Canadian Society of Landscape Architects (CSLA)

Report on the Value of Landscape Architecture in Canada

Appendix A: Quantitative Research

InterGroup CONSULTANTS

Appendix A

Appendix A summarizes the findings of the quantitative research conducted for the Report on the State of the Profession of Landscape Architecture.

Section A-1 reviews indicators analyzing landscape architecture employment and labour force characteristics classified under the National Occupation Classification System (NOC). This includes:

- The number of individuals employed in landscape architecture;
- The labour force status of individuals working in landscape architecture;
- The employment location quotient for provinces and metropolitan areas;
- The work activity of landscape architects;
- A forecast of future occupational supply of landscape architects; and
- The income of landscape architects.

Appendix A (continued)

Section A-2 reviews demographic variables of workers classified as landscape architects under the NOC. This includes:

- The level of education that landscape architects have obtained;
- A breakdown of landscape architects by age and gender; and.
- Details on the number of landscape architects who identify as a minority or as Indigenous.

Appendix A (continued)

Section A-3 summarizes business performance for firms classified as landscape architecture firms under the North American Industry Classification System (NAICS). This includes:

- The number of landscape architecture firms operating in Canada;
- The revenue, expense, and profit generated by landscape architecture firms;
- An estimate of gross domestic product produced by landscape architecture firms;
- Direct, indirect, and induced economic multipliers;
- The number of building permits issued annually; and
- The number of annual housing starts.

Section A-4 covers indicators analyzing the number of accredited landscape architecture program graduates.

Landscape Architecture Occupation Definition (NOC)

Landscape architects are classified by the Canadian government under the National Occupation Classification (NOC) system as code 21201 (2021) and 2152 (2016 and 2011). Occupational data used in this report was collected by Statistics Canada for through the Census of Population and National Household Survey. Landscape architects are defined by Statistics Canada as individuals who “conceptualize, design, plan and manage the construction of natural, cultural and built landscape development for commercial projects, office complexes, parks, golf courses and residential development” employed by governmental environmental and development agencies, landscape consulting firms, architectural and engineering consulting firms, or are self-employed. (Statistics Canada 2023a)

Landscape Architectural Services Industry Definition (NAICS)

Landscape architectural services are classified under the North American Industry Classification System (NAICS) as code 54132 or its only subcategory, 541320. Industry data contained in this report was collected by Statistics Canada in the Business Register Survey (BR), Annual Survey of Service Industries: Architectural Services (ARCH), and Financial and Taxation Statistics for Enterprises (AFTS).

NAICS classifies businesses by establishments, generally a single physical location or the smallest operating entity for which the appropriate records and data exist. Establishments are classified to an industry "when its principal activity meets the definition for that industry" based on the "relative share of value-added". (Statistics Canda 2023d)

Landscape architectural services are defined under the NAICS as establishments whose work primarily involves "planning, designing and administering the development of land areas for projects such as parks and other recreational areas, airports, highways, hospitals, schools, land subdivisions, and commercial, industrial and residential areas by applying knowledge of land characteristics, location of buildings and structures, use of land areas, and design of landscape projects". (Statistics Canada 2023e)

Statistics Canada Industry and Occupation Data Quality

Data obtained in this report is from a variety of Statistics Canada data products. The appropriate data sources are referenced under each figure. While Statistics Canada data is known to be of a high standard of data quality, Statistics Canada notes that there is the risk of some data being inaccurate.

In the Statistics Canada long-form census, occupation codes (NOC) are assigned to respondents based on self-reported “write-in descriptions of the respondents’ job title and main duties and responsibilities” while industry codes (NAICS) are matched to individuals based on self-reported “write-in responses describing the respondents’ employer name and type of business”.

There is a higher risk for landscape architecture industry and occupation data to experience quality issues as they exist at the most detailed level of NOC and NAICS classifiers. Errors due to poorly written responses as well as a high level of variability between samples may affect the data. (Statistics Canda 2023c)

For more information and limitations regarding Statistics Canada data please see the “Statistics Canada Data Limitations” section.

Statistics Canada Data Limitations

In some instances, Statistics Canda does not provide data at the landscape architecture business or occupation code levels. If data is not available at the landscape architecture level, data from a broader business or occupation code containing landscape architecture is used. It should be noted that the broader category code level may not necessarily be representative of the landscape architecture code level.

People who obtain landscape architect degrees may work in a variety of occupations such as golf course architecture, green roof and wall design, campus planning and design, urban design, transportation design and planning, housing site design, and park design and planning. (Michigan State University, n.d.) Under Statistics Canada's definition, these individuals may not be recognized under NOC 21201 or 2152 as landscape architects.

NAICS data on landscape architecture firms captures only firms whose primary line of business is landscape architecture. It will not capture multi-disciplinary firms who offer landscape architecture services but whose primary line of business is not landscape architecture.

Other limitations on Statistics Canada data are summarized in section A-5.

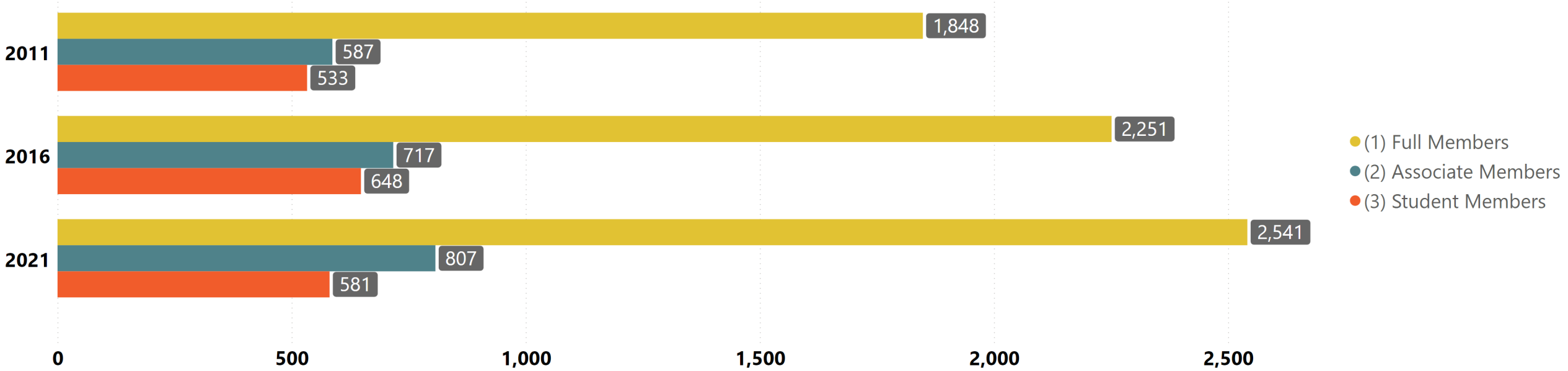
Appendix A-1: Employment and Labour Force Characteristics

Figure 1: Landscape Architecture Employment (2011-2021)

Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2011, 2016, and 2021 Census. Tables 9810044901, 98-400-X2016295, and 99-012-X2011033.

From 2016 to 2021, the number of landscape architects (LAs) in Canada grew from 2125 to 2135, an increase of 0.5%. This is down from the rate of increase seen between 2011 and 2016 of 22.5%.

Figure 2: Active Landscape Architecture Membership (2011-2021)

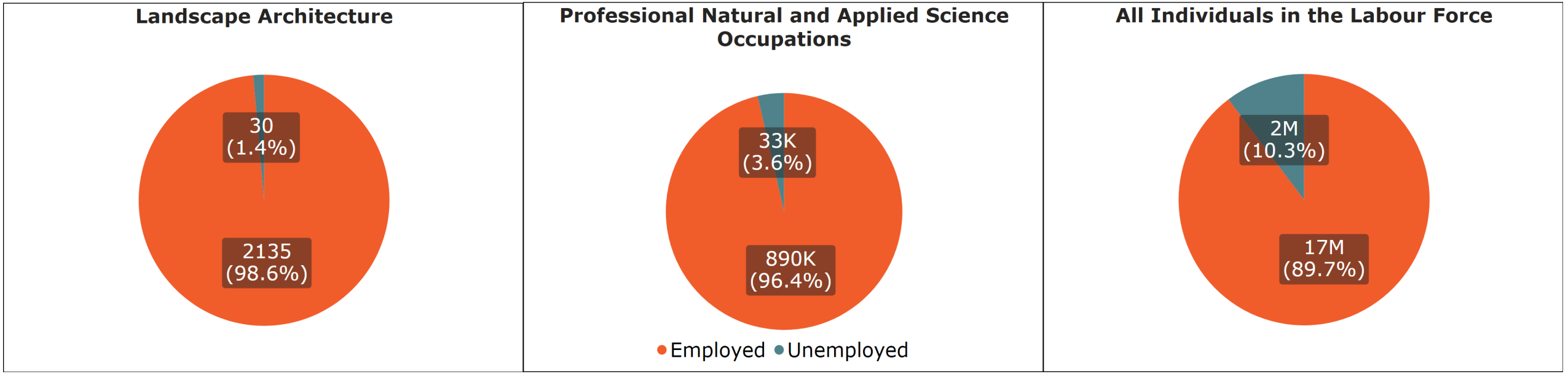


In cases of where data is missing, membership numbers are inputed from the average of prior and following years.
Source: CSLA 2023.

The number of full and associate CSLA members increased between 2011 and 2021. CSLA student membership increased between 2011 and 2016 before decreasing by 2021.

In 2021 the Ontario component (OALA) accounted for 49% of members, followed by British Columbia (BCSLA) with 18%, and Quebec (AAPQ) with 16% of members.

