

Contribution of the Architectural Services Industry to Ontario's Economy

Independent Real Estate Intelligence

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EXECUTIVE SUMMARY

The architecture industry plays an important role and makes a significant contribution to Ontario's economy. The architectural services footprint in Ontario is much more than the spending and design associated with the architectural services industry and the vertical construction industry; it also encompasses spending in the architectural, engineering and related technologies education & training sector, spending by tourists whose travel to Ontario is significantly motivated by Ontario's architecture, as well as the economic benefits that all of these activities generate.

The architecture industry in Ontario creates and supports thousands of jobs and adds tremendous value to Ontario's gross domestic product (GDP) annually.

Economic activity from the architecture industry's entire footprint in Ontario totaled **\$128.4 billion, or 14% of Ontario's GDP**. The industry also **contributes \$65.4 billion to Ontario's GDP** and generates **\$43.0 billion in personal income** as well as **\$21.7 billion in business earnings**. In addition, the footprint of the architecture industry supports nearly **one million jobs** in Ontario.

The architectural services industry's expenditure in providing architectural and related services' contribution to the Ontario economy cannot be overlooked, as it produces **\$2.2 billion in annual economic activity**. These activities add to the economy in various ways by:

- Contributing **\$1.4 billion** to Ontario's GDP;
- Supporting **15,800 jobs each year**, many of which are high-paying jobs in professions and the trades;
- Generating **\$1.0 billion in personal income**, related to labour income and other sources of income; and
- Generating **\$450 million in business earnings** for small, medium and large companies.

Architectural services play a crucial role in supporting Ontario's construction industry. Every year, the construction sector generates about \$115.5 billion in economic activity and contributes about \$58 billion to Ontario's GDP. It also supports \$38.3 billion in personal income and \$19.5 billion in business earnings. There are 713,048 jobs that are supported by the construction sector in Ontario.

Ontario's architects also contribute to Ontario's prosperity in varied and significant ways. Building design is at the foundation of the aesthetic appeal, functionality, and environmental sustainability of buildings and the space in between. It is also instrumental in:

- Supporting the housing, workplace and recreational needs of Ontario residents;
- Contributing to the tourism and economic investment attractiveness of Ontario; and
- Influencing the construction and assessment values of our buildings, and therefore, the property taxes collected by governments.

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1 INTRODUCTION

The architectural services industry plays a critical role in Ontario's economy, particularly in its rapidly expanding real estate industry. The development and construction of buildings, and subsequently their daily operations, directly support thousands of jobs and add tremendous value to Ontario's gross domestic product (GDP). Although architectural services professionals represent a very small minority of the range of professionals and trades involved in bringing new buildings to life, they play an important and outsized role. Architectural designs are essential to the multi-billion dollar construction sector. In addition to building up and maintaining Ontario's infrastructure, the construction sector generates about \$58 billion per year, or 6.7% of Ontario's GDP. It is also a significant source of jobs, wages and government revenue. Ontario's physical infrastructure provides an important platform for economic growth, prosperity and social well-being.

While millions of Ontarians rely on buildings designed by the architectural industry for housing, commercial accommodation and recreation spaces, its fundamental value to our communities and economy can sometimes be overlooked.

Gaining an understanding of the extent of the economic contribution of an industry such as architectural services is of importance to multiple stakeholders. Policymakers, as well as municipal planners and politicians, can make smarter decisions and have an improved perspective on the industry with more information on its extent. Homeowners, contractors, developers, and private and public investors in Ontario will be better able to see how their decisions affect the industry and the millions of Ontarians who live, work and play in the properties designed by architects.

In 2017, Altus Group was approached by the Ontario Association of Architects (OAA) to prepare an analysis of the economic benefits of the architectural services industry and its contribution to the construction sector.

This report takes a comprehensive approach to assessing the economic contribution of the entire footprint of the architectural services industry in Ontario. This includes an assessment of the impact of spending associated with the provision of architectural services, the architectural education and training sector, tourism induced by architecture, and the vertical (building) construction sector:

- **The size and share of Gross Domestic Product (GDP);**
- **Jobs created, directly and indirectly;**
- **Jobs and economic activity** induced by the direct and indirect rounds of job creation;
- **Wage and salary income** generated by the direct and indirect jobs created;
- **Business earnings**, generated by the direct and indirect economic activity created; and
- **An array of other benefits to Ontario.**

1.1 Report Structure

The report contains the following four main sections:

- **Section Two** provides an economic profile of Ontario's architectural industry, including recent economic trends, and the economic indicators used in this report;
- **Section Three** estimates the economic benefits generated by the architectural footprint in Ontario, including economic activity, GDP, employment, income, and other benefits;
- **Section Four** provides a synopsis of other benefits of architecture, including the importance of good building design, architecture's contribution to the provision of residential and commercial accommodation for Ontario's residents and visitors; and
- **Section Five** is the conclusion.

In addition, appendices are provided with detailed tables and information on the methodology used in the report.

