would therefore overestimate the relevant travel costs. Therefore, the effective travel costs for such visitors are assumed to be the costs within the day trip boundary. Visitors from beyond the boundary were assigned to zones based on the proportion of "within boundary" visitors from each zone visiting each GLAM. This reflects the fact that such visitors from outside the boundary were likely to stay in the same zones which were the source of local GLAMs visitors—i.e. more densely populated zones and/or ones which had a higher propensity to visit GLAMs. Note that similar cut-off boundaries were used in Wieland, R. C., & Horowitz, J., "Estimating the Recreational Consumer Surplus at Maryland's State-owned Forests", 2008 and Land Water People, "Travel Cost Valuation of Recreation in the Upper Waitaki Catchment", 2015

[44] Canadian Automobile Association, "Driving Costs 2013". Parkopedia, "Global Parking Index 2017".

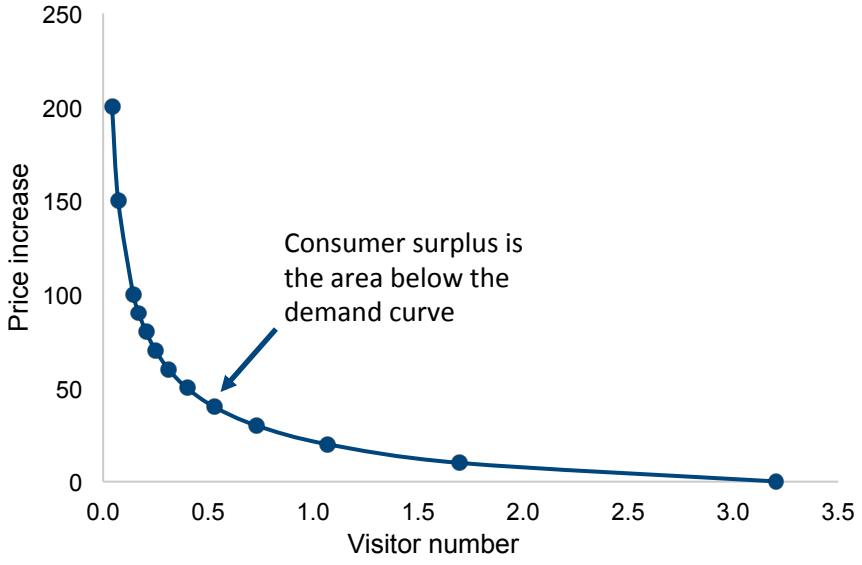
[45] Statistics Canada, "Table 14-10-0320-02 Average usual hours and wages by selected characteristics, monthly, unadjusted for seasonality".

institutions for work or research purposes and used the full hourly wage for these visitors.[46]

Based on these travel zones and visit rates, we were able to infer how sensitive visitors are to changes in the cost of going to GLAMs, and the maximum amount they would be willing to pay to visit an institution. When these data are displayed graphically, it is known as a demand curve. An example demand curve for visitors to GLAMs, based on a selection of simulated rises in ticket (or other access) prices, is shown in Fig. 10.

The demand curve shows that when the additional entry cost is zero (i.e. the entry cost is the same as at present) there are as many visits as there are at present. As the entry cost increases, the number of visits declines. While the number of visitors is initially very sensitive to small changes in the cost of visiting GLAMs (at the right-hand end of the curve), the degree of sensitivity (or "elasticity") declines as the additional cost increases. For example, an increase in the additional cost of a visit from zero to $10 would be expected to approximately halve the number of visitors, whereas further increases in the additional cost would have a much smaller impact on visitor numbers.

**Fig. 10. Example visit demand curve for GLAMs**




Estimation of demand curves therefore offers a powerful tool for GLAMs analysis. These curves provide information on how much people value GLAMs and how many people would be willing to use them at different price levels. This could be of particular interest to ticketed venues, but also in situations where access

[46] BNC Research, "Borrow, Buy, Read: Library Use and Book Buying", May 2019. Elizabeth Yakel, Wendy Duff, Helen Tibbo, Adam Kriesberg, and Amber Cushing, "The Economic Impact of Archives: Surveys of Users of Government Archives in Canada and the United States", *The American Archivist*, 75 (2012): 297-325.

conditions change for all venues (e.g. it becomes more/less costly to access GLAMs).

Moreover, the demand curve incorporates people's preferences to use GLAMs for whatever purpose they choose (e.g. reading books, researching jobs, viewing art). It also incorporates people's preferences to use GLAMs rather than pursue alternatives. For example, people may use public libraries, which have no entry fee, but if there was such an entry fee, they may seek alternatives (e.g. buying books).

The demand curve's shape, as measured by its sensitivity to price changes (or elasticity) tells us how appealing GLAMs are against those other alternatives, and what would happen if indeed such a fee was levied. In doing so, it shows us how people may trade off the use of their resources (time and money) and so provide the key to valuing GLAMs.

The demand curve can also be used to estimate the consumer surplus of GLAMs visitors by looking at the impact on visitor numbers from different simulated increases in the cost of visiting. In essence, the total area underneath the demand curve is equal to the difference between the actual cost and the maximum amount visitors would have been willing to pay to visit the institution. This is the consumer's "profit" or consumer surplus as discussed above.[47] The various models yield a range of consumer surplus estimates, which vary both by the type of institution, but also by the geographical location and the size of the institution (urban vs. rural, small vs. large, etc.).

In addition to individual GLAMs' travel cost models, we also developed **"supermodels" (national models) from the national survey** for each institution category. These national models offer a "top down" approach using national survey data, as opposed to the "bottom up" approach using the behavioural data drawn from the various GLAMs. The national models cover a much broader sweep of the population and so are a useful complement to the individual bottom up models. Another important feature of these differing modelling approaches is that the national models use people's reported travel costs (along with the defined values of time developed above). The national models therefore reflect perceived travel costs, whereas the bottom up models reflect what is sometimes referred to as "researcher defined costs."[48]

For **museums and galleries**, combining bottom up results with our national model ones suggests that the average value of each visit is $44. Canadian Heritage 2015 data (the latest available) suggest a total of 45.6 million visits to non-profit galleries

[47] Combining the measure of consumer surplus with price changes provides us with another tool. We can see how much value (consumer surplus) society would lose if GLAMs raised prices or reduced the number of GLAMs so it would be harder for people to visit them. Or how much society might gain by lowering prices and/or increasing the number of GLAMs.

[48] Note that neither approach is necessarily right or wrong. Researcher defined costs using actual travel costs (e.g. fuel, maintenance, public transport fares) may seem to be the more accurate measure at first sight. However, perceived costs effectively lie behind demand curves since people's decisions about whether or not to use GLAMs will be driven by the perceived access costs.

and museums in Canada; 31.5 million to museums and 14.1 million to galleries.[49] Multiplying the consumer surplus of each visit by the total number of visits provides an estimate for the total value of Canadian galleries and museums to their users. Our estimates suggest that galleries and museums generate a total annual consumer surplus of $2.0 billion.

For **archives**, visitation data are more limited, as the area is less well studied. However, we were able to overcome this to some extent by gaining access to supplementary data. Our estimates relied on four main sources. We utilized information from (1) the University of New Brunswick's Archives & Special Collections and (2) Ontario Archives, as well as (3) developing a "supermodel" (national model) from the survey results. As a fourth and last data source, we obtained visitor origin data from the archive visitor survey undertaken by Yakel et al. (2012).[50] This included 468 usable responses on visits to 23 Canadian archives, nationwide. This last source would appear to represent one of the richest available data sources on archival visits in the world.

Combining the four models, we estimate a consumer surplus of $65 per visit or $185 million nationally. Evidence suggests archives' in-person visitors are likely to be particularly determined—especially given the increasing availability of online access.[51] This helps explain the much greater consumer surplus per visit we identified.

Lastly, for **libraries**, we have sourced data to develop TCMs for the Hamilton, Kitchener, Regina, and Vancouver Public Libraries. We also supplemented this with a "supermodel" (national model) drawn from the national survey results. Combining these two suggests a consumer surplus/visit of $18. Multiplying this figure by the total visits to public libraries from the Canadian Urban Libraries Council (hereafter, CULC), scaled up to include all public libraries, yields a total value of $1.8 billion per year.[52] The figure below provides a summary of physical use values.

[49] Canadian Heritage, "Government of Canada Survey of Heritage Institutions: 2017", 2018.

[50] Elizabeth Yakel, Wendy Duff, Helen Tibbo, Adam Kriesberg, and Amber Cushing, "The Economic Impact of Archives: Surveys of Users of Government Archives in Canada and the United States", *The American Archivist*, 75 (2012): 297-325.

[51] While online availability of archival material is still limited due to the large amount of material still awaiting digitalization, the advent of online services has made some archival material much more accessible than was previously the case.

[52] CULC "2017 Canadian Public Library Statistics". Based on the CULC website, CULC library usage accounts for more than 80% of Canada's public library activity. See "About Canadian Urban Libraries Council", http://www.culc.ca/about/ accessed 21 July 2019. We have therefore adopted a scaling factor of 1.25 (i.e. 1/0.8) to allow for non-CULC public libraries. This factor has also been applied to costs, revenue and website usage. Note that LAC and BAnQ activity is included under "Archives" by Canadian Heritage's "Government of Canada, Survey of Heritage Institutions, 2017" (GCSHI).

**Fig. 11. GLAMs physical use value**

| Item | Galleries | Libraries | Archives | Museums | Total |
|---|---|---|---|---|---|
| Average physical use value per visit $(1) | 43.6 | 17.6 | 65.2 | 43.6 | |
| Estimated visits 2019 (million) (2) | 14.1 | 102.2 | 2.8 | 31.5 | |
| **Physical use value $(million) (3) = (1) * (2)** | **615** | **1,797** | **185** | **1,374** | **3,972** |

Source: Oxford Economics
All figures subject to rounding

### 4.3 ACADEMIC LIBRARIES

The discussion above relates to the estimation of the value of physical visits to GLAMs including public libraries. However, it does not include estimations of visits to academic libraries. Academic libraries have a different usage base, purpose and character to public libraries.

In addition, many of their users are students and some students live on campus. The students who live on campus do so because that is where they have gone to be taught and to use campus facilities—including the library. This creates what is technically known as an "endogeneity problem"—the users' choice of living location is not independent of the facility they are using but is at least in part governed by it. The TCM generally assumes that the choice of living location is "exogenous" or independent of the facility—e.g. we assume that most users of galleries do not deliberately live close to an art gallery (though of course in a broad sense, the gallery may be one of many things that attracted them to live in a town or city).

Another issue is that many of the benefits of academic libraries are educational and educational benefits may only play out in the long term.

Therefore, we have not used the TCM to measure the benefits of academic libraries but instead have chosen a different approach. There have been many attempts to measure the value of academic libraries. Many of these focus on measures such as student retention and/or superior academic performance as a result of high usage of academic libraries.[53] However, these may only capture part of the benefits of academic libraries. For example, high usage of academic libraries may improve student grades but all students (including low usage students) may ultimately get a benefit.

Academic libraries are effectively embedded in university education. Accordingly, the approach adopted in this study is to see academic libraries as a part of the broader benefits offered by a tertiary education over the long term.[54] If that is the case, then academic libraries would account for a share of student benefits from

[53] There are a large number of studies of academic libraries, however a good source is: Association of College and Research Libraries, "Value of Academic Libraries: A Comprehensive Research Review and Report", 2010

[54] This is similar in some respects to the assessment of formal education benefits of GLAMs to school students discussed in a later chapter.

such an education. Of course, faculty also use these institutions and an allowance is also made for the benefits of faculty usage of such facilities. The approach taken is detailed in the box below. This approach suggests a BCR for academic libraries of about 3.4, with an NPV of $3.4 billion.

Because of their quite different character, we have nonetheless separated out results for academic libraries from public libraries, as some may feel mixing these in with public libraries reduces transparency and may blur the quite distinctive character of each institution. The main BCR and NPV results presented in the Executive Summary and Conclusion therefore only detail public library results (i.e. exclude academic libraries).

**ASSESSING THE VALUE OF ACADEMIC LIBRARIES**

The approach to the estimation of academic libraries was based on estimation of the long term returns to university education in Canada. Academic libraries are part of a mix of learning that occurs in universities and so would be expected to be responsible for a share of the benefits. Given data on the return to university education in Canada, and attribution of library share of costs, this allows for the calculation of a BCR and NPV for student usage. In addition, allowance can also be made for academic usage to estimate a combined total.

**Students**

The following approach was adopted to assess benefits from student usage:

- Data sourced from the Organisation for Economic Co-Operation and Development (OECD) was used to calculate the total social costs and benefits of a Canadian university degree over the working lifetime of students.[55] These include both the private costs and benefits (e.g. fees, employment income forgone, higher future wages) and public ones (government subsidies, future tax income).
- Based on OECD data, the present value of costs is $89,249 and that of benefits is $297,764 over the lifetime of a typical Canadian student.[56] This equates to a 3.3 BCR, which implies the social benefits of a Canadian university degree are 3.3 times the costs.
- The next question is how to apply these results to academic libraries. Given that benefits are 3.3 times costs, there is a need to estimate library costs. Data from the Canadian Association of Research Libraries (hereafter, CARL) was used to estimate academic library running costs (an adjusted $737 million in 2016-17).[57]
- However, the benefits cited above result from society incurring not just direct costs (running costs recorded by CARL) but indirect ones (forgone income while studying).
- Based on the estimates above, we calculate that indirect costs account for 47% of total social costs. Accordingly, total social costs attributable to CARL libraries were assessed at approximately $1.4 billion per annum.
- Given a BCR of 3.3, this suggests total social benefits of $4.7 billion from academic libraries and an NPV of $3.3 billion.

**Faculty**

Faculty benefits were determined based on the work of King & Tenopir (2008).[58]

- King and Tenopir undertook contingent valuation work in five US universities finding that scholarly journal usage is by far the most common academic library activity undertaken by

[55] OECD, "Indicator A7, What are the incentives to invest in education?" in *Education at a Glance 2014*, OECD publishing 2014.

[56] Figures are in $US 2010 terms.

[57] Canadian Association of Research Libraries, "CARL Statistics, 2018". CARL statistics cover Canada's 29 largest university libraries and include Library and Archives Canada (LAC) data. However, we excluded LAC data from these calculations as this activity is included under "Archives" within Canadian Heritage's GCSHI used elsewhere in this report. While partial data were available, a comprehensive data set for non-CARL institutions could not be obtained for this report.

[58] King D. and Tenopir, C., Linking Information Seeking Patterns with Purpose, Use, Value and Return on Investment of Academic Library Journals, *Evidence Based Library Practice 2013,* 8.2 (2013)

faculty. Accordingly, their study concentrates on the annual usage of scholarly journals in academic libraries.

- This work is in some ways a parallel to the student benefits above. It incorporates both private access costs (annual faculty wage costs of $US 704 per person) along with costs to libraries of purchasing and maintaining journal collections ($US 1,052 per faculty member in total). It also includes the benefits of usage, given the cost of obtaining the data from alternative sources ($US 3,466 per faculty member per annum).[59] A BCR of 3.3 is recorded.
- Since the costs of journal collections are already included in the student usage above, only the academic faculty time costs are included in the calculations for the current study.
- The number of academics at CARL institutions was estimated based on CARL data indicating 845,782 students at these institutions and using an average student faculty ratio of 20.[60] These calculations produce a total of 42,289 academics at CARL member universities. Adjusting the 2008 $US faculty values to 2019 Canadian values, in turn, suggests $216 million in annual benefits and $43.9 million in costs for academic library usage by faculty (excluding library running costs).[61]

**Results**

The combined results from the student and faculty estimates above suggest that the total benefits equate to $4.9 billion and total costs to $1.4 billion in present value terms. This suggests a BCR of 3.4 for academic libraries (and a net present value of $3.4 billion). Note this result largely reflects the long-term benefits of these libraries as they contribute to higher student wages and government income over the working lifetime of students.

[59] Note these figures relate to access costs rather than time spent reading the material and relate to journals only. Costs of $US 704 per faculty member per annum cited by the authors were based on salaries of $US 55 per hour and 12.8 hours per faculty member per year spent searching, browsing, obtaining citations, downloading, copying and printing journal articles. In addition, libraries incurred a cost of $US 65 per faculty per year in photocopying downloading and printing costs, while costs of readings obtained by libraries averaged $283 per faculty member per year. These costs total $1.052 per faculty member per year ($US 704+$US 65+$US 283). Alternative access costs of $3,466 per faculty member per year were based on the time, travel, communications and subscriptions costs of obtaining information from alternative sources.

[60] Student numbers based on CARL, *op. cit.* Student, staff ratio derived from The Varsity, 7 December, 2015 "Student to Faculty ratio consistently high at U of T" https://thevarsity.ca/2015/12/07/student-to-faculty-ratio-consistently-high-at-u-of-t/ accessed 22 July 2019. Note the estimated number of academics is similar to the 46,029 in 2017-18 reported by Statistics Canada, "Number of Full time teaching staff at Canadian universities", https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3710007601 accessed 22 July 2019, though this figure would include staff at non-CARL institutions.

[61] Adjustments made on a purchasing power parity (PPP) basis and allowing for inflation since 2008.

# 5. NON-USE VALUE

### 5.1 BACKGROUND

In assessing the value of GLAMs, it is important to pay attention not only to their direct usage but to a broader set of values above and beyond such usage. Whether or not they use GLAMs, people may value them simply for "being there"—i.e. the fact that GLAMs exist and it is good that society does these sorts of things. Or they may see value in ensuring GLAMs are preserved for future generations. Or perhaps they wish to use GLAMs "one day" and want to keep that option open.

This collection of values is often known as "non-use value" or "passive use value." Non-use value is in fact fairly intuitive; societies are prepared to subsidize a range of activities over the longer term. Apart from the arts, another example might be subsidies for services in remote communities. Most people would not be citizens of such communities, or ever expect to use these services. Nonetheless, they might be happy to fund such services on equity or other grounds. They might see such subsidization as part of what society does. Likewise, society's willingness to subsidize cultural assets over the longer term may be seen as an implicit indication of non-use value.

Non-use value is commonly estimated for environmental or cultural amenities, which are often seen as intrinsically valuable by citizens. Past studies have found that non-use values can account for a substantial proportion of the benefits of a cultural or environmental asset.

In the case of GLAMs, non-use value can be seen as consisting of three different components:

- **Existence value—**The value people attach to the existence of GLAMs despite the fact that they may have no intention of visiting them.
- **Bequest value—**The value that people place on GLAMs as a benefit to future generations.
- **Option value—**The value people attach to having the option of visiting GLAMs at some point, whether or not they ever exercise that option.

In practice, people may have a mix of all three of these components in mind when assessing non-use values in situations such as those discussed in our national survey and it may be difficult to disentangle one from the other.

The importance of non-use value to cultural institutions has been demonstrated in jurisdictions such as Detroit, where voters, the private sector and government acted to prevent the sale of part of the collection of the Detroit Institute of the Arts (DIA) during a time of financial crisis. This involved providing over $US 800 million in funding under what came to be known as the "Grand Bargain." Given that the majority of the public were unlikely to be users of the facility, the fact that society

was willing to pay such amounts to retain its art collection during a time of financial crisis provides a "real world" example of the role of non-use value in respect of cultural assets.[62]

Non-use value can be measured through the use of a public survey, employing a survey technique known as contingent valuation (CV). A CV assessment was carried out as a part of the national GLAMs survey described above.

### 5.2 NATIONAL SURVEY

By definition, non-use value is not traded within a market, since it relates to the way people value something they do not directly pay for or use. So, in order to measure non-use value for GLAMs, a national survey of the general population had to be conducted. The established approach for such surveys is to focus on people's "willingness to pay" (WTP) for cultural assets and this was followed here.

As indicated, WTP questions were therefore incorporated into the online national survey of the Canadian population, described above.[63] Survey quotas were imposed by sex, age, education, language (English/French) and province or territory of residence in order to ensure a broadly representative sample of the Canadian population. A total of 2,045 completed responses were received from Canadian residents. The survey questionnaire was informed by recent literature on contingent valuation approaches.[64]

The national survey included current users of GLAMs (i.e. those who had used such facilities within the last 12 months), as well as non-users (i.e. those who had not used GLAMs within the last 12 months or had never used them at all). The non-users are of particular interest here, since they could value GLAMs even though they do not use them. This can be interpreted as a sign of society's underlying non-use value for GLAMs (across both current users and non-users).

The survey results were then used to assess WTP across the various institutions and GLAMs as a whole. The approach to doing so is described in the box below.

[62] In the case of the DIA, initial financial issues led to voters approving additional local taxes in 2012 in return for free entry (*New York Times*, 8 August. 2012) though it is likely that many voters would not actually use the facility. The 2014 Grand Bargain involved State and private foundations, as well as DIA donors (such as the auto industry) providing over $800 million to city pensions. In return, the sale of the works was halted (*Wall Street Journal*, November 7 2014).

[63] The national survey was limited to Canadian residents aged 16 and older and was undertaken between March and April 2019.

[64] An excellent discussion of these is provided in Morrison M., "A guide for estimating the non-market values associated with improved fire management", March 2011.

**ASSESSING THE NON-USE VALUE OF GLAMS**

The national survey asked all respondents (i.e. both current users and non-users) about their willingness to pay (WTP) for the four defined types of GLAMs.[65]

Care needs to be taken in setting questions about cultural resources such as GLAMs. Analysts need to bear in mind the fact that unlike goods that people buy on an everyday basis (e.g. grocery shopping) people are not always familiar with the "price" of the resource in question. In addition, there is the risk of people providing very high WTP responses because "talk is cheap" ("hypothetical bias") or saying they would pay too little because they think they might be saddled with new taxes or charges ("strategic bias") and/or the word "tax" setting off *in principle* objections ("protest votes.") Although some academics suggest providing the cost of the service to respondents (e.g. public spending per GLAM), other analysts also point to "anchoring" as a form of bias—where respondents latch on to the value provided by the questionnaire.

In order to ameliorate some of these potential biases, respondents were provided with brief information about the contribution GLAMs make to society. They were then asked if they would be willing to make a donation to support GLAMs across the country in the event that public funding was withdrawn. A short form of the WTP question is below. (The full question is included in the questionnaire, located in Appendix 6)

> *In one way or another, all Canadians currently pay towards the annual upkeep and development of galleries, libraries, archives and museums (GLAMs) whether through taxes, donations, entry fees or other means. However, imagine that GLAMs had no other sources of government or private funding and the only way of maintaining them was to rely on individual donations. In such a situation, what is the maximum amount you would be willing to pay each year as a donation to maintain all of Canada's non-profit GLAMs?*

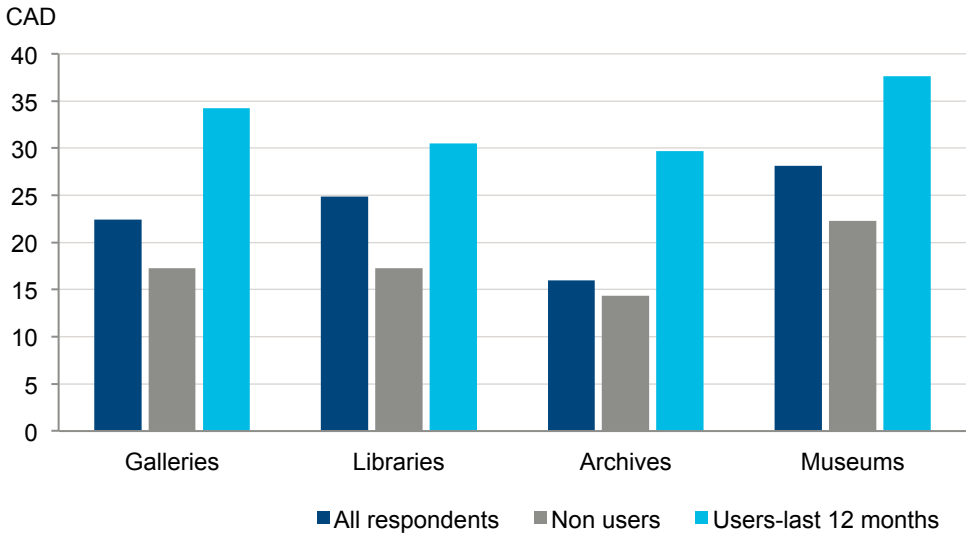
Respondents were then asked to consider how much they would be willing to pay given various price options, but they could also freely select a value of their own if they wished to.[66]

Respondents were reminded of the fact that they had limited budget to pay for GLAMs in addition to their everyday spending. In addition, the online survey allowed respondents to see how their WTP for each institution added up to a total for all GLAMs as another counter to overestimating WTP. All 2,045 respondents were required to provide values for this section of the survey.

[65] Current users, past users and those who have never used GLAMs would all hold non-use values. However, current users could mix in such values with those they hold for actually using the facility (i.e. use values). As past usage instances could vary widely amongst GLAMs, both past users and those who never used a GLAM were defined as non-users. This was done to get the most consistent idea of non-use, given the likely variance in past usage status between different GLAMs. For example, past users could include people who used a library a few years ago but could also include those who visited an archive, many years ago.

[66] The use of payment options is sometimes referred to as the "payment card approach". These amounts were broadly informed by the relevant literature. Some suggest that this approach produces more reliable WTP answers (Morrison, 2011). Nonetheless, there is no consensus among analysts on which approach is best. So, respondents were also given the choice of providing an amount of their choosing via an "open ended" response format. Responses from both formats were included in the final estimation of WTP.

**Fig. 12. Average WTP for GLAMs per respondent** [67]




Source: Oxford Economics

As indicated in Fig. 12 above, current users tended to have higher valuations than non-users. This is in line with expectations and would reflect the fact that such respondents may be mixing their use values with broader non-use values held across society.

It is the value reported by non-users that is of primary interest for this study. This can be taken as the underlying non-use value for GLAMs held by society as a whole (i.e. users and non-users alike). Multiplying the respective non-use values per respondent by the estimated total number of Canadian residents aged 16 and older on July 1, 2018 (31.1 million) allows for an assessed non-use value for each institution, as well as for the GLAM sector as a whole.[68] These values are reported below. They reflect one assessment of how much society is willing to pay to preserve GLAMs, above and beyond the values placed in their everyday usage.

Of course, some would argue that even when non-use value is added to the other values discussed in this report, it still does not capture all the social value to be found in GLAMs. The chapter on Multi-Criteria Analysis (MCA) provides a qualitative indication of the broader value of GLAMs.

[67] The number of respondents was 2,045 in total, of which 626 users and 1,419 non-users of galleries, 1,173 users and 872 non-users of libraries, 219 users and 1,826 non-users of archives, 781 users and 1,264 non-users of museums.

[68] Statistics Canada, "Population Estimates on July 1st by age and sex" https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501, accessed 22 July 2019.

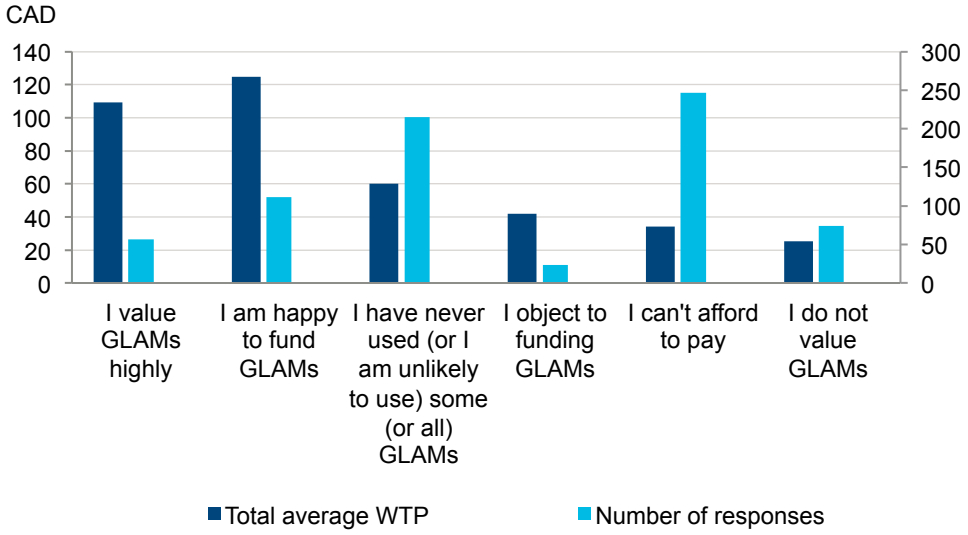
**Fig. 13. GLAMs non-use value**

| Item | Galleries | Libraries | Archives | Museums | Total |
|---|---|---|---|---|---|
| Average non-use value per person $(1) | 17.2 | 17.3 | 14.3 | 22.3 | 71.1 |
| Canadian population, 16 and over as at 1 July 2018 (million) (2) | 31.1 | 31.1 | 31.1 | 31.1 | 31.1 |
| **Non-use value $(million) (3) = (1) * (2)** | **536** | **537** | **446** | **693** | **2,212** |

Source: Oxford Economics
All figures subject to rounding.

After reporting their valuation of GLAMs, respondents were asked to justify their response. The figure below shows the average willingness to pay of non-users according to the reasons given for their valuation.[69] Very few non-users (74) said they did not value GLAMs, while most non-users stated they valued GLAMs highly and/or were happy to fund GLAMs. Some non-users (210) who reported having never used GLAMs (or being unlikely to use one) still reported a willingness to pay of $60 to maintain their operations. Lastly, the largest group of non-users reported being unable to afford to fund GLAMs (247 respondents) and hence reported a lower willingness to pay ($34 for all GLAMs).