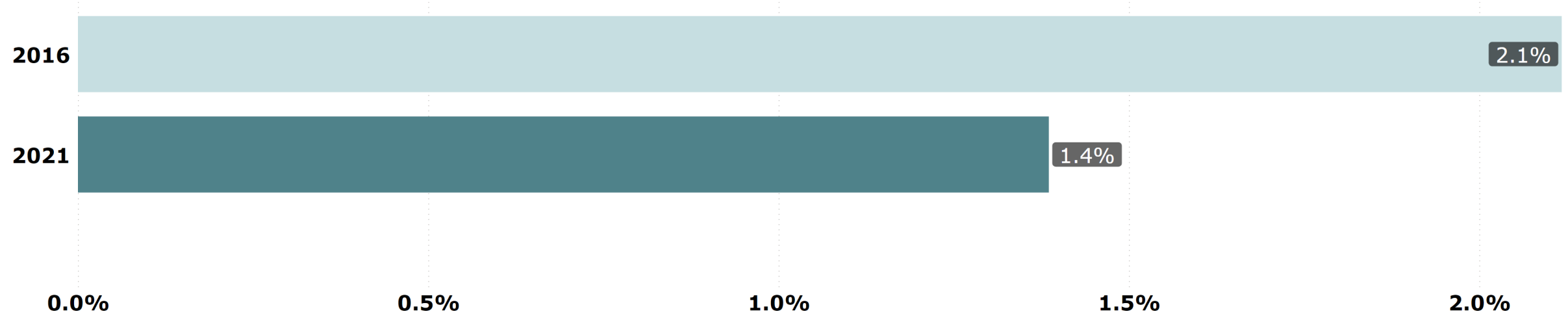
Figure 3: Labour Force Status (2021)



Includes individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

Landscape architects have a low rate of unemployment, measured at 1.4% in the 2021 Census. This compares favourably to the unemployment rate for natural and applied science occupations (3.6%) and the Canadian labour force as a whole (10.3%)

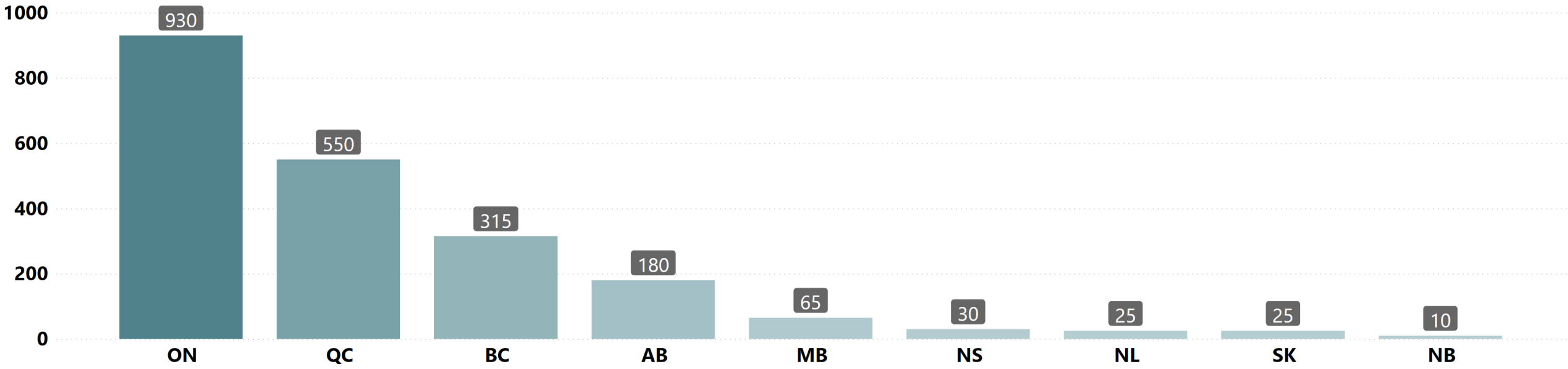
Figure 4: Landscape Architecture Unemployment Rate (2016-2021)



Includes individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2016 and 2021 Census. Tables 9810044901 and 98-400-X2016295.

From 2016 to 2021 the percentage of unemployed landscape architects decreased from 2.1% to 1.4%.

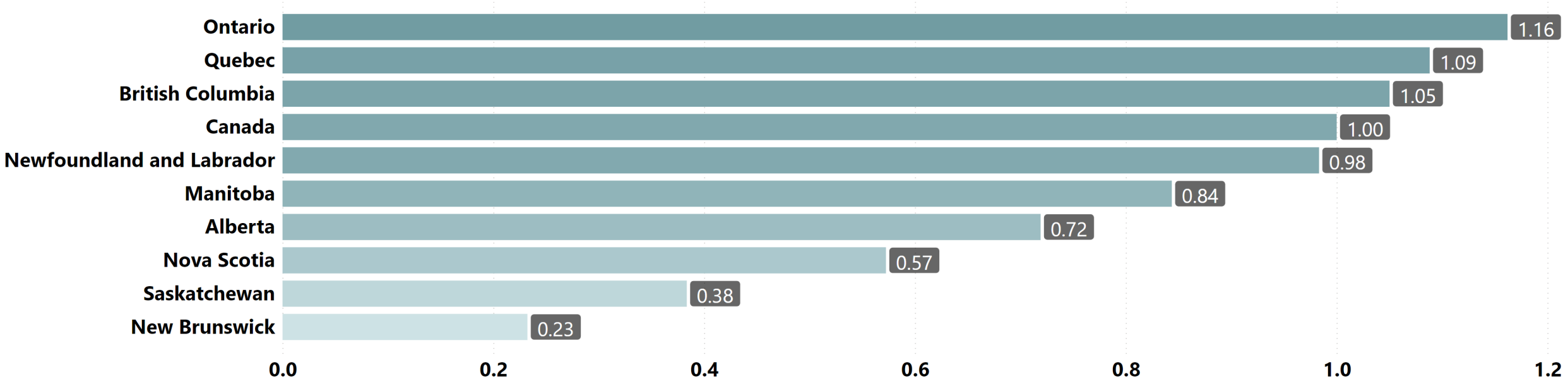
Figure 5: Landscape Architecture Employment by Province (2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

Nearly 70% of landscape architects employed in Canada reside in Ontario and Quebec compared to the Canadian labour force, where 61% reside in Ontario and Quebec. (Census Profile, Statistics Canada 2021 Census)

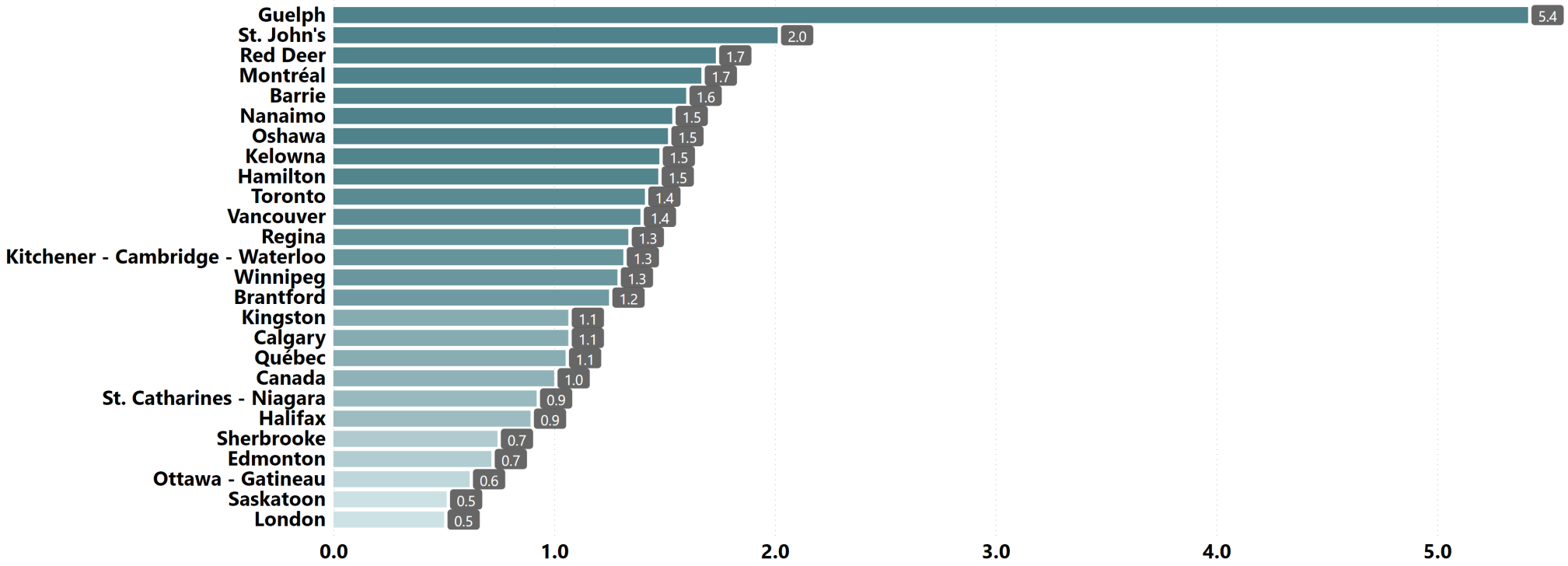
Figure 6: Landscape Architecture Employment Location Quotient (LQ) by Province (2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

ON, QC, and BC have above-average employment location quotients (see note 1), representing the concentration of landscape architects in those locations compared to the national average, while NL, MB, AB, NS, SK, and NB are below average.

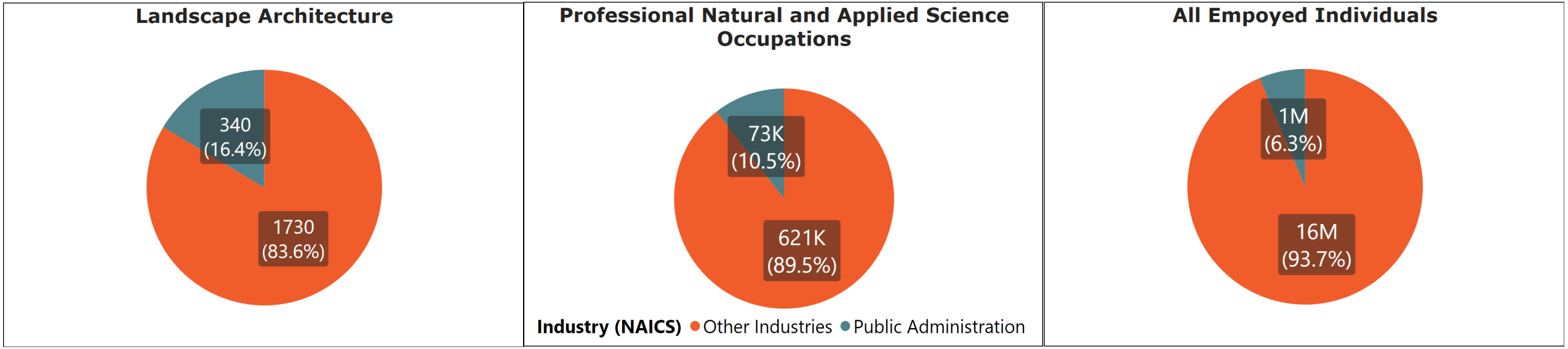
Figure 7: Landscape Architecture Employment LQ for Major Metropolitan Areas (Population > 100,000) (2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

Major metropolitan areas have higher employment location quotients (see note 1) than the Canadian average, indicating that the majority of landscape architecture businesses are located in major metropolitan areas.