1.2 Research Methodology

The data in this report are derived from several sources, as listed below:

- **Statistics Canada:** Data on the operating revenue and expenses of architectural services, expenditures of students enrolled in architectural studies, investment in residential and non-residential building construction, the input-output model, and activities related to real estate management are sourced from Canada's national statistical agency, Statistics Canada;

- **Altus Group:** Site development and management fees estimates were derived from Altus Group Cost Consulting information. We estimated site development expenditures at about 6% of new residential construction costs, and management fees at about 3% of investment in residential apartments and investment in commercial and institutional buildings. Information also came from Altus Group's in-house databases for sale transactions of commercial real estate properties in Canada; and
- **Other Secondary Sources:** The analysis also uses data from Canada Mortgage and Housing Corporation (CMHC), The Ontario Association of Architects (OAA), and the Ontario Ministry of Tourism's "Travel Activities and Motivations" survey.

The methodology employed in this study has two major components:

- 1. Estimations of Direct Activity:** The estimates of economic activity within the various components of the industry draw heavily on data from Statistics Canada and other sources as described above. Where direct data are not available, estimates are calculated, based on appropriate indirect sources of information; and
- 2. Analysis of Spinoff Activity:** In addition to the direct activity (estimated in 1. above), it is important to consider two more rounds of spinoff economic activity, including the indirect (suppliers of goods and services to the architectural services industry and the construction sector) and induced (expenditure of income earned by the architectural services industry) rounds of activity. The analysis uses economic multipliers, which are derived from the Statistics Canada's Input-Output Model of the Ontario Economy. These multipliers are applied to the direct activity (estimated in 1. above) to determine total economic activity. The input-output approach is the most appropriate approach to use in undertaking a study such as this as it very carefully maps and tracks the detailed interrelatedness between all sectors of the economy. In this way, the model is able to track the impact of spending on the provision of architectural services, construction and building operations back to all aspects of the value chain.

A more detailed discussion of the Statistics Canada Input-Output model can be found in Appendix A.

1.3 Caveat

This analysis has been prepared on the basis of the information and assumptions set forth in the text. However, it is not possible fully to document all factors or account for all the changes that may occur in the future. This report relies on information from a variety of secondary sources. While every effort is made to ensure the accuracy of the data, Altus Group cannot guarantee the complete accuracy of the information used in this report from these secondary sources. This report has been prepared solely for the purposes outlined herein and is not to be relied upon or used for any other purposes or by any other party without the prior written authorization of Altus Group Limited.

2 PROFILE OF ONTARIO'S ARCHITECTURAL INDUSTRY

This section provides an overview of economic indicators used in this report to illustrate recent trends in the architecture industry and measure its contribution to the Ontario economy i.e. industry revenues, employment etc. It also explains how architectural services and the overall footprint of architecture-related spending in Ontario make a significant contribution to the economy and social well-being of Ontario and its residents.

2.1 Economic Benefits Measured by This Report

This report analyzes economic benefits of the architectural industry in Ontario as well as its broader footprint, which is comprised of architecture building design and other related services, education and training, tourism, and construction. The various benefits are generated by four major components of the industry:

- **The architectural services provided by the members of the OAA are essential components of construction activity:** The planning, design, site development and construction and/or renovation of various buildings contribute directly to the Ontario economy and generate substantial “spinoff” benefits. The operating expenditure of the architecture industry also has a multiplier effect on provincial economic activity: operating expenditure, including salaries, wages, commissions and benefits, as well as professional, administrative and rental, leasing and accommodation expenditure, generate notable economic benefits annually;
- **The architectural education and training sector;**
- **Tourism spending** induced by visitors to Ontario that are attracted by the province’s architecture generates billions of dollars in economic activity and related economic and social benefits; and
- **Investment spending of the construction sector** generates a significant contribution to Ontario’s economy annually.

To quantify the economic contribution of the architecture industry and construction sector, this report focuses on several economic parameters, including:

- **Economic Activity:** The volume of goods and services consumed in the economy that are related to the provision of architectural services such as sub-contracting professional services to other design professionals and both residential and non-residential construction investment;
- **Contribution to GDP:** The value-added component of the economic activities, quantified by the contribution of the activities to Ontario's Gross Domestic Product (GDP);
- **Jobs:** The number of jobs generated from the activities of architectural services and construction, including both direct and spinoff jobs;
- **Income:** The volume of income generated through these various economic activities, including: wages, other labour earnings, mixed-income, and corporate profits; and
- **Government Tax Revenues:** Federal and provincial tax revenues, primarily personal and corporate income taxes, and other payroll deductions.

2.2 The Architectural Services Industry

The architecture industry plays an important role in Ontario's economy. The design and construction of residential, industrial, commercial, institutional and government buildings and their daily operations directly support thousands of jobs each year. The construction sector also provides housing and workplaces to millions of Ontarians, while architecture students in Ontario and the educational infrastructure established for their training make a noteworthy economic contribution.