**Fig. 14. Average non-users' WTP by reason given for valuation, with respondent numbers**




Source: Oxford Economics

[69] Respondents were able to choose more than one reason. There was a total of 659 non-users (people who have not used at least one GLAM over the past 12 months).

# 6. ONLINE VALUE

## 6.1 BACKGROUND

Just like physical visits, people can connect using GLAMs online portals either through "traditional" websites and catalogues, or increasingly via social media portals.[70] And just like physical visits, online visits are one way users directly interact with GLAMs. So, they constitute another form of consumer surplus that needs to be taken into account in valuating GLAMs.

GLAMs websites and social media portals are becoming an increasingly important resource for users. The functions of these online channels include providing information about the facility itself and about upcoming events, offering interactive shows and educational initiatives, research in online catalogues and placing holds and requests for materials, access to various e-resources as well as to digitalised documents and images, downloading or streaming content, as well as a direct exchange with users through social media.

GLAMs' online services therefore provide a way for the public to "virtually connect" with such facilities without necessarily visiting them. To the extent that people give up their free time to access online GLAMs' data rather than doing other things, they are implicitly valuing the online services provided by these institutions.

Economists have only recently turned their attention to methods to assess the value of online activity. One way forward in understanding such value is to adapt existing literature on the value of the Internet to the range of online services offered by GLAMs. This approach is described briefly below and in more detail in Appendix 3.

## 6.2 ESTIMATING ONLINE VALUE

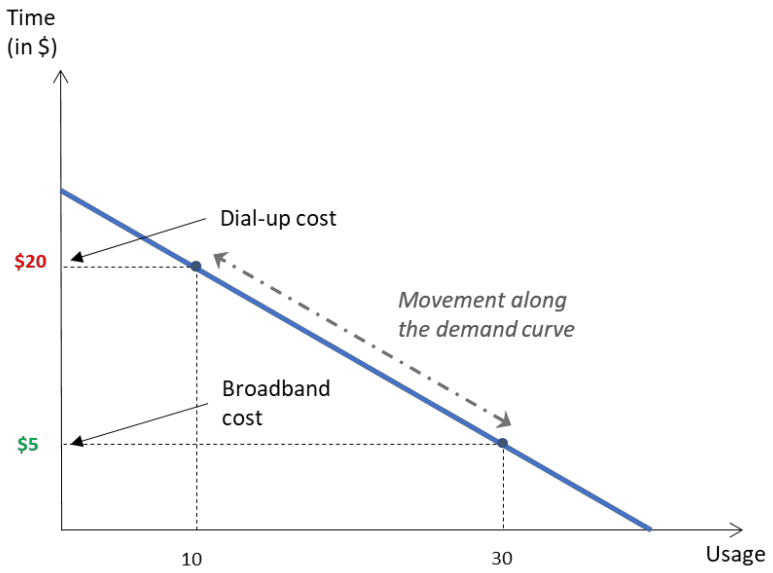
The key to understanding the value of online services is to see them as a form of information, with the cost of accessing such information mainly being expressed in terms of time. And, the more time required to obtain a given piece of online information, the less people are likely to use it.

For example, consider if all GLAMs online users had to revert to dial-up rather than broadband to access GLAMs' online services. The increased hassle and slower speeds of a dial-up connection would likely deter many users, so demand would fall (and consumer surplus would be lowered). Conversely, the introduction of online services and fast broadband has seen much greater access to GLAMs information in recent years because it has become much quicker and easier to access data.

[70] Social media portals analyzed for this report include Facebook, Twitter and Instagram. Although users were also asked about Flickr, Podcasts, Blogs, Crowdsourcing and "other" portals, the small number of responses received means these had to be excluded due to small sample sizes.

The figure below indicates this. While the numbers are hypothetical, imagine users were still restricted to dial-up connections to access GLAMs data and the cost in time taken was equal to $20. In the example, only 10 people use the connection. However, with a broadband connection, things are obviously much quicker—the time cost falls to $5 and so 30 people use GLAMs' online resources. These facts also give us a clue about how much people value access to the data and how sensitive they are to time costs (i.e. their "elasticity.") The 20 extra people who use GLAMs online services at $5 must value this data at less than $20. Why? Because otherwise they would be spending this much to access the data in the first place.

**Fig. 15. GLAMs usage and (online) time taken**




The high online usage of certain GLAMs, such as archives, relative to their physical usage also provides an indication of these preferences.[71] The speed and convenience of the Internet means that many more archival inquiries are made than would be the case if all such users had to physically access the data. If the online services *did not* exist, then many current online users would face higher (physical) access costs and, like our dial-up example above, many could be deterred.

So, essentially the more time taken to obtain a piece of information (i.e. the higher the cost), the lower the demand for it and vice versa.

These facts give us clues about how to value online services. The time users spend online accessing GLAMs content indicates how much time they give up to

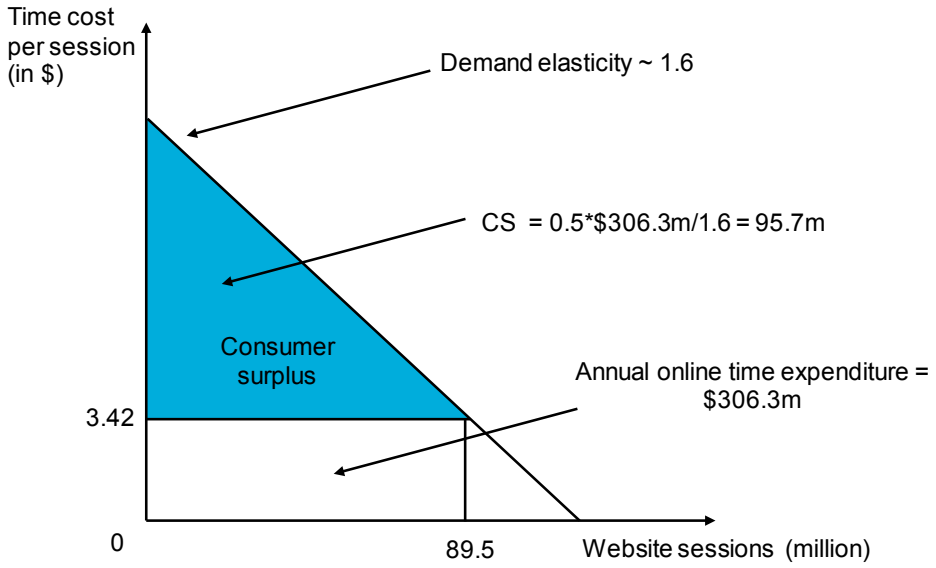
[71] The Government of Canada, Survey of Heritage Institutions (GCSHI), 2017 recorded 2.8 million physical visits to archives, and over 44.6 million online visits to archives in 2015, a ratio of about 16:1. Of course, it is also noteworthy that those who *do* make physical use of archives, even given the existence of online tools, have a particularly low price elasticity (0.55 using the national demand curve results discussed in Appendix 2). In other words, this suggests that physical users are relatively price insensitive—and that making a physical trip is especially important to them.

do so (i.e. their online access cost). With some information about how sensitive people are to changes in such costs (i.e. elasticities), we can then estimate a demand curve for GLAMs online content and consumer surplus in a way that is analogous to the estimation of consumer surplus for physical access using TCMs.[72]

Accordingly, our national survey asked respondents to nominate time spent and frequency of use of GLAMs website, catalogues and social media portals. This was supplemented by data on time spent online reported by various GLAMs across the country. This allowed us to develop a view on the amount of time spent per session for various GLAMs across official websites, catalogues and social media portals.

The estimated median amount of time spent on websites, catalogues and social media was combined with Canadian values of time (also employed in the TCMs) to give the time cost of online usage per session.[73] Using information on the number of sessions (using Canadian Heritage and CULC data), and sensitivity to the cost of time online, we estimated a demand curve and consumer surplus for the online usage of various GLAMs. Fig. 16 indicates how this was done for museums' websites. The same approach was used for other GLAMs and for social media.

**Fig. 16. Museums' websites consumer surplus**




Appendix 3 provides more details on the approach adopted to measure the value of GLAMs online services.

[72] Consumer surplus can be estimated using data on elasticities. For a technical discussion of this see Chapter 4 of Boardman, A., Greenberg, D., Vining, A. and Weimer, D., *Cost Benefit Analysis: Concepts and Practice*, Fifth Edition, 2018

[73] This was the value of leisure time for museums and galleries ($13.7/hour). In the case of libraries and archives, the average time cost was a mix of recreational time and work time as some users were there for work purposes.

However, the national survey and supplementary material from GLAMs provide more than just data about dollar values. One of the issues uncovered in the data exploration phase of this report is that there is a lack of information about the usage of social media in GLAMs in general. Given the rising importance of social media this is an important issue.

The survey data suggests that websites remain the single most commonly used online tool to access GLAMs. However, analysis of such data also suggests that social media make a relatively large contribution to total usage and that the *frequency* of use of some forms of social media is higher than that of websites.

These facts suggest that social media could be an important avenue through which people access GLAMs (though to date the extent of this has not been comprehensively quantified).

### 6.3 ONLINE VALUE

Estimates for GLAMs online value (i.e. consumer surplus) are indicated in the figure below. As indicated, these results include official websites, catalogues and Facebook, Twitter and Instagram usage but exclude other social media portals due to concerns over small sample sizes.

**Fig. 17. GLAMs online value**

| Item | Galleries | Libraries | Archives | Museums | Total |
|---|---|---|---|---|---|
| Website and catalogue value ($million) (1) | 68 | 367 | 114 | 120 | 668 |
| Social media value ($million) (2) | 310 | 269 | 240 | 157 | 975 |
| **Total online value ($Million) (3) = (1) +(2)** | **378** | **636** | **353** | **277** | **1,644** |

Source: Oxford Economics
All figures subject to rounding.

# 7. FORMAL EDUCATION

In addition to their offerings for adult visitors, GLAMs generate significant educational benefits to school students who undertake visits as part of formal school or educational programs.

This chapter draws on evidence from the academic literature on the long-term returns to school education in order to estimate the value of GLAMs' educational contribution to students and society as a whole.

School student visits to GLAMs are an important part of the educational process. Schooling provides a formal framework in which learning can occur and, as indicated below, the benefits of such education are well documented. Accordingly, it would be expected that school visits to GLAMs as a part of an educational curriculum would form a part of these benefits. At the same time, visiting GLAMs can serve to inspire creativity, ideas and learning, all of which may be of long-term benefit to students as part of their formal education. Indeed, there are some scholars who argue that the learning experience offered by school field trips to GLAMs (or related cultural institutions) can offer particularly effective learning environments. For example, a school trip to a museum need not directly inspire someone to become a scientist or artist. The long-term value of the trip can often lie in the way in which structured visits to GLAMs can encourage a mindset which is more innovative and promote critical thinking—and this can be reflected in the value of the jobs which people ultimately get.

Quantifying the value of school student visits to GLAMs may seem a difficult issue to come to grips with. However, over the long term, formal education, whether it consists of student visits to GLAMs, or more typical day-to-day school learning, produces a more knowledgeable and productive workforce. This productivity benefit, in turn, will be reflected in the future wages of workers. Economists have long recognized this, which is why a key component of the value of school or post-school education is often measured as the value that they contribute to future wages. Likewise, to the extent that formal educational visits to GLAMs contribute to this long-term acquisition of knowledge and skills base, their value should be embedded in such wages.[74]

In addition, there may be other long-term non-wage effects of education, such as the effects of better civic values, trust, reduced criminality and commitment to democratic institutions—often referred to as "social capital." A discussion of such wider benefits is provided in a later chapter of this report.[75]

[74] The skills and capabilities of the workforce are more formally known by economists as "human capital". GLAMs could therefore be said to contribute to the development of such human capital through the transmission of knowledge, innovation and creativity.

[75] In particular, the work of Canadian analysis such as Riddell suggests that non-wage benefits may account for an additional 7-10 percentage points on top of traditional estimates of the return to education—i.e. up to twice the traditional returns. However, these consist of a mix of long-term economic effects as well as social ones. See Riddell, C., "The Impact of Education on Economic and

Also note that the educational values measured here occur over the longer term (as opposed to the immediate value of trips measured by the TCM). This reflects the long-term nature of the educational process—its benefits may only be revealed across a person's lifetime, well after the initial education. Some of the benefits may also flow to "third parties," such as the government which benefits from higher future wages through higher tax revenue. These third-party benefits are referred to as "externalities" by economists.

The international evidence on the benefits of school education over the long-term is especially strong and consistent. In particular, the Canadian work of Oreopoulos using changes in compulsory education regulations across provinces provides powerful evidence of the returns to school education in Canada. This work suggests that the value of a year of school education is equivalent to a long-term wage uplift of 11.7% per year over an average person's working lifetime.[76]

This work is also highly consistent with other international studies of the returns to school education.[77] Knowing the returns to school education therefore allows us to measure the value of formal educational visits to GLAMs.

The box below indicates how the quantification of the value of educational visits was carried out. In essence the number of student visits to GLAMs was used along with the lifetime value of each visit (as measured by the wage uplift). This allowed an estimation of the value of formal education visits to GLAMs over a person's lifetime.

Social Outcomes: An Overview of Recent Advances in Economics" Statistics Canada, 2006. This estimate is of note though non-wage benefits have not been formally accounted for here.

[76] Oreopoulous, P., "Canadian Compulsory School Laws and their Impact on Educational Attainment and Future Earnings", Statistics Canada, 2005. The strength and consistency of these estimates and the fact that "natural experiments" (i.e. the measured effects of policy changes outside researcher control) were used as the basis for international estimates makes the case for school education benefits especially strong. This alleviates many of the concerns about causality which affect other estimates of the wider benefits of GLAMs. This issue is taken up below in the chapter on wider benefits.

[77] Studies in Norway, the UK and Australia yield similar findings with Australian evidence suggesting a rate of return of some 10%. See Leigh, A. and Ryan, C., "Estimating Returns to Education using different natural experiment techniques", *Economics of Education Review* 27 (2008). Work in the US has suggested a rate of return of 9%--see Angrist J. and Krueger, A., "Does Compuslory School Attendance Affect Schooling and Earnings?", *Quarterly Journal of Economics*, 106, Issue 4 (1991).

**DETERMINING THE VALUE OF FORMAL EDUCATION VISITS TO GLAMS**

Estimation of the value of formal educational visits was based on a variety of sources. Canadian Heritage's *Survey of Heritage Institutions: 2017* indicates the numbers of school group visitors to galleries, archives and museums in 2015, along with the defined size of school groups.

In the case of libraries, CULC figures report educational figures including school educational programs, so this was used as an indicator of formal educational instruction sessions.[78] These were then grossed up to allow for non-CULC public libraries using the adjustment factor of 1.25, described above.

These data were supplemented by information on school visits provided by a number of GLAMs across the country. These institutions indicated that visits could typically last 1-2 hours. However, as it is likely that the visit time itself was complemented by pre and post educational instruction in a school setting, so an average time of one day's instruction was assumed.

Oreopoulos suggests the annual rate of return in future wages from a year of school education (comparing those who completed high school to those who did not) is 11.7% in Canada.[79] That is, an extra year of education adds 11.7% to a person's earnings during each year of their working life. The lifetime income of a Canadian, who did *not* complete high school, was then estimated over the ages 20 to 65 on a present value (PV) basis using a 3.5% real discount rate.[80]

We estimate an average lifetime income of $536,000 in present value (PV) terms for Canadians who did not complete high school.[81] Given an 11.7% uplift, the lifetime value of doing an extra year's school is therefore estimated as approximately $63,000.

Based on a school year of 196 days this implies that the average PV of a school visit to GLAMs is $320 per student (63,000/196).[82] Multiplying this across the annual number of school students visiting GLAMs (estimated at 9.7 million from the data above) suggests the PV of educational benefits of GLAMs is some $3.1 billion per annum. (Note that these effects do not include any non-wage (social capital) benefits from GLAMs or the additional learning benefits that may accrue from field trips above and beyond a typical day at school.)

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[78] CULC records educational programs for children and teenagers. Communications with CULC indicate that school visits to libraries are treated as programs with specified aims such as research skills or coming for a speaker. Librarian visits to schools are also treated as programs.

[79] Oreopoulous, *op. cit.*

[80] Benefits that occur in the future are valued less than those which occur in the present. So rather than simply adding up the wage benefit every year it is necessary to discount future benefits (i.e. adjust them downwards) using a defined rate. The rate chosen here is that recommended by Boardman et al. (2010). See Boardman, E., Moore, M., Vining A. "The Social Discount Rate for Canada Based on Future Growth in Consumption" *Canadian Public Policy*, Vol. XXXVI No. 3, 2010.

[81] Based on "Young Men and Women without a High School Diploma," Statistics Canada 2017, Table 4 https://www150.statcan.gc.ca/n1/pub/75-006-x/2017001/article/14824-eng.htm. This estimate was adjusted to reflect the account for wages at later stages of life using data provided at Statistics Canada, "Income of Individuals by Age, Group and Income Source,"

[82] This value is of course spread out over a lifetime. The number of days in a school year was estimated as 196 based on the Ontario school calendar for 2019-20 http://www.edu.gov.on.ca/eng/general/list/calendar/holidaye.html. Although the number of school days per year varies slightly across the provinces this provides a reasonable approximation for these calculations.

The value of formal educational benefits for Canadian GLAMs can be calculated using the values derived by the calculations in the box above. This process yields a total value of $3.1 billion. Values for individual GLAMs are also indicated in the table below.

**Fig. 18. Value of GLAMs formal educational benefits**

| Item | Galleries | Libraries | Archives | Museums | Total |
|---|---|---|---|---|---|
| Number of school children visits or educational sessions per annum (million) (1) | 1.36 | 4.26 | 0.13 | 3.97 | 9.72 |
| Lifetime PV per visit $(2) | 320 | 320 | 320 | 320 | 320 |
| **Value of formal educational benefits $(million) (3) = (1) * (2)** | **435** | **1,361** | **41** | **1,271** | **3,108** |

Source: Oxford Economics
All figures subject to rounding.

# 8. WIDER BENEFITS

## 8.1 BACKGROUND

Standard economic principles assume that people using GLAMs have perfect information—that is, they are fully aware of all of the benefits of their usage and make their decisions to use them accordingly. This allows for powerful insights into people's behaviour (or "revealed preferences") through techniques such as the travel cost models (TCM), discussed above.

To recap: the demand curves and consumer surplus developed through the TCM are one way of indicating the value that people place on GLAMs usage, taking into account usage costs and alternatives. If it cost more to use GLAMs, some people may stop using them, as the costs would exceed their perceived benefits (and consumer surplus would fall). If it cost less to use GLAMs, more people would use them and/or people may use them more often.

However, economists (and in particular the burgeoning field of behavioural economics) recognize that information may be imperfect. People may use GLAMs with only partial knowledge of the benefits they bring to themselves and/or others in the community. There may be wider benefits ("externalities") to society which may not be captured by a user's consumer surplus as measured using TCM or other direct valuation approaches.[83] Some of these wider benefits have already been addressed in the preceding chapter on formal educational benefits. However, there may be others beyond these, which may be more difficult to incorporate into a CBA for a variety of technical and methodological reasons, but which are important to recognize.

This chapter discusses these wider economic benefits of GLAMs. These do not form part of the assessed CBA for reasons explained below (and in Appendix 4). In addition, there is an argument that economic frameworks cannot (and should not) attempt to quantify all aspects of GLAMs impacts—and indeed it is for this reason that broader qualitative measures are also used to measure such benefits. These measures are discussed in the following chapter on MCA.

A number of wider benefits are sometimes noted in the context of GLAMs. Some of these include:

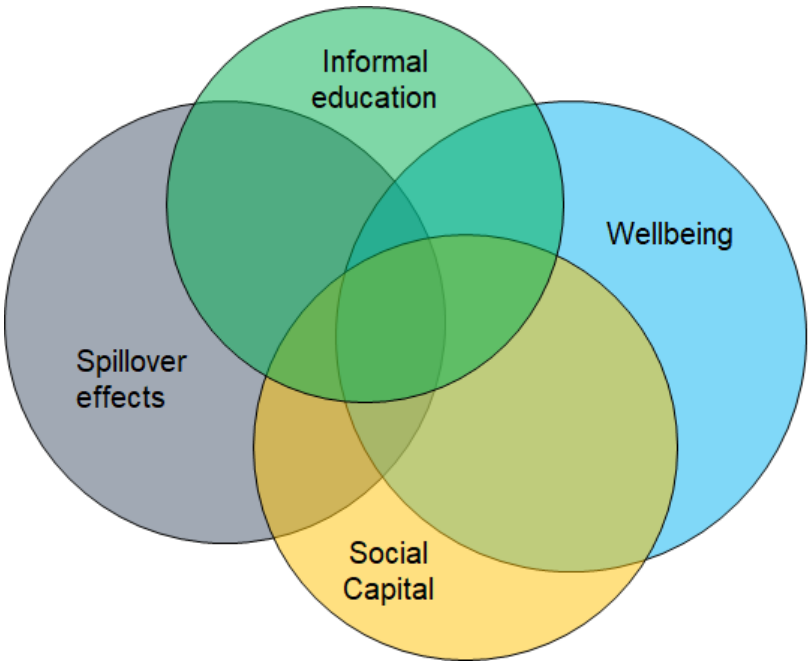
- Wellbeing effects
- Social capital
- Informal education effects (of children and adults)
- Long term economic "spillover" effects

[83] Externalities refer to situations when the effect of production or consumption of goods and services imposes costs or benefits on others that are not reflected in the prices charged for the goods and services being provided. From: OECD Glossary of Statistical Terms.

In considering these effects, it is important to balance considerations about the additional value GLAMs may have above and beyond conventional measures, while recognizing the power and rigour of an economic welfare approach (and the structure it requires).

It should also be noted that many of the concepts below have some degree of overlap, meaning they could not necessarily simply be "added up" even if they were amenable to full quantification. Fig. 19 indicates some of the key concepts discussed below and the ways in which they may overlap.

**Fig. 19. Interaction of wider benefits**




### 8.2 WELLBEING EFFECTS

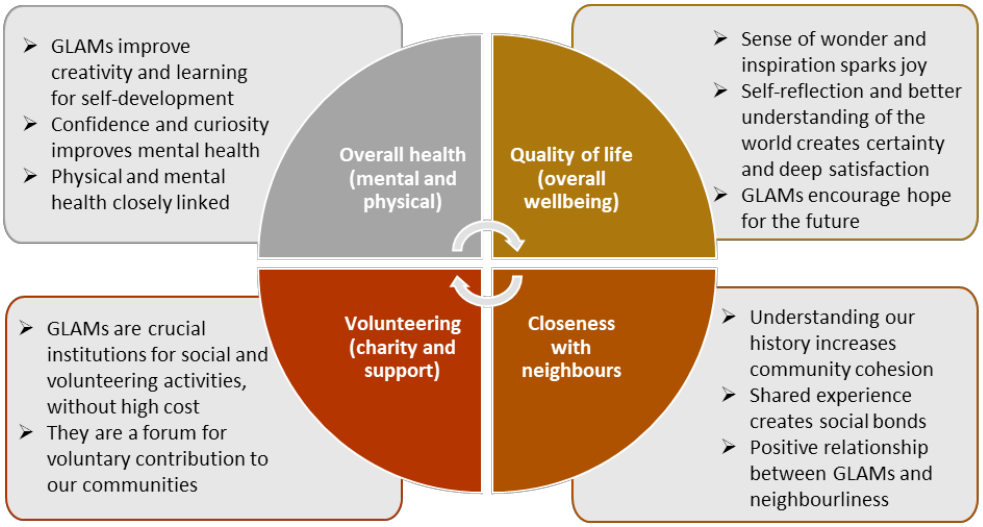
GLAMs can be sources of reflection and inspiration for creativity to their visitors. In principle, all GLAMs share these attributes. Many who have visited a gallery can attest to the sense of peace, reflection and inspiration such institutions can create. They can also help us find fulfilment by generating creative insights. Museums can help us understand our place in the world—or the cosmos—and cause us to reflect on our own purpose and contribution to society. They can inspire us with the struggles of past generations—and spur on our hopes for the future. And they can help us understand the struggles and hopes of cultures other than our own.

Libraries—particularly in their growing role as a civic hub—can also be an important source of personal wellbeing. Apart from the opportunity for deep thinking, learning and reflection, they also allow for interaction, the exchange of ideas and bonding, all of which can contribute to a sense of meaning and community. And while it may seem less obvious, the same effects could be

discerned for archives, where research can also allow users to uncover new ideas and find fulfilment through deep research and learning.

In doing all of this, GLAMs can enhance our sense of overall wellbeing. A greater appreciation of the wider world could also help us understand our points of view and cultures, potentially helping us reach out to others in our neighbourhood and/or increase our likelihood to volunteer within our community. The figure below summarizes these virtuous pathways, showing how GLAMs help to mutually enforce the different aspects of wellbeing and social cohesion.

**Fig. 20. The role of GLAMs in promoting multidimensional wellbeing**




The wellbeing effects associated with GLAMs have been the subject of much discussion, study and debate in recent years. The research on wellbeing effects has gradually become more compelling as evidence has accumulated.[84] Indeed, Canada has become a world leader in recognizing the wellbeing effects of GLAMs. Extensive cooperative research work between the Montreal Museum of Fine Arts and the medical profession has resulted in a recognition of wellbeing effects, with doctors now being enabled to write prescriptions for visits to GLAMs.[85]

Are such wellbeing effects quantifiable through an economic framework? One line of argument is that this is indeed precisely one of the reasons why people visit GLAMs in the first place. If that is the case, then one argument would be that the

[84] Excellent quantitative research in this field has been done by Daniel Fujiwara and a series of co-authors in the UK. See Fujiwara D., "Museums and happiness: The value of participating in museums and the arts", Arts Council of England, April 2013 ; Fujiwara D., Kudrna, L. and Dolan P., "Quantifying and Valuing the Wellbeing Impacts of Culture and Sport", UK Department for Culture Media & Sport, April 2014; Fujiwara D., Lawton R., Mourato, S., "The Health and Wellbeing benefits of public libraries: Full report", March 2015; Fujiwara D., Kurdna L., Cornwall, T., Laffan, K., Dolan P., "Further analysis to value the health and educational benefits of sport and culture", March 2015; Bakshi H., Fujiwara D., Lawton R., Mourato, S., Dolan P., "Measuring Economic Value in Cultural Institutions", Arts and Humanities Research Council, October 2015

[85] BBC 26 October 2018, "Montreal museum partners with doctors to prescribe art" https://www.bbc.com/news/world-us-canada-45972348 accessed 23 July 2019 ; Montreal Museum of Fine Arts, "Art therapy and wellness at the Montreal Museum of Fine Arts".

wellbeing effects are fully incorporated into people's decision-making to visit and therefore into the measures of consumer surplus estimated above.

However, an alternative is that **these effects are not incorporated into people's decision-making** (or are only partly so). People may not (fully) realize how a visit to GLAMs may be therapeutic in some sense, increase their awareness of the world or indeed make them a better citizen.

As it is uncertain whether people take (or fully take) such effects into account in their visits to GLAMs, analysts such as Fujiwara suggest an alternative approach (wellbeing valuation or "WV,") which focusses on measuring the wellbeing people obtain from GLAMs.[86] This is seen as an alternative to the traditional methods such as TCM or contingent valuation.

Work done by such analysts is, to date, in its relatively early stages. Moreover, as it relies on complex "top down" economic modelling, and assumptions about relationships, there are inevitably questions relating to causality. For example, it may be that those visiting GLAMs are more "neighbourly" than those who do not—but is this because GLAMs inspire such people to "chat across the fence" or because "more neighbourly" people lead active and diverse lives and choose to visit GLAMs? Moreover, much of the estimation involved can vary depending on the modelling specifications and assumptions involved.

Accordingly, this approach has not been undertaken as the main basis of this study. Nonetheless, it is important to recognize wellbeing as a potential wider benefit and worth investigating potential relationships between GLAMs usage and wellbeing measures more closely.

Extensive work relating museums, galleries and libraries to various life satisfaction measures has been done by Fujiwara et al. in the UK using a variety of self-reported wellbeing measures (e.g. subjective wellbeing, health, happiness). This approach looks at how using these institutions impacts people's self-reported measures of wellbeing. It also offers a method for converting these impacts into equivalents in monetary terms. In a series of papers these authors find that:

- Visiting museums is associated with an improvement in wellbeing (happiness) equivalent to receiving £3,228 ($6,874) per year.[87]
- Frequent library use was associated with an improvement in wellbeing equivalent to receiving £1,359 ($2,894) per year.[88]
- Library usage could improve the prospects of young people advancing to higher education, with an estimated benefit of £2,114 ($4,955) per person.[89]

[86] Fujiwara et.al, (Oct. 2015), *op. cit.*

[87] Fujiwara (2013) *op. cit.* Converted from 2011 values at purchasing power parity rates, allowing for inflation.

[88] Fujiwara et al. (2014) *op. cit.* Converted from 2011 values at purchasing power parity rates, allowing for inflation.

[89] Fujiwara et al. (March 2015) *op. cit.* Converted from 2009 values at purchasing power parity rates, allowing for inflation.

The values cited in the first two dot points above represent the amount of money that would generate the same effect on a person's wellbeing as using the institution. In other words, visiting museums, for example, has the same wellbeing impact as receiving $6,874 per year. The value for library usage cited in the final dot point represents the net benefit per person associated with libraries increasing the likelihood of higher education attendance (which in turn increases future earning power as detailed in the discussion of formal education above).