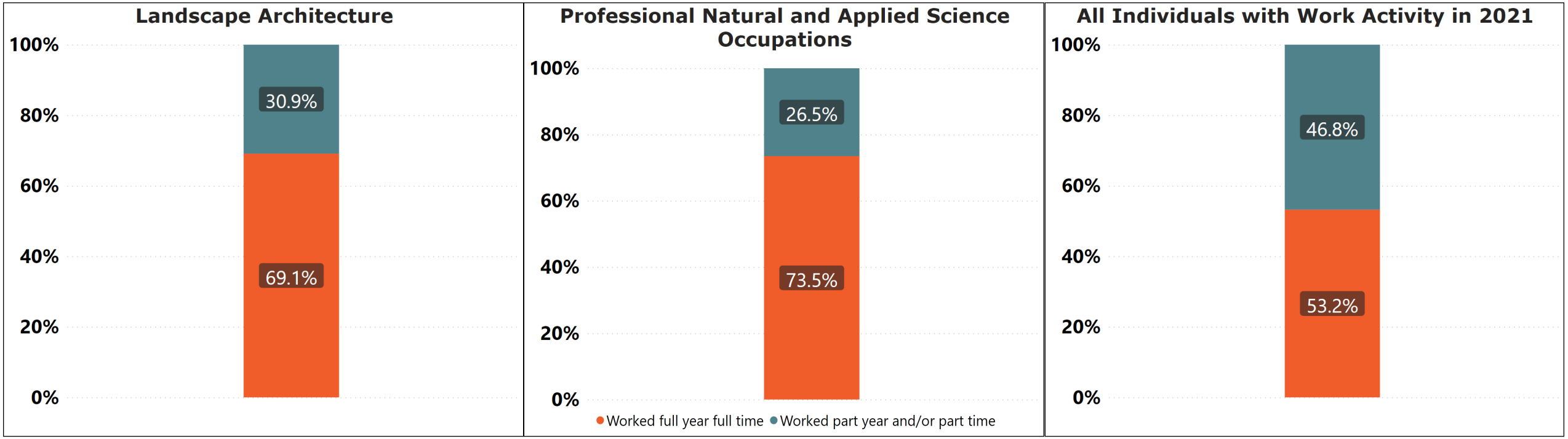
Figure 8: Public Administration Employment (2016)



Includes employed individuals in the labour force aged 15 years of age and older.
Public administration includes all establishments that are "primarily engaged in activities of a governmental nature" (Statistics Canada 2018). For more information on this classification see Note 2.
Source: Statistics Canada 2016 Census. Table 98-400-X2016298.

As of the 2016 Census, a higher percentage of landscape architects worked in public administration compared to other professional science occupations and the Canadian labour force as a whole.

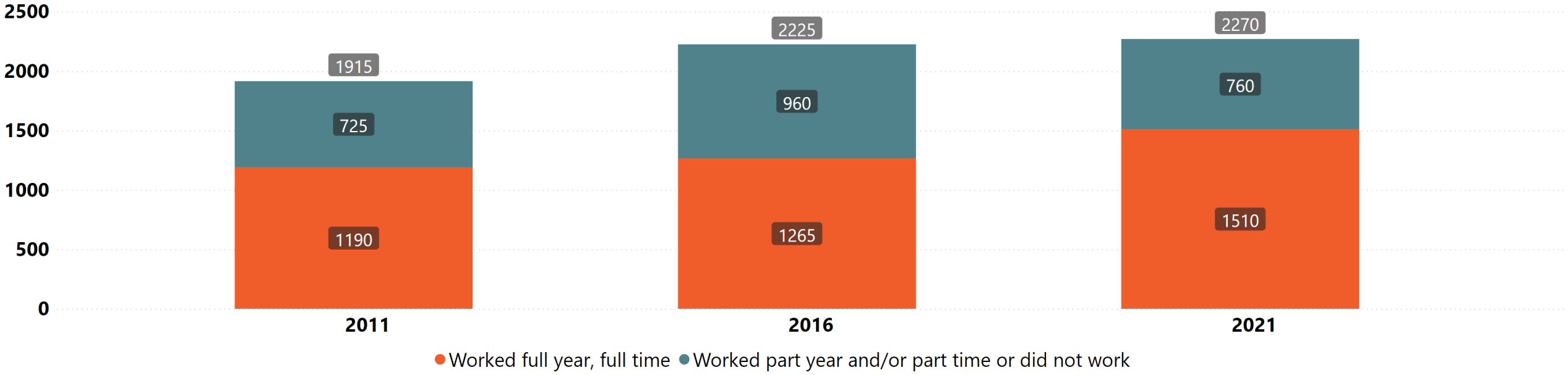
Figure 9: Work Activity (2021)



Includes individuals who had work activity in the reference year aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810041201.

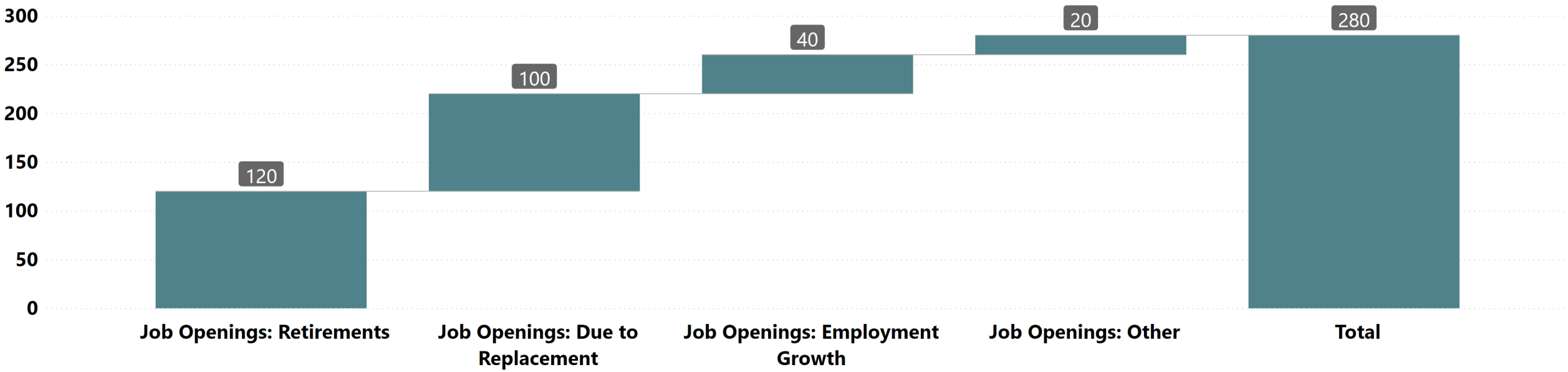
Landscape architects work full time at a similar rate to those in professional science occupations, and a higher rate than the average seen across all occupations.

Figure 10: Landscape Architecture Work Activity (2011-2021)



The number of landscape architects working full year, full time increased by 27% from 2011 to 2021. The number of landscape architects not working or working part year and/or part time increased by 32% from 2011 to 2016 returned to near-2011 levels in 2021.

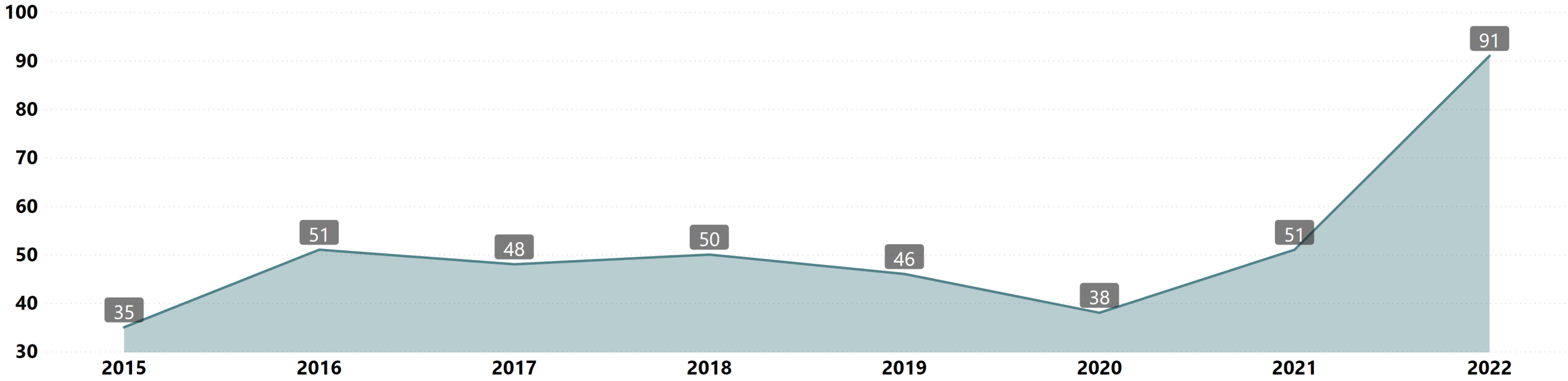
Figure 11: Projected Annual Job Openings for Landscape Architects, Urban and Land Use Planners, and Land Surveyors (2022 – 2031)



Source: Canadian Occupational Projection System (COPS) - 2022 to 2031 projections. Employment and Social Development Canada.

Employment and Social Development Canada projects an average of 280 job openings per year between 2022 to 2031 for the landscape architect, urban and land use planners, and land surveyors job category. Out of the projected 280 annual job openings, 43% are due to retirements.