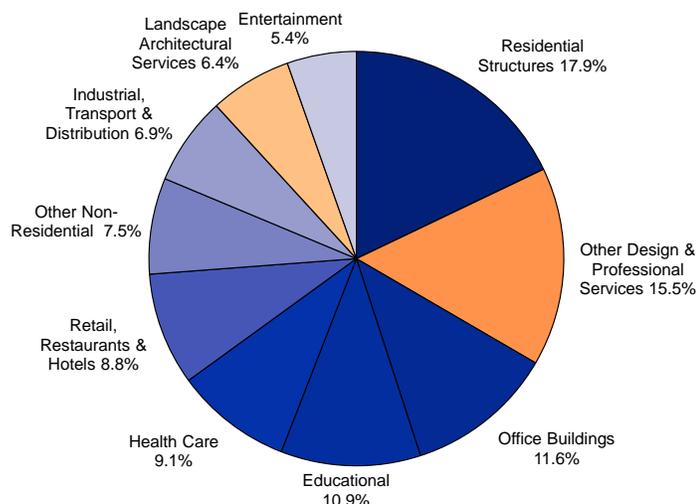
Architectural companies, architects and other professionals involved in the provision of architectural services generate significant economic activity in Ontario as they compensate employees; pay utilities, office expenses, and rental and leasing fees; advertise and sub-contract services to other construction design service providers such as landscape architects, engineers, and interior designers.

2.2.1 Distribution of Operating Revenue by Type for Architectural & Landscape Architectural Services

Figure 1 shows the distribution of operating revenue by type of service, earned from the provision of architectural services, landscape architectural services, and other design & professional services¹ (for Canada).

Figure 1

Distribution of Operating Revenue by Type for the Architectural & Landscape Architectural Services Industries, 2016 (Canada)



Source: Altus Group Economic Consulting based on data from Statistics Canada

The analysis is based on data from Statistics Canada's Annual Survey of Service Industries and shows the following trends:

- The architectural services industry generated 78.1% of the total industry operating revenue of architectural services and landscape architectural services in 2016. Landscape architects (6.8%) and other design and professional services (15.5%) accounted for the other 21.9% of industry operating revenue.
- The majority of the operating revenue earned from the provision of architectural services (about 57% of total industry operating revenue) is from the design of non-residential structures; and
- The largest sources of operating revenue from non-residential structures are the design of office buildings (11.6%), education

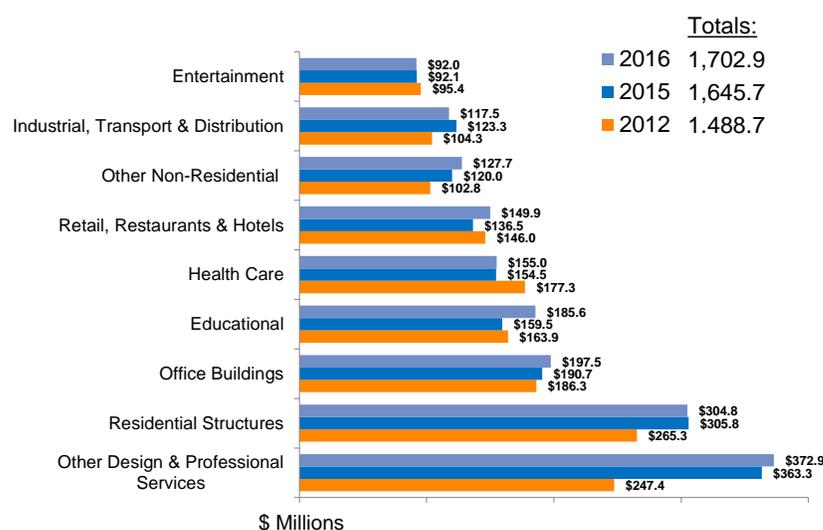
¹ Services include urban planning, project site master planning, interior design, engineering and other services.

institutions (10.9%), healthcare institutions (9.1%), and retail, restaurant and hotel establishments (8.8%).

Figure 2 shows the operating revenue of architectural and landscape architectural services by type of service in 2016, 2015 and 2012. It provides a comparative illustration of the growth in operating revenues over a five-year period as well as over the last two years.