These authors note that this work should be subject to caveats about causality. In essence, best efforts were made to control for the effects of demographic variables (e.g. age, education, income) and in some cases "instrumentation" to deal with causality, but reverse causality could still be an issue. Nonetheless they argue that the approach adopted would be acceptable for public policymaking.

Nonetheless, such work raises interesting questions, namely: do similar effects show up in the case of Canadian GLAMs? The box below provides an outline of how the current study went about this task. More technical detail is provided in Appendix 4.

**MEASURING WELLBEING**

In order to explore this question, the national survey undertaken for this study included questions relating to several dimensions of wellbeing, based on past Canadian social surveys.[90] The detailed questionnaire is included in Appendix 6 but, in brief, questions from the survey selected for further analysis include those relating to:

- *Life satisfaction*—How satisfied a person was with their life
- *Health*—How a person rated their health
- *Neighbourliness*—Whether a person knew most or none of their neighbours
- *Volunteering*—Whether a person had volunteered or not in the last 12 months.[91]

Consistent with the work cited above, participants were asked to assess their wellbeing for life satisfaction, health, neighbourliness as well as whether or not they had been volunteers in the past year. These were then coded on the numerical scales indicated above.

Given that GLAMs attendance (and the frequency of such attendance) are also known from the national survey, this allows for analysis of the impact of GLAMs usage on measures of wellbeing.

The most straightforward way of doing this is to compare the average ratings of respondents who had

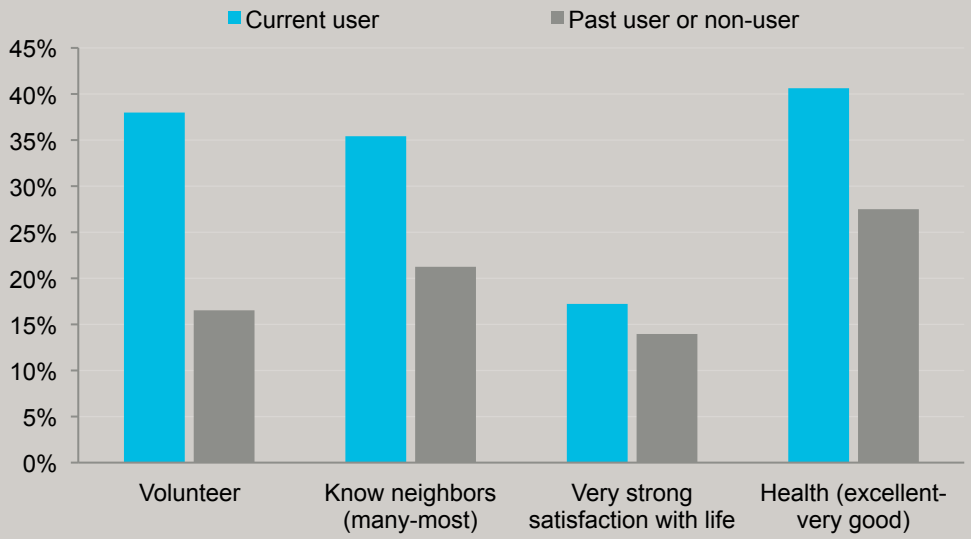
[90] Questions were derived from those in the "General Social Survey, 2010 Cycle 24 – Time Stress and Well Being", Statistics Canada, 2010.

[91] Note that a stress indicator was also examined, although this appeared to produce counter-intuitive results, indicating that current GLAMs users experienced more stress than non-users. One possibility for this is the finding in other research that the well educated groups more likely to use GLAMs also tend to experience higher stress. On further econometric examination, allowing for other demographic variables, the effects of stress did not appear to be statistically significant for GLAMs apart from libraries. The reasons for this are unclear, however the conflicting results between GLAMs (in contrast with the consistency demonstrated by other indicators) could suggests this measure may not be as reliable as the others used in the study.

used at least one GLAM in the past year with those who had not.

Fig. 21 compares wellbeing measures for users and non-users of GLAMs.

**Fig. 21. Wellbeing measures for GLAMs users and non-users** [92]




Source: Oxford Economics

Of course, many other influences such as age, education, employment status and gender could have an influence on people's wellbeing. Accordingly, more detailed econometric work was undertaken, controlling for the influences of income, age, education, employment and gender. In addition, the frequency with which users visited GLAMs could make a difference. If so, an approach examining just the subgroup of high frequency users could have different results to a model which looks at overall average usage. Two basic model specifications were therefore used for this analysis:

- *Approach 1*—the relationship between those who used GLAMs during the past year and wellbeing (the usage approach); and
- *Approach 2*—the relationship between frequent (3 or more times) GLAMs users and wellbeing measures (the frequency approach).

Both of these approaches used regression analysis to control for age, income, employment status and gender so as to unpick the impact GLAMs usage might have on wellbeing.

These approaches and more detailed results are described in more detail in Appendix 4.

The key modelling results for the approach relating wellbeing to usage of GLAMs over the past year (Approach 1 in the box above) are indicated below. The dependent variable represents the wellbeing indicator.

[92] Respondents included 1,386 current users of at least one GLAM, and 659 past or non-users of GLAMs.

**Fig. 22. GLAMs wellbeing: regression results for usage[93]**

| Dependent Variable | Impact of using at least one GLAM in the past year (coefficient size) | Scale[94] |
|---|---|---|
| Life satisfaction | Not significant | - |
| Health | 0.14 | 1-5 |
| Neighbourliness | 0.07 | 1-4 |
| Volunteering | 0.16 | 0-1 |

Source: Oxford Economics analysis

In straightforward terms these results indicate positive and significant relationships between GLAMs usage and wellbeing indicators for health, neighbourliness and volunteering. For example, usage of at least one GLAM in the past year is associated with a 0.14 increase in self-reported health status (on a scale of 1-5, where 1 is poor and 5 is excellent). Positive correlations were also recorded between GLAMs usage and neighbourliness and volunteering.

Interestingly enough, no significant relationship was found between GLAMs attendance and life satisfaction. This is in contrast to the findings of Fujiwara et al. (April 2014) for UK libraries. However, life satisfaction can be distinguished from "happiness" measures which are sometimes used in wellbeing surveys. Life satisfaction represents people's evaluation of life overall (and how it may measure up to their goals). Happiness taps into people's emotions and moods at the moment. Fujiwara (2014) makes the point that since these measures tap into different aspects of people's life, we might expect them to produce different results when measuring the impacts of GLAMs. Moreover, he also notes that health is highly correlated with happiness measures and may shed light on how GLAMs usage impacts wellbeing.

Although the current study contains no happiness measure, these observations are instructive. Aside from being of interest in its own right, health may therefore be something of a "masking variable" (or proxy) for happiness. With this in mind, and with recent Canadian initiatives recognizing the potential impact of GLAMs on health, the results for health impacts are of particular interest.

These approaches and more detailed results are described in more detail in Appendix 4. Also, as indicated in Appendix 4, these regression results also make it possible to provide monetary estimates of the equivalent benefit in terms of wellbeing conferred by GLAMs usage. These estimates suggest that the annual value to average GLAMs users is equivalent to $1,440 in improved wellbeing (as measured through health effects).[95]

[93] Ordinary least squares regression. Health and volunteering coefficients significant at the 1% level, neighbourliness significant at the 10% level.

[94] Scales were as follows: Health: 1= Poor, 5 = Excellent; Neighbourliness: 1= Know no neighbours, 4 = Know most neighbours; Volunteer: 1= Have volunteered in last 12 months, 2= Have not volunteered in last 12 months

[95] Note that those who used GLAMs by this measure may have done so on a number of occasions and across a number of institutions. Some may have used them infrequently during the year, others would be frequent users of several GLAMs.

An alternative approach (Approach 2, or the frequency approach) is to look only at more dedicated GLAMs users (i.e. those who used GLAMs three times or more during a year). This was modelled using a variety of specifications: simple linear regression, logistic regression ("logit"), instrumental variable model with two-stage least squares (2SLS) estimator, and the ordinal logit model.

Generally, we started with simpler models (the simple linear regression model) with more variables (including cross products between variables), then gradually reduced the number of variables to only those that were significant and without any statistical issues.

Appendix 4 provides details regarding the methodology used and the full results of the regressions that performed best. These results cover each of the wider benefits of overall subjective wellbeing, health, community engagement and volunteering. Each benefit is broken down by venue type: galleries, libraries, archives and museums.

To compare different models, we used a range of criteria:

- Whether the independent variables are statistically significant at a 95% confidence level (i.e. their parameters have a p-value smaller than 0.05);
- Size of the visitation frequency coefficient (where a larger positive coefficient shows a greater impact on the wellbeing aspect of interest); and
- Overall model fit (adjusted R-square or Chi-square statistic).

Fig. 23 below shows the coefficients for visitation frequency (often referred to as "impact factors") across these different model specifications.

**Fig. 23. Broader benefit impact factors, by regression model type**

| Broader benefit type | Coefficient (standard error, frequency variable type) | | | |
|---|---|---|---|---|
| | Simple linear regression | Logistic regression | Instrumental variable (2SLS) | Ordered logit regression |
| Overall subjective wellbeing | 0.016*** (0.004) [Cont.] | | **0.276*** ** (0.029) [Cont.] | 0.165* (0.095) |
| *Galleries* | **0.717*** (0.183)** | | | |
| *Libraries* | **0.667*** (0.093)** | | | |
| *Archives* | **0.880*** (0.267)** | | | |
| *Museums* | **0.686*** (0.100)** | | | |
| Health | 0.083* (0.044) | | **0.419*** ** (0.152) | 0.276*** (0.094) |
| *Galleries* | 0.062*** (0.031) | 0.426* (0.237) | | **0.603*** ** (0.174) |
| *Libraries* | 0.062*** (0.020) | **0.375*** ** (0.124) | | 0.358*** (0.094) |
| *Archives* | 0.104*** (0.044) | | | **0.484* ** (0.251) |

Accordingly, the value captures the average benefit across a spectrum of users and institutions rather than simply using a GLAM on one particular instance during the year.

| | | | | |
|---|---|---|---|---|
| *Museums* | 0.047***<br>(0.020) | | | **0.232*****<br>(0.114) |
| Neighbourliness | 0.255***<br>(0.065) | **1.055***<br>(0.281) | 0.510***<br>(0.118) | 0.523***<br>(0.104) |
| *Galleries* | 0.224***<br>(0.042) | **0.944***<br>(0.174) | | 0.758***<br>(0.168) |
| *Libraries* | | | | **0.167***<br>(0.098) |
| *Archives* | 0.300***<br>(0.065) | **1.250***<br>(0.276) | | 1.017***<br>(0.250) |
| *Museums* | 0.089***<br>(0.022) | 0.341***<br>(0.107) | | **0.374***<br>(0.100) |
| Volunteering | 0.247***<br>(0.065) | **0.983*****<br>(0.282) | 0.308***<br>(0.069) | |
| *Galleries* | | **1.195*****<br>(0.182) | | |
| *Libraries* | | **0.562*****<br>(0.108) | | |
| *Archives* | | **0.983*****<br>(0.282) | | |
| *Museums* | | **0.636*****<br>(0.109) | | |

Source: Oxford Economics
Significance: *** = 0.01, ** = 0.05. * = 0.1. Standard errors are robust. Superior results are bolded. Models with insignificant frequency parameters are excluded. [Cont.] = continuous dependent variable.

This more involved approach evidently reveals positive correlations between GLAMs visitation and core dimensions of wellbeing, controlling for demographic factors. Note that, of the simple linear regression models, only the overall subjective wellbeing for all GLAMs has a dependent variable that is effectively continuous (measured on a 0-10 ordered scale), as does the 2SLS instrumental variable model. This means that each of the impact factors, or coefficients, represents the increase in wellbeing resulting from additional visits. The other simple linear regressions regress binary or dummy variables (1 for frequent users, otherwise 0) on a mixture of continuous and binary regressors (the dependent variables).

Different combinations of variable formats mean that most of the regressions used must be interpreted carefully. For instance, what does it mean to fit a line when the result can take only either 1 or 0? Such a regression function is interpreted as a *conditional probability*. For instance, we estimate that there is a 0.72 probability that regular gallery visitors (three or more visits) report higher overall subjective wellbeing than non-regular visitors, controlling for demographic variables (Stock & Watson, 2015). Notably, all regressions control for only those demographic factors that are statistically significant to avoid bias and inflation in the results.

At a glance, robust regression models signal that GLAMs visitation has a significant positive influence on wellbeing. We see stronger impacts of visitation frequency on different aspects of wellbeing for individual GLAM types. This is an intuitive result since we might expect that the same groups of people who visit certain venues also share greater similarities in their self-reported wellbeing and demographic factors. In order to compare these wider benefits across wellbeing dimensions or individual GLAMs venues, a more detailed investigation of the regression results is needed, as provided in Appendix 4.

In short, while the relationship between GLAMs and wellbeing may be modelled in a variety of ways (and issues relating to causality persist) these results provide some indicative evidence that GLAMs *could* contribute to wellbeing.

As is the case for the simpler models examining GLAMs usage vs non-usage above, these benefits may be monetized to the extent that the regression used contains statistically significant parameters, most notably income. For instance, using the 2SLS specification, we find that regular visitation (three times or more annually, across all venue types) is associated with an annual improvement in wellbeing (as measured through health effects) equivalent to $4,149 per GLAMs user. The higher value could be indicative of the fact that more frequent GLAMs usage is associated with improved wellbeing.

### 8.3 SOCIAL CAPITAL

There are a variety of definitions of social capital, which circle around the ideas of trust, social cohesion and commitment to institutions. The OECD defines it as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups."[96]

To a large extent, arguments about social capital would appear to overlap with those about wellbeing discussed above and informal education discussed below. For example, it may be the case that GLAMs visits could enhance understanding of other communities, neighbourliness, volunteering, and result in better educated communities. More education could allow for people to find better jobs (i.e. increased productivity via human capital) and be better citizens.

As is the case with wellbeing and informal education, there have been a large number of studies of social capital, both within Canada and internationally, both as an area of interest in general and in terms of how GLAMs might promote such effects.[97]

However, these impacts may not only be of benefit to the individuals involved. There may be spillover effects such that society as a whole gains—e.g. more people volunteering or being neighbourly could inspire others to do so as well, creating a virtuous circle.

However, to date most arguments relating to social capital have focused on qualitative or descriptive measures rather than trying to measure the phenomenon quantitatively. Apart from the wellbeing analysis in the current study, a partial exception to this is the work of Riddell. However, the social effects would appear to

[96] As referenced in OECD's Glossary of Statistical Terms at https://stats.oecd.org/glossary/detail.asp?ID=3560 accessed 23 July 2019

[97] Notable work in the library space includes Ferguson, S. "Are public libraries developers of social capital? A review of their contribution and attempts to demonstrate it," *The Australian Library Journal* 61:1, 22-33, 2012. This references the work of Johnson and Griffis, indicating a close relationship between Canadian library usage and social capital, although with uncertain causal flow. A good applied study of the relation between social capital and library usage by a Canadian academic is also offered in Johnson, C., "Do public libraries contribute to social capital? A preliminary investigation into the relationship," *Library & Information Science Research* 32 (2010) 147-155

relate mainly to the individuals themselves rather than measuring the follow-on effects (or spillovers) to the rest of society.

The overlap between concepts of social capital and the ideas explored elsewhere in this chapter, combined with the lack of quantification in the literature, make it difficult to quantify such effects.

### 8.4 INFORMAL EDUCATION

Apart from the formal educational benefits referred to in Chapter 7, GLAMs may assist with people's informal education—i.e. education undertaken in people's own free time. Examples of informal education effects could include improving reading/literacy skills from books borrowed from public libraries and the acquisition of knowledge from attending public museums and galleries.

The suggested link often runs as follows: exposure to GLAMs may help children, in particular, to expand their knowledge. In the case of public libraries, it could help encourage reading, improving their literacy and test scores and thereby improving their chances of entry into higher education and higher paying (and more productive) jobs. In the case of institutions such as museums and galleries, it could help stoke their curiosity, knowledge and creativity and promote after-school learning and better educational results, again increasing the odds of post-secondary education and better wage and employment outcomes. The promotion of STEM learning through museums is often held up as a particular example of such effects.[98]

Many of these effects (particularly those relating to galleries and museums) are referred under the rubric of "cultural capital," a term originally coined by Pierre Bourdieu to describe familiarity with society's dominant cultural codes.[99]

Knowing these codes can benefit the individual, even if it is just "signaling" cultural awareness. However, a better educated population may hold potential benefits for learners themselves through higher wages and productivity (the benefit most commonly measured by economists). There may also be effects on broader society as suggested above, since a better educated population may demonstrate better civic values, such as a commitment to the rule of law, lower crime rates, higher participation in voting and other democratic institutions, and increased environmental awareness.

The figure below provides an overview of the positive cycle through which informal education of children and young adults could have these effects for various types of GLAMs.

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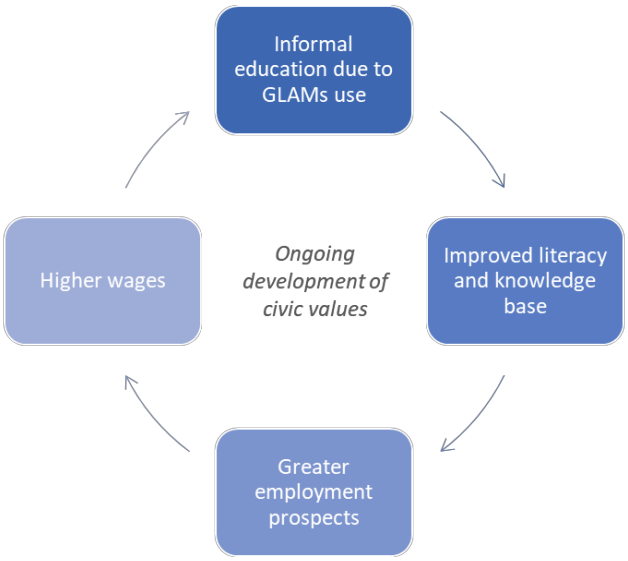
[98] See for example, Andrew, L., Durksen, T., Volman, M, "Museums as avenues of learning for children: a decade of research," *Learning Environ Res* (2017), 20:47-76 ; Lennon C., "Informal Learning: How care Providers Can Engage in learning Outside of the Classroom", Merrimack College; DeWitt, J, "Recognising and Valuing Student Engagement in Science Museums," Museum Management and Curatorship, Vo. 34, Issue 2, (2019)

[99] Jager M and Andersen, I, "Cultural capital in context: Heterogeneous returns to cultural capital across schooling environments," *Social Science Research* 50 (2017) 177-188

**Fig. 24. Impacts of informal education**




These issues are explored in more detail in Appendix 5. In short, there have been promising advances in our understanding of the effects of GLAMs on informal education, and some effects may be quantifiable, particularly in the case of informal learning by children and young adults. We have adopted a relatively cautious stance on this issue and excluded these effects from the CBA for this study. Nonetheless, it is important to highlight the ways in which such effects might impact on economic welfare.

### 8.5 LONG-TERM ECONOMIC SPILLOVERS

As indicated above, the standard CBA framework adopted above assumes that those using GLAMs do so using a judgement about how valuable GLAMs usage is to them. Consider the example of an entrepreneur who uses a library for work purposes, as part of research for a new business. The TCM should capture the benefits to society of making the trip to the library. If the costs of making the trip were higher than the benefits of the research, the trip would not have been made.[100]

However, economics recognizes (within reason) the potential for what are known as "spillover effects." These occur when the consequences of personal or corporate actions are not fully appreciated by those involved. A form of (positive) spillover effects, often cited in the economics literature is research and development (R&D). Firms may invest in R&D for their own purposes and gain some benefit from it. However, the ultimate uses of their innovations are of more

[100] Note the same approach is used for CBA approaches across a range of major social investments, including infrastructure. For example, opening up a new urban metro route with faster travel times may increase patronage. More people may now use the link for business and/or to take up new jobs which now become viable to access. The value to businesspeople and commuters taking up new jobs due to the link is captured by the increase in demand, along with the reduced cost of travel.

use to society than these firms themselves originally intended, because others build upon and adapt their inventions in ways the original inventors never intended.

In principle, there might therefore be a case for GLAMs to exhibit long-run spillover benefits that are not captured in a conventional economic welfare framework in the short-term. Undertaking work-related research in a public library for example could ultimately result in a new product or business. Other businesses might improve on that product in unanticipated ways. Spillover effects may therefore ultimately arise from the usage of the public library to develop the product.

These issues are discussed in more detail in Appendix 5. In short, current economic welfare frameworks have proved remarkably robust to critiques, and issues relating to causality and double counting raise concerns over the application of long-term spillover effects.

Nonetheless, while due caution about such benefits must be exercised, there may be an *in principle* case for spillover benefits from GLAMs as an addition to conventional economic welfare. In particular, it may be the case that access to GLAMs is an indicator of a society with strong civic values and trustworthy institutions, and one that adheres to democratic principles and the rule of law. The resulting effects could help spur on economic growth over the longer term and provide social benefits.

This is true not only in economic welfare terms, but in still broader social ones as well (a theme taken up in the following chapter). The examples below reinforce this point by considering what happens when access to GLAMs is restricted, more specifically, in the case of archives. Even though archives might be perceived by some as innocuous, they are one of the most socially contentious of all GLAMs. What is kept (and, indeed, what is not) and who can access it can be the subject of great social debate.

**CASE STUDY: DOES OPENING UP THE ARCHIVES MAKE A DIFFERENCE?**

Underlying many of the questions in this report is the issue of what a world without GLAMs would look like—i.e. what difference do they make? It is not possible to examine such a counterfactual in full (though we point to differences between users and non-users), but it is possible to examine cases where something similar has occurred.

One such example is the partial opening up of the archives of the former Soviet Union (and indeed of its satellite states) after the end of the Cold War. The opening of the archives can be seen as what economists term a "natural experiment"—where events occurring outside the control of analysts provide insights into a particular issue. In this case, a unique event allows us to gain insights which are not limited to the nuances of Soviet history but point to much broader issues concerning the importance of archives in Canada and elsewhere.

While halting and partial, the opening of the Soviet archives has highlighted issues such as:[101]

- Secrecy was so pervasive between different ministries that it was difficult to plan or allocate resources effectively.
- Inefficient ministerial coordination and quality control were major impediments to Soviet civilian technological progress; the military was differentiated by extensive quality control.
- "Storming" (meeting monthly targets in the last few days of the month, resulting in poor quality products) was pervasive and accounting for 40-60% of production by the 1960's.
- Macroeconomic growth rates were exaggerated by hidden inflation.
- World War 2 deaths were found to be approximately 7 million higher than the figures cited prior to 1991 (27 million rather than 20 million).
- Security rather than ideology was a key driver of the Cold War.

Applebaum (2004) points to released Soviet archival data as being key to her research into the Gulag, helping to quantify the nature of the camps (most inmates were peasants and workers, not intellectuals) and their pervasiveness (with 18 million passing through them). Her point is not that archival research helps us ensure "such things will never reoccur" (or will be identical), but that an understanding of how and why prepares societies to deal with them when they do.[102]

Archival revelations may also be deeply personal; former Stasi archives revealed a pervasive pattern of surveillance which forced families, friends and neighbours to come to terms with difficult issues.[103] Others have drawn the link between Soviet archival release and international examples, such as South Africa's post-apartheid Truth and Reconciliation Commission, seeing the opening

[101] Kragh, M. "The Soviet Enterprise: What have we learned from the archives?", *Enterprise and Society*, Vol. 14, Issue 2, June 2013; Ellman,M. "The political economy of Stalinism in the light of the archival revolution," *Journal of Institutional Economics (*2008) 4,1; Ellman M. and Maksudov, S, "Soviet Deaths in the Great Patriotic War", *Europe-Asia Studies*, Vol. 46, No.4, (1994); Morris, S., "The Evolving Interpretations of the Origins of the Cold War"

[102] Applebaum, A., "The Gulag: What We Now Know and Why It Matters," *Cato's Letter*, Vol. 2, No.1, 2004

[103] See for example *The Guardian*, "The spies who loved me: My dad the Stasi agent," 11 July 2015. Considerable time and money have been put into retrieval of Stasi archival material since 1990. See *The Guardian*, 3 January 2018 "Stasi files, scanner struggles to stitch together surveillance state scraps". The time and effort put into the recovery of the records provides one indication of the value societies place on the retrieval of archival material, even if the results may be painful.

up of archives as a good indication of government transparency and social robustness.[104]

Western countries are not immune from such issues. In Canada, archives have played a significant role in providing essential documents for the Truth and Reconciliation Commission. The Commission worked from 2008 to 2015 with a mandate to reveal the truth about the individual and collective harms of the residential school system on Indigenous students and their families and inspire a process of healing and reconciliation.

Apart from the fact that ongoing archival research can make countries confront troubling issues in their own history, some have recently faced the somewhat different question of what happens when archival material is destroyed or closed off. Recent examples include the loss of Windrush documents and the cutting off of access to post-1945 Hungarian National Archives.[105]

Is any of this relevant to an economic framework? Should it be? The work cited above indicates how blocking off information impedes our understanding of how economies and societies function. Indeed, the archives suggest that Soviet decision makers themselves suffered from a lack of information about their own society and economy, which impeded their efforts to manage it.

This chimes with the issues explored in the text above. Firstly, restriction of information can tend to mean that key decisions are not made in an efficient way.[106] Archives are a part of this process—we cannot fully understand the workings of the economy or society if we cannot learn from them, or make optimal decisions. In short, the "burst dam" of Soviet archival material provides a clear indication that archives **do** make a difference—even in raw economic terms, not to mention broader social concerns.

Secondly, do archives (and GLAMs) have long-run spillover effects? As indicated above, in Canada and most comparable Western countries we would expect that, precisely because access to information **is** available (unlike the former Soviet Union), much of the ongoing value of archives is revealed in the decision to use them (as measured through methods like the TCM).

Nonetheless, this case study also provides another hint that there may be longer term spillover effects beyond a CBA framework. Seeing what happens when access to data is restricted *in extremis* allows us to see that archives are an element in creating a society in which confidence about access to information is an element of social capital. They are part of a process upholding a civil society, answerable to an informed and educated citizenry and the rule of law. In principle, some of these spillover effects might be in addition to the direct value obtained by usage and only apparent in the long run at the macroeconomic level (i.e. the "open data" argument).

Beyond this, there are of course the broader social issues, highlighted above, which economic frameworks cannot capture. Restricting access to personal records (whether it be those of the

[104] Ninua, T. "Breaking down iron doors: why opening up Soviet archives matters," Open Government Partnership at https://www.opengovpartnership.org/stories/breaking-down-iron-doors-why-opening-up-soviet-archives-matters/

[105] Vargha, D, "Windrush scandal: a historian on why destroying archives is never a good idea" *The Conversation*, April 24, 2018 https://theconversation.com/windrush-scandal-a-historian-on-why-destroying-archives-is-never-a-good-idea-95481 accessed 23 July 2019. A related point is that societies can never be sure at the time of what is truly of historic significance—a point underlined by recent machine learning experiments. See Risi et. al. "Predicting history," *Nature Human Behaviour*, 3 June 2019

[106] Of course, recent times coupled with the ubiquity of the Internet have also seen concerns about "information overload" and the proliferation of "fake news". This presents a separate challenge but does not obviate the point.

Stasi or the Windrush generation) can have direct effects on living individuals, bringing home the importance of memory institutions to society.

### 8.6 A NOTE ON EMPLOYMENT AND MULTIPLIER EFFECTS

Apart from the wider effects noted above, employment and multiplier effects are sometimes noted as important benefits of GLAMs.

As noted, libraries in particular can play an important role in **employment and training**. For example, a user with a current job may use a public library to find a new one. The library has therefore played some role in finding them a new job. And indeed, the fact that such a job seeker has chosen to use the public library would form a part of their decision to travel to it. Like other reasons for travelling to the library, this would be captured by the TCM estimation. If the benefits offered by library services were lower than the cost of getting to the library, they would not make the trip.

Likewise, those who are unemployed may use library resources to train and find work; the value of the library to these users would be reflected within the TCM.

However, with some exceptions, the new jobs themselves are not part of the benefits measured by economic welfare assessments. This issue is further discussed in Appendix 5.

Multiplier effects on local retailers are also often mentioned in the context of GLAMs. For example, the opening of a new gallery may encourage people to visit and then go shopping in the local area, providing welcome revenue to retailers, who then order from their suppliers and so on (**multiplier effects**). However, there are strong technical reasons as to why such impacts are excluded from economic welfare analysis.

In both cases, it is important to distinguish an *economic impact* study (which measures jobs, GDP and multiplier impacts) from an *economic welfare study* (which measures the net benefits to society). Economic impact studies measure economic activity in terms of contributions to the economy as a whole, or the *share* of the “economic pie” accounted for by institutions such as GLAMs. By comparison, economic welfare studies measure how society is better off in terms of net benefits (benefits less costs), i.e. how institutions such as GLAMs *grow* the “economic pie”.

As noted, the current study is an economic welfare study, so jobs *per se* and multiplier effects do not form part of the assessed benefits. Conversely many other effects such as consumer surplus, non-use value and formal educational benefits are included in an economic welfare analysis but excluded from an impact study.

A summary of the wider benefits often associated with GLAMs is provided below. This indicates how such effects may (or may not) form part of the wider economic benefits in addition to the economic welfare framework used in this study.