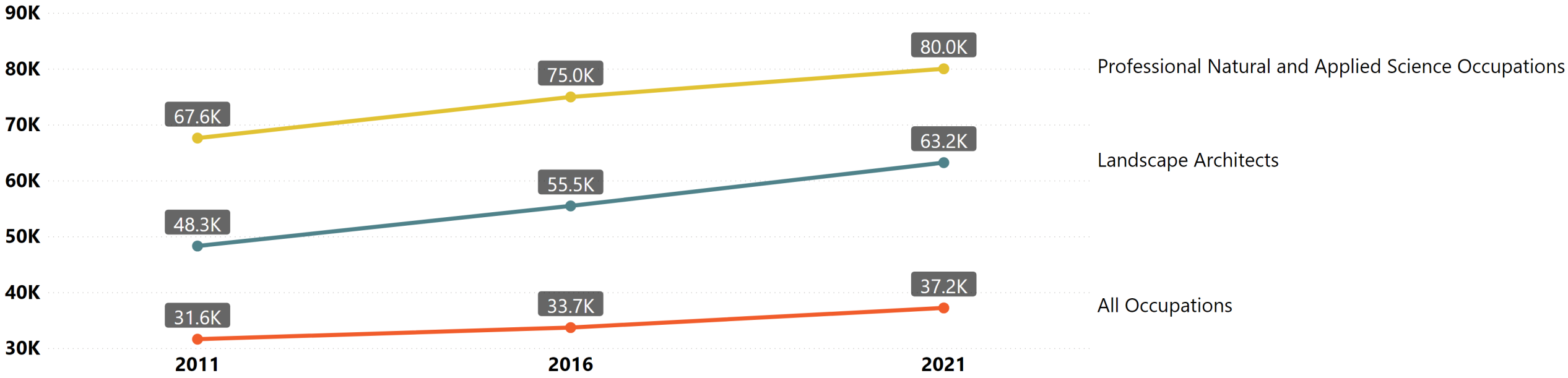
Figure 12: Annual Job Postings (CSLA) (2015 – 2022)



Source: CSLA 2022

The number of job postings on the CSLA's website for landscape architecture positions ranged between 35 and 51 from 2015 to 2021. In 2022 it reached a new high of 91.

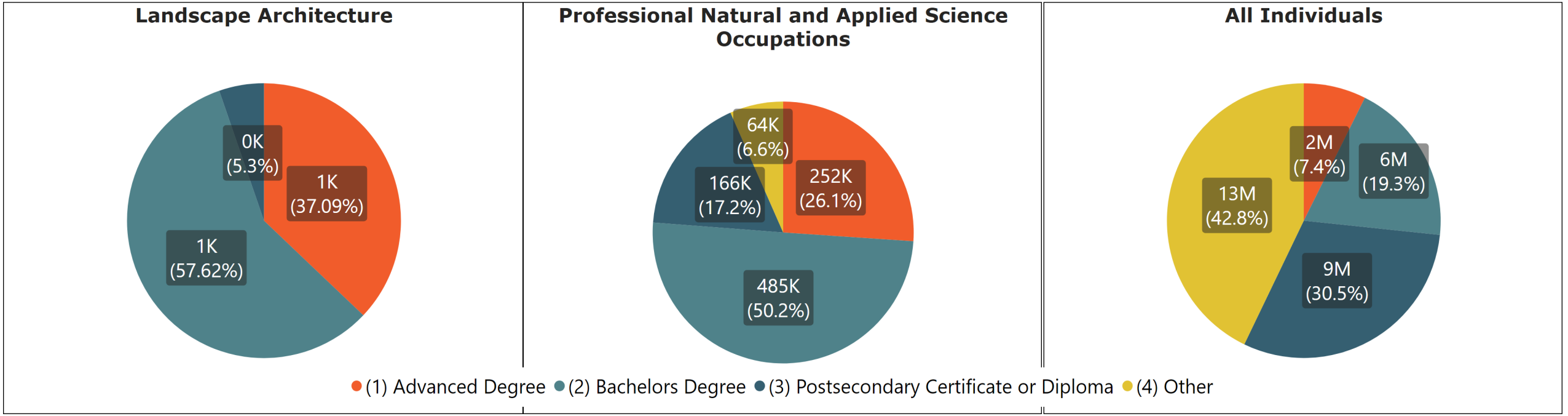
Figure 13: Median Employment Income (2011-2021)



Includes individuals aged 15 years and older.
Source: Statistics Canada 2021, 2016, and 2011 Census. Tables 9810041201, 98-400-X2016281, and 99-014-X2011042.

Median incomes for landscape architects increased 31% from 2011 to 2021, a higher increase than that of the broader professional natural and applied sciences category and average across all occupations, both of which increased 18%.

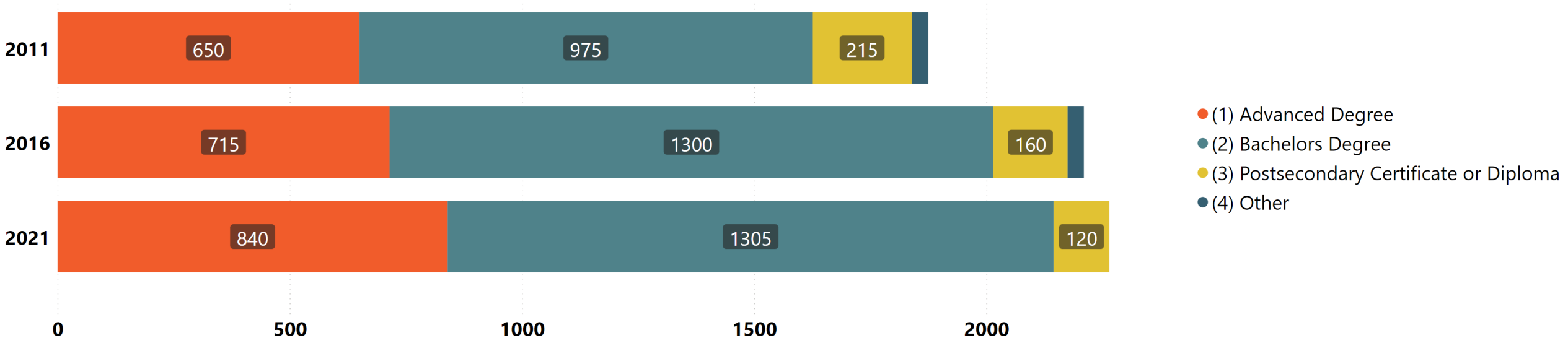
Figure 14: Educational Attainment Level (2021)



Includes individuals aged 15 years and older.
Source: Statistics Canada 2021 Census. Table 9810041201.

Landscape architecture is a highly educated profession, with 94.7% of landscape architects reporting to have a university education compared to 76.3% of individuals working in professional science occupations and 49.8% of the entire population.

Figure 15: Landscape Architecture Educational Attainment (2011-2021)

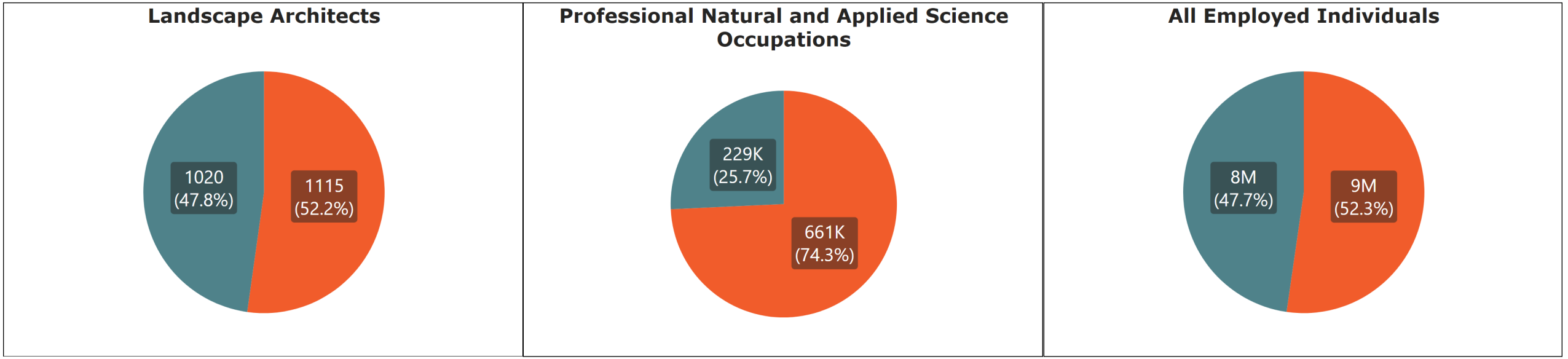


Includes individuals aged 15 years and older.
Source: Statistics Canada 2021, 2016, and 2011 Census. Tables 9810041201, 98-400-X2016281, and 99-014-X2011056.

The number of landscape architects with advanced degrees increased by 31% from 2011 to 2021 while those with bachelors degrees increased by 33% between 2011 and 2016, remaining relatively constant in the 2016 to 2021 period. The number of landscape architects without a university degree has been decreasing.

Appendix A-2: Demographics

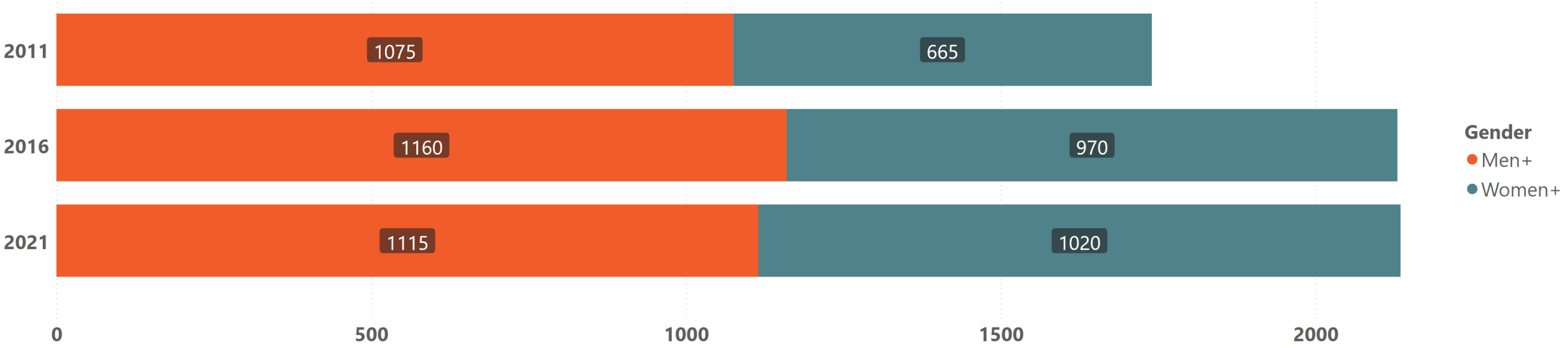
Figure 16: Gender Distribution (2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

Landscape architecture has a similar gender distribution compared to the Canadian labour force and is more gender balanced compared to other professional science occupations.