Figure 2

Ontario Architectural Services Operating Revenue by Type of Service



Source: Altus Group Economic Consulting based on data from Statistics Canada

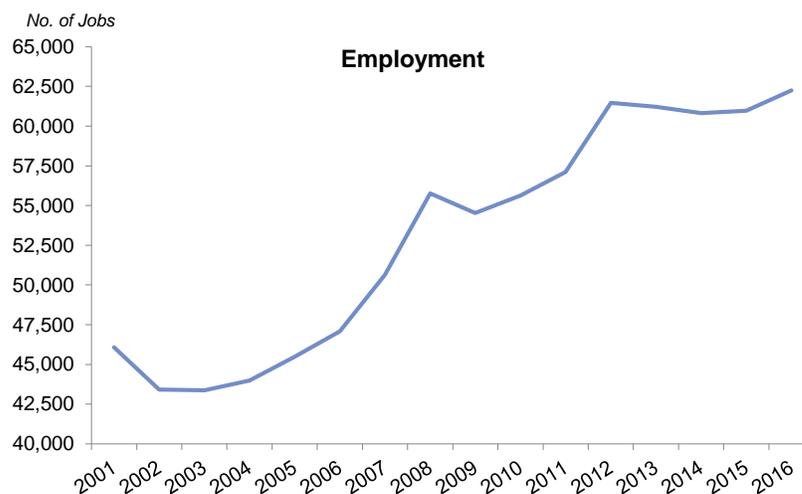
- In 2016, the architectural and landscape architectural services industry earned \$1.7 billion in operating revenue, of which 87% was generated by architectural services.
- Operating revenue of the architectural and landscape architectural services industry increased by 3.6% in 2016 compared with the previous year, and by 14.3% compared with five years earlier (i.e. at an annual compound growth rate of 3.4%).
- Over the five-year period, operating revenue grew by all types of services, with the exception of healthcare building design and the design of entertainment, recreational and cultural venues. The decline in operating revenue from the design of healthcare buildings was most significant (-12.6%) and is reflective of the government's health care infrastructure planning cycle.

2.2.2 Jobs Profile of Architectural, Engineering and Related Services Industry in 2016

- Architects are categorized by the Labour Force Survey as part of a broader group of professionals including engineers and related services, a category which accounted for some 60,250 jobs in Ontario in 2016. Roughly 16,170 of those jobs were created since 2001, representing industry employment growth of about 35% between 2001 and 2016. In comparison, during the same period, job growth in Ontario was about 23% (Figure 3);
- Architectural, engineering and related services represent about 10% of science, technology, engineering and mathematics and computer science (STEM) jobs in Ontario. STEM jobs are drivers of innovation, competitiveness and economic growth, and are an important component of Ontario's innovation ecosystem. Over the past five years, the unemployment rate among STEM professional has been about 4 percentage points below Ontario's unemployment rate, 1.9%, compared with 6.0% in 2017.

Figure 3

Employment – Architectural, engineering and related services, 2001 to 2016



*Includes engineering and related services employment

Source: Altus Group Economic Consulting based on data from Statistics Canada and CMHC

- In 2016, average hourly earnings for Ontario's architectural, engineering and related services employees were \$29.77, excluding overtime (up 30% from 2001 and 10% from 2009).

- For a 38.9 hour work week, average income in the industry is estimated at \$60,219 annually, 12% lower than Ontario's average employment income for full-year, full-time workers.³

2.2.3 *Number of Architectural Services Firms and Firm Size Distribution*

There are over 6,270 registered employers in architectural, engineering and related services in Ontario; of those, there are 1,031⁴ architectural services firms. The majority (i.e. 1,021) of Ontario's architectural services firms are small firms with 0-99 employees. The other firms include nine medium-sized firms with 100-499 employees, and one large firm with 500+ employees.

In addition, we have estimated that there are approximately 687 architectural services firms or sole proprietors registered in Ontario that don't have employees.

2.3 **Architectural Education and Training Sector**

There were 94,071 students enrolled in architecture, engineering, and related technologies programs at Ontario's colleges and universities in 2016. Over 60% of those students were university students and almost 40% were college students.

The tuition fees of architecture students account for about 30% of related post-secondary revenue and expenditure. With per-student architecture and related technologies tuition fees averaging \$8,700 a year, it is estimated that some \$29,000 per student is spent by the architecture post-secondary education sector per year.

Gross post-secondary spending in Ontario to educate and train students of architecture, engineering, and related technologies is about \$2.7 billion.

Another \$1.4 billion is spent on the non-tuition expenses of university and college students, including accommodation, food, books and other supplies⁵.

Altus Group estimates that every year, almost \$4.1 billion is spent in the post-secondary education sector on the educational, training, and related living costs of architecture, engineering, and related technologies students.

³ Based on Statistics Canada's Job Vacancy and Wage Survey

⁴ Source: Statistics Canada Business Register

⁵ University students in Ontario spend up to \$15,000 a year on non-tuition expenses.

2.4 Architecture Tourism

The architecture of buildings is one of the attractions of arts and culture tourists. It is also an important feature of all buildings involved in the tourism infrastructure of most destinations. These buildings include airports, hotels, museums and art galleries, heritage buildings, entertainment venues, restaurants, and of course, iconic buildings and landmarks.

Arts and culture tourists are visitors who are motivated to travel in order to visit historic sites; patronise museums, art galleries, and art performances; and attend festivals, fairs and attractions. In 2010, Ontario hosted 9.5 million tourists who took part in arts and culture activities.⁶ This represented over one-fifth of the 42.8 million overnight trips to Ontario. Of these arts and culture tourists, 66% were Canadians, 23% were Americans, and 11% were from other countries. Arts and culture tourists outspent typical overnight tourists in Ontario at a rate of two-to-one, grossing \$4.1 billion, or 36% of total spending by all overnight tourists.