**Fig. 25. Typology of wider benefits**

| Effect | Comment on application to economic framework |
|---|---|
| **Wellbeing** | Wellbeing effects are an important potential effect. However, this approach may be best seen as an alternative valuation approach to the conventional economic welfare framework. |
| **Social Capital** | Important concept, widely discussed in literature but many aspects overlap with wellbeing, informal education, and spillover effects. |
| **Informal Education** | Mounting evidence of effects. Nonetheless, there continues to be uncertainty over causal linkages. |
| **Spillover effects** | There may be some evidence of spillover effects, and "natural experiments" provide some evidence, but a robust quantification dealing with causality remains elusive. |
| **Employment effects** | Benefits to finding jobs using GLAMs should be captured in the TCM. However, the new jobs themselves would not be part of an economic welfare framework. |
| **Multiplier effects** | Only appropriate for an economic impact study. Inclusion is inconsistent with principles of economic welfare. |

Source: BIS Oxford Economics analysis

As indicated, further discussion of wider benefits is included in Appendices 4 and 5.

# 9. QUALITATIVE SOCIAL BENEFITS: MULTI-CRITERIA ANALYSIS

As suggested above, economic analysis is an important tool that can shed light on issues such as society's valuation of GLAMs usage in ways that are insightful, subtle and powerful. However, it is not the only way of looking at the world (nor should be). A good caution to the limits of any world view was offered by one William Shakespeare some centuries ago:

*There are more things in heaven and earth, Horatio,*
*Than are dreamt of in your philosophy.*
Hamlet (Act 1, Scene 5)

Some may feel that GLAMs provide more benefits than can be captured by economic analysis—or indeed that they provide intrinsic social values that economic frameworks cannot address. Accordingly, **Multi-Criteria Analysis** (MCA) was also used to assess the perceived importance and the degree of effectiveness of these attributes. MCA is used to gain a more holistic view of benefits—e.g. thoughts and feelings about GLAMs. Similar to the welfare approach, the MCA was incorporated into the national survey of the Canadian population, as well as into a survey of GLAMs stakeholders.

Our MCA focused on seven key dimensions that were identified as particularly relevant in discussion with the CMA and LAC. These dimensions are:

(1) Community engagement and civic participation;
(2) Preserving cultural and historical heritage;
(3) Providing access to resources for research, innovation and education;
(4) Protection of truth, integrity and social values;
(5) Quality of life, mental and physical health and wellbeing;
(6) Providing inspiration for creativity; and
(7) Nurturing of identity for marginalized communities, contributing to community cohesion.

As part of the MCA, we included in our national survey questions about which attributes the general public and GLAMs stakeholders valued the most about GLAMs. Respondents were asked to rate each attribute on a scale of 1-10 to assess their **relative importance**, thus providing a straightforward indication of the relative value of these criteria to various audiences.

Results tend to show the general public and GLAM stakeholders agree on which social objectives matter the most for each GLAM (Fig. 26). Both groups of respondents agree that archives and museums play a key role in preserving Canadian heritage, while libraries are crucial for providing access to resources for research.

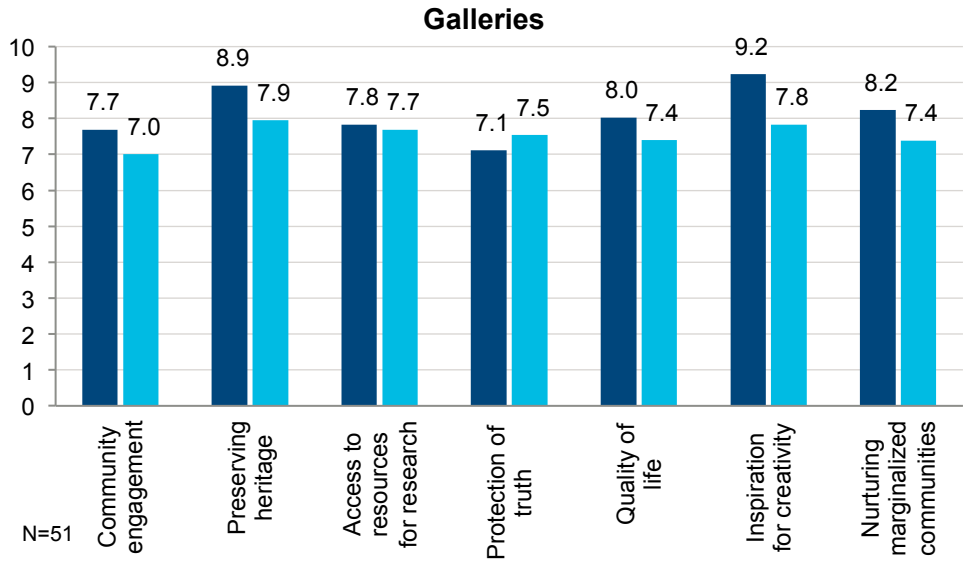
Interestingly, there is less of an agreement on the social objectives of art galleries; heritage preservation is deemed most important to the general public and

inspiration for creativity is ranked as number one attribute by GLAMs stakeholders. Another interesting finding relates to perceptions of libraries. Stakeholders see community engagement as the second most important attribute, while the general public ranks it among the least relevant.

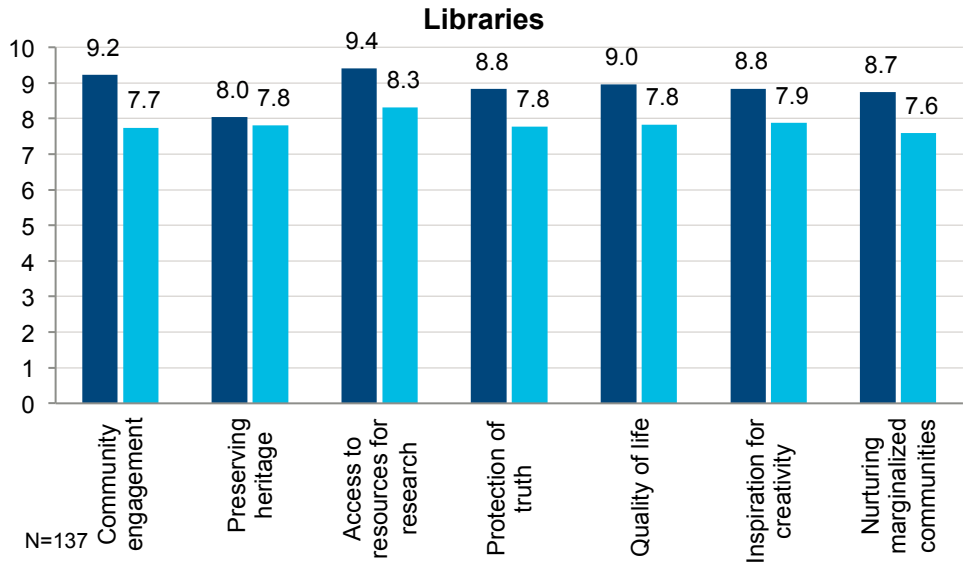
As a general rule, stakeholders tend to be more generous in their ratings, with a few exceptions. Galleries' role in protecting the truth is perceived as more important for the general public than it is for stakeholders. Similarly, archives' impact on quality of life is felt more strongly among the general public, than among stakeholders.

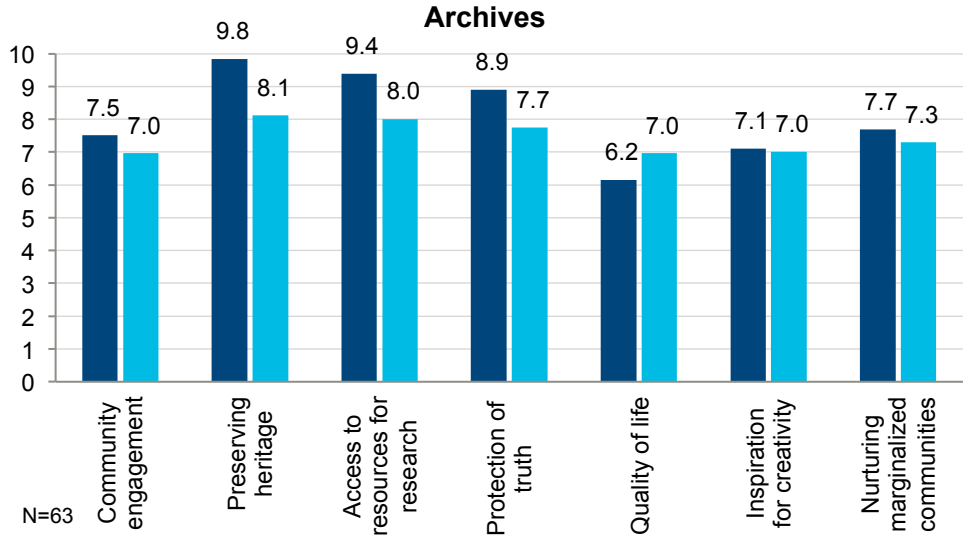
Although these differences should not be exaggerated, they should be kept in mind; these data offer unique insights about the broader role of GLAMs. They can be used for considerations well beyond the scope of this study and beyond quantitative estimations. For example, they might help GLAMs answer questions like: are GLAMs offering or prioritizing what the public feels is important? Should GLAMs be leading the way, even if the public does not (yet) see some attributes as important as stakeholders do?

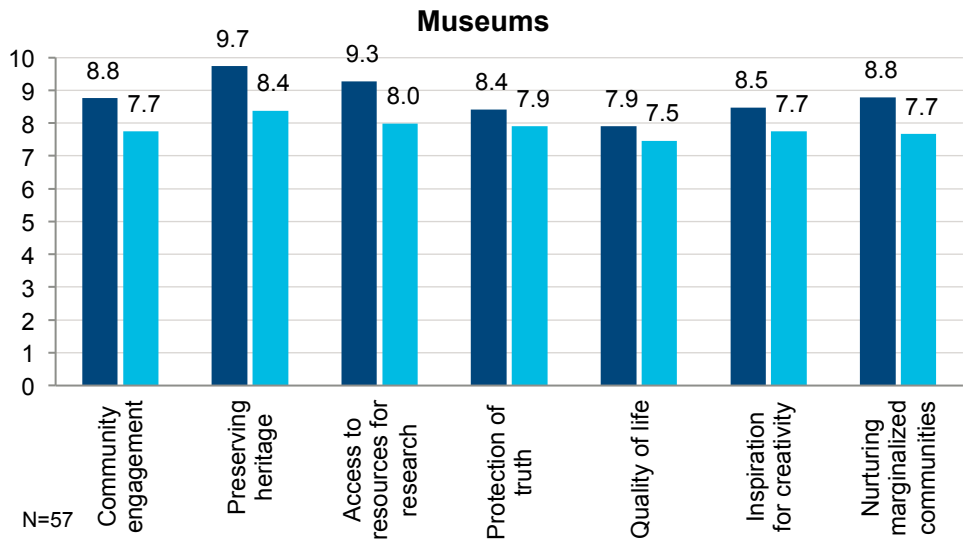
**Fig. 26. Importance of GLAMs, according to stakeholders (dark blue) and the general public (light blue), N = number of stakeholder respondents[107]**




[107] As this question was mandatory, the number of public respondents was 2,045 in each case.

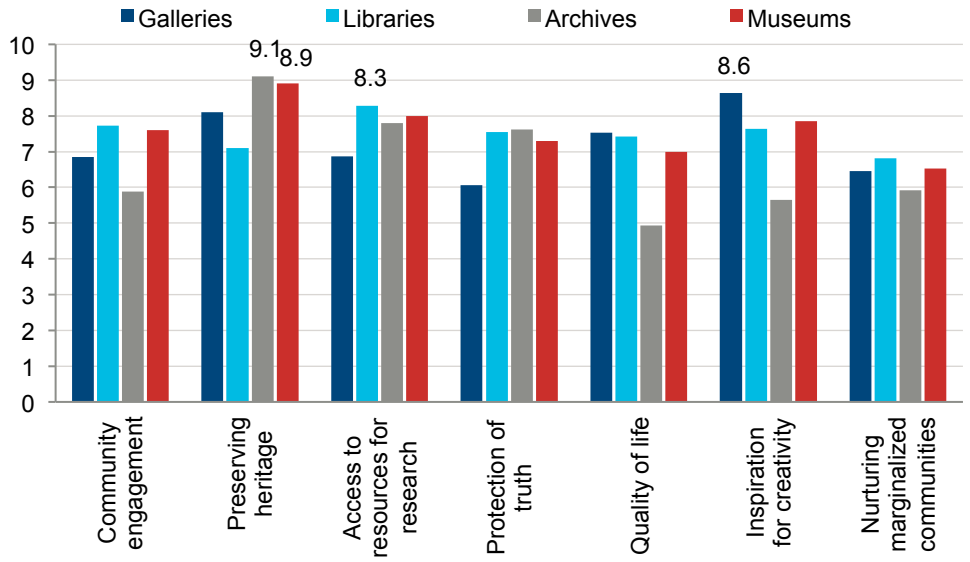

Libraries
10
9
8
7
6
5
4
3
2
1
0
9.2
7.7
8.0
7.8
9.4
8.3
8.8
7.8
9.0
7.8
8.8
7.9
8.7
7.6
N=137
Community engagement
Preserving heritage
Access to resources for research
Protection of truth
Quality of life
Inspiration for creativity
Nurturing marginalized communities


Archives
10
9
8
7
6
5
4
3
2
1
0
7.5
7.0
9.8
8.1
9.4
8.0
8.9
7.7
6.2
7.0
7.1
7.0
7.7
7.3
N=63
Community engagement
Preserving heritage
Access to resources for research
Protection of truth
Quality of life
Inspiration for creativity
Nurturing marginalized communities




Interestingly, when asked about **effectiveness levels**, stakeholders reported high levels of perceived effectiveness, especially in relation to the most important attributes (Fig. 27). However, effectiveness ratings tend to be lower than the importance ratings shown above. This is important, as, if stakeholders feel GLAMs—or certain types of GLAMs—are not as effective as they could be, it is relevant to understand the reasons behind this gap. As with the issue of importance above, perhaps the value lies in asking the question to begin with, rather than necessarily seeking the "right" answer. These data provide insights into such issues and offer a unique opportunity to initiate such debates.

**Fig. 27. MCA results, effectiveness according to GLAM stakeholders**



# 10. CONCLUSION

The preceding chapters have presented estimates of the value generated by GLAMs to visitors, the perceived value attributed to them by non-users as well as online, educational and revenue values. We estimate the gross economic value of GLAMs to Canada in 2019 to have been $11.7 billion (Fig. 28). However, it is important to place this estimation of the gross value generated by the sector in context, by setting it against the costs of GLAMs operations, estimated at $3.0 billion in 2019. Dividing the value of quantified benefits by these costs gives a BCR of 3.9. This means that for each $1 spent operating GLAMs in 2019, $3.90 of benefits were generated for society in the same year, while net benefits totalled over $8.6 billion.

**Fig. 28. Summary of costs and benefits of GLAMs, 2019**

| $million 2019 | Galleries | Libraries | Archives | Museums | All GLAMs |
|---|---|---|---|---|---|
| Revenue | 222 | 31 | 22 | 451 | 727 |
| Non-Use value | 536 | 537 | 446 | 693 | 2,212 |
| Use value | 615 | 1,797 | 185 | 1,374 | 3,972 |
| Online usage | 378 | 636 | 353 | 277 | 1,644 |
| Educational value | 435 | 1,361 | 41 | 1,271 | 3,108 |
| **Total benefits** | **2,185** | **4,362** | **1,047** | **4,067** | **11,662** |
| Operating costs | 556 | 955 | 395 | 1,106 | 3,012 |
| **Total costs** | **556** | **955** | **395** | **1,106** | **3,012** |
| *Benefit-Cost Ratio (BCR)* | **3.9** | **4.6** | **2.7** | **3.7** | **3.9** |
| *Net benefits* | **1,629** | **3,408** | **652** | **2,961** | **8,650** |

Source: Oxford Economics

The BCR of 3.9 is a powerful indicator of the sector's value. While BCRs provide useful decision-making tools, caution must be exercised in comparing them across different types of investments, due to the use of different methodologies and components (for example, some studies may not include an assessment of non-use value). Further, one might have a low BCR attached to a project with a high net value in monetary terms.[108]

It is nevertheless useful to compare the BCR identified above with similar studies of cultural institutions around the world. For example, the Americans for Libraries Council's (ALC) review of US libraries reported that a BCR of 3.1 or better was

[108] For example, a project costing $10 billion might generate $11 billion in benefits. The BCR is 1.1, however net benefits of $1 billion are sizeable. Conversely a project costing $1 million might generate $3 million in benefits—providing a BCR of 3, but only $2 million in net benefits to society.

common among the studies it reviewed.[109] BCRs between 2.8 and 4.2 have also been recorded for Australian and New Zealand public libraries.[110] These and other similar results are presented below in Fig. 29.

In addition, due to the large size of the investments involved, transport economics is a common field of application for cost-benefit analyses. Examples of BCRs for infrastructure investments in Canada are also summarized in Fig. 29. Fig. 30 presents GLAMs' BCR in context of major public infrastructure investment projects in Canada.

**Fig. 29. Benefit Cost Ratios in the literature**

| Author | Year | Subject | Geography | BCR |
|---|---|---|---|---|
| **Infrastructure studies, Canada** | | | | |
| Centre for Public Management Inc. | 2009 | Alaska Highway upgrading | Canada | 1.5-2.6 |
| City of Markham | 2018 | Grey infrastructure | Markham, Canada | 2.0-5.0 |
| Iacobacci | 2017 | Transit investments | Greater Montreal, Greater Toronto, and Hamilton, Canada | 0.7-3.3 |
| **Public library studies, global** | | | | |
| Aabø et al. | 2009 | National library studies | Global | 3.0 (mean)<br>3.5 (median) |
| Imholz et al. (ALC) | 2010 | US libraries | US | 3.1 |
| SGS Economics & Planning | 2013 | Public libraries | Australia | 2.9 |
| Strode et al. | 2012 | Reading rooms and lending services | Latvia | 1.4 |
| Aabø | 2005 | Public libraries | Norway | 4.0 |
| Yanez | 2014 | Libraries | Spain | 2.8-3.8 |
| Kim | 2011 | Public libraries | Global | 3.8 (CV)<br>4.5 (RP)[111] |
| Ko et al. | 2012 | Public libraries | Korea | 3.7 |

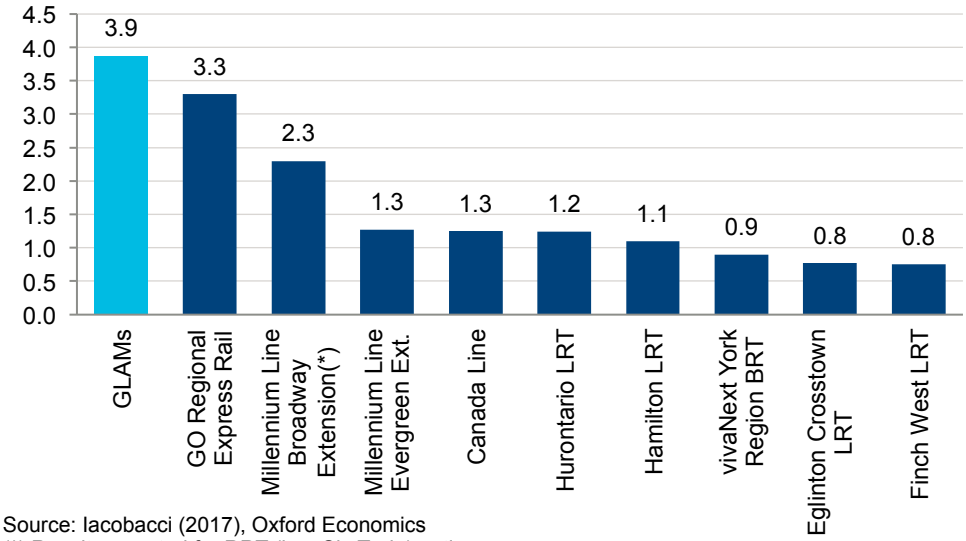
Source: Oxford Economics
All figures subject to rounding.

[109] Americans for Libraries Council (ALC), "Worth Their Weight: An Assessment of the Evolving Field of Library Valuation", 2007

[110] SGS Economics & Planning, "National Welfare & Economic Contributions of Public Libraries", March 2013.

[111] CV=Contingent Valuation, RP=Revealed Preference

**Fig. 30. GLAMs' BCR compared to major public infrastructure projects in Canada**[112]




Source: Iacobacci (2017), Oxford Economics
(*) Results reported for RRT (i.e., SkyTrain) option.

These results provide one indication that GLAMs perform very favourably when compared to other major social investments. In essence, a dollar invested in GLAMs can potentially yield higher social returns then the investments in other commonly measured forms of investment, such as transportation infrastructure. [113]

It should also be recalled that this report has provided a national level overview of a wide variety of institutions using a range of measurement tools. In considering ways forward for the sector and practical lessons, it is important that this work's discussions and findings be further developed at the local, provincial and national levels, along with the tools used by the analysis itself. Even if no formal economic analysis is undertaken, the key categories of value explored in this report can act as an initial signpost to GLAMs in exploring their user base and how they add value to society.

For example, the travel cost analysis used in this report is derived from postal code data on the origin of GLAMs users. These or similar data could be collected more systematically and used for many other purposes such as examining exactly where users live through "heat maps" and the demographics of these neighbourhoods. This could help understand which communities GLAMs are providing services to and how well different population groups are represented. Likewise, closer monitoring of online services metrics, particularly social media, could provide

[112] Iacobacci M., "Business Cases for Major Public Infrastructure Projects in Canada", SPP Research Paper, November 2017.

[113] It is recognised that the comparisons are to regional projects and focus on the transportation infrastructure sphere. This reflects the facts that, in practice, there are few comparable studies at the national level (i.e. most CBA work is at the sub-national level), that the large expenditures involved make transportation a reasonable comparison to other large scale initiatives (such as the GLAMs sector) and that transportation is an area in which CBA is particularly well developed, allowing for comparisons to a number of different projects.

additional insights into how GLAMs services are being used. Apart from understanding what is of particular interest to users, this could allow for the development of new GLAMs' offerings which are geared to online engagement. More detailed data collection (e.g. via repeat surveys) on how users obtain both formal and informal educational benefits could be of use in understanding such benefits over the long term. This is especially so for informal education, where the long-term studies are lacking.

In considering broader effects, while Canada has been a world leader in recognising the wellbeing effects of GLAMs, further attention could also be paid to follow up data collection on how visitation is improving user quality of life. This would complement the national level data collection undertaken for this study.

Finally, the broader issues explored by the MCA in this study should not be forgotten. Individual GLAMs could explore not only how highly (or otherwise) users rate them on an agreed set of attributes, but also how effectively users see them as fulfilling their objectives and how such ratings compare with the perceptions of key stakeholders. This would allow for an assessment of whether and/or how GLAMs are fulfilling their mandate and whether the opinions of stakeholders differ from users in a systematic way.

At the same time, the limitations of the current study or any quantitative work should not be ignored. Some of these are detailed in the box below.

**LIMITATIONS OF THE CURRENT STUDY**

Any major study involving a range of estimation techniques and quantitative methods, will be subject to limitations. A number of potential limitations relating to the current study are listed below:

- *Population sample* – As indicated, the current study sought to obtain a demographically representative sample of the Canadian population based on 2,045 participants using quotas to allow for age, gender, highest educational attainment, official language spoken and province. More extensive work could also seek to control for other factors such as employment status, and income (although these demographic questions were asked in the survey no specific quota samples were adopted). However, we believe that the current approach controls for most of the key demographic variables of interest. Additional demographic variables might be highly correlated with these ones already allowed for (e.g. income could be closely related to educational status).

- *Institutional sample* – Data for the travel cost and online modelling included information sourced from a number of GLAMs responding to data requests, as indicated above. Given the large number of GLAMs across Canada, and the fact that it was obviously not possible to include every GLAM in this sample, this raises the question of the representativeness of the data supplied. Note however that the analysis sought to address this by collecting data from as many GLAMs of varying sizes and geographical locations across the country as possible and, most significantly, by combining "top down" national survey data with the "bottom up" data collected from individual institutions. In the case of archives, the data set was further supplemented by the use of extensive

unpublished data supplied by Professor Wendy Duff.

- *Non-use valuation*– There is a large literature on the approaches using stated preference estimations to derive willingness to pay and potential biases in estimation. Some of these are detailed in the chapter of this report dealing with non-use value. As described in that chapter, we have attempted to address these biases by paying careful attention to question wording and presentation. Nonetheless, as this valuation is inherently subjective, this issue may never be fully resolved. Future analysis may seek to use more advanced techniques such as choice modelling, which adopt further measures to deal with the issue of respondent bias.

- *Non-CULC and non-CARL libraries*- While good data exists for CULC libraries, information for non-CULC libraries was found to be less comprehensive, as it was organised into provincial data with varying levels of detail. As indicated in the discussion of library valuation above, values were therefore based on data for CULC libraries, supplemented by an estimation for non-CULC libraries. This allowed for a derivation of an estimate for the entire public library sector. In addition, as indicated, academic library estimations were based on CARL data only, as, while partial data were available, comprehensive non-CARL data did not appear to be available at the national level. Future work could seek to address these data issues and refine the estimations made in this study.

- *Scope* -The current study does not distinguish between the usage of GLAMs by Canadians and foreigners (e.g. tourists visiting GLAMs, foreign users of GLAMs websites). The benefits from using GLAMs accrue to users regardless of whether they are Canadian residents or not. However, most of the costs of supporting GLAMs would be incurred by Canadian society. We took a view that GLAMs are a benefit not only to Canadians but to global society as a whole and therefore the study should be global in scope. However, a more restrictive approach would have seen benefits restricted to Canadians and matched against the costs incurred by Canadian society.

As with all research and empirical work, future work could seek to extend knowledge to deal with these limitations in more detail.

Finally, it is also worth pointing out that many of the valuations in the current study have been developed on the basis of individual preferences, whether revealed (e.g. using the TCM) or stated (e.g. non-use value). This is consistent with standard economic frameworks, which emphasise the importance of such preferences in valuing goods and services and making decisions. Nonetheless, it may be that “the whole is greater than the sum of the parts”. That is, GLAMs may offer broader social benefits above and beyond what an assessment of individual preferences can provide. Some of these concepts were explored in the discussions in the wider benefits chapter of this report, particularly those relating to social capital and spillover effects, which encompass the idea that the value of GLAMs themselves may be above and beyond what any individual user (or non-user) might perceive.

As suggested in those discussions, one way to explore the value of GLAMs in a fuller sense is to explore the effects on society when they stop effectively functioning (i.e. the case of archives explored above). This can clearly produce damaging social impacts, even though no individual might fully appreciate the extent of such impacts at the time.

The counterpoint to this is that GLAMs form an integral part of the fabric of any healthy functioning society. Accordingly, as indicated by the findings of this report, their preservation, promotion and development should be the concern not only of those who work in the sector, but of citizens and policymakers alike.

# APPENDIX 1 ECONOMIC WELFARE APPROACH

**THEORETICAL FRAMEWORK**

This report uses what is known as an economic welfare approach in order to undertake a CBA for the GLAM sector in Canada. CBA has often been employed for the appraisal of major social initiatives, such as new infrastructure or health projects but, as discussed below, extensions of the approach are increasingly being employed in areas such as the environment and the arts.

Of key importance in assessing value under this sort of approach is the assessment of consumer ”willingness to pay” (WTP) for a given good or service.

For example, in this case, if visitors to GLAMs placed a value on their visit only just equal to the cost of getting there (in time and money), then what they spend and receive would be equivalent and they would be indifferent between visiting and not visiting. In practice, they visit because what they are willing to pay for the experience exceeds the costs of the visit. So, they evidently see visiting as “worth it.”

In economic welfare, the difference between what people *do* pay and the maximum they are *willing to* pay is known as their “consumer surplus.” So, a visitor may pay $20 in travel and time costs to get to a GLAM but enjoy it so much that he or she would have been prepared to visit, even if it cost $30. The consumer surplus for such a person would be $10. If a second visitor also experiences costs of $20 to get to the GLAM but is only willing to pay $25 to visit, his or her consumer surplus would be $5.

In this way, consumers enjoy benefits over and above the prices they actually pay. A similar dynamic can be seen on the producer’s side. The “producer surplus” is therefore the difference between the revenue received by the producer (in this case GLAMs) and the minimum they would have been able to produce these services for. Roughly speaking then, producer surplus equates to the producer’s profits.

Fig. 31 below illustrates these concepts graphically. When the price of the thing being valued (for example, the cost to get to a GLAM) is P, the consumer surplus is identified by the area shaded in dark blue, which represents the sum of all these individual visitors’ consumer surpluses. This is the difference between the maximum those visitors would be willing to pay and the amount they actually pay. The latter defines a demand curve, which traces the number of visitors that would be expected given differing access costs.

Consumer surplus may also arise from other forms of interaction with GLAMs, such as usage of their online services and social media as discussed in Chapter 6.

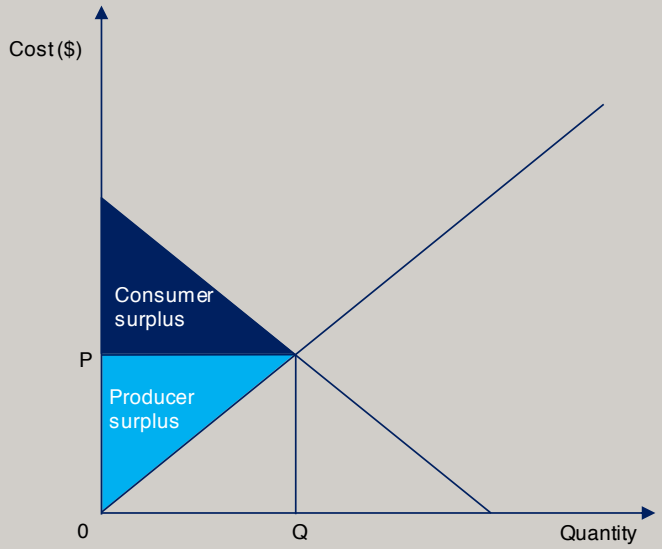
Similarly, the producer surplus (the light blue area) represents the difference between the revenue received by the producer and its operational and maintenance costs.