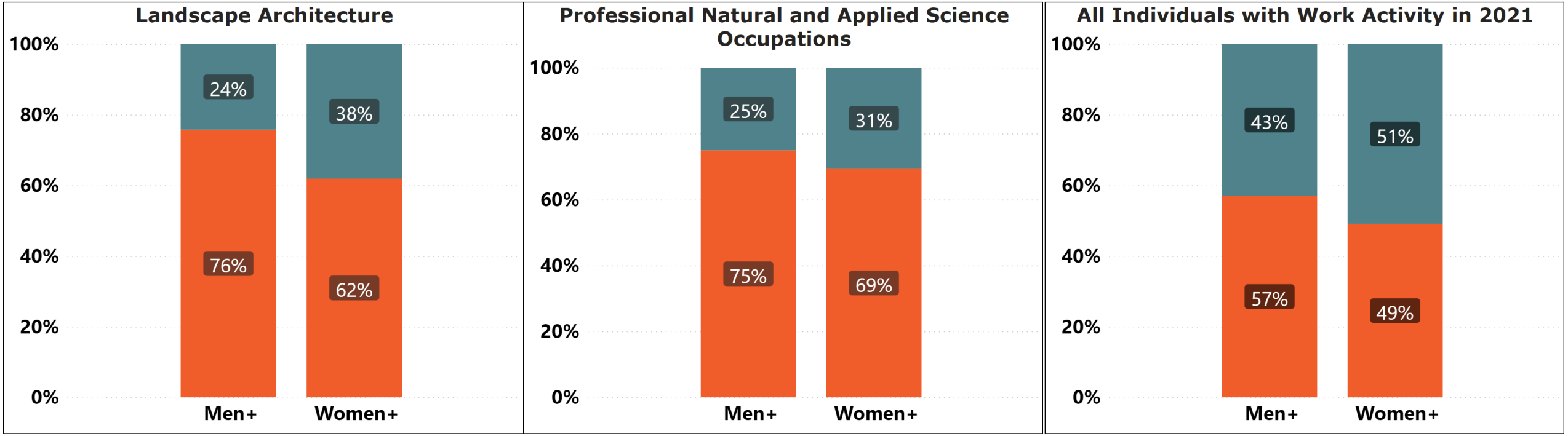
Figure 17: Landscape Architecture Gender Distribution (2011-2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

There has been a substantial increase in the number of women working in landscape architecture, increasing by 53% from 2011 to 2021. The number of men in the profession has remained relatively stagnant, increasing 4% during the same period.

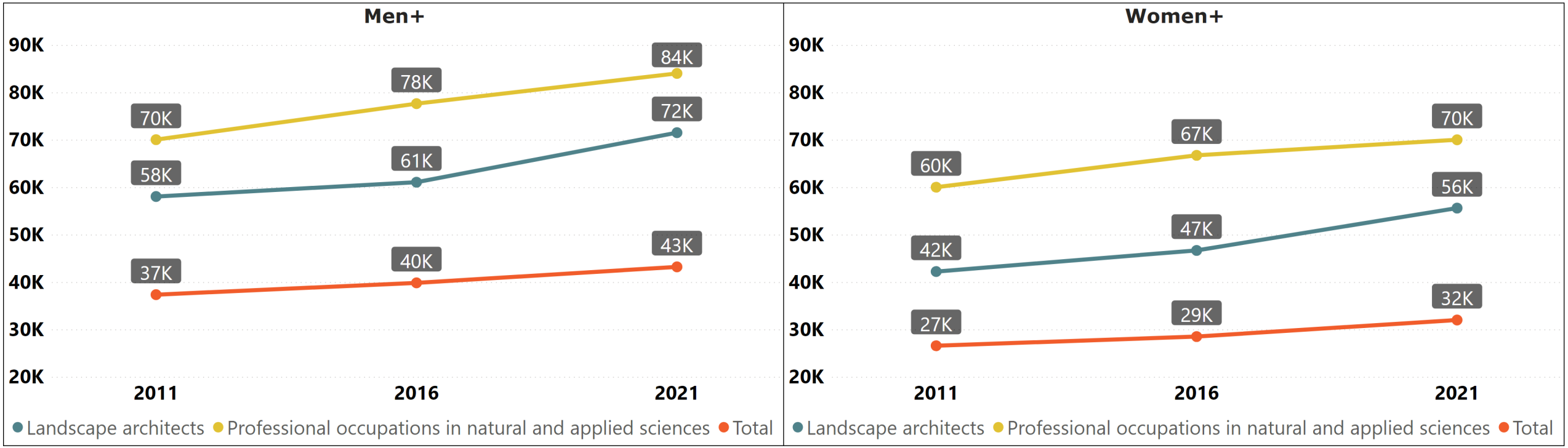
Figure 18: Work Activity by Gender (2021)



Includes individuals who had work activity in the reference year aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810041201.

Landscape architecture has a similar proportion of men working part year and/or part time compared to other professional science occupations and a 7% higher proportion of women working part year and/or part time.

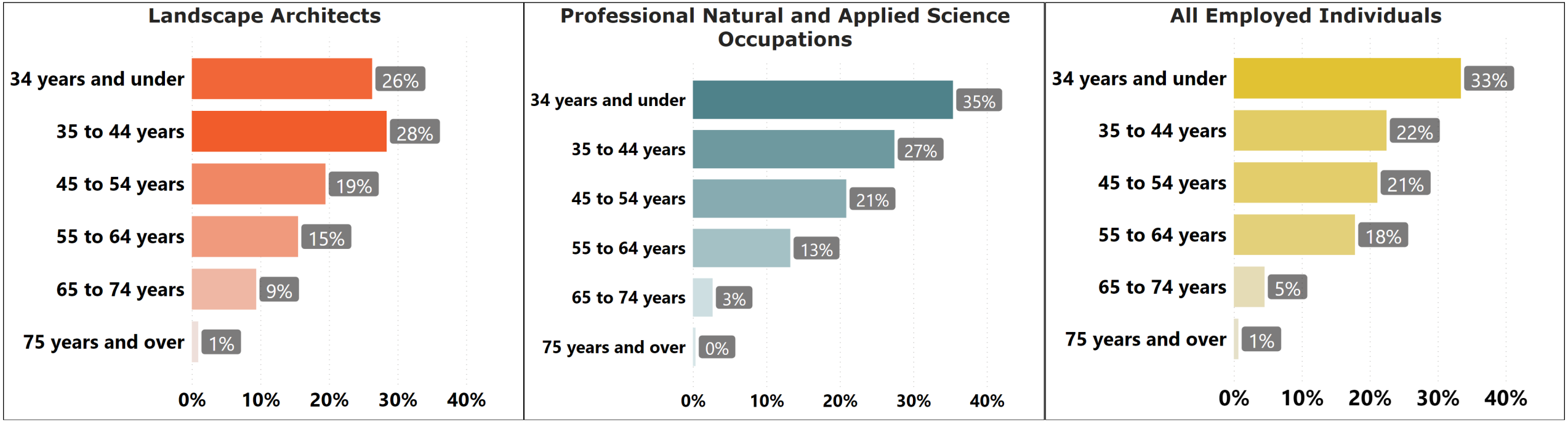
Figure 19: Median Employment Income by Gender (2011-2021)



Includes individuals aged 15 years and older.
Source: Statistics Canada 2021, 2016, and 2011 Census. Tables 9810041201, 98-400-X2016281, and 99-014-X2011042.

From 2011 to 2021, women saw a 32% increase in median employment income compared to a 23% increase for men. Women in landscape architecture have seen a larger increase than other professional science occupations, which increased by 17%.

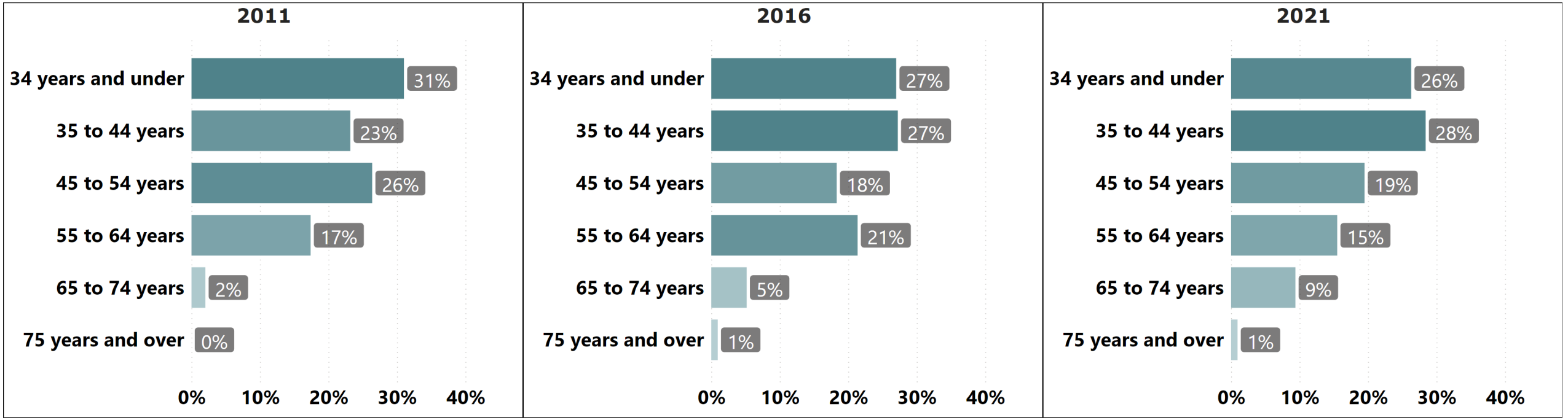
Figure 20: Age Distribution (2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

Compared to other profession occupations and the Canadian labour force, landscape architecture has a smaller proportion of individuals 34 years of age and under and a larger proportion of individuals aged 65 and over. The largest proportion of landscape architects are in the 35 to 44-year-old age category at 28%.

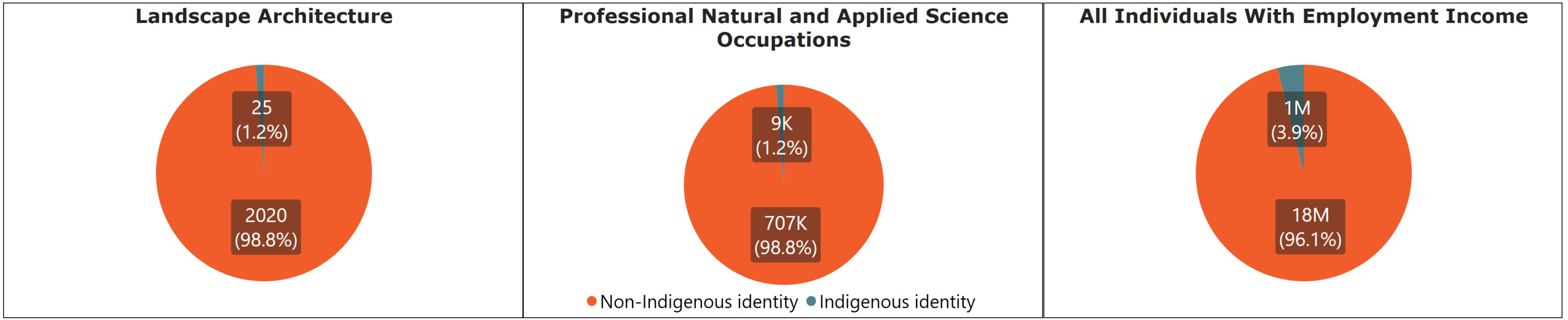
Figure 21: Age Distribution (2011-2021)



Includes employed individuals in the labour force aged 15 years of age and older.
Source: Statistics Canada 2021 Census. Table 9810044901.