In 2010, these tourists contributed \$3.7 billion to Ontario's GDP and generated or supported 67,700 jobs and \$2.4 billion in wages as a result of their spending.

The Ontario Ministry of Tourism's 2007 "Travel Activities and Motivations" survey⁷ provides more details about the trip motivations and demographics of arts and culture tourists. According to a 2012 Ontario Arts and Culture Tourism Profile, North American arts and culture tourists who travelled to Ontario in 2010 were "likely drawn from the pool of all North American tourists who have been to Ontario over a two-year span and were motivated to take a trip by an arts or cultural activity".

Of the 20.8 million North Americans with Ontario travel experience, 89% have participated in an arts or cultural activity as one of their many travel activities on trips taken over a two-year period. Visiting historic sites or strolling in cities to see architecture was a significant motivator for 61% of North Americans who have visited Ontario. However, for almost one-fifth of

⁶ 2012 Ontario Arts and Culture Tourism Profile.

⁷ This survey examined out-of-town, overnight travel behaviour of one or more nights over the 2005-2007 period and provided detailed information on Travelers' activities, travel motivators, places visited, type of accommodation used, impressions of Canada, its provinces and territories, demographics and media consumption patterns. Mexico is excluded from the North American classification.

North Americans with Ontario travel experience, visiting historic sites and/or strolling through cities to see architecture was the main reason for travelling to Ontario. The single largest motivator to visit Ontario was a desire to visit historic sites and see architecture. We estimate that North American travellers to Ontario who were primarily motivated by Ontario's historic sites, museums and architecture spent \$1.9 billion in 2010.

2.5 Construction

The vast majority of buildings built in Ontario are designed by architects and in many cases other architectural services critical to the development processes. Architects and the services that they provide are vital to Ontario's construction industry. Ontario's construction sector is an important component of Ontario's economy, and a range of economic benefits are generated from Ontario's vertical construction industry (i.e. building construction). Construction spending includes the residential and non-residential construction investment, site development expenditures, and management fees.

3 ESTIMATED ECONOMIC CONTRIBUTIONS

This section presents the economic benefits arising from the contribution of architects to the Ontario economy, including the benefit of spending arising from the provision of architectural services, sub-contractors, professionals, etc.

The non-tax benefits are calculated using multipliers derived from Statistics Canada's Interprovincial Input-Output Model of the Canadian Economy, and it is recognized that there are three "rounds" of activity:

- The direct round (actual economic activities and actual jobs within the multi-family rental sector); and
- Two spinoff rounds: the indirect (providers of goods and services to the sector) and the induced (economic activity and jobs related to the spending of incomes earned by workers in the sector).

In this section, economic benefits are generally expressed as direct impacts (the direct round) and "total impacts" – all three rounds.

A detailed description of the input-output model methodology is provided in Appendix A.

3.1 Economic Benefits Associated with the Architectural Footprint in Ontario

The architectural services footprint in Ontario is much more than the spending and design associated with the architectural services industry and the vertical construction industry; it also encompasses spending in the architectural, engineering and related technologies education & training sector, spending by tourists whose travel to Ontario is significantly motivated by Ontario's architecture, as well as the economic benefits that all of these activities generate.

The architectural footprint in Ontario results in billions of dollars of spending and economic activity that generates many more billions of dollars of Gross Domestic Product (GDP), personal income, and business earnings, as well as hundreds of thousands of direct, indirect and induced jobs. These significant economic benefits to the Ontario economy are built up from the spending and economic impact of:

- Architectural services;
- Architectural education and training sector;

- Tourism induced by architecture; and
- Vertical (i.e. building) construction.

Ontario's architectural footprint delivers significant economic benefits annually by generating:

- About **956,500 person-years** of direct, indirect and induced employment;
- About **\$128.4 billion** in direct, indirect and induced economic activity, contributing 14% of Ontario's GDP;
- About **\$65.4 billion** in net contribution to GDP;
- About **\$43.0 billion** in personal income tied to the creation of direct, indirect and induced jobs; and
- Some **\$21.7 billion** in operating business earnings (Economic Benefits of Ontario's Architectural Services).

Direct jobs and economic activity result from spending associated with architectural services; architectural education, training and related accommodations and amenities; tourism induced by architecture; and the vertical construction industry.

Figure 4 Estimated Economic Benefits of the Architecture Industry in Ontario

	Overall Architectural Footprint	Components of Architectural Footprint			
		Architectural Services	Education & Training	Tourism	Construction
Economic Activity (\$millions)	128,408	2,249	7,309	3,316	115,534
Gross Domestic Product (\$millions)	65,355	1,362	4,482	1,579	57,932
Number of Jobs*	956,525	15,787	157,619	70,071	713,048
Wages (\$millions)	42,961	1,001	2,669	994	38,298
Business Earnings (\$millions)	21,698	451	1,306	430	19,512

* Person-years of employment

Source: Altus Group Economic Consulting based on Input / Output Model and Other Sources

3.2 Economic Benefits of Ontario's Architectural Services Industry

Ontario's architectural services industry designs and contributes to the construction of residential, industrial, commercial, institutional and government buildings. These daily operational activities directly support thousands of jobs each year.