In the case of GLAMs though, the sector as a whole does not produce a profit in the conventional sense. However, it is still necessary to include its commercial revenues (e.g. earned through admissions, shops, cafes, etc.) as these represent a source of value to be set against the costs of running the organizations.

Adding up the producer and consumer surpluses that flow from a good, program or initiative provides a measure of its benefits. In addition, there may be benefits to third parties (“externalities”) arising from

GLAMs' activities. For example, school trips may develop learning and educational skills, boosting participants' "human capital."

**Fig. 31. Consumer and producer surplus**




The sum of all of these benefits can be compared to the costs of the initiative to produce a BCR. A BCR divides benefits by costs; a BCR greater than 1.0 indicates that an initiative provides a net benefit to society.

**TOTAL ECONOMIC VALUE**

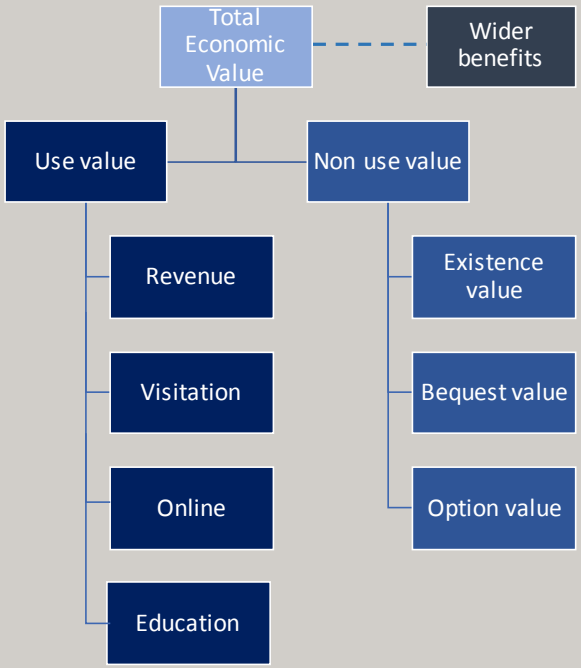
The above approach is often employed when estimating the value of commodities traded in markets, along with an allowance for some externalities. However, in recent years economists have broadened these ideas to develop what is known as a Total Economic Value framework (TEV).[114]

A TEV provides an expanded concept of externalities. It recognizes that institutions like GLAMs may be valued not only through their direct "use value" to society, but through a variety of "non-use" (or "passive use") values. These include existence value (the value placed on the fact that GLAMs exist even though the person in question never uses them), bequest value (the value of preserving GLAMs for future generations), and option value (having the option of using GLAMs, whether or not a person ever chooses to do so).

This study uses a TEV framework for its assessment of the GLAMs sector. The figure below indicates the various components of use and non-use value adopted for this study. These sources of value are then compared to costs to develop a BCR for the sector.

[114] For further references to the concept of TEV see "Cost-Benefit Analysis and the Environment: Recent Developments" OECD accessed 11 April 2017 at http://www.oecd.org/environment/tools-evaluation/36190261.pdf and also the "Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations", accessed 11 April 2017 at http://www.teebweb.org/our-publications/teeb-study-reports/ecological-and-economic-foundations/.

**Fig. 32. Total Economic Value framework for GLAMs**




## PHYSICAL AND TEMPORAL SCOPE

In some cases, a "ringfence" is applied to limit the scope of a CBA or TEV. For example, studies may limit the analysis of costs and benefits to a province or a country, such as Canada. People and entities to which an assessment is restricted are known as the "population of standing."

In the case of the current analysis, no ringfence has been applied. That is, no distinction has been made between Canadian and foreign users of GLAMs (e.g. tourists visiting GLAMs, foreign users of GLAMs websites). Benefits accruing to all of these parties are therefore considered within the framework of the analysis, though most of the costs are borne by Canadian society (e.g. government subsidies to maintain GLAMs).

Another scoping issue relates to time. As the objective here is to appraise the impact of a single year of GLAMs' operations, the current year used in this study is assumed to be 2019. Accordingly, this assessment generally matches current costs, expressed in 2019 prices, with the benefits enjoyed during that year.[115]

In the case of the assessments for education and student use of academic libraries, however, the bulk of the benefits occurs in the future, but nonetheless arises out of costs incurred in the present. Accordingly, these benefits have been measured over future years on a present value (PV) basis. A PV approach

[115] Note that, while values are expressed in 2019 prices, usage is based on 2015 patronage figures for galleries, archives and museums derived from the "Government of Canada Survey of Heritage Institutions: 2017" while 2017 figures for Libraries were derived from CULC's "2017 Canadian Public Library Statistics". These were the latest available data for institutional usage at the time of writing and have not been adjusted to take account of potential factors such as patronage changes and/or population growth (though CULC data have been adjusted by 1.25 to allow for non-urban public libraries). In other words, 2019 patronage is assumed to be equivalent to the patronage figures provided in these publications (plus the adjustment for non-urban public libraries).

adds up benefits enjoyed in future years, subject to discounting to allow for the fact that future benefits are worth less than current ones. Another way of viewing this approach is that all benefits associated with costs incurred in the present are effectively measured on a PV basis, but are greater than zero only in the case of education and academic libraries. This is because other forms of benefits (e.g. physical use value) cannot be realized in future years without future expenditures.

# APPENDIX 2 VALUING GLAM VISITS

## APPROACH

As indicated in Chapter 4, travel cost models for various GLAMs were estimated using a combination of "bottom up" TCMs gathered from various GLAMs across the country, and the results of our national survey, which produced "top down" perceived cost measures. The average of the bottom up and top down estimates was used to derive the final values for consumer surplus for the various GLAMs.

## BOTTOM UP INSTITUTIONAL TRAVEL COST MODELS (TCMS)

The starting point for our bottom up analysis was the detailed information on postal code of residence gathered by various GLAMs from their visitors at the point when they purchased a ticket or requested a service.[116] While all visitors to GLAMs were included in the analysis, for the purposes of assigning travel and time costs in our travel cost models, a "day trip" cost boundary of 250 kilometres from the relevant institution was set. Trips originating within this boundary were assigned to zones as described below. Trips originating from outside the boundary were assumed to have a similar pattern of trips to those inside it and assigned to zones within the boundary accordingly.[117]

To obtain an estimate for the value of GLAMs to their visitors, we then worked through the following steps:

- We matched the postal codes identified in the institutions' data with the Forward Sortation Areas (FSA) used in Statistics Canada population data.
- For each FSA in our dataset we estimated the distance to the institution under consideration based on a Google maps algorithm.
- We aggregated FSAs into 10 zones based on the distance from the GLAM under consideration. Using population data for the FSAs within each zone and the number of visitors identified in our dataset we could establish a visit rate to the GLAM for each zone. For example, if 200,000 visits to a museum came within 10-20 km driving distance, and the total population in this zonal bracket was one million, then the visit rate per thousand population would be 200.
- To determine the time travelled by visitors from each FSA, we used the same Google maps algorithm described above. Since we needed a single travel cost and time for each FSA, we

[116] Institutions that are looking to assess their value are encouraged to start collating postal code data information from their visitors over long-enough periods (ideally one year). This would provide a representative sample of visitors' origin and would constitute the backbone of a Travel Cost Model.

[117] As indicated, all visitors to GLAMs, regardless of location of origin were included in the analysis. The setting of this day trip boundary recognizes that some visitors travelling long distances are also more likely to have multiple purposes for their trip. For example, a resident of Vancouver visiting Ottawa may be there to visit family and friends, but also visit GLAMs as an effective side trip during one day of his/her stay. Assigning the total cost of the trip from Vancouver to Ottawa to GLAMs would therefore overestimate the relevant travel costs. Therefore, the effective travel costs for such visitors are assumed to be the costs within the day trip boundary. Visitors from beyond the boundary were assigned to zones based on the proportion of "within boundary" visitors from each zone visiting each GLAM. This reflects the fact that such visitors from outside the boundary were likely to stay in the same zones which were the source of local GLAMs visitors—i.e. more densely populated zones and/or ones which had a higher propensity to visit GLAMs. Note that similar cut-off boundaries were used in Wieland, R. C., & Horowitz, J. "Estimating the Recreational Consumer Surplus at Maryland's State-owned Forests", 2008 and Land Water People, "Travel Cost Valuation of Recreation in the Upper Waitaki Catchment", 2015

made some assumptions on the transport mode. These assumptions were designed to align as closely as possible with the results from our national survey of the general Canadian population.

- To capture the full cost of a visit it was necessary to calculate the true direct travel costs—taking account of fuel consumption and other vehicle costs, or transit fares—as well as the "opportunity cost" of the time spent travelling.
- The next step was to identify the demand curve implied by the rate at which visits to GLAMs fell as travel costs increased. It is important to recognize that this is a non-linear relationship, with visit rates falling at a slower rate at greater distances from the GLAM. Taking the natural logarithm of visit rates and travel costs produced a linear relationship from which we could estimate a statistical relationship between visit rates ($Vr$) and total individual costs ($TC$) using ordinary least squares, as shown in the equation below:

$$\ln(Vr_i) = \alpha + \beta \ln(TC_i) + \gamma \ln(income_i) + \varepsilon_i$$

Fig. 33 below shows an example plot of this model (Royal BC Museum data), which suggests a good fit of the data, exhibiting an R squared of 91%. The travel cost coefficient is negative and highly significant.

- The results of this regression determine the relationship between costs and visit rates in the abstract, allowing us to simulate the likely number of visitors should the entry fee to the GLAM be raised by any given amount. Simulating visitor numbers at a variety of new entry fees traces the full demand curve, giving the consumer surplus as the area under the curve, as shown in Fig. 34.
- GLAMs' data suggest that a small number of people would be prepared to incur large costs to visit them. Since large expenditures begin to look implausible, when calculating consumer surplus, we truncated the demand curve at $200. This provides a more conservative estimate of consumer surplus.
- The consumer surplus is calculated as the area under the demand curve. Dividing the resulting total by the total number of visits in the sample produces the average consumer surplus per visit.

**Fig. 33. Example regression model for visit rates and total costs**

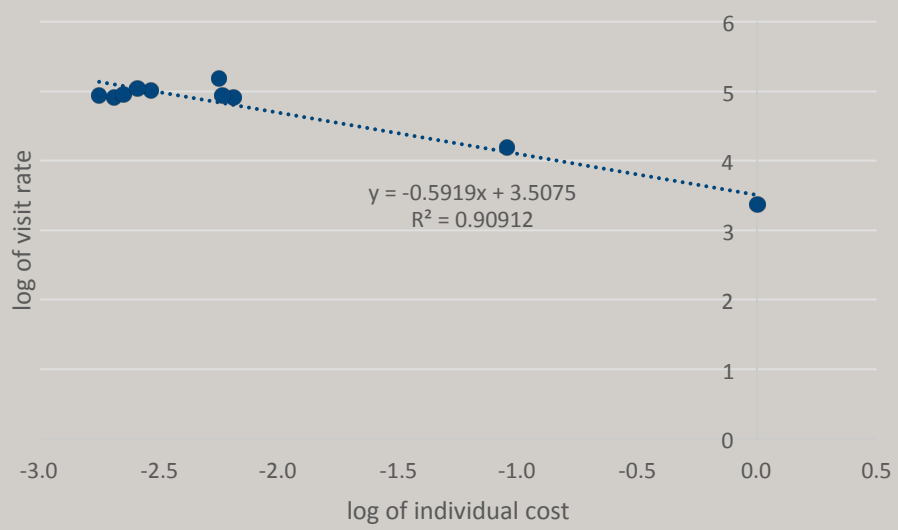
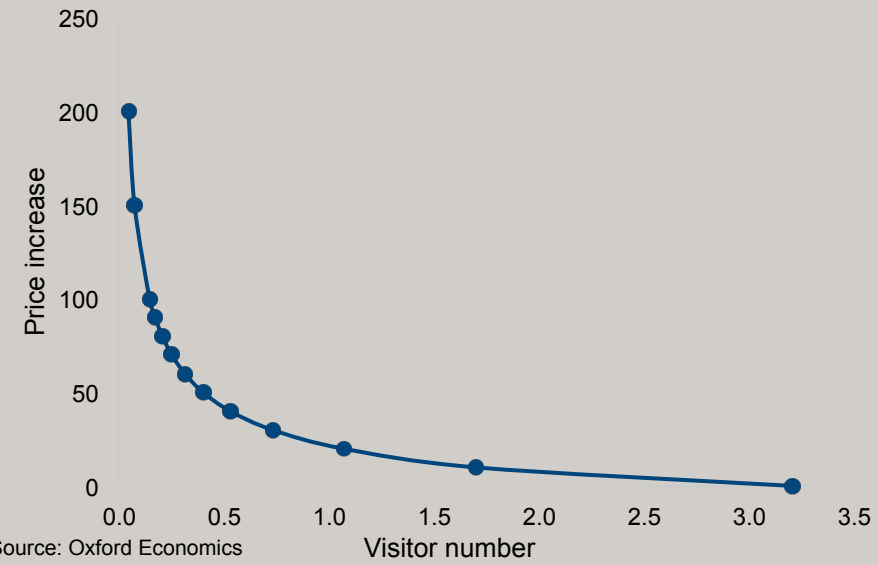


**Fig. 34. Example visit demand curve for GLAMs**




Source: Oxford Economics

**TOP DOWN TCMS**

The top down TCMs used data gathered through our national survey. In the case of archives, this was supplemented by data gathered by Yakel et al (2012). An anonymized version of the origin-destination data from this study was kindly provided to us by Professor Wendy Duff of University of Toronto.

The survey included questions about whether respondents had used a GLAM in the previous year. If so, they were asked to nominate how much time and money they spent on the most recent visit to that institution.[118] This allowed us to develop separate "supermodels" (national models) for galleries, libraries, archives and museums using a TCM approach, as described below. The methodology was similar in its broad outlines to the bottom up approaches, though with some important differences. The approach was as follows:

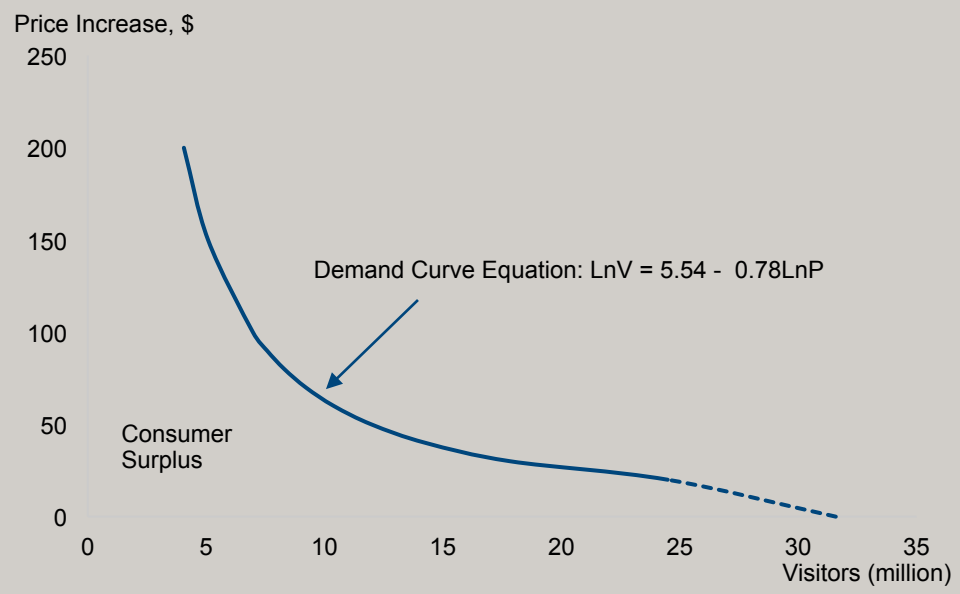
- The estimated (one way) cost of travel was directly provided by respondents.
- The (one way) time taken to reach the institutions was also directly provided. This was monetized using the Canadian values of recreational time described in Chapter 4 ($13.7/hour). In the case of libraries and archives, the average time cost was a mix of recreational time and work time, as some users were there for work purposes (21% for libraries, 27% for archives). This produced value of time estimates of $16.6/hour for libraries and $17.4/hour for archives.
- The one-way trip costs were then added up and doubled to reflect the cost of two-way trips.
- As indicated these costs reflected perceived costs of the journey and perceived time taken to complete the trips, as opposed to the researcher defined costs in the bottom up models.
- In the case of the archival data, using the information from Yakel et al., the base data consisted of usable origin-destination points for 468 trips across the nation. We then used the Google Maps algorithm from the bottom up model to determine distance and travel time by transport mode, and then used these as the basis for travel costs.

[118] The idea of asking only about the most recent visit and one-way trips was to help ensure that responses were as accurate as possible, since these are the costs and travel times which would be relatively fresh in their memory.

- As was the case with the bottom up models, demand curves were estimated using a double log approach, although data limitations meant that only total individual costs (TC) were employed as explanatory variable (i.e. income was excluded). In addition, admission prices were not explicitly incorporated into the national models, though these may be only a relatively modest part of total costs.[119] Nonetheless, all specifications returned relatively high $R^2$ indicating good model fit.
- As is the case with the bottom up models, the results of this regression determine the relationship between costs and visit rates in the abstract, allowing us to simulate the likely number of visitors should the entry fee to the GLAM be raised by any given amount. Simulating visitor numbers at a variety of new entry fees traces the full demand curve, giving the consumer surplus as the area under the curve.
- The consumer surplus is calculated as the area under the demand curve. Dividing the resulting total by the total number of visits in the sample produces the average consumer surplus per visit.
- As is the case with the bottom up models, since large expenditures begin to look implausible, when calculating consumer surplus, we truncated the demand curve at $200 (with the exception of libraries where it was truncated at $125). This provides a more conservative estimate of consumer surplus.[120]

We have given an example of the demand curve from the national model for museums below. The equation indicates the relationship between visitation (LnV) and travel costs (LnP) (expressed in logs). This form of model, known as "double log," allows us to determine the responsiveness of visits to price in percentage terms. The coefficient on travel costs (-0.78) indicates the elasticity or responsiveness of museum demand to price. In other words, for every 1% increase in the cost of getting to museums, the number of visits falls by 0.78%.

**Fig. 35. Museums national model demand curve**




[119] Respondents were asked about travel costs though it is possible that some may have included admission price estimates in their cost estimates.
[120] 95% of Canadian library users were estimated to be willing to pay less than this amount.

As suggested above, based on the national models it is possible to provide estimates of the elasticities (or responsiveness) of users to the costs of accessing GLAMs. This provides a hint of how much changes in access price might affect usage.

Elasticities over 1.0 are said to be price elastic—e.g. a 1% change in price would generate a greater than 1% change in demand. Elasticities below 1.0 are said to be inelastic—e.g. a 1% change in price would be accompanied by a smaller than 1% change in demand.

Elasticities can be affected by the uniqueness of the resource in question, the preferences of the group and/or the presence of alternatives. For example, the elasticity of 1.06 for libraries may be indicative of the fact that there are several alternatives to library usage if access prices get too high (e.g. borrowing from friends, buying). The elasticity of 0.55 for archives could reflect the uniqueness of physical archival resources and the determination of a smaller number of users to access them even if costs are high.

Likewise, the elasticities can tell us what would happen if prices rose (or fell) in real terms (i.e. after allowing for inflation). So, for example, according to the model results, a 10% increase in the cost of accessing archives might be met with only a 5.5% decrease in demand. But a 10% increase in the cost of library access would be met with a 10.6% decrease in demand.

We have also provided some key model diagnostics in Fig. 36.

**Fig. 36. Elasticity and basic model diagnostic data**

| Item | Galleries | Libraries | Archives (Yakel et al data) | Museums |
|---|---|---|---|---|
| **Elasticity** | **0.81** | **1.06** | **0.55** | **0.78** |
| T statistic | 16.5 | 31.1 | 56.2 | 19.8 |
| Model $R^2$ | 0.86 | 0.94 | 0.91 | 0.87 |
| Number of respondents (n) | 204 | 826 | 468 | 253 |

Source: Oxford Economics
All figures subject to rounding.

## FINAL RESULTS

As indicated, the bottom up approach pooled results from a number of institutions across the country, while the top down approach utilized the national survey data (or, in the case of archives, the Yakel et al. national data).

In addition, the bottom up approach used institutional data and combined this with estimates of the time, distance and ultimately costs faced by GLAMs users.[121] So the approach used what is sometimes called objective or researcher defined costs—i.e. the costs were estimated by the analysts. With the exception of the archives' model, the top down approach used respondents' own estimates of the time taken and distance travelled—i.e. perceived costs.

Researcher defined costs may appear preferable as they seem more objective and less subject to bias, but debates continue around this issue.[122] This is because demand curves are effectively the product of

[121] Though note the estimation of car running costs was limited to the variable costs which the researcher (ourselves) thought users might typically perceive, such as fuel, maintenance and tires.
[122] See Mules T., et al., "The Economic Value of Tourism in the Australian Alps", 2005.

perceived costs. So if users truly feel that a GLAM visit took, for example, more time and money than the "objective" costs suggest, their valuations and number of visits will reflect that. In addition, the national models may give a more comprehensive picture of user costs across many institutions, nationwide, than the bottom up modelling approach.

There are no "right" or "wrong" answers to this issue. We have taken a middle path in this analysis by taking the average of the pooled bottom up consumer surplus per trip values and the top down models. The final consumer surplus estimates using the average of these two approaches are indicated in Fig. 37.

**Fig. 37. Consumer surplus estimates**

| Item | Galleries | Libraries | Archives | Museums |
|---|---|---|---|---|
| Consumer surplus per trip– final estimate (CAD) | 44 | 18 | 65 | 44 |

Source: Oxford Economics
All figures subject to rounding.

# APPENDIX 3 ONLINE VALUE

## APPROACH

As indicated in the main text, the time users spend online accessing GLAMs' websites, catalogues and social media portals provides one indication of how much people are willing to give up to access GLAMs' content. This can be used to develop the online equivalent of TCMs in some ways.

Work by Goolsbee and Klenow (2006) and Pantea and Martin (2014) was used as a "mathematical road map" to estimate a demand curve and CS for online activity.[123] The estimate of elasticity (responsiveness) to the cost of time online (1.6 as detailed below) was then used to estimate the consumer surplus for online users.

## DETAILS

Work by Goolsbee and Klenow on the value of the Internet indicates that time spent online can be combined with an estimate of leisure demand elasticity to derive a "linear demand" estimate of online consumer surplus. This would form a lower bound value for consumer surplus.[124]

Examining the Goolsbee and Klenow work suggests an elasticity of leisure demand of 1.6. That is, for every 1% increase in the amount of time taken to access a given amount of information on a GLAM website, user demand falls by 1.6%.

However, these authors note that this linear approach represents a lower-bound estimate, with a log demand model suggesting values 3.8 to 9.2 times higher than those produced by the linear model. Subsequent authors have also undertaken quantitative work, which suggests that Goolsbee and Klenow's linear consumer surplus estimates are likely to be much too low.[125]

Calibrating the results of Goolsbee and Klenow's work with later authors, such as Pantea and Martin (who analyzed European Internet elasticities), suggests that values derived through the upper bound are probably in the close to the minimum log to linear model ratio examined by Goolsbee and Klenow (3.8).

Data on the number of website visits to GLAMs is available through Canadian Heritage, while data on large public libraries' online sessions is available through CULC.[126] There is no equivalent comprehensive information on social media portal usage, so social media usage was estimated from the national survey data, as described below.

Data on the time spent on GLAMs' websites form the starting point for an estimate of the consumer surplus enjoyed by their users. The national survey included questions on the time spent online using

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[123] Goolsbee, Austan, and Peter J. Klenow, "Valuing Consumer Products by the Time Spent Using Them: An Application to the Internet", *American Economic Review*, 96(2) (2006): 108-13. Pantea, Smaranda and Martens, Bertin., "The Value of the Internet for Consumers", 2014.

[124] More formally, in this (linear) case, consumer surplus (CS) = (time cost * 0.5)/elasticity. While a full discussion of the analysis would be somewhat technical, a reference to the approach can be found in Goolsbee, A. and Klenow, P., "Valuing Consumer Products by the Time Spent Using Them: An Application to the Internet", *American Economic Review*, Vol. 96, No.2 (2006).

[125] See for example Greenwood, J. and Kopecky, K.' "Measuring the welfare gain from personal computers", *Economic Inquiry*, Vol.51, No.1 (2013).

[126] Canadian Heritage, "Government of Canada Survey of Heritage Institutions: 2017", 2018. Canadian Urban Libraries Council, "2017 Canadian Public Library Statistics".

websites and social media portals of individual GLAMs and the frequency of such usage. Social media portals examined included Facebook, Twitter and Instagram.[127]

In addition, data was sought from GLAMs across Canada on usage of websites and/or social media, as a consistency check on the survey results.[128]

The average session time on GLAMs' websites ranged from 24 to 35 minutes according to the national survey results, whereas the average session times reported by available GLAMs institutional data typically ranged from roughly 2 to 6 minutes.[129]

In considering this and the other issues above, there are a number of upward and downward factors which could impact on the assessment of online benefits:

- *Linear vs logarithmic model*—Using a log model would constitute an upper bound estimate for the consumer surplus valuation, while using a linear approach would produce a lower bound estimate. So, a linear model could bias results downwards while a log one could bias them upwards.
- *Survey vs reported session times*—As indicated, the average survey session times reported in the national survey were considerably greater than the session times reported by individual GLAMs. One reason for this can simply be that users "got it wrong" and overestimated the time spent online. If so, using survey average times would bias results upwards. However, the national data are comprehensive, whereas the institutional data are limited to reporting institutions, and session times vary depending on the type of institution. More fundamentally, neither time measure may be "wrong." The issue here may be similar to that of perceived versus researcher defined costs for the TCMs. Demand curves are built on perceived costs, so if users perceive they are sacrificing this much time online, this will define their demand curves and valuations, rather than the "objective" session time recorded by institutions.
- *Coverage of social media portals*—As indicated, coverage was limited to Facebook, Twitter and Instagram due to sample size issues with the national survey. While the small samples sizes themselves indicate much lower usage of these portals, the omission of other portals would bias results downwards.
- *Leisure time versus work time*—The elasticity estimation (1.6) represents a leisure elasticity. However, some of the time spent on libraries' and archives' websites is work time. If that is the case, online demand for those institutions may also be less elastic. Applying a constant elasticity of 1.6 could therefore bias results downwards for those institutions.

In balancing these considerations, we have used the national survey median session times as the basis for the amount of time spent on GLAMs' online channels. Median times are lower than average times, ranging from 15 to 20 minutes for websites and 15 to 23 minutes for social media portals. This recognizes that perceived time costs may be relevant to valuations, while taking into account data from individual

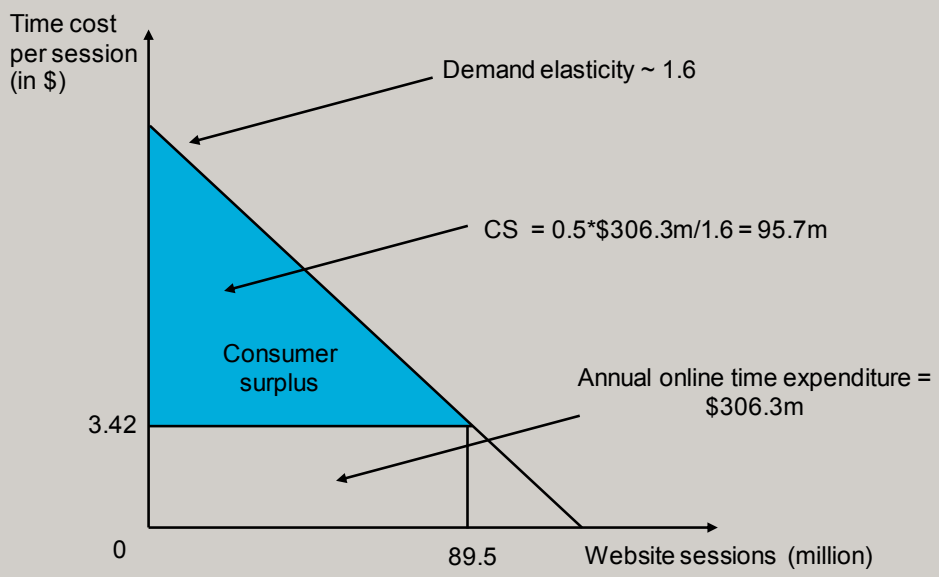
[127] While respondents were also questioned about Flickr, Podcast, Blogs, Crowdsourcing and "other" online channels. However, the sample size was too low to allow for meaningful interpretation of results, so these have been excluded from analysis.
[128] Institutions that provided usable data on online usage included: Laval University's Library, University of New Brunswick Libraries, LAC, the Canada Science and Technology Museum, Canada Aviation and Space Museum, Canada Agriculture and Food Museum, Ontario Public Libraries, BAnQ and many others.
[129] Likewise, average session times for GLAMs social media ranged from 17 to 38 minutes.

GLAMs, suggesting that average session times might be subject to overestimation. We have also adopted a linear (i.e. lower bound) model to help ameliorate any issues with overestimation of session time in the national survey. As there remains some potential for downward bias from some of the other factors described above, our online value estimates may be on the conservative side.