While the proportion of landscape architects under and over 45 years of age has remained relatively constant between 2011 and 2021, the number of landscape architects 34 years of age and under has decreased by 5%. The number of landscape architects 65 years of age and older has increased by 8%.

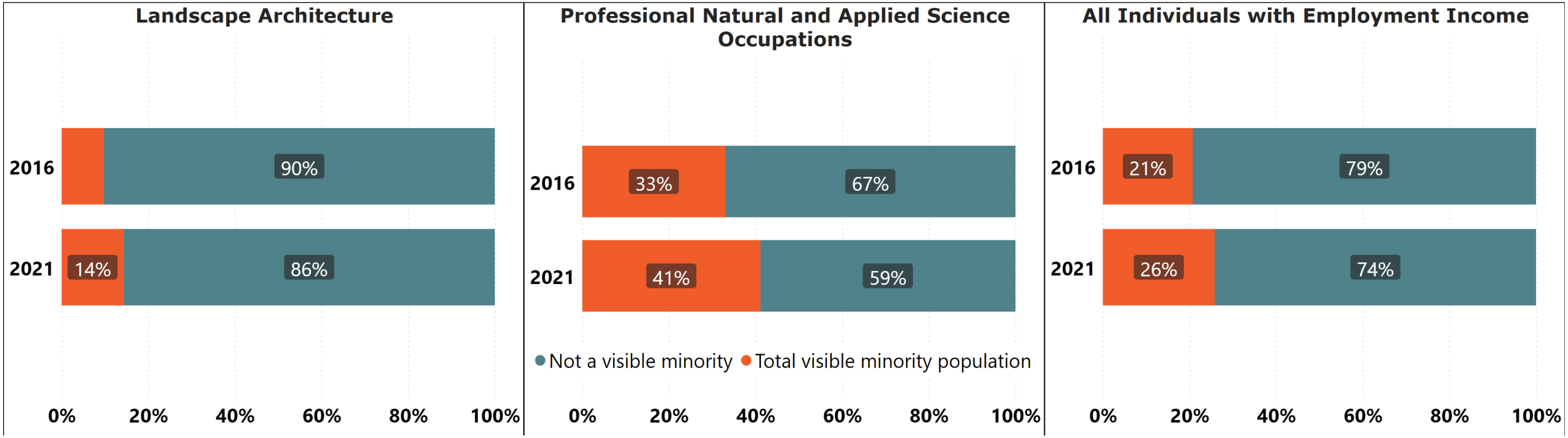
Figure 22: Indigenous Identity (2016)



Includes individuals who worked and reported employment income in the reference year aged 15 years of age and older.
Source: Statistics Canada 2016 Census. Table 98-400-X2016357.

As of the 2016 Census, 1.2% of landscape architects identified as Indigenous, equivalent to the average for professional science occupations and 2.7% lower than the Canadian average.

Figure 23: Visible Minorities (2016-2021)

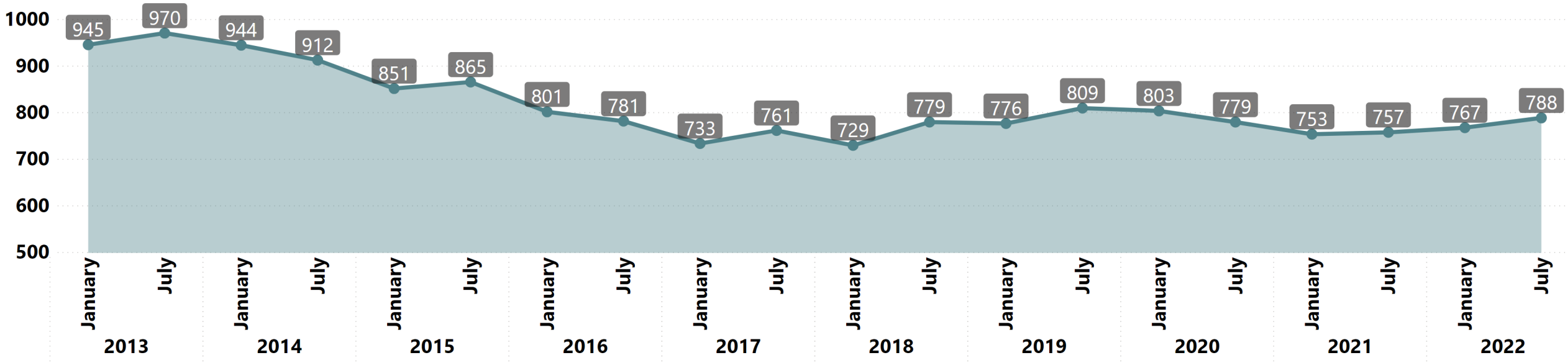


Includes individuals who worked (weeks) and reported employment income in the reference year aged 15 years of age and older.
Source: Statistics Canada 2021 and 2016 Census. Tables 9810058601 and 98-400-X2016356.

Landscape architecture has a lower proportion of individuals who identify as a visible minority than other occupations, including professional science occupations. However, the number of visible minority individuals has increased by 45% since 2016, stronger growth than other occupations.

Appendix A-3: Business Performance

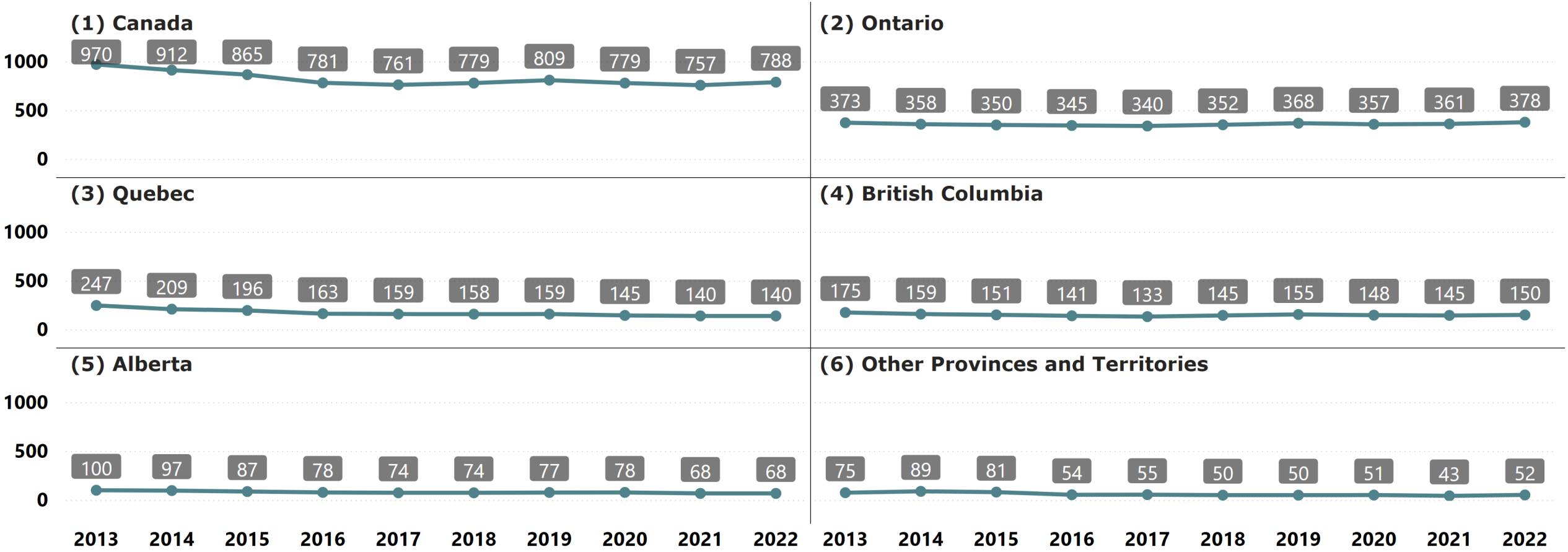
Figure 24: Landscape Architecture Business Count (2013-2022)



Fluctuations in these figures from one reference period to another can come from methodological changes (for example, changes to the method for identifying inactive units or in business industrial classification strategies).
Source: Canadian Business Counts, with employees. Statistics Canada. 2013-2022.

The number of landscape architect businesses decreased from 2013 through 2016 but has remained relatively stable since. This varies across provinces, as some provinces have seen increases over the time period while others have seen declines.

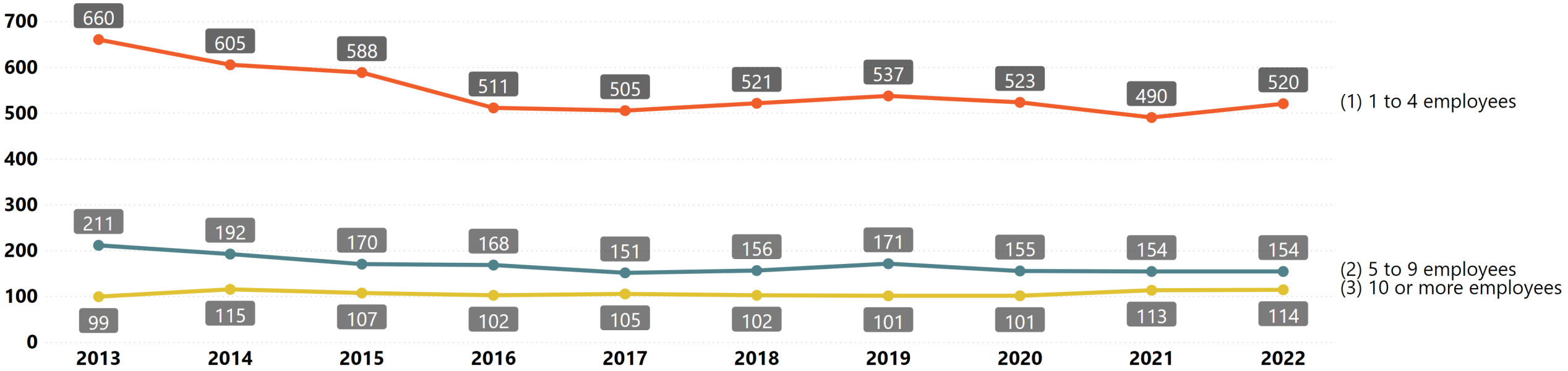
Figure 25: Landscape Architecture Business Count By Province (2013-2022)



Fluctuations in these figures from one reference period to another can come from methodological changes (for example, changes to the method for identifying inactive units or in business industrial classification strategies).