Architectural companies, architects and other professionals involved in the provision of architectural services generate significant economic activity in Ontario as they compensate employees; pay utilities, office expenses, and rental and leasing; advertise and sub-contract services to other construction design service providers, such as landscape architects, engineers, and interior designers.

The operating expenditures of the architectural services industry deliver annual economic benefits by generating:

- About **15,800 person-years** of direct, indirect and induced employment;
- About **\$2.2 billion** in direct, indirect and induced economic activity;
- About **\$1.4 billion** in net contribution to GDP;
- About **\$1.0 billion** in personal income tied to the creation of direct, indirect and induced jobs; and
- Some **\$451 million** in operating business earnings (Figure 5).

Direct jobs and economic activity also results from operating expenditures incurred in the provision of architectural services.

Figure 5

Estimated Economic Benefits of Architecture Industry in Ontario

	Direct	Indirect	Induced	Total
Economic Activity (\$millions)	1,238	499	512	2,249
Gross Domestic Product (\$millions)	783	278	301	1,362
Number of Jobs*	9,131	3,346	3,310	15,787
Wages (\$millions)	650	210	140	1,001
Business Earnings (\$millions)	207	102	142	451

* Person-years of employment

Source: Altus Group Economic Consulting based on Input / Output Model and Other Sources

3.3 Economic Benefits of Ontario's Architectural Education, Training & Related Spending

Ontario's education and training infrastructure for the architectural, engineering and related technology services industries is responsible for billions of dollars of spending and economic activity and thousands of jobs. The over 94,000 architecture, engineering, and related technologies students enrolled in Ontario's colleges and universities are supported by an education

and training ecosystems that generates about \$4.1 billion in annual spending, or \$44,000 per student. Spending includes expenditure on tuition, academic and research grants, public and private sector investments, student accommodation, meals, supplies, amenities and other living expenses of students.

Spending in Ontario's architectural education and training sector delivers annual economic benefits by generating:

- About **157,600 person-years** of direct, indirect and induced employment;
- About **\$7.4 billion** in direct, indirect and induced economic activity;
- About **\$4.5 billion** in net contribution to GDP;
- About **\$2.7 billion** in personal income tied to the creation of direct, indirect and induced jobs; and
- Some **\$1.3 billion** in operating business earnings (Figure 6).

Direct jobs and economic activity result from the architectural education and training sector.

Figure 6

Estimated Economic Benefits of Architectural Education, Training & Related Spending in Ontario

	Direct	Indirect	Induced	Total
Economic Activity (\$millions)	4,139	1,178	1,992	7,309
Gross Domestic Product (\$millions)	3,043	635	804	4,482
Number of Jobs*	39,173	8,045	110,400	157,619
Wages (\$millions)	1,982	441	247	2,669
Business Earnings (\$millions)	923	258	124	1,306

* Person-years of employment

Source: Altus Group Economic Consulting based on Input / Output Model and Other Sources

3.4 Economic Benefits of Architecture Related Tourism Spending

The single largest motivator to visit Ontario among many tourists is a desire to visit historic sites and see architecture. The architecture of Ontario's built environment is a magnet for tourists, especially those that are attracted to the unique features of the province, its cities and iconic structures and heritage buildings. Altus Group estimates that North American travellers to Ontario who were primarily motivated by Ontario's historic sites, museums and

architecture spent around \$1.9 billion across Ontario. This spending by tourists that are drawn to Ontario mainly by its architecture delivers annual economic benefits by generating:

- About **70,100 person-years** of direct, indirect and induced employment;
- About **\$3.3 billion** in direct, indirect and induced economic activity;
- About **\$1.6 billion** in net contribution to GDP;
- About **\$994 million** in personal income tied to the creation of direct, indirect and induced jobs; and
- Some **\$430 million** in operating business earnings (Figure 7).

Direct jobs and economic activity result from spending by tourists whose travel to Ontario is significantly motivated by its architecture.

Figure 7

Estimated Economic Benefits of Tourism Spending Induced by Architecture in Ontario

	<u>Direct</u>	<u>Indirect</u>	<u>Induced</u>	<u>Total</u>
Economic Activity (\$millions)	1,700	792	824	3,316
Gross Domestic Product (\$millions)	905	417	257	1,579
Number of Jobs*	17,962	5,188	46,921	70,071
Wages (\$millions)	595	317	82	994
Business Earnings (\$millions)	236	158	36	430
Tax Revenue (\$millions)				

* Person-years of employment

Source: Altus Group Economic Consulting based on Input / Output Model and Other Sources

3.5 Economic Benefits of Ontario's Construction Sector

The vast majority of buildings built in Ontario are designed by architects and in many cases other architectural services critical to the development processes. Architects and the services that they provide are vital to Ontario's construction industry. Ontario's construction sector is an important component of Ontario's economy, and a range of economic benefits are generated from Ontario's vertical construction industry (i.e. building construction).