Data on website sessions' number and duration described above were combined with information on the value of leisure time ($13.7 per hour, as derived for the TCMs). Social media usage was estimated based on national survey results. In the case of libraries and archives, an allowance was also made for proportion of time that was work related, based on the physical usage statistics derived for the TCMs (21% for libraries and 27% for archives).

The figure below provides an illustration of how the estimation process worked in the case of museums websites. The process takes the data above and uses the fact that consumer surplus can be estimated using elasticities.[130] Given an estimated time cost of $3.42 per session, 89.5 million annual website sessions and an elasticity of 1.6, this suggests a consumer surplus of $95.7 million for museum websites alone. A similar approach was adopted for other GLAMs' websites, catalogues and for social media.

**Fig. 38. Museum website consumer surplus**




An additional note to the above discussion is that the data collection process suggests that there is little information about the usage of social media data by GLAMs users. The survey may help addressing such issues though, as noted, coverage was incomplete due to sample size issues.

[130] For a technical discussion of this see Chapter 4 of Boardman, A., Greenberg, D., Vining, A. and Weimer, D., *Cost Benefit Analysis: Concepts and Practice*, Fifth Edition, 2018

# APPENDIX 4 WIDER BENEFITS: WELLBEING

## APPROACH

As indicated in Chapter 8, two approaches were utilized in undertaking quantitative modelling of wellbeing. These were:

- *Approach 1*—the relationship between those who used GLAMs during the past year and wellbeing (the usage approach); and
- *Approach 2*—the relationship between frequent (three or more times) GLAMs users and wellbeing (the frequency approach)

Both of these approaches are discussed in more detail below.

## MODELLING METHODOLOGY: USAGE APPROACH

Under Approach 1, those who used GLAMs during the past year (i.e. current users) were separated out from those who did not, using our national survey data. As indicated in Chapter 8, a series of regressions were run to try to determine if GLAMs usage was related to improvements in various measures of wellbeing explored in the national survey (i.e. subjective wellbeing, health, neighbourliness, and volunteering).

The wellbeing measures draw off the questions reported in Questions G4-G7 in the national survey (see Appendix 6). These questions were based on those used in past surveys such as Statistics Canada's *General Social Survey, 2010 Cycle 24 – Time Stress and Well Being*. Many things can affect a person's wellbeing; for example, people on higher incomes might be healthier (or indeed their superior health might help them earn a higher income). Accordingly, to help tease out the importance of GLAMs usage on wellbeing, the regressions also used demographic information collected in the national survey and controlled for other factors such as income, age, education and employment status.[131]

Consistent with the approach taken in recent wellbeing research, a series of ordinary least squares (OLS) regressions were run to determine the impact of GLAMs usage on various wellbeing indicators.[132] The wellbeing states were specified as dependent variable (i.e. the variable being measured) whereas the independent variables (i.e. the factors that might affect the dependent variable) were GLAMs usage, disposable income (logged), age, education and employment status. Apart from income, the independent variables were specified as categorical variables (i.e. variables used to distinguish between different groups). This is consistent with the use of categories to distinguish different groups (e.g. employed, unemployed) in the national survey.

[131] The survey questions asked respondents about their individual gross income. However, arguably, disposable income is more closely correlated with wellbeing. Accordingly, gross income was converted to disposable income, taking into account differing provincial tax rates using SimpleTax: 2019 Canadian Tax Calculator ( https://simpletax.ca/calculator) and weighted for provincial populations. In addition, log of disposable income was used as an independent variable, as the use of logs may more accurately pick up the changing relationship of rising income to wellbeing states.

[132] Examples of this approach are described in the various studies undertaken by Fujiwara et al. cited above. See also Maccagnan et al., "Valuing the Relationship Between Drug and Alcohol Use and Life Satisfaction: Findings from the Crime Survey for England and Wales", *Journal of Happiness Studies*, 2019.

Fig. 39 indicates the variables and scales in the usage regressions.

**Fig. 39. Variables and scales adopted in the usage approach**

| Variable | Description | Coding |
|---|---|---|
| Health | Self-assessed health rating | Scale of 1-5 where 1= poor and 5 = excellent. (Dependent variable) |
| Neighbourliness | Know neighbours | Scale of 1-4 where 1 = know no neighbours and 4 = know most neighbours (Dependent variable) |
| Volunteering | Volunteered in last 12 months | Scale of 1-2 where 1= Have volunteered in last 12 months and 2 = Have not volunteered in last 12 months (Dependent variable) |
| Current User GLAMs | User of at least one GLAM in the last 12 months | 1 if Yes, 0 if No (dummy variable) |
| Current User Galleries | Visited galleries in last 12 months | 1 if Yes, 0 if no (dummy variable) |
| Current User Libraries | Visited libraries in last 12 months | 1 if Yes, 0 if no (dummy variable) |
| Current User Archives | Visited archives in last 12 months | 1 if Yes, 0 if no (dummy variable) |
| Current User Museums | Visited museums in last 12 months | 1 if Yes, 0 if no (dummy variable) |
| Disposable income | Disposable income | Log of disposable income |
| Degree | Have a degree | 1 if have a degree, 0 otherwise (dummy variable) |
| Employed | Employed full time or part time | 1 if employed full or part time, 0 otherwise (dummy variable) |
| 15-24 | 15-24 years old | 1 if 15-24, 0 otherwise (dummy variable) |
| 65+ | Over 65 years old | 1 if 65 or over, 0 otherwise (dummy variable) |
| Gender | Male, female or other | 1 if Male, 0 if Female (dummy variable) (no “other” responses received) |

An “At Least One GLAM” (ALG) model was run, examining whether the usage of at least one GLAM during the past year was related to an improvement in wellbeing. In addition, separate models were run examining how usage of each individual institution affected wellbeing.[133]

No statistically significant relationship was found between GLAMs usage and subjective wellbeing. However, as indicated in Chapter 8, there may be a variety of reasons for this, and wellbeing may be distinguished from happiness. Health states, in turn, may be a lead indicator—if not a proxy for—happiness. Given this and recent Canadian initiatives recognizing the relationship between GLAMs and health visitation (e.g. writing prescriptions for visits to the Montreal Museum of Fine Arts), the health regressions are of particular interest. These are indicated below.

[133] As noted, current GLAMs usage does not simply mean one visit to a GLAM during the past year. It covers a spectrum of states from occasional to frequent users. The impact of especially frequent visitations is explored in the next section.

**Fig. 40. Visited at least one GLAM in the last 12 months—health model**

| Variable | Coefficient |
|---|---|
| Ln of Disposable Income | 0.28* |
| Current user GLAMs | 0.14* |
| Degree | 0.16* |
| Employed | 0.22* |
| 15-24 | 0.44* |
| 65+ | 0.18* |
| Male | 0.00 |
| _constant | - 0.09 |
| $R^2$ | 0.09 |

Source: Oxford Economics analysis
*Significant at the 5% level

**Fig. 41. Visited galleries in the last 12 months—health model**

| Variable | Coefficient |
|---|---|
| Ln Disposable Income | 0.27* |
| Current user of galleries | 0.13* |
| Degree | 0.16* |
| Employed | 0.23* |
| 15-24 | 0.43* |
| 65+ | 0.19* |
| Male | 0.00 |
| _cons | 0.05 |
| $R^2$ | 0.09 |

Source: Oxford Economics analysis
*Significant at the 5% level

**Fig. 42. Visited libraries in the last 12 months—health model**

| Variable | Coefficient |
|---|---|
| Ln Disposable Income | 0.28* |
| Current user of libraries | 0.13* |
| Degree | 0.16* |
| Employed | 0.23* |
| 15-24 | 0.44* |
| 65+ | 0.18* |
| Male | 0.01 |
| _cons | 0.11 |
| $R^2$ | 0.09 |

Source: Oxford Economics analysis
*Significant at the 5% level

**Fig. 43. Visited Archives in the last 12 months—health model**

| Variable | Coefficient |
|---|---|
| Ln Disposable Income | 0.27* |
| Current user of archives | 0.22* |
| Degree | 0.18* |
| Employed | 0.23* |
| 15-24 | 0.43* |
| 65+ | 0.19* |
| Male | - 0.01 |
| _cons | 0.02 |
| $R^2$ | 0.09 |

Source: Oxford Economics analysis
*Significant at the 5% level

**Fig. 44. Visited Museums in the last 12 months—health model**

| Variable | Coefficient |
|---|---|
| Ln Disposable Income | 0.27 |
| Current user museums | 0.10* |
| Degree | 0.16* |
| Employed | 0.23* |
| 15-24 | 0.45* |
| 65+ | 0.18* |
| Male | - 0.00 |
| _cons | 0.01 |
| $R^2$ | 0.09 |

Source: Oxford Economics analysis
*Significant at the 5% level

These regressions indicate that GLAMs usage is associated with a statistically significant increase in health states.[134] For example, gallery visitation during the past year was associated with a 0.13 point higher reported health state (on a scale of 1-5), compared to non-users. Of course, these regressions also tell us about the impact of other variables—e.g., using the galleries model again, having a university degree is also associated with a 0.16 point higher reported health state than those who did not have one.

Correlation does not prove causation. For example, GLAMs may improve people's health—or perhaps more healthy people are the ones who visit GLAMs. Nonetheless, analysts such as Fujiwara contend that the various demographic controls in similar model specifications help support the case for GLAMs having positive effects on wellbeing.[135]

Moreover, as discussed in much of the wellbeing and "happiness economics" literature in recent years, these values can be monetized to provide an indication of how much visiting GLAMs is equivalent to in

[134] We note the $R^2$ for these models are low, however this is consistent with the findings of other analysts such as Fujiwara. In essence what this is saying is there are many factors that could influence wellbeing and those listed in the regression are only a small part of what explains total wellbeing, which is to be expected.

[135] Fujiwara (2013) *op. cit*. Ideally, one could use a more sophisticated approach to try to deal with the causality issue, such as Two Stage Least Squares Regression (2SLS). The following section explores such approaches.

terms of wellbeing. What is essentially being measured is the effect of GLAMs on wellbeing and the monetary equivalent of that. For example, if visiting GLAMs increases self-reported health (and, thereby wellbeing) by 1 point, and $1,000 in income also increases self-reported health by 1 point, then the equivalent value of using GLAMs is $1,000 in improved wellbeing. The technical name for the effect on wellbeing is the "Compensating Surplus."[136]

We have used the ALG model to provide a broad indication of how GLAMs visitation might be valued using such a wellbeing approach. The approach to doing so followed the established literature in the field and was as follows:

- The relationship between the ALG usage coefficient (0.14 for all GLAMs) and the income coefficient allows for an estimation of the effect of GLAMs visitation expressed in Canadian dollars.
- This approach uses the fact that income is expressed in monetary terms and the fact that the equation coefficients report the relative sizes of these factors (GLAMs and income) on health (the dependent variable). So, if income does indeed improve health (and, by doing so, happiness), then, as suggested above, the relationship between the size of the income coefficient (0.28) and the size of the usage coefficient (0.14) gives us a clue of the effects of GLAMs usage on wellbeing, as expressed in monetary terms.
- This can be further adjusted to deal with health-income causality (i.e. good health could cause income to be higher or vice versa). Ideally this could be done by using an "instrument" for income. However, where this is lacking, Fujiwara suggests inflating the income term by a factor of 2-10.[137] We apply a factor of 10 (i.e. the most conservative value) and use this to multiply the income coefficient to control for reverse income causality.
- Given a logged income term, this relationship can be expressed as Compensating Surplus = $M^0 - e^{[\ln(M0)-\beta 2/\ \beta 1]}$ where $M^0$ is median disposable income estimated based on the national survey results ($29,855), β1 is the adjusted income coefficient (2.75) and β2 the usage coefficient (0.14).[138]
- Applying this equation, we derive a monetized equivalent value of $1,440 per annum for GLAMs users.

In other words, visiting at least one GLAM during the past year was equivalent to an annual increase in wellbeing (as measured through health effects) of $1,440 per visitor.

Of course, much depends on model specification and issues of causality may still remain. For these reasons, and the relatively new nature of the wellbeing valuation field, such results should be seen as indicative and they have not been incorporated into our CBA. More complex specifications, some of which attempt to deal with causality, are presented in the following section.

Results were also obtained for the other wellbeing indicators (neighbourliness and volunteering) using the same modelling structure and dependent and independent variables as described above. These were undertaken using both the ALG model and for each of the individual institutions. With the exception of the ALG Neighbourliness model (where significance was at the 10% level), all usage variables were

[136] Fujiwara (2013) *op. cit*.
[137] See Fujiwara (2013,2014,2015) *op. cit.;* Maccagnan et. al., *op. cit.*
[138] Fujiwara (2013) *op. cit*.

statistically significant at the 5% level. In other words, GLAMs usage is also positively associated with neighbourliness and volunteering, though due caveats on causality should be noted.

In the interest of brevity, we have summarized results by referring only to the ALG results for the Neighbourliness and Volunteering models below.

In essence, the key point from the above modelling is that there appears to be a relationship between GLAMs usage and wellbeing across several (though not all) indicators. This suggests that GLAMs may indeed play some role in improving wellbeing (and these effects can be monetized in some cases), but issues of causality remain.

**Fig. 45. Neighbourliness and Volunteering models**

| Dependent Variable | Impact of using at least one GLAM in the past year (coefficient size) | Scale[139] |
|---|---|---|
| Neighbourliness | 0.07* | 1-4 |
| Volunteering | 0.16** | 0-1 |

Source: Oxford Economics analysis
*Significant at the 10% level
**Significant at the 5% level

## MODELLING METHODOLOGY: FREQUENCY APPROACH

Another approach to estimating the usage of GLAMs (Approach 2) is to examine visit frequency.

Our methodology for these models was more sophisticated and detailed than Approach 1. It can be described as a process of iterative testing of many combinations, alternate regression model specifications, different sets of independent variables, coding variables (e.g. taking the natural logarithm, square or dummy coding). For each relationship of interest between GLAMs visitation and wellbeing, four different regression models are tested to determine the best specification: simple linear regression, logit regression, ordinal logit regression, and instrumental variable regression using the two-stage least squares (2SLS) estimator. Generally, we started with simpler models (the simple linear regression model) with more variables (including interactions between variables), then gradually reduced the number of variables to only those that were significant and without any issues of endogeneity.[140]

To compare different models, we use a range of criteria including:

- Whether the independent variables are statistically significant at a 95% confidence level (i.e. their parameters have a p-value smaller than 0.05);
- Size of the visitation frequency coefficient (where a larger positive coefficient shows a greater impact on the wellbeing aspect of interest); and
- Overall model fit (adjusted R-square or Chi-square statistic).

As the key independent variable of interest, visitation frequency is measured or coded in two distinct ways: as either a continuous variable or a dummy variable. A continuous visitation frequency variable

[139] Scales were as follows: Neighbourliness: 1 = Know no neighbours, 4 = Know most neighbours; Volunteer: 1= Have volunteered in last 12 months, 0 = Have not volunteered in last 12 months

[140] Endogeneity refers to the case where an independent variable is correlated with the error term, meaning that the parameters for these variables (and the overall model) are imprecise.

uses the number of times an individual has attended the GLAMs annually, based on the results of our national survey.

When a continuous parameter is used, its coefficient represents the expected increase in quality of life rating (on the Likert scale) resulting from an additional visit to the GLAMs. For example, a coefficient of 0.25 indicates that each time someone visits the GLAMs (on average) their subjective overall wellbeing score is predicted to increase by 0.25 points. By contrast, a dummy visitation frequency variable takes either a value of 1 for "regular users" (visit GLAMs three *or more* times annually) or 0 for "non-regular users" (visit *2 or fewer* times per year, including those who have never visited). For instance, a dummy coefficient of 0.73 means that regular visitors are expected to have a 0.73 increase in their overall quality of life score compared with non-regular visitors.

Since we assume that some of the variables in a standard regression are correlated with variables that could not be included (due to an absence of data, for instance) or with each other, tests were performed for endogeneity and correlation among variables. Endogeneity is addressed using either an instrumental variable regression or alternate model specifications (e.g. if a superior model was found that excluded this endogenous variable). The instrumental variable regression model fits a linear regression, estimated using two-stage least squares (2SLS). Essentially, statistically valid "proxies" are used to capture the effect of the endogenous variable in the first-stage regression. The results from this regression are then used as a predictor in the second stage, alongside any other exogenous variables of interest.

Correlation among variables was tested using pair-wise correlations between variables. Any pairs of independent variables showing high correlations were multiplied together to form a new "cross-product" variable that captures their interaction effect, or one variable was removed. Despite testing such model forms, we did not find statistically significant interaction effects.

Robust standard errors were used for both linear regressions and instrumental variable regressions. This procedure ensures that statistical inference is valid even if the model's predicted errors are heteroskedastic.[141]

**Defining variables**

The following table clarifies the survey questions used to derive the variables used in the following regressions and their coding or format. Overall subjective wellbeing is measured by self-reported quality of life (QOL).

**Fig. 46. Variable definitions used in detailed modelling**

| Variable | Code name: format | Survey question |
|---|---|---|
| QOL galleries | Y_QOL_G: 1-10 ordinal scale (treated continuous) | Quality of life, mental and physical health and wellbeing - Importance of galleries to… |
| QOL libraries | Y_QOL_L: 1-10 ordinal scale (treated continuous) | Quality of life, mental and physical health and wellbeing - Importance of libraries to… |
| QOL archives | Y_QOL_A: 1-10 ordinal scale (treated continuous) | Quality of life, mental and physical health and wellbeing - Importance of archives to… |

[141] Heteroskedasticity refers to substantial variances in the predicted error terms across subpopulations, which compromises the ability to make valid inferences about the larger population.

| | | |
|---|---|---|
| QOL museums | Y_QOL_M: 1-10 ordinal scale (treated continuous) | Quality of life, mental and physical health and wellbeing - Importance of museums to… |
| Overall QOL | Y_QOL: Average of individual GLAMs scores | [Compilation of questions above] |
| Visits galleries | X_Freq_G_Cont: Number of visits (continuous) X_Freq_G_YN: Binary, 1 if visited more than once, or 0 | Galleries - How many visits did you make to GLAMs over the past 12 months? |
| Visits libraries | X_Freq_L_Cont: Number of visits (continuous) X_Freq_L_YN: Binary, 1 if visited more than once, or 0 | Libraries - How many visits did you make to GLAMs over the past 12 months? |
| Visits archives | X_Freq_A_Cont: Number of visits (continuous) X_Freq_A_YN: Binary, 1 if visited more than once, or 0 | Archives - How many visits did you make to GLAMs over the past 12 months? |
| Visits museums | X_Freq_M_Cont: Number of visits (continuous) X_Freq_M_YN: Binary, 1 if visited more than once, or 0 | Museums - How many visits did you make to GLAMs over the past 12 months? |
| Visitation frequency (visits) | X_Freq_GLAM_Cont: Aggregated total number of annual visits across all GLAMs (continuous) X_Freq_GLAM_Dum: Binary, 1 for three or more visits annually, or 0 | [Compilation of questions above] |
| Health | Y_Health_Ord: 0-4 (ordinal scale) Y_Health_DumYN: 1 for at least "good," 0 for less | In general, would you say your health is? |
| Neighbourliness | Y_SocNeigh_Ord: 1-4 (ordinal scale) Y_SocNeigh_Bin: Binary, 1 for at least "many," 0 for less | Would you say that you know most, many, a few or none of the people in your neighbourhood? |
| Volunteering | Y_CommCE_Bin: Binary, 1 for yes, 0 for no | In the past 12 months, did you do unpaid volunteer work for any organization? |
| Educational and professional impact of GLAMs | Y_EducProf_Ord: 0-4 (ordinal scale) Dummy variables (5 levels less 1, gives 4 dummies): Y_EducProf_D1, Y_EducProf_D2, Y_EducProf_D3, Y_EducProf_D4 | To what extent would you say that you have benefitted from using GLAMs' resources in your education, or your professional or personal development? |
| Employment | Dummy variables (8 levels less 1, gives 7 dummies): X_Employ_D1, X_ Employ _D2, X_ Employ_D3, X_ Employ_D4, X_ Employ_D5, X_ Employ_D6, X_ Employ_D7 | Which of the following best describes your current employment situation? |
| Education | X_Educ_Ord: 0-5 (ordinal scale) Dummy variables (6 levels less 1, gives 5 dummies): X_Educ_D1, X_Educ_D2, X_Educ_D3, X_Educ_D4, X_Educ_D5 | What is the highest educational level you have completed? (6 levels provided) |
| Income | X_Income_Ord: 0-5 (ordinal scale), aligned with StatCan gross income brackets (pre-tax) X_Income_Cont: Calculated post-tax based on Canadian Tax Calculator (continuous) | Which income bracket best describes your individual gross income (before tax) over the past year? |
| Age | X_Age_Ord: 0-5 (ordinal scale) X_Age_Cont: Average of age ranges (continuous) | What is your age? |
| Gender | X_Gender: Binary, 1 for male, 0 for female | What is your gender? |

**Valid instruments and educational/professional impacts**

For the instrumental variable regressions, the first stage regression must use valid instruments—those that are highly correlated with the first-stage dependent variable, but not correlated with independent variables in the second stage. To determine the validity of self-reported educational/professional impact, we ran a non-linear (ordered logistic) regression of the original ordinal form of this variable on the core variable of interest, visitation, and demographic control variables.

```
Ordered logistic regression                     Number of obs     =      1,782
                                                Wald chi2(6)      =     389.22
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -2396.6344               Pseudo R2         =     0.0766
```

| Y_EducProf_Ord | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_GLAM_YN | 1.70938 | .1090511 | 15.68 | 0.000 | 1.495644 | 1.923116 |
| X_Gender | -.2665263 | .0893668 | -2.98 | 0.003 | -.4416821 | -.0913705 |
| X_Age_Cont | -.0016541 | .0026689 | -0.62 | 0.535 | -.006885 | .0035768 |
| LogIncome | .0433395 | .0583056 | 0.74 | 0.457 | -.0709375 | .1576164 |
| X_EducD | .4086243 | .095912 | 4.26 | 0.000 | .2206403 | .5966084 |
| Y_SocNeigh_Bin | .473329 | .0943274 | 5.02 | 0.000 | .2884506 | .6582074 |
| /cut1 | -1.237398 | .6165505 | | | -2.445815 | -.0289813 |
| /cut2 | .221874 | .6080128 | | | -.9698092 | 1.413557 |
| /cut3 | 2.211168 | .6109286 | | | 1.01377 | 3.408566 |
| /cut4 | 3.887493 | .6135543 | | | 2.684949 | 5.090037 |

Notice in the regression above, that self-reported educational/professional impact of GLAMs is correlated with being a regular GLAMs visitor, education and even gender. However, there is no statistically significant correlation between this variable and log-income nor age as a continuous variable. Although all four dummy variables for educational/professional impact were tested, only the first three are statistically significant, so only these are included.

This result also underscores the relationship between self-reported educational/professional impact of GLAMs and regular GLAMs visitation (three or more annual visits), even after controlling for income and demographic control variables (gender, education and neighbourliness). These educational returns are, in turn, correlated with factors such as neighbourliness (significant with an impact of 0.48 points on 5-point scale). Refer to the main body of the text for a more detailed inquiry into the educational benefits of GLAMs.

## SELECT REGRESSION RESULTS

### Overall subjective wellbeing

*All GLAMs*

The optimal model result for overall subjective wellbeing is determined by the maximum size of the visitation frequency variable coefficient, its statistical significance (p-value <0.05) and minimal standard error. Based on these criteria, the 2SLS instrumental variable regression model performs best. With a visitation frequency (continuous) coefficient of 0.276, each visit to all GLAMs is expected to increase self-reported quality of life measures (on a 0-10 Likert scale) by 0.276 points; a modest yet positive result.

```
Instrumental variables (2SLS) regression          Number of obs   =      1,846
                                                  Wald chi2(3)    =      93.38
                                                  Prob > chi2     =     0.0000
                                                  R-squared       =          .
                                                  Root MSE        =      3.077

------------------------------------------------------------------------------
           Y_QOL |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----------------+------------------------------------------------------------
X_Freq_GLAM_Cont |   .2755532   .0286821     9.61   0.000     .2193373    .3317691
      X_Age_Cont |   .0111213   .0044417     2.50   0.012     .0024158    .0198268
       LogIncome |  -.1227627   .0956694    -1.28   0.199    -.3102713    .0647459
           _cons |   6.633669   .9912041     6.69   0.000     4.690944    8.576393
------------------------------------------------------------------------------
Instrumented:  X_Freq_GLAM_Cont
Instruments:   X_Age_Cont LogIncome Y_EducProf_D1 Y_EducProf_D2 Y_EducProf_D3
```

We see stronger impacts of visitation frequency on quality of life for individual GLAM types, all with coefficients between 0.6 and 0.9. Although differences between venues are minimal, archives have the greatest impact with a coefficient of 0.880, followed by galleries with 0.717, museums with 0.686, and finally libraries with 0.667. All visitation frequency parameters are statistically significant. Refer to the regression outputs below for details. In cases where income is statistically significant, this was included for monetization purposes and consistency across the variety of models run.

*Galleries*

```
Linear regression                               Number of obs     =      1,807
                                                F(4, 1802)        =       6.99
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0145
                                                Root MSE          =     2.2116

------------------------------------------------------------------------------
             |               Robust
     Y_QOL_G |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_G_Dum |   .7169088   .1823488     3.93   0.000     .3592715    1.074546
   LogIncome |  -.0469445    .073174    -0.64   0.521    -.1904592    .0965703
    X_Gender |    -.26947   .1040015    -2.59   0.010    -.4734462   -.0654938
     X_EducD |   .2374382   .1108452     2.14   0.032     .0200395    .4548368
       _cons |   7.921712   .7500132    10.56   0.000     6.450725    9.392699
------------------------------------------------------------------------------
```

*Libraries*

```
Linear regression                               Number of obs     =      1,818
                                                F(3, 1814)        =      26.87
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0378
                                                Root MSE          =     1.9501

------------------------------------------------------------------------------
             |               Robust
     Y_QOL_L |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_L_Dum |   .6673436   .0930819     7.17   0.000     .4847845    .8499027
   LogIncome |   .0082554   .0652362     0.13   0.899    -.1196906    .1362014
    X_Gender |  -.4210491   .0917072    -4.59   0.000    -.6009118   -.2411863
       _cons |   7.763069    .677781    11.45   0.000     6.433756    9.092383
------------------------------------------------------------------------------
```

*Archives*

```
Linear regression                               Number of obs     =      1,747
                                                F(3, 1743)        =       5.64
                                                Prob > F          =     0.0008
                                                R-squared         =     0.0073
                                                Root MSE          =     2.2953

------------------------------------------------------------------------------
             |               Robust
     Y_QOL_A |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_A_Dum |   .8801611   .2671623     3.29   0.001     .3561688    1.404153
   LogIncome |   .0269782   .0792413     0.34   0.734    -.1284399    .1823963
     X_EducD |  -.2796897   .1204254    -2.32   0.020    -.5158831   -.0434962
       _cons |   6.776982   .8166097     8.30   0.000     5.175344     8.37862
------------------------------------------------------------------------------
```

*Museums*

```
Linear regression                               Number of obs     =      1,795
                                                F(3, 1791)        =      18.41
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0279
                                                Root MSE          =     2.1053

------------------------------------------------------------------------------
             |               Robust
     Y_QOL_M |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 X_Freq_M_YN |   .6860379   .1001794     6.85   0.000     .4895571    .8825186
   LogIncome |   .0065236   .0707579     0.09   0.927     -.132253    .1453003
    X_Gender |  -.2240473   .0995189    -2.25   0.024    -.4192327   -.0288619
       _cons |   7.288246   .7325185     9.95   0.000     5.851565    8.724927
------------------------------------------------------------------------------
```

**Health**

*All GLAMs*

The strongest result for all-GLAMs health benefits is the 2SLS instrumental variable regression, which includes an ordinal dependent variable and a dummy variable for visitation frequency in the second stage regression. The first stage shows that three of the four dummy variables for self-reported educational/professional impact of GLAMs visitation are significant. The errors from this regression are then used in the second stage regression which incorporates age and log of income, both significant. Cross-products between these variables, or interaction terms (age*income, income*education etc.), were tested, but not found to be significant predictors.

Using this two-stage approach, we estimate that regular GLAMs visitors report a 0.4 point increase in self-reported health, on a 1-5 scale, controlling for age, income, and effectively the self-reported educational/professional impact of GLAMs. Notice that income is statistically significant, meaning that the impact of GLAMs visitation on health, controlling for demographic factors, can be monetized (see Section 8.2).

```
Instrumental variables (2SLS) regression          Number of obs   =      1,861
                                                  Wald chi2(3)    =     140.71
                                                  Prob > chi2     =     0.0000
                                                  R-squared       =     0.0650
                                                  Root MSE        =     .99259

------------------------------------------------------------------------------
   Y_Health_Ord |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_GLAM_Dum |   .4193881   .1521203     2.76   0.006     .1212377    .7175385
     X_Age_Cont |  -.0063142   .0014852    -4.25   0.000    -.0092251   -.0034032
      LogIncome |   .2802038   .0318784     8.79   0.000     .2177233    .3426842
          _cons |  -.6129779   .3191288    -1.92   0.055    -1.238459    .0125031
------------------------------------------------------------------------------
Instrumented:  X_Freq_GLAM_Dum
Instruments:   X_Age_Cont LogIncome Y_EducProf_D1 Y_EducProf_D2 Y_EducProf_D3
```

For the individual GLAMs, the strongest results were produced using ordered logit regressions, with the exception of libraries, for which a simpler logistic regression (logit) model produced a marginally higher visitation coefficient. Across all models, visitation frequency is captured using a dummy variable (i.e. its coefficient measures the impact of regular visitors, those who visit three or more times annually), as this produced the best results. The preferred model choice makes intuitive sense since self-reported health is measured on an ordinal scale, and the non-linear ordinal logistic regression is designed specifically to meet this purpose.