Source: Canadian Business Counts, with employees. Statistics Canada. 2013-2022.

Figure 26: Landscape Architecture Business Count By Number of Employees (2013-2022)

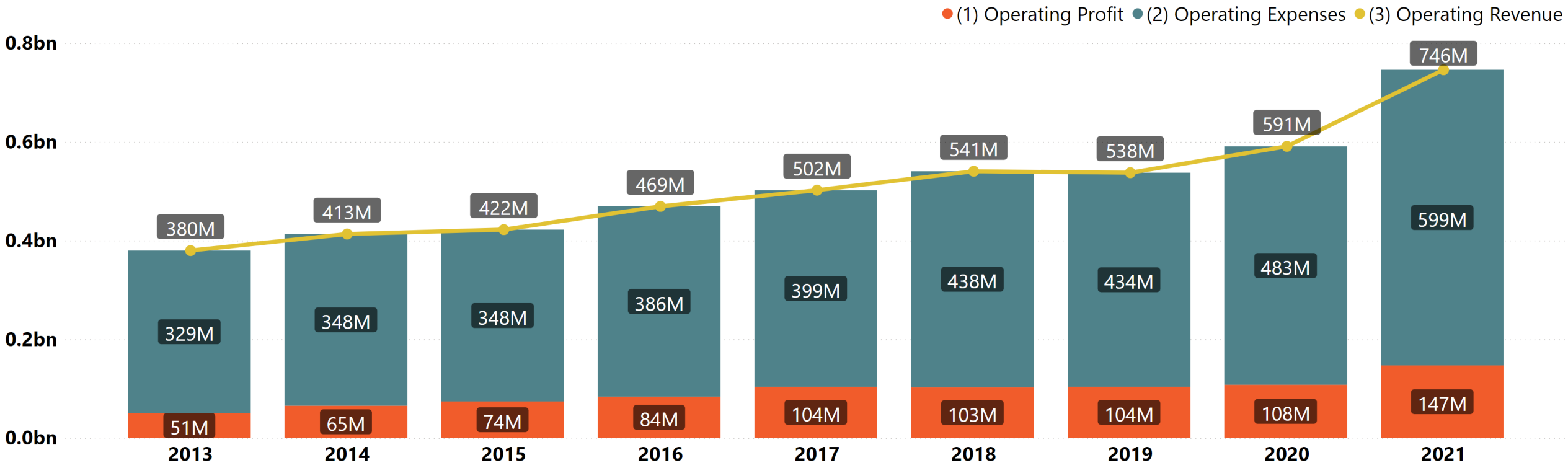


Fluctuations in these figures from one reference period to another can come from methodological changes (for example, changes to the method for identifying inactive units or in business industrial classification strategies).

Source: Canadian Business Counts, with employees (July). Statistics Canada. 2013-2022.

Most landscape architecture businesses have between 1 and 4 employees (66% in 2022). The number of landscape architecture businesses with 1 to 9 employees has decreased since 2013, while the number of businesses with 10 or more employees has remained relatively stable.

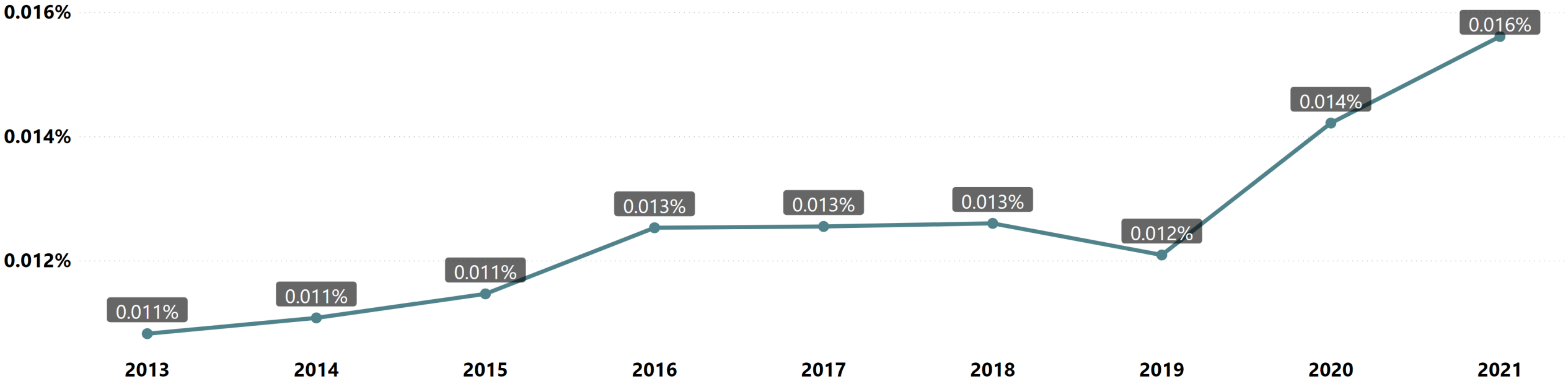
Figure 27: Landscape Architecture Operating Profits, Expenses, and Revenues (2013-2021)



Statistics Canada estimates for the most recent year are preliminary.
Source: Architectural services, summary statistics. Annual Survey of Service Industries: Architectural Services. Statistics Canada. Table 2110003601.

The operating revenue of landscape architecture firms increased by 96% from 2013 to 2021. Operating profit increased from 13% of revenues in 2013 to 20% in 2021.

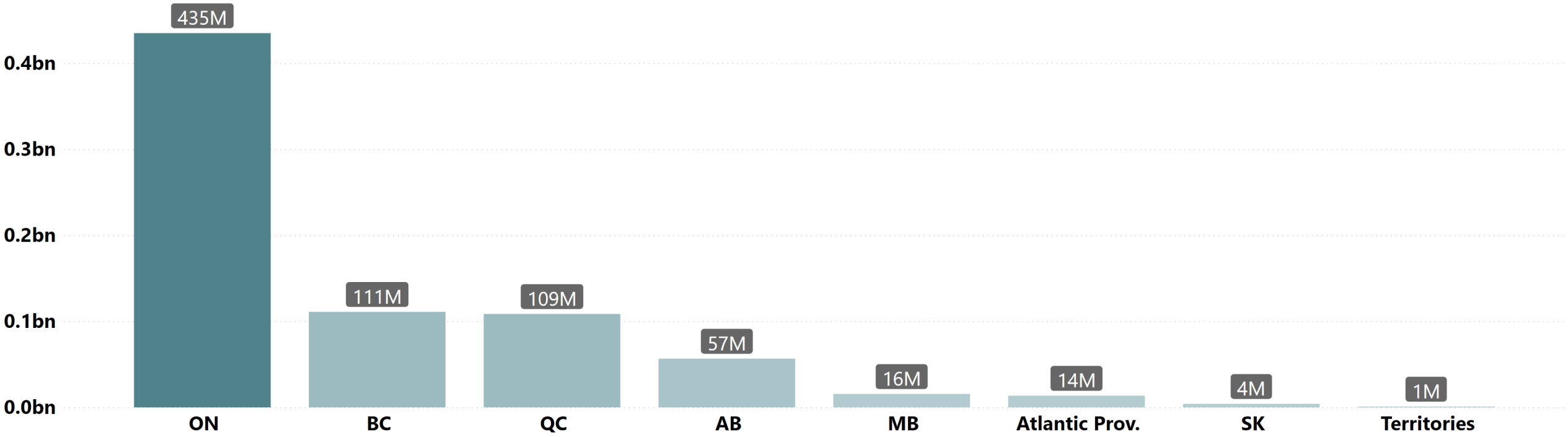
Figure 28: Landscape Architecture Operating Revenues (% of Total Across All Industries) (2013-2021)



Statistics Canada estimates for the most recent year are preliminary.
Sources: Architectural services, summary statistics. Annual Survey of Service Industries: Architectural Services. Statistics Canada. Table 2110003601.
Balance sheet, income statement and taxation statistics with selected financial ratios, by total all industries. Statistics Canada. Table 3310049801.

Operating revenue for landscape architecture businesses as a share of revenues across all industries increased from 2013 to 2018, dipping slightly in 2019 with a rapid increase in subsequent years.

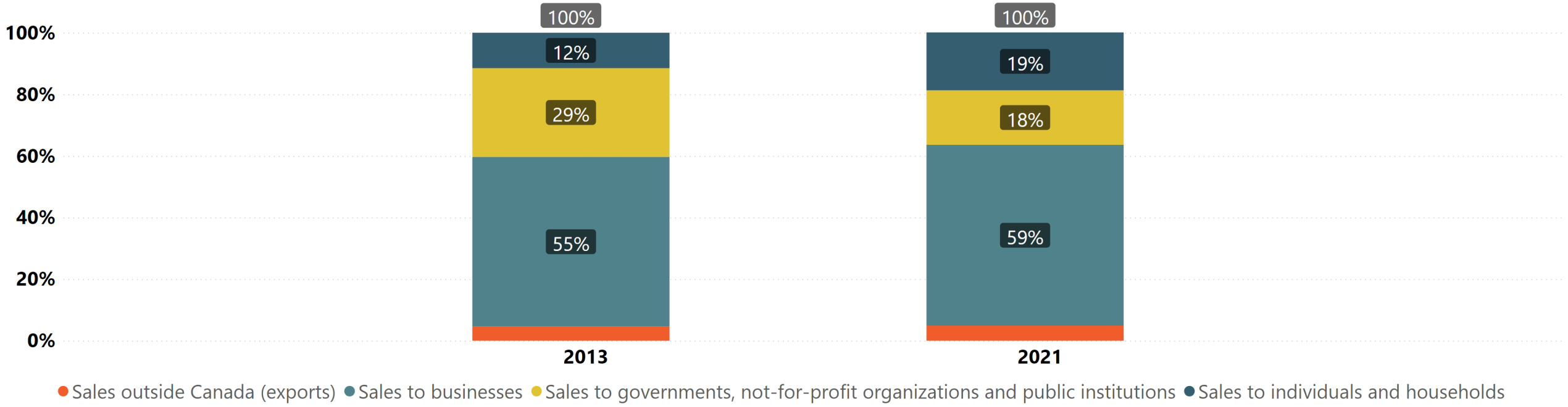
Figure 29: Landscape Architecture Operating Revenues (2021)



Statistics Canada estimates for the most recent year are preliminary.
Sources: Architectural services, summary statistics. Annual Survey of Service Industries: Architectural Services. Statistics Canada. Table 2110003601.