Below are estimates of the jobs, economic activity, personal income, and business earning that are sustained or generated annually as a result of the

residential and non-residential construction activity, site development expenditures, and management fees:

- Approximately **713,000 person-years** of direct, indirect and induced employment;
- About **\$115.5 billion** in direct, indirect and induced economic activity;
- Some **\$57.9 billion** in total net contribution to GDP;
- About **\$38.3 billion** in personal income from the creation of direct, indirect and induced jobs; and
- Some **\$19.5 billion** in total operating business earnings (Figure 8).

Figure 8

Estimated Economic Benefits of Ontario's Construction** Sector and Development Activities

	<u>Direct</u>	<u>Indirect</u>	<u>Induced</u>	<u>Total</u>
Economic Activity (\$millions)	64,595	31,603	19,336	115,534
Gross Domestic Product (\$millions)	30,951	15,631	11,350	57,932
Number of Jobs*	379,876	204,747	128,425	713,048
Wages (\$millions)	22,427	10,589	5,281	38,298
Business Earnings (\$millions)	8,954	5,208	5,350	19,512

* Person-years of employment

** Excluding engineering

Source: Altus Group Economic Consulting based on Input / Output Model and Other Sources

4 OTHER BENEFITS

4.1 Good Design of Buildings

There are many potential benefits of well-designed buildings as a result of a design from a qualified architect, including:

- The improvement of indoor environmental quality (IEQ) can reduce respiratory illnesses, allergies and asthma (8% to 25% decrease in symptoms), and reduce sick building syndrome symptoms (20% to 50% decrease in symptoms) for the patrons of the building.⁸
- Good building design can reduce future operating and maintenance costs.⁹
- The life expectancy of a building can be increased with good design and regular maintenance.¹⁰
- Good building design can improve safety and reduce crime.¹¹

4.2 Residential and Commercial Accommodation

- In 2016, the construction sector produced and added 121.4 million square feet of new residential and commercial accommodation to the existing stock of residential, commercial, and government & institutional buildings; the categories which accommodate most of Ontario's 6.2 million employees.

⁸ Center for Environmental Design Research at the College of Environmental Design, *Benefits of Improving Occupant Comfort and Well-being in Buildings*, Berkeley USA

⁹ Government of Western Australia, *Good Design Guide*, February 2013

¹⁰ Journal of Building Appraisal, *Implications of Design Deficiency on Building Maintenance at Post-Occupational Stage*, August 2007

¹¹ Commission for Architecture & the Built Environment, *The Value of Good Design*, London UK, 2002

5 CONCLUSION

The architecture industry plays an important role and makes a significant contribution to Ontario's economy. The architectural services footprint in Ontario is much more than the spending and design associated with the architectural services industry and the vertical construction industry; it also encompasses spending in the architectural, engineering and related technologies education & training sector, spending by tourists whose travel to Ontario is significantly motivated by Ontario's architecture, as well as the economic benefits that all of these activities generate.

The architecture industry in Ontario creates and supports thousands of jobs and adds tremendous value to Ontario's gross domestic product (GDP) annually.

Economic activity from the architecture industry's entire footprint in Ontario totaled \$128.4 billion or 14% of Ontario's GDP. The industry also contributes \$65.4 billion to Ontario's GDP, generates \$43.0 billion in personal income, and generates \$21.7 billion in business earnings. In addition, the footprint of the architectural industry supports nearly one million jobs in Ontario.

Architectural services play a crucial role in supporting Ontario's construction industry. Every year, the construction sector generates about \$115.5 billion in economic activity and contributes about \$58 billion to Ontario's GDP. It also supports \$38.3 billion in personal income and \$19.5 billion in business earnings. There are 713,048 jobs that are supported by the construction sector in Ontario.

Ontario's architects also contribute to Ontario's prosperity in varied and significant ways. Building design is at the foundation of the aesthetic appeal, functionality, and environmental sustainability of buildings and the space in between. It is also instrumental in supporting the housing, workplace and recreational needs of Ontario residents; contributing to the tourism and economic investment attractiveness of Ontario, influencing the construction and assessment values of our buildings, and therefore the property taxes collected by governments.

Glossary

Capital Investment in Vertical Construction (buildings) — A term that represents investment in the erection, assembly, and completion of free-standing and static buildings in the residential, industrial, commercial and/or institutional sectors, generally on a permanent foundation, bedding or location. It includes both new construction and renovation:

- **New Construction Investment** — spending that includes capital investment in construction of new buildings and major additions to existing buildings.
- **Capital Improvement** — spending that includes capital investment related to the alteration and improvements of existing buildings.