Galleries show the highest impact with a visitation coefficient of 0.603, meaning that frequent gallery visitors have an estimated 0.603 point higher self-reported health score on a scale from 0-4. Archives show the second highest impact with 0.484, followed by libraries with 0.375 and museums with 0.232 impact factors.

*Galleries*

```
Ordered logistic regression                       Number of obs     =      1,861
                                                  Wald chi2(4)      =     142.45
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -2584.3875                 Pseudo R2         =     0.0270

------------------------------------------------------------------------------
             |               Robust
Y_Health_Ord |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_G_Dum |    .603309   .1743859     3.46   0.001      .261519    .9450991
   LogIncome |   .4843616   .0594548     8.15   0.000     .3678324    .6008908
     X_EducD |   .2607808   .0950891     2.74   0.006     .0744096    .4471519
  X_Age_Cont |  -.0120584   .0024708    -4.88   0.000     -.016901   -.0072157
-------------+----------------------------------------------------------------
       /cut1 |   1.699228   .6145037                      .4948225    2.903633
       /cut2 |   3.419552   .6114256                       2.22118    4.617924
       /cut3 |   5.165627   .6171784                      3.955979    6.375274
       /cut4 |   6.928856   .6241453                      5.705554    8.152158
------------------------------------------------------------------------------
```

*Libraries*

```
Logistic regression                               Number of obs     =      1,868
                                                  Wald chi2(3)      =      92.05
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -990.85703                 Pseudo R2         =     0.0456

------------------------------------------------------------------------------
             |               Robust
Y_Health_DumYN |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  X_Freq_L_Dum |   .3749885   .1242957     3.02   0.003     .1313734    .6186035
     LogIncome |   .6153566   .0718507     8.56   0.000     .4745319    .7561814
    X_Age_Cont |  -.0107438   .0030222    -3.55   0.000    -.0166672   -.0048205
         _cons |  -4.810084   .7357486    -6.54   0.000    -6.252125   -3.368043
------------------------------------------------------------------------------
```

*Archives*

```
Ordered logistic regression                       Number of obs     =      1,861
                                                  Wald chi2(4)      =     136.81
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -2589.3951                 Pseudo R2         =     0.0251

------------------------------------------------------------------------------
             |               Robust
Y_Health_Ord |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
X_Freq_A_Dum |   .4834203   .2509483     1.93   0.054    -.0084293    .9752699
   LogIncome |   .4973458   .0593042     8.39   0.000     .3811117    .6135799
     X_EducD |   .2772827   .0948597     2.92   0.003     .0913611    .4632042
  X_Age_Cont |  -.0126041   .0024896    -5.06   0.000    -.0174837   -.0077246
-------------+----------------------------------------------------------------
       /cut1 |   1.788007   .6128054                      .5869305    2.989083
       /cut2 |   3.508155   .6097789                      2.313011      4.7033
       /cut3 |   5.248686   .6154153                      4.042494    6.454878
       /cut4 |   7.001095   .6221673                      5.781669     8.22052
------------------------------------------------------------------------------
```

*Museums*

```
Ordered logistic regression                       Number of obs     =      1,861
                                                  Wald chi2(4)      =     141.11
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -2588.2297                 Pseudo R2         =     0.0255

------------------------------------------------------------------------------
             |               Robust
Y_Health_Ord |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 X_Freq_M_YN |   .2265405   .0941418     2.41   0.016     .0420259    .4110551
   LogIncome |   .4794061   .0602376     7.96   0.000     .3613426    .5974696
     X_EducD |   .2402237   .0955968     2.51   0.012     .0528574    .4275899
  X_Age_Cont |   -.012195   .0025115    -4.86   0.000    -.0171176   -.0072725
-------------+----------------------------------------------------------------
       /cut1 |   1.679211   .6158798                      .4721083    2.886313
       /cut2 |   3.399752    .612699                      2.198884     4.60062
       /cut3 |   5.142999   .6180694                      3.931605    6.354393
       /cut4 |   6.896288   .6244821                      5.672325     8.12025
------------------------------------------------------------------------------
```

### Neighbourliness

*All GLAMs*

Relative to the other subjective wellbeing-related dimensions, GLAMs visitation has a large effect on neighbourliness. Using a logistic regression model, we see a visitation impact or coefficient of 1.054 that is highly significant (p-value of 0.000) and with acceptable robust standard errors (0.281), as shown in the model output below. Since the dependent variable is binary, we do expect the non-linear, logarithmic model to provide a better fit. However, if the visitation coefficient is to be interpreted as the conditional probability that frequent visitors will have high interaction with their neighbours, this gives a probability over 1, which is clearly impossible. This overshooting of the model is caused by an imperfect fit of the regression curve to the data. Yet we can say that there is a very high degree of correlation between frequent visitors and neighbourliness.

```
Logistic regression                               Number of obs     =      1,868
                                                  Wald chi2(4)      =      47.29
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1151.0578                 Pseudo R2         =     0.0215
```

| Y_SocNeigh_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_A_Dum | 1.054563 | .2807858 | 3.76 | 0.000 | .5042325 | 1.604893 |
| LogIncome | .1165387 | .0678406 | 1.72 | 0.086 | -.0164264 | .2495038 |
| Age2 | -.0001657 | .0000336 | -4.94 | 0.000 | -.0002315 | -.0000999 |
| X_EducD | -.2193529 | .1132436 | -1.94 | 0.053 | -.4413063 | .0026005 |
| _cons | -1.525796 | .6973523 | -2.19 | 0.029 | -2.892581 | -.1590103 |

Despite estimating a slightly lower frequency coefficient, the 2SLS instrumental variable regression is another important result. This regression involves an ordinal dependent variable and a dummy variable for visitation frequency in the second stage regression. This approach parallels that used for health; indeed, the same variables were found to be significant in both the first stage (self-reported educational/professional impact of GLAMs dummy variables) and the second stage (age and log of income) regressions. Again, interactions between these variables were tested, without significant results. Using this two-stage approach, we estimate that regular GLAMs visitors report a 0.5 point increase in self-reported health, on a 1-5 scale, controlling for age, income and effectively self-reported educational/professional impact of GLAMs.

```
Instrumental variables (2SLS) regression          Number of obs   =      1,851
                                                  Wald chi2(3)    =      45.24
                                                  Prob > chi2     =     0.0000
                                                  R-squared       =          .
                                                  Root MSE        =     .77305
```

| Y_SocNeigh_Ord | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_GLAM_Dum | .5103311 | .1179083 | 4.33 | 0.000 | .2792351 | .741427 |
| X_Age_Cont | -.0026092 | .0011624 | -2.24 | 0.025 | -.0048875 | -.0003309 |
| LogIncome | .027124 | .0248388 | 1.09 | 0.275 | -.0215591 | .0758072 |
| _cons | .9482992 | .2490345 | 3.81 | 0.000 | .4602005 | 1.436398 |

```
Instrumented:  X_Freq_GLAM_Dum
Instruments:   X_Age_Cont LogIncome Y_EducProf_D1 Y_EducProf_D2 Y_EducProf_D3
```

For the individual GLAMs, we see an even higher impact factor for archives of 1.250. Given the caveats expressed in the all-GLAMs regression, we can say that those who visit archives are exceedingly likely to

know and interact with many of their neighbours. Galleries also show a high impact factor of 0.944. Optimal results for libraries and museums are obtained by ordered logistic regressions, which seem to provide a better fit to the data. Indeed, the logistic regression for libraries did not yield statistically significant results. Regular library visitors are expected to have a 0.167 increase in the probability of associating closely with their neighbours, and regular museum visitors a 0.374 increase in probability.

*Galleries*

```
Logistic regression                               Number of obs     =      1,864
                                                  Wald chi2(4)      =      33.27
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood =  -1155.404                 Pseudo R2         =     0.0140
```

| Y_SocNeigh_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_G_Dum | .943566 | .1735581 | 5.44 | 0.000 | .6033983 | 1.283734 |
| LogIncome | .0805917 | .0678373 | 1.19 | 0.235 | -.052367 | .2135504 |
| X_EducD | -.2017786 | .1130336 | -1.79 | 0.074 | -.4233203 | .0197631 |
| X_Gender | -.0394285 | .1002094 | -0.39 | 0.694 | -.2358354 | .1569783 |
| _cons | -1.580022 | .6969178 | -2.27 | 0.023 | -2.945955 | -.2140878 |

*Libraries*

```
Ordered logistic regression                       Number of obs     =      1,847
                                                  Wald chi2(5)      =      31.28
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1986.6506                 Pseudo R2         =     0.0083
```

| Y_SocNeigh_Ord | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_L_Dum | .1665339 | .0982489 | 1.70 | 0.090 | -.0260305 | .3590983 |
| LogIncome | .1849778 | .0619236 | 2.99 | 0.003 | .0636099 | .3063458 |
| X_EducD | -.1891335 | .1014314 | -1.86 | 0.062 | -.3879354 | .0096684 |
| X_Age_Cont | -.0126894 | .0029342 | -4.32 | 0.000 | -.0184404 | -.0069385 |
| X_Gender | .0819249 | .0933729 | 0.88 | 0.380 | -.1010825 | .2649323 |
| /cut1 | -.9075005 | .650709 | | | -2.182867 | .3678657 |
| /cut2 | 2.145454 | .6467288 | | | .8778889 | 3.413019 |
| /cut3 | 3.779223 | .6498764 | | | 2.505488 | 5.052957 |

*Archives*

```
Logistic regression                               Number of obs     =      1,868
                                                  Wald chi2(3)      =      23.85
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood =  -1164.254                 Pseudo R2         =     0.0103
```

| Y_SocNeigh_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_A_Dum | 1.247178 | .275871 | 4.52 | 0.000 | .7064812 | 1.787875 |
| LogIncome | .0976999 | .0678166 | 1.44 | 0.150 | -.0352183 | .230618 |
| X_EducD | -.1732549 | .1123153 | -1.54 | 0.123 | -.3933889 | .046879 |
| _cons | -1.738039 | .69737 | -2.49 | 0.013 | -3.104859 | -.3712186 |

*Museums*

```
Ordered logistic regression                     Number of obs     =      1,851
                                                Wald chi2(4)      =      44.75
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -1989.0323               Pseudo R2         =     0.0109
```

| Y_SocNeigh_Ord | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_M_YN | .3742688 | .0996984 | 3.75 | 0.000 | .1788634 | .5696741 |
| LogIncome | .1498693 | .0626722 | 2.39 | 0.017 | .0270341 | .2727046 |
| X_EducD | -.228308 | .1007259 | -2.27 | 0.023 | -.4257272 | -.0308888 |
| X_Age_Cont | -.0108636 | .0029299 | -3.71 | 0.000 | -.0166062 | -.0051211 |
| /cut1 | -1.160536 | .6491654 | | | -2.432877 | .1118048 |
| /cut2 | 1.901534 | .6448367 | | | .6376772 | 3.165391 |
| /cut3 | 3.53608 | .6479595 | | | 2.266102 | 4.806057 |

**Volunteering**

*All GLAMs*

Volunteering also produces a very strong result, with frequent visitors to all GLAMs estimated with 0.983 probability—conditional on consistency in demographic controls of income and education level, both significant—to participate in volunteering and similar community engagement activities. The strength of this result compared to the simple linear regression and 2SLS instrumental variable regression models is no doubt based on the specification of the dependent variable, which is a dummy variable. Interestingly, age has a negative (although very small) coefficient, meaning that people are less likely to volunteer as they age—perhaps a counterintuitive result. Not surprisingly however, education has a strong positive impact, with those having a college degree being 48% more likely to volunteer; a highly significant result with p-value of 0.000.

```
Logistic regression                             Number of obs     =      1,839
                                                Wald chi2(4)      =      85.46
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -1100.2699               Pseudo R2         =     0.0395
```

| Y_CommCE_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_A_Dum | .9825882 | .2816035 | 3.49 | 0.000 | .4306554 | 1.534521 |
| LogIncome | .147595 | .0704149 | 2.10 | 0.036 | .0095843 | .2856057 |
| X_EducD | .4885199 | .1125555 | 4.34 | 0.000 | .2679152 | .7091246 |
| X_Age_Cont | -.0184283 | .0031493 | -5.85 | 0.000 | -.0246009 | -.0122557 |
| _cons | -1.685909 | .7264016 | -2.32 | 0.020 | -3.10963 | -.2621879 |

We see very high impact factors for the individual GLAMs, especially galleries with 1.195 and archives with 0.983. Since the best models are all logistic regressions with dummy dependent variables, this corresponds to near certainty (approaching or even overshooting conditional probabilities of 1) that being a regular visitor to these venues aligns with volunteering and related community involvement behaviour. The relatively lower results for libraries and museums are still high compared with the other wellbeing aspects considered. Overall, we can conclude that regular GLAMs visitation has a large and significant impact on volunteering.

*Galleries*

```
Logistic regression                               Number of obs     =      1,839
                                                  Wald chi2(4)      =     114.41
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1084.5541                 Pseudo R2         =     0.0532
```

| Y_CommCE_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_G_Dum | 1.195322 | .1819416 | 6.57 | 0.000 | .8387234 | 1.551921 |
| LogIncome | .1118087 | .0714868 | 1.56 | 0.118 | -.0283027 | .2519202 |
| X_EducD | .4597336 | .113829 | 4.04 | 0.000 | .2366328 | .6828344 |
| X_Age_Cont | -.0172736 | .0031763 | -5.44 | 0.000 | -.0234991 | -.0110481 |
| _cons | -1.428546 | .7357438 | -1.94 | 0.052 | -2.870578 | .0134851 |

*Libraries*

```
Logistic regression                               Number of obs     =      1,839
                                                  Wald chi2(4)      =      97.24
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1093.1388                 Pseudo R2         =     0.0458
```

| Y_CommCE_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_L_Dum | .5621306 | .1079608 | 5.21 | 0.000 | .3505313 | .7737299 |
| LogIncome | .1574833 | .0708643 | 2.22 | 0.026 | .0185918 | .2963747 |
| X_EducD | .3935704 | .1147976 | 3.43 | 0.001 | .1685712 | .6185696 |
| X_Age_Cont | -.0187908 | .003133 | -6.00 | 0.000 | -.0249313 | -.0126503 |
| _cons | -1.90445 | .7308118 | -2.61 | 0.009 | -3.336815 | -.4720857 |

*Archives*

```
Logistic regression                               Number of obs     =      1,839
                                                  Wald chi2(4)      =      85.46
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1100.2699                 Pseudo R2         =     0.0395
```

| Y_CommCE_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_A_Dum | .9825882 | .2816035 | 3.49 | 0.000 | .4306554 | 1.534521 |
| LogIncome | .147595 | .0704149 | 2.10 | 0.036 | .0095843 | .2856057 |
| X_EducD | .4885199 | .1125555 | 4.34 | 0.000 | .2679152 | .7091246 |
| X_Age_Cont | -.0184283 | .0031493 | -5.85 | 0.000 | -.0246009 | -.0122557 |
| _cons | -1.685909 | .7264016 | -2.32 | 0.020 | -3.10963 | -.2621879 |

*Museums*

```
Logistic regression                               Number of obs     =      1,839
                                                  Wald chi2(4)      =     106.46
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -1089.1906                 Pseudo R2         =     0.0492
```

| Y_CommCE_Bin | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| X_Freq_M_YN | .6361195 | .1085705 | 5.86 | 0.000 | .4233253 | .8489137 |
| LogIncome | .0962376 | .071868 | 1.34 | 0.181 | -.0446211 | .2370963 |
| X_EducD | .3835104 | .1152959 | 3.33 | 0.001 | .1575346 | .6094862 |
| X_Age_Cont | -.0170389 | .0031403 | -5.43 | 0.000 | -.0231939 | -.010884 |
| _cons | -1.416684 | .7338814 | -1.93 | 0.054 | -2.855065 | .0216975 |

# APPENDIX 5 OTHER WIDER BENEFITS

## BACKGROUND

As indicated in Chapter 8, there are a number of potential wider benefits associated with GLAMs which have been explored in the literature. This appendix provides further details on such benefits.

## SOCIAL CAPITAL AND INFORMAL EDUCATION

There is a large volume of evidence that improving key indicators such as literacy is of benefit to society and the economy. For example, recent Canadian work has indicated strong links between literacy and economic growth.[142] Other past Canadian and international work has had similar findings. However, it should be noted that the authors in question invariably make the point that causal linkages remain an issue.

As indicated above, this study allows for the impacts of formal school education and its interaction with GLAMs. In principle, informal education could also be accounted for within an economic welfare framework. However, an additional challenge with informal education is that, while the returns to formal education are well established, those for informal education rely to varying degrees on additional inferences about causality. For this reason, we are more cautious about the attribution of informal educational benefits to GLAMs.

Nonetheless several studies have attempted to explore such linkages both internationally and within Canada, and the evidence is gradually becoming more compelling. For example, work by Copenhagen Economics (2015) explores the potential link between Danish school children reading books borrowed from public libraries, PISA reading test scores, the likelihood of post-secondary educational entry and higher wages. This work suggests that child usage of public libraries in Denmark could equate to DKK 2.1 billion annually (or $0.4 billion) in economic benefits (expressed as higher education productivity gains).[143]

Fujiwara et al. (2015) examined the probability of tertiary education entry with increased library usage, finding that library visits increase the probability of entering tertiary education, with total benefits equating to £2,113 per person (in 2009 prices).[144] Detailed Australian work has also shown some linkages between children's reading activity, PISA reading scores and economic growth, though the evidence is more mixed for effects on long-term wages effects.[145]

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[142] A good recent paper is Schwerdt, G and Wiederhold, S., "A Macroeconomic Analysis of Literacy and Economic Performance", February 2019 http://www.dataangel.ca/docs/A%20Macroeconomic%20Analysis%20of%20Literacy_February2019.pdf accessed 24 July 2019. These authors use the Program for the International Assessment of Adult Competencies (PIAAC) survey of adult skills across Canadian provinces to find that a 1% increase in literacy is associated with an increase in GDP of 3%.

[143] Copenhagen Economics, "The economic value of public libraries", 2015. Figures converted at Purchasing Power Parity (PPP) rates (i.e. long term exchange rates) and adjusted for inflation since 2015.

[144] Fujiwara D., Kudrna, L., Cornwall, T., Laffan, K, Dolan, P., "Further Analysis to value the health and educational benefits of sport and culture", UK Department of Culture, Media and Sport, March 2015

[145] Deloitte Access Economics, "The Economic Impact of Improving School Quality", November 2016

In Canada, past work by the OECD has linked student borrowing of books from public or school libraries with PISA scores, both at a national and provincial level.[146] Other OECD studies focusing on Canada also examine the link between reading, PISA reading scores and the probability of entry to tertiary education.[147] Past work has also examined the links between public library usage and the literacy scores of Ontario youth, finding a positive relationship between the two using regression analysis.[148]

Some of the most intriguing (and compelling) Canadian research comes from the recent work of Childs et al. (2016) on cultural capital.[149] These authors look at the frequency of attendance at Canadian cultural venues, including museums and galleries, the incidence of informal reading, PISA scores and the probability of college or university entry. Moreover, this work is especially compelling since it is longitudinal in nature—i.e. it uses recent waves of the Youth in Transition surveys to examine whether those who attended GLAMs and/or undertook more informal reading did actually attend higher education to a greater extent than those who did not. Their work finds that attending an art museum or gallery, an opera, ballet or classical symphony concert, or live theatre increased the probability of university attendance by about 6.6 percentage points for females and 3.4 percentage points for males, while indicating a "love" for reading (reading engagement) increased it by 6 percentage points. As is the case with the other studies above, however, the authors do issue cautions about interpreting these results as causal.

Other recent Canadian research includes the work of Andersen and Jæger (2016). This analysis used relatively sophisticated econometric modelling to find that various forms of cultural capital (including reading) had an impact on Canadian PISA scores, noting that effects were larger for students in more challenging educational environments than those in more privileged ones.[150]

Of course, it may also be that informal education through GLAMs is of importance to adults. Once again there is a large body of evidence in Canada and elsewhere that adult literacy and skills development is correlated with beneficial economic outcomes. Recent Canadian modelling work using adult PIAAC scores, for example, has shown an association between literacy and informal educational attendance.[151]

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[146] Statistics Canada, "Measuring Up: The performance of Canada's youth in Reading, Mathematics and Science", 2001. While written some time ago (and also including school libraries) this work appears to be the most comprehensive exploration of the direct association between library usage and PISA scores. It is also notable for its breakdown of the results at the provincial level. Nonetheless not all results are straightforward. For example, beyond a certain point too much borrowing of books was found to be associated with a reduction of PISA scores. The authors speculate this may be due to the fact that children from disadvantaged families may also be heavy borrowers.

[147] OECD, "Pathways to Success: How Knowledge and Skills at Age 15 shape future lives in Canada", 2012 ;OECD, "The High Cost of Low Educational Performance", 2010

[148] Kapsalis, C. "Literacy Profile of Ontario's Youth", Ministry of Training Colleges and Universities, 2000

[149] Childs S. et al., "Assessing the importance of cultural capital on post-secondary education", *Journal of Further and Higher Education*, 42(1) (2016): 57-91.

[150] Ida Gran Andersen and Mads Meier Jæger, "Cultural capital in context: Heterogeneous returns to cultural capital across schooling environments", *Social Science Research*, 57 (2016): 273. Apart from being of interest in its own right this work was undertaken due to concerns that cultural capital could be a self-reinforcing elite concept—i.e. the children of the privileged attend GLAMs, do better at school and so on. The study suggests that reading and other forms of cultural capital may actually have greater effect in low-achieving environments.

[151] Krupar, A., Horvatek, R., Byun, S, "Does Nonformal Education Matter ? Informal Education and Skills in Canada", *Adult Education Quarterly* Vol. 67 (3), 2017

Other studies have examined links between adult library usage and literacy.[152] As noted above, literacy in turn has been linked with higher wages and/or economic growth.

However, direct evidence on the specific impact of GLAMs on such adult skills development and wage and economic growth outcomes is more limited. This may be because less interest is shown in adults (compared to children), but also because such work would require longitudinal studies for more solid evidence of effects (i.e. it would require the study of adult GLAM usage and social and economic outcomes over an extended period of years), a point also made by Krupar et al. While some longitudinal work has also been undertaken on adult museum visitation by Falk and Needham, the evidence base remains limited.[153]

For example, it seems logical to assume that adults who are regular museum visitors come away as better educated, more informed and more engaged citizens. Indeed, some of these informal learning outcomes may be reflected in the wellbeing indicator results for health, neighbourliness and volunteering, discussed in the previous appendix. These are important results within the Canadian context as noted above.

Nonetheless, in contrast to younger visitors, there is less evidence on the effects of such informal learning on potential wages and/or economic growth and no comparable quantification of broader effects akin to those developed by authors such as Riddell. The same is true for public libraries; while a variety of studies have noted potential impacts of libraries on adult learning and literacy, comprehensive studies linking public library usage, literacy and growth over time remain rare.[154]

Some of these effects may be included in studies which examine long term “macroeconomic” effects of GLAMs such as libraries. These are discussed below. However, the broad nature of these studies makes it difficult to isolate out what effects are being included.

In short, there have been promising advances in our understanding of the effects of GLAMs on informal education, and some effects could be quantifiable, particularly in the case of informal learning by children and young adults. We have adopted a relatively cautious stance on this issue and excluded these effects from the CBA for this study. Nonetheless, it is important to highlight the ways in which such effects might impact on economic welfare.

**LONG-TERM ECONOMIC SPILLOVER EFFECTS**

As indicated in Section 8.5, one contention is that GLAMs may create long-term spillover effects, which are not captured within conventional economic welfare frameworks.

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[152] Campbell, A. and Gagnon, N., “Literacy, Life and Employment: An Analysis of Canadian International Adult Literacy Survey (IALS) Microdata”, The Conference Board of Canada 2006

[153] Falk, J. and Needham, M., “Factors Contributing to Adult Knowledge of Science and Technology”, *Journal of Research in Science Teaching* Vol. 50, No. 4, (2013); Falk. et. al. “International Science Centre Impact Study”, John Falk Research 2014

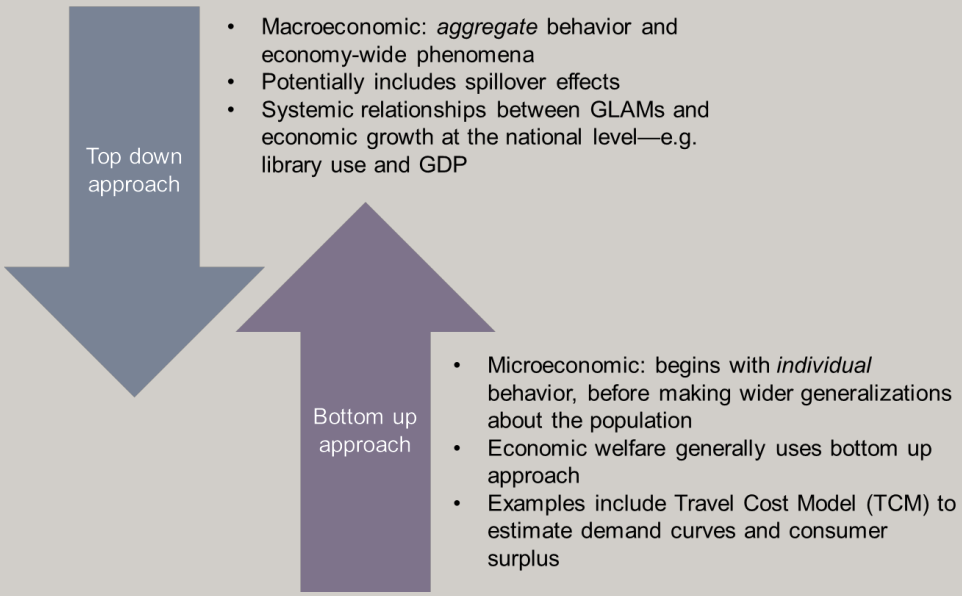
[154] Similar points were made in a comprehensive international literature review of potential linkages between public libraries and growth by the Arts Council of England. See Arts Council England, "Evidence review of the economic contribution of libraries", June 2014. Nonetheless some analysts have attempted to address this issue. See Liu, Lewis G. 2004. “The contribution of public libraries to countries' economic productivity: a path analysis.” *Library Review*. 53:9, 435–441; Skelly, L. “The public library’s contribution to economic growth and development: a Path Analysis”, PhD dissertation, University of KwaZulu-Natal

Note, however that this is no more or less true for GLAMs than for other forms of economic activity. For example, using a conventional framework, the economic benefits (i.e. increase in productivity) from the new metro link, referred to in the main text, would be reflected in the lower costs of the new route and increased business usage of the service. While it may not seem obvious, the conventional framework would actually incorporate the benefits of the new link as they spread out to other business across the economy.[155]

However, it may be that, in time, the increased commercial interaction leads to *still greater* (and unanticipated) long-run innovation and higher productivity within the economy as a whole, as people develop ideas upon ideas and so on. Like R&D spillovers, perhaps the increased interactions result in inventors coming up with brilliant new ideas, for example. The magnitude of such additional long-term spillover effects would not be captured within a standard economic welfare framework.

Some have therefore argued for alternative "top down" macroeconomic approaches to incorporate such missing spillover effects. Akin to some of the work on literacy described above, these studies look at the relationships between factors such as GLAMs usage and economic growth at the broad national level. This is distinguished from the "bottom up" approach used by economic welfare and in the TCM framework above, where user behaviour is the basis of the assessment. A comparison between the two is indicated in Fig. 47.

**Fig. 47. Bottom up vs top down modelling**




However, such approaches are subject to the same critiques as those noted above—they look at broad relationships at the national level and require assumptions about causality. This is in contrast to the known benefits of GLAMs usage using the bottom up economic welfare approaches such as the TCM—i.e. we know that people are using GLAMs and then proceed to measure value on the basis of that usage.

[155] For a good discussion of the subtly powerful nature of the conventional framework see Boardman et. al *op. cit.*, Australian Bureau of Transport Economics, *Facts and Furphies in Transport Economics*, 1999

In addition, some (or much) of the assessed benefits of such modelling could be captured by the standard economic welfare approach, so there is a need to be wary of double counting. To date, the standard framework has proved remarkably robust in dealing with the critiques of those who suggest that missing benefits are picked up by top down modelling. This is particularly so in more commonly analyzed areas (such as transportation economics), where economic welfare approaches have been compared to top down ones in detail.[156] This suggests that such arguments need to be treated with due initial caution.

It is also the case that much GLAMs visitation is not commercial in purpose, which could limit the applicability of spillover arguments.

Nonetheless, it is worth examining the case for economic spillover effects of GLAMs, though these are limited and would mainly appear to relate to the library and archival sectors.

Work by Liu and Skelly, cited above, has examined links between libraries and economic growth using a top down approach. However, the authors of such studies note that causality remains an issue. Other recent top down work has been related to a variety of open data or open government data (OGD) initiatives, which may have implications for the potential spillover benefits of public archives. This work examined the economic value of freeing up government data and making it available to the general public. In essence, freeing up data could allow decisions to be made in a more optimal way, benefiting individuals and society. Conversely, restricting access to data means decisions cannot be made optimally.