Economic Impact — the generation of new spending and the creation of new jobs within a jurisdiction as a result of new economic activity in a specific sector. Generally, there are three “rounds” of economic impact:

- **Direct Impact** — effects of economic activity directly related to the subject sector. Here, it means the multi-family rental sector.
- **Indirect Impact** — effects are related to economic activity in industries providing goods and services to the companies directly involved in the particular sector.
- **Induced Impact** — effects are generated from the expenditure of incomes generated in the direct and indirect rounds.

Note: collectively the ‘indirect’ and ‘induced’ rounds are referred to as economic “**spinoff**” activities.

Economic Parameters — a set of statistical measurements that can illustrate a sector’s impacts on the economy. In this report, they include:

- **Economic Activity** — the volume of goods and services consumed in the economy related to the development, construction and ongoing operation of the office real estate sector.
- **Contribution to GDP** - the value-added component of the economic activities, a measure of the contribution of the activities to Canada’s GDP.
- **Jobs** - in this report, the term “jobs” is close to but not the same as “person-years of employment.” The estimate of jobs provides the

number of workers that would be employed for a full-year; however, the estimate of person-years of employment includes both full and permanent part-time jobs.

- **Income** - the volume of income generated through various economic activities, with income including wages, other labour earnings, mixed-income, and corporate profits.
- **Government Tax Revenues** - federal and provincial tax revenues, primarily personal and corporate income taxes, and other payroll deductions such as Canadian Pension Plan contribution and Employment Insurance premium.

Full-Time Equivalent Jobs — represents the number of workers that would be employed for a full-year. Full-time equivalent jobs includes both full and permanent part-time jobs at the ratios appropriate for each of the industries involved. For example, two part-time jobs of twenty hours per week would be equivalent to one full-time equivalent job at forty hours per week.

Gross Domestic Product (GDP) — the total unduplicated value of the goods and services produced in the economic territory of a country or region during a given period.

Mixed-Income — this type of income consists of earnings of proprietors of unincorporated businesses (sole proprietorships and partnerships) such as retailers and consultants, earnings of independent professional practitioners such as lawyers and dentists, net (after expenses) rental income of owners of real property and the accrued net farm income of farm operators.

Multiplier — an input-output multiplier is a quantitative measure created by a particular input-output based economic model. It is an analytical answer to a hypothetical question about how a certain expenditure is expected to impact the economy.

Ongoing Operations of Properties - in this report, this term includes two categories of economic activity: brokerages fees and building management fees.

Sector – a grouping of industries or firms by similar characteristics of operations (e.g., retail trade sector, manufacturing sector, construction sector, mining sector, service sector, government sector).

Appendix A

Description of the Input-Output Model

Estimates for the economic impact of the current operations of the architectural sector are derived through the use of Statistics Canada's Input-Output Model of the Canadian Economy. The current model relates to the year 2010.

An input-output model is used to estimate the impacts of various types of economic activities. It is an accounting framework of an economy's production system. It shows the interconnections that exist between the various sectors of the economy when goods and services are produced. Using an input-output model, it is possible to determine which goods and services are required to achieve a certain production level in a particular industry – or the economy as whole.

There are generally said to be **three “rounds”** of impact:

- **Direct round** – jobs and economic activity directly related to the industry;
- **Indirect round** – jobs and economic activity connected to the supply chain supporting the industry; and
- **Induced round** – jobs and economic activity stimulated by the first two rounds.

Direct and Indirect Impacts

The model takes expenditure on a given economic activity and translates it into the impacts on various industries – and ultimately, the amount of income, economic output, GDP and jobs supported.

A key component of an input-output model is the set of “input structures” for each economic activity covered by the model. An input structure literally splits the original expenditure among all the different inputs that are used in that economic activity. For example, building construction involves expenditures within a variety of industries – wood, steel, concrete, various service industries, etc. Each of these industries has an input structure of its own that involves inputs from a variety of other industries plus labour and owners of firms in that industry.

The input structure used to account for the impact on various sectors takes into consideration the origin of the various inputs. The model, therefore, is able to segment the location of the impacts that will take place somewhere in

the province and those that take place elsewhere in Canada. Imported materials and services do not provide an economic impact with respect to their point of origin, but will contribute to the economy in terms of components of their value added that accrue on Canadian soil – such as transportation and wholesale and retail margins.

An input-output model includes a full array of input structures that have been estimated for all industries in the economy. Use of the model in this analysis involves estimating the impacts of new building construction. To generate these estimates, capital investment in construction is applied to the model.

Definition of Jobs Impact

Some of the findings are presented in terms of “jobs” generated. This is the term used by the Input-Output Division of Statistics Canada in its estimates of employment generated. The estimate of jobs provides the number of workers that would be employed for a full-year; however, the estimate includes both full and permanent part-time jobs at the ratios appropriate for each of the industries involved.

Induced Impact

Traditionally, there is thought to be an additional round of economic impact from an activity, referred to as an induced impact. This is the so-called Keynesian multiplier effect resulting from the expenditure of incomes generated in the first two rounds. The wages, salaries and other income that accrue to households as a result of the direct and indirect rounds will, in turn, generate economic activity as these households spend their incomes in the general economy.