Such studies have estimated extremely large economic benefits arising from open data, including $134 billion in the case of Canada.[157] In addition, arguments have been made that open data initiatives could help support broader social objectives, such as the rule of law, democratic institutions and trust. These are effectively another form of social capital argument.[158]

However, some critiques have been made of the size of such estimations.[159] In many cases, much of the benefits relate to the sale of commercial data, such as land and/or geospatial data, which may be quite different to the offerings in public archives.[160] Archives themselves have expressed skepticism along these lines. Responding to a paper exploring the valuation of public sector information (PSI), Australia's National Archives argued that material from the archives, and material produced by the archives, largely has a social or cultural or evidential value, rather than an economic value.[161] As the paper states:

> *The economic value of some types [of data], such as geospatial information can be assessed quite readily. It is less appropriate to attempt to attach a dollar-value to cultural collections.*
>
> *The archives would support this, emphasizing that the material released by the archives, although it may be used in commercial products, for example, school text books and*

[156] Boardman *op. cit*; Australian Bureau of Transport Economics

[157] Australian Bureau of Communications Research, "Open Government Data and why it matters", 2016

[158] See Viscusi et. al., "Assessing Social Value in Open Data Initiatives: A Framework", *Future Internet*, 2014, 6, (2014); OECD "Data driven innovation for growth and well-being", 2014

[159] Australian Bureau of Communications Research *op. cit*

[160] We note that user data provided by the Archives of Ontario for this study indicated that forestry resource and inventory aerial photography prints were the single most retrieved materials. However, only roughly 4% of clients indicated that land records and photographs and maps were the reason for their visit to these archives.

[161] National Archives of Australia, "Understanding the value of public sector information in Australia, Issues paper 2: Public consultation", http://www.naa.gov.au/Images/OAICIssuesPaper2_tcm16-77230.pdf accessed 18 July 2019

> *documentaries, does not in itself generate a significant commercial value in the way that statistical information, spatial data and hydrological data is of immediate commercial use in specific sectors. Therefore, we would assert that for the material published by the archives, the economic value arising from its use is insignificant to the point of being unmeasurable.*

However, this may be taking too narrow a view of "economic" value, focused more on measures such as revenue and GDP. As indicated above, economic welfare includes the concepts of consumer surplus and people's valuation of GLAMs offerings (such as heritage), whether or not a market transaction is involved. So, for example, the TCM and non-use valuations both act as starting points for an economic welfare-based valuation of archival holdings.

Some of the most extensive international quantification work in this area has been undertaken by Houghton, Beagrie and Gruen. These authors also establish a typology of open data value in which geographical information is of highest commercial re-use value and public archives are the lowest. Nonetheless, they stress that the typology is not exact in all cases and that institutions such as archives can have more value than those seemingly higher up the "value chain."[162] Beagrie and Houghton examine a number of digital repositories in the UK, in particular, using both conventional economic welfare approaches and a top down economic modelling approach. Their work suggests benefit cost ratios of 3.0-4.9 for the UK's Economic and Social Data Service (ESDS) using economic welfare approaches, but up to 10 using a top down macroeconomic approach.[163] However, apart from the usual caveats on causality, the extent to which such results would apply to mainstream public archives in Canada or elsewhere is unclear.

In short, there may be an *in principle* case for GLAMs spillover benefits, as indicated by the example box in the main text, which underlines the broader importance of archival research. However, the lack of strong and comprehensive evidence across GLAMs to date does not allow for a full quantification of such effects.

## EMPLOYMENT AND MULTIPLIER EFFECTS

### Employment

As indicated in the main text, some GLAMs such as libraries may be of great assistance in helping their visitors research jobs and/or in helping the unemployed search for new employment. However, as discussed, it is important not to confuse economic welfare measures with economic impacts. Under an economic welfare approach, there is a working assumption of full employment. This means that a person already in employment getting a new job is not a benefit in the strict economic sense, as the person has simply transferred from one job to another.

However, an *unemployed* person getting a job would be generally considered a benefit. That person is currently underutilized from an economic perspective and would now be getting a job and earning a wage (to say nothing of the positive psychological effects of employment, which are increasingly recognized). To the extent GLAMs help this process, that could count as a benefit.

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[162] Houghton J., and Gruen N., "Issues Paper 2: Understanding the Value of Public Sector Information in Australia: Submission to the OAIC", February 2012

[163] Beagrie, N. and Houghton J., "The Value and Impact of Data Sharing and Curation", *Jisc*, March 2014

In practice, it is challenging to quantify the role of libraries in unemployment assistance; while wages would represent an economic benefit, a key issue would be whether the new role was permanent. Another issue would be how much of a role the library played among other factors in getting the new job. Indeed, conventional "welfare to work" studies often deal with similar issues.

However, the issue of economic measurement should also be distinguished from that of practical significance. An unemployed person who successfully uses a library to attend training courses and/or research jobs would doubtless view it as a positive outcome, regardless of the technicalities of measurement.

**Multipliers**

The presence of GLAMs may provide a boost to businesses such as local retailers. For example, consider the opening of a new gallery in a local area. This could provide a boost to local retailers, which in turn buy from suppliers, who in turn buy from theirs and so on, creating multiplier effects across the local area. Should these effects be included in a GLAMs cost-benefit analysis?

These effects would be the type of impacts captured by an economic impact analysis. As noted above, economic welfare should not be confused with economic impact analysis. *Economic impact* analysis measures the amount of economic activity an initiative might bring—e.g. a new library might create jobs and boost GDP through spending. However *economic welfare* frameworks measure a different set of metrics and use a different starting point. Economic impact studies measure economic activity in terms of contributions to the economy as a whole, or the *share* of the "economic pie" accounted for by institutions such as GLAMs. By comparison, economic welfare studies measure how society is better off in terms of net benefits (benefits less costs), i.e. how institutions such as GLAMs *grow* the "economic pie".

In the example above, a retailer might obtain higher revenues from the presence of a GLAM. However, economic welfare analysis focusses on net benefits—so it is profits rather than revenues which would be of relevance. Moreover, the conventional economic welfare framework may in fact capture many of these transmitted benefits, so adding multiplier effects could be double counting. For these and many other technical reasons, multiplier effects on local businesses are generally excluded from an economic welfare framework, unless there are very specific circumstances. This is the approach taken in this study. This is consistent with the guidelines issued by the Treasury Board of Canada (which notes that such "secondary market" effects must be excluded from cost-benefit analysis) and the analysis offered in standard economic texts.[164]

As indicated, this does not mean economic impact or economic welfare are the "right" or "wrong" answer to measuring the value of GLAMs. For example, an alternative approach to measuring the economic effects of the gallery would be to define the local area as the clear (and only) area of interest and to use an economic impact approach to assess the GDP and jobs generated in that area. This would produce an alternative viewpoint on galleries' benefits (i.e. one focused on benefits as conventionally measured by markets). However, just as it would be incorrect to add multiplier effects to a welfare framework, so consumer surplus and non-use value cannot be added to an economic impact one—they measure different things. Neither answer is necessarily "better." However, the key point is for analysts to be aware

[164] Treasury Board of Canada, "Canadian Cost-Benefit Analysis Guide, Regulatory Proposals", 2007. See also Boardman et. l, *op. cit*. and Australian Bureau of Transport Economics *op. cit.* for detailed technical discussion on the exclusion of multiplier effects from CBA.

of the framework and scope of the analysis they wish to undertake and to be consistent with that framework.

# APPENDIX 6 QUESTIONNAIRE

**NATIONAL SURVEY**

The Canadian Museums Association (CMA), on behalf of the Ottawa Declaration Working Group, is undertaking work with Oxford Economics to quantify how galleries, libraries, archives, and museums (GLAMs) contribute to the Canadian economy, as well as more broadly to society. In order to do this, it is important for us to understand how the general public views these institutions.

Throughout this survey we will ask you a series of questions about the following institutions:

- Non-profit, public galleries whose primary purpose is communication rather than selling;
- Non-profit, public libraries in municipalities and regions, Indigenous libraries, academic libraries at Canadian post-secondary institutions, special libraries (for example, in hospitals, museums, galleries, botanical gardens, as well as serving people with disabilities) and provincial, territorial and national libraries;
- Non-profit, public archives in municipalities and regions, Indigenous archives, archives at Canadian post-secondary institutions, and provincial, territorial and national archives; and
- Non-profit, public museums in municipalities and regions, Indigenous museums, and museums at Canadian post-secondary institutions.

Please DO NOT answer the questionnaire in relation to any institutions that are profit-focused (i.e. those that exist for the sole purpose of generating revenue through buying and selling cultural collections).

We appreciate you taking the time to complete this survey. It will only take a few minutes and all responses will be treated as confidential.

**Quota questions (1 min)**

**A1** First official language spoken

| | |
|---|---|
| French | 1 (administer French questionnaire) |
| English | 2 (administer English questionnaire) |
| Other | 3 (ask to choose preferred language for questionnaire between English and French) |

**A2** In which Province or Territory do you have your permanent residence?

| | |
|---|---|
| Alberta | 1 |
| British Columbia | 2 |
| Manitoba | 3 |
| New Brunswick | 4 |
| Newfoundland and Labrador | 5 |
| Northwest Territories | 6 |
| Nova Scotia | 7 |

| | |
|---|---|
| Nunavut | 8 |
| Ontario | 9 |
| Prince Edward Island | 10 |
| Quebec | 11 |
| Saskatchewan | 12 |
| Yukon | 13 |

**A3** What is your Postal Code?

FREEFORM

**A4** What is your gender?

| | |
|---|---|
| Male | 1 |
| Female | 2 |
| Other | 3 |

**A5** What is your age?

| | |
|---|---|
| 15-19 | 1 |
| 20-24 | 2 |
| 25-34 | 3 |
| 35-44 | 4 |
| 45-54 | 5 |
| 55-64 | 6 |
| 65+ | 7 |

**A6** What is the highest educational level you have completed?

| | |
|---|---|
| No certificate, diploma or degree | 1 |
| High school diploma | 2 |
| Apprenticeship or other trades certificate | 3 |
| College diploma or university below bachelor's | 4 |
| Bachelor's degree | 5 |
| Postgraduate | 6 |
| Other (please specify) | 7 |

**User/non-user split (1 min)**

**B1** Have you visited the following venues?

**Galleries** (these could range in size from major ones such as Art Gallery of Nova Scotia, Art Gallery of Ontario, etc. to smaller local ones.)

Yes, I have visited a gallery within the last 12 months 1

Yes, I have visited a gallery, but it was more than 12 months ago. 2

No, I have never visited a gallery…. 3

**Libraries** (these could range in size from large urban ones such as Toronto Public Library, La Grande Bibliothèque, Ottawa Public Library, etc. to smaller local ones and specialist ones such as academic libraries and special libraries - e.g., in hospitals, museums, galleries and those serving people with disabilities.)

Yes, I have visited a library within the last 12 months 1

Yes, I have visited a library, but it was more than 12 months ago 2

No, I have never visited a library…. 3

**Archives** (these could range in size from Archives de Montréal, Archives of Ontario, etc. to smaller local ones, like the archives at the Whyte Museum of the Canadian Rockies in Banff.)

Yes, I have visited an archive within the last 12 months 1

Yes, I have visited an archive, but it was more than 12 months ago 2

No, I have never visited an archive…. 3

**Museums** (these could range in size from Royal Ontario Museum, Royal BC Museum, Royal Tyrrell Museum, etc. to smaller local ones, like the Reynolds-Alberta Museum.)

Yes, I have visited a museum within the last 12 months 1

Yes, I have visited a museum but it was more than 12 months ago 2

No, I have never visited a museum…. 3

**Users (3-4 mins)**

You've indicated you visited a gallery, library, archive or museum within the last 12 months**.**

**C1** How many visits did you make to GLAMs over the past 12 months? (Enter numbers for each category where relevant)

**Galleries**

0 1

1-2 2

3-4 3

5-6 4

More than 6 (please specify how many) 5

**Libraries**

| | |
|---|---|
| 0 | 1 |
| 1-2 | 2 |
| 3-4 | 3 |
| 5-6 | 4 |
| More than 6 (please specify how many) | 5 |

**Archives**

| | |
|---|---|
| 0 | 1 |
| 1-2 | 2 |
| 3-4 | 3 |
| 5-6 | 4 |
| More than 6 (please specify how many) | 5 |

**Museums**

| | |
|---|---|
| 0 | 1 |
| 1-2 | 2 |
| 3-4 | 3 |
| 5-6 | 4 |
| More than 6 (please specify how many) | 5 |

And now to help understand your usage a bit better, we'd just like to ask you a few more questions about your last trip to a gallery, library, archive or museum.

**C2** Considering for a moment your last trip to a GLAM, was it to a:

| | |
|---|---|
| Gallery | 1 |
| Library | 2 |
| Archive | 3 |
| Museum | 4 |
| Don't know | 5 |

**C3** And do you remember the name of the GLAM you visited on that last trip? If so, please enter it below (free text). If you can't remember please go to the next question.

FREE TEXT RESPONSE (NON-MANDATORY)

**C4** And how you did you get there on that trip?

| | |
|---|---|
| Walk | 1 |
| Drive | 2 |

Public Transportation 3

Taxi/Uber or other ridesharing 4

Airplane 5

Train 6

Bike 7

Other (please specify) 8

Don't know 9

**C5** And on that last trip, how much time did it take to get there (as a one-way trip)? Just give your best estimate.

Less than 5 minutes. 1

5 - 9 minutes 2

10 - 19 minutes 3

20 - 29 minutes 4

30 - 59 minutes 5

60-90 minutes 6

More than 90 minutes (please specify how long) 7

Don't know 8

**C6** How long did you spend there on your last visit? Just give your best estimate.

Less than 30 minutes 1

30 minutes to an hour 2

1 to 2 hours 3

2 to 3 hours 4

3 to 4 hours 5

4 to 5 hours 6

5 to 6 hours 7

Over 6 hours 8

Don't know 9

**C7** And finally on travel, how much did you spend to get there on your last trip (as a one-way trip)? Include travel costs such as fares, gasoline and parking if relevant. Just give your best estimate.

$0 1

$1-5 2

| | |
|---|---|
| $5-10 | 3 |
| $10-15 | 4 |
| $15-20 | 5 |
| $20-80 | 6 |
| $80-140 | 7 |
| $140-200 | 8 |
| More than $200 (please specify how much) | 9 |
| Don't know | 10 |

**Willingness to pay (4-5 mins)**

The following questions are designed to help us capture the value that you place on galleries, libraries, archives and museums and on the services they provide. These questions are not an indication that current funding arrangements will change.

Galleries, libraries, archives and museums have traditionally been important contributors to Canadian society. They have also been broadening their services through providing Internet access, community gathering spaces, educational opportunities, maker spaces, programming for marginalized community members and many other services. In so doing, the sector aims to further extend its social impacts.

**D1** In one way or another, all Canadians currently pay towards the annual upkeep and development of galleries, libraries, archives and museums (GLAMs) whether through taxes, donations, entry fees or other means.

However, imagine that GLAMs had no other sources of government or private funding and the only way of maintaining them was to rely on individual donations.

In such a situation, what is the maximum amount you would be willing to pay each year as a donation to maintain all of Canada's non-profit GLAMs?

In answering this question:

- remember that your donation is for all non-profit Canadian GLAMs across the whole country, not just your local one(s);
- try to be as honest as possible in your response; and
- remember that you must also meet your other everyday costs of living.

You can either choose one of the amounts indicated below OR provide an amount in the "Other amount (please specify) $" field below.

Note that you must select the maximum amount you would donate to each one of the institutions (i.e. one for galleries, one for libraries, one for archives and one for museums). These will add up to a total amount that will represent the total maximum amount you are willing to pay for Canadian non-profit GLAMs as a whole.

(RESPONSE REQUIRED FOR EACH TYPLE OF GLAM)

| **Institution** | | | |
|---|---|---|---|
| Canadian galleries: (Maximum amount you are willing to pay each year $) | Canadian libraries: (Maximum amount you are willing to pay each year $) | Canadian archives: (Maximum amount you are willing to pay each year $) | Canadian museums: (Maximum amount you are willing to pay each year $) |
| $0 | $0 | $0 | $0 |
| $10 | $10 | $10 | $10 |
| $20 | $20 | $20 | $20 |
| $30 | $30 | $30 | $30 |
| $40 | $40 | $40 | $40 |
| $50 | $50 | $50 | $50 |
| $75 | $75 | $75 | $75 |
| $100 | $100 | $100 | $100 |
| $150 | $150 | $150 | $150 |
| Other amount (please specify) | Other amount (please specify) | Other amount (please specify) | Other amount (please specify) |

**D2** What is the basis for the answers you give when you were asked to value GLAMs? Please select all that apply.

MULTIPLE RESPONSES PERMITTED

I value GLAMs highly 1

I am happy to fund GLAMs 2

I have never used (or I am unlikely to use) some (or all) GLAMs 3

I object to funding GLAMs 4

I can't afford to pay 5

I do not value GLAMs 6

Other (please specify) 7

**Qualitative analysis (4-5 mins)**

Galleries, libraries, archives and museums (GLAMs) make a broader contribution to Canadian society in many ways that can't be measured through dollars and cents. For this reason, it is also important to get a broader idea of people's thoughts and feelings about Canadian GLAMs.

The following questions ask you to consider some of these broader values.

**E1** Please rate (on a scale of 1-10) how important you think the role of each institution is in contributing to the key social objectives below, where 1 is "Not important at all" and 10 is "Extremely important."

Give a higher rating if you feel the institution makes an important contribution to a social objective and a lower one if you feel it makes a less important one.

Remember that your response relates to Canadian GLAMs across the nation as a whole, not just your local one(s).

Please provide your ratings for each institution in the boxes below. If you feel you don't know, or can't say, how important the institution's contribution to these objectives is, you may click the "don't know" box.

RESPONSE REQUIRED FOR EACH TYPE OF GLAM, HOWEVER CLICKING THE DON'T KNOW BOX IS ACCEPTABLE.

Not important at all Extremely important

1 2 3 4 5 6 7 8 9 10

| | Institution | | | |
|---|---|---|---|---|
| Social objective | Importance of Canadian galleries to… | Importance of Canadian libraries to… | Importance of Canadian archives to… | Importance of Canadian museums to… |
| Community engagement and civic participation | | | | |
| Preserving cultural and historical heritage | | | | |
| Providing access to resources for research, innovation and education | | | | |
| Protection of truth, integrity and social values | | | | |
| Quality of life, mental and physical health and wellbeing | | | | |
| Providing inspiration for creativity | | | | |
| Nurturing of identity for marginalized communities, contributing to community cohesion | | | | |

**E2** To what extent would you say that you have benefitted from using GLAMs' resources in your education, or your professional or personal development?

Not at all 1

| | |
|---|---|
| Not very much | 2 |
| Moderately | 3 |
| Very much | 4 |
| Extremely | 5 |
| Don't know | 6 |

**E3** If you have any other comments on why galleries, libraries, archives and museums may or may not have value to you, please feel free to provide them below:

FREEFORM, NON-MANDATORY

**Online usage (3-4 mins)**

**F1** Please indicate if you have used any of the following online channels to access Canadian galleries, libraries, archives or museums (GLAMs) content within the last 12 months. Select all online channels and institutions that you have used.

Ignore those channels you have not used. If you have not used any of these channels, you may select the last check box in each column.

For each channel you select, an open box will appear. Please provide an estimate in that box of how many minutes you think you spent online the last time you accessed the institution (i.e. the length of your last "online session" with that institution).

MULTIPLE RESPONSE WITH OPEN TEXT BOX APPEARING WHEN LIST ITEM IS SELECTED

| | Institution | | | |
|---|---|---|---|---|
| | Galleries | Libraries | Archives | Museums |
| Official Website | 1 | 1 | 1 | 1 |
| Online Catalogue | 2 | 2 | 2 | 2 |
| Facebook | 3 | 3 | 3 | 3 |
| Twitter | 4 | 4 | 4 | 4 |
| Instagram | 5 | 5 | 5 | 5 |
| Flickr | 6 | 6 | 6 | 6 |
| Podcast | 7 | 7 | 7 | 7 |
| Mobile app | 8 | 8 | 8 | 8 |
| Blog | 9 | 9 | 9 | 9 |
| Crowdsourcing | 10 | 10 | 10 | 10 |
| Other online channel | 11 | 11 | 11 | 11 |
| Don't know | 12 | 12 | 12 | 12 |

| | | | | |
|---|---|---|---|---|
| I have not used any of these channels to access this institution within the last 12 months | 13 | 13 | 13 | 13 |

**F2** Please indicate approximately how many times per month you use these online channels to access GLAMs (i.e. the number of online sessions in an average month). Select all the online channels you have used.

Ignore those channels you have not used. If you have not used any of these channels, you may select the last check box in each column.

For each channel you select, an open box will appear. Please provide an estimate in that box of how many times you use that online channel to access the institution in an average month.

If you think you use that channel less than once in an average month, tick the "less than once a month" box.

As above, just give your best estimate.

MULTIPLE RESPONSE WITH OPEN TEXT BOX APPEARING WHEN LIST ITEM IS SELECTED

| | Institution | | | |
|---|---|---|---|---|
| | Galleries | Libraries | Archives | Museums |
| Official Website | 1 | 1 | 1 | 1 |
| Online Catalogue | 2 | 2 | 2 | 2 |
| Facebook | 3 | 3 | 3 | 3 |
| Twitter | 4 | 4 | 4 | 4 |
| Instagram | 5 | 5 | 5 | 5 |
| Flickr | 6 | 6 | 6 | 6 |
| Podcast | 7 | 7 | 7 | 7 |
| Mobile app | 8 | 8 | 8 | 8 |
| Blog | 9 | 9 | 9 | 9 |
| Crowdsourcing | 10 | 10 | 10 | 10 |
| Other online channel | 11 | 11 | 11 | 11 |
| Don't know | 12 | 12 | 12 | 12 |
| I have not used any of these channels to access this institution within the last 12 | 13 | 13 | 13 | 13 |

| | | | | |
|---|---|---|---|---|
| months | | | | |

**F3** Which online channels were most useful for you in completing the task that you were trying to achieve? Please rate them on a scale of 1-10, where 1 is “Not at all useful” and 10 is “Extremely useful.”

Give a higher rating to where you feel a channel has been more useful and a lower one where you feel it has been less useful.

For each channel you select, an open box will appear. Please provide your rating in that box.

As above, select all the channels you have used. Ignore those you have not used. If you don’t know or can’t say you may click “don’t know.” If you have not used any of these channels, you may select the last check box in each column.

MULTIPLE RESPONSE WITH OPEN TEXT BOX APPEARING WHEN LIST ITEM IS SELECTED

| | Institution | | | |
|---|---|---|---|---|
| | Galleries | Libraries | Archives | Museums |
| Official Website | 1 | 1 | 1 | 1 |
| Online Catalogue | 2 | 2 | 2 | 2 |
| Facebook | 3 | 3 | 3 | 3 |
| Twitter | 4 | 4 | 4 | 4 |
| Instagram | 5 | 5 | 5 | 5 |
| Flickr | 6 | 6 | 6 | 6 |
| Podcast | 7 | 7 | 7 | 7 |
| Mobile app | 8 | 8 | 8 | 8 |
| Blog | 9 | 9 | 9 | 9 |
| Crowdsourcing | 10 | 10 | 10 | 10 |
| Other online channel | (Please specify) | (Please specify) | (Please specify) | (Please specify) |
| Don’t’ know | 12 | 12 | 12 | 12 |
| I have not used any of these channels to access this institution within the last 12 months | 13 | 13 | 13 | 13 |

**More about you (3 min)**

**G1** Which of the following best describes your current employment situation?

Full time employment 1

Part time employment 2

Self-employed 3

Looking after family 4

Student 5

Unemployed 6

Retired 7

Long term illness 8

Other (please specify) …… 9

Prefer not to say …… 10

**G2** Which income bracket best describes your individual gross income (before tax) over the past year? Include all sources of income (wage/salary, pensions etc.)

Less than $25,000 1

$25,001 - $50,000 2

$50,001- $75,000 3

$75,001 - $100,000 4

$100,001 - $200,000 5

Over $200,000 6

Prefer not to say 7

**G3** Do you identify as any of the following?

MULTIPLE RESPONSES ALLOWED

Indigenous person 1

Person with disability 2

Member of a visible minority 3

Newcomer to Canada (immigrant or refugee). 4

Prefer not to say 5

None of the above 6

**G4** In the past 12 months, did you do unpaid volunteer work for any organization?

Yes 1

No 2

Prefer not to say 3

**G5** Would you say that you know most, many, a few or none of the people in your neighbourhood?

Most 1

Many 2

A few 3

None. 4

Prefer not to say 5

**G6** How do you feel about your life as a whole right now?

Very dissatisfied 1

Dissatisfied 2

Neither satisfied nor dissatisfied 3

Satisfied. 4

Very satisfied 5

Prefer not to say 6

**G7** In general, would you say your health is:

Excellent 1

Very good 2

Good 3

Fair. 4

Poor 5

Prefer not to say 6

**G8** Thinking about the amount of stress in your life, would you say that most days are:

Not at all stressful 1

Not very stressful 2

A bit stressful 3

Quite a bit stressful. 4

Extremely stressful 5

Prefer not to say 6

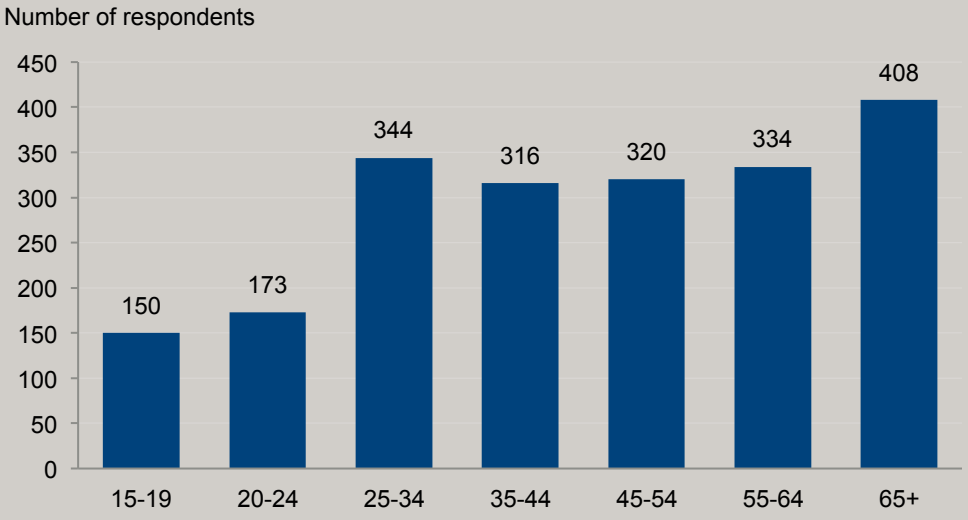
**End script:** *"Thank you for completing this questionnaire. We appreciate your time and wish you a pleasant day."*

# APPENDIX 7 DESCRIPTIVE STATISTICS ON QUESTIONNAIRE

Oxford Economics surveyed 2,045 Canadian residents during the Spring of 2019. To ensure all segments of the Canadian population were being accounted for, we adopted a quota sampling approach along the following dimensions:

- Gender;[165]
- Age band (as illustrated in Fig. 48);[166]
- Official language spoken (23% French and 77% English);[167]
- Highest educational attainment;[168] and
- Province and territory (as illustrated in Fig. 49).[169]

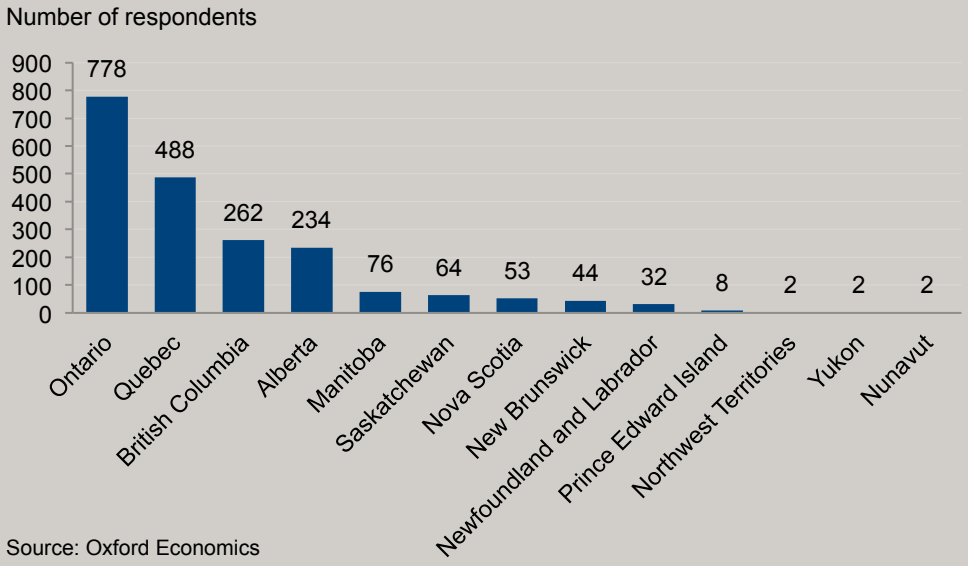
**Fig. 48. Respondents by age**




Source: Oxford Economics

[165] Statistics Canada, "Population estimates on July 1st, 2018, by age and sex"
[166] *Ibid.*
[167] Statistics Canada, "Census Profile, 2016 Census"
[168] *Ibid.*
[169] Statistics Canada, "Canada at a Glance 2018"

**Fig. 49 Respondents by province and territory**




Source: Oxford Economics

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