Ontario generates the majority of landscape architecture operating revenue in Canada, at 59%. British Columbia and Quebec generate 16% each respectively while Alberta generates 8%.

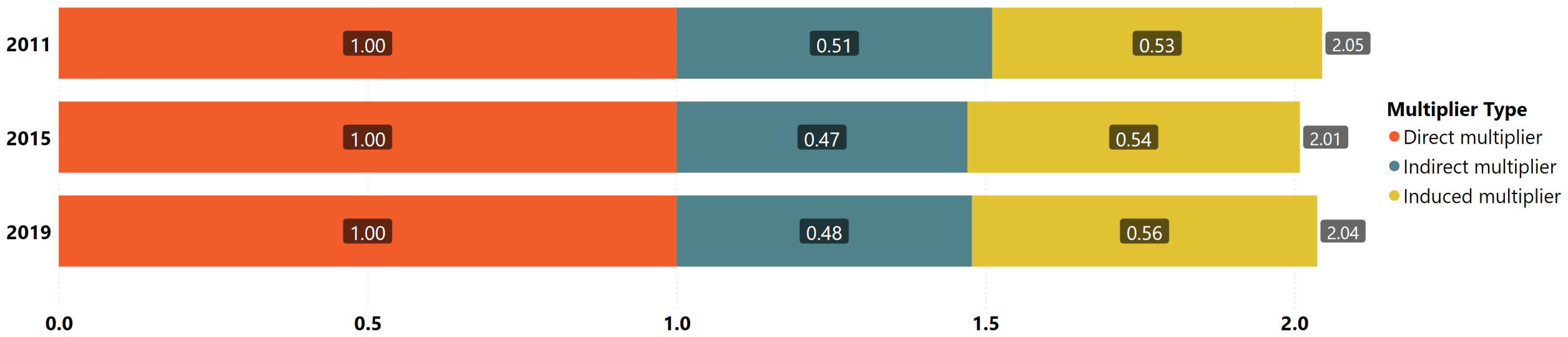
Figure 30: Landscape Architecture Sales By Type of Client (2013-2021)



Source: CSLA 2023.

Most landscape architecture firm sales are to other businesses. The proportion of total sales landscape architecture firms make to governments, not-for-profit organizations, and public institutions decreased between 2013 and 2021 while sales to businesses, individuals, and households increased. Sales outside Canada have remained relatively stable at 5%.

Figure 31: Architectural, Engineering, and Related Services Output Multiplier (Per $ of Output) (2019)



Input-output multipliers are calculated by Statistics Canada for the Architectural, engineering, and related services category (NAICS 5413).
For more information on input/output multipliers see Note 3.
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.

For every dollar of output produced by architecture, engineering, or related services, an additional $0.48 of output is created by industries that service landscape architecture (indirect effects), and $0.58 is created as a result of worker income generating household spending (induced effects).

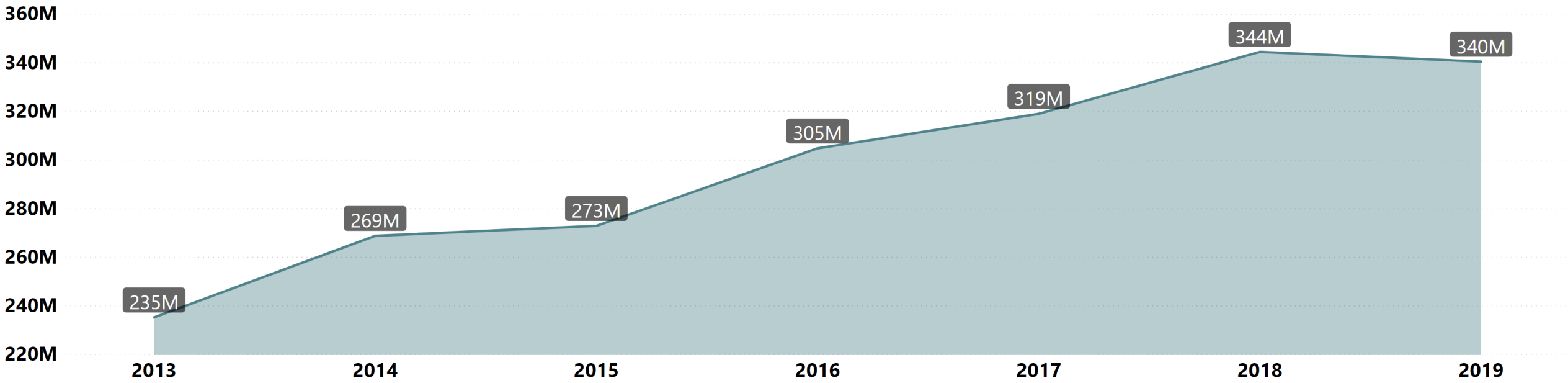
The output multiplier has been relatively stable, between 1.98 and 2.05.

GDP vs. Operating Revenue

The GDP of an industry (also referred to as value added) equals output by the industry minus the value of intermediate inputs that were purchased from other industries, domestic or foreign. Value added is a measure of how much an industry has contributed to the value of its output over and above the value of intermediate inputs. GDP by industry for the economy as a whole is the sum of values added by all industries resident in Canada. (Statistics Canada 2023f).

GDP contribution is generally lower than operating revenue, because operating revenue pays for expenses that have been incurred at market prices such as office costs, accounting and legal services, and other supplies and services. The largest contribution to GDP (or value added) for professional services like landscape architecture is the labour provided by these firms.

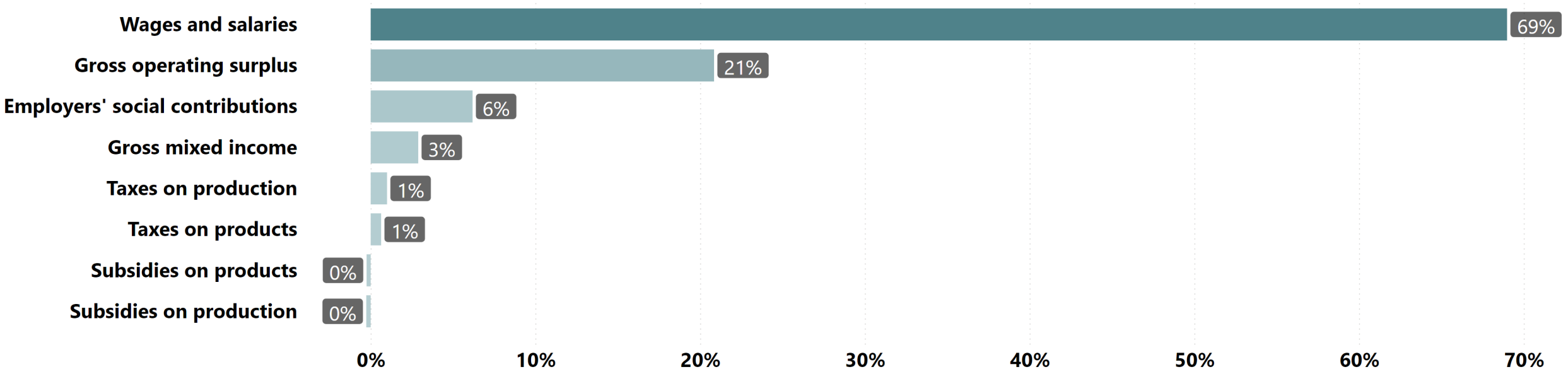
Figure 32: Landscape Architecture GDP Estimate (2013-2019)



GDP is estimated using Statistics Canada's input-output multipliers for the architectural, engineering, and related services category (NAICS 5413) and total operating revenue for landscape architecture (54132).
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.
Architectural services, summary statistics. Statistics Canada. Table 2110003601.

The estimated contribution to GDP of landscape architecture increased from $235 million in 2011 to $340 million in 2019.

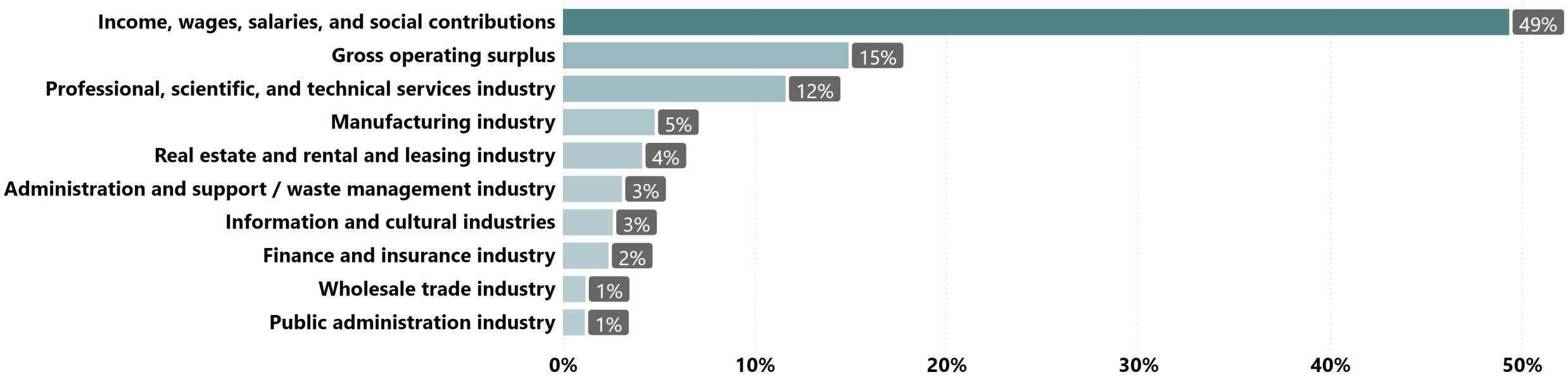
Figure 33: Architecture, Engineering, and Related Services GDP Components (2019)



Value-added (GDP) components of the input-output tables are taken from Statistics Canada for the architectural, engineering, and related services category (NAICS 5413).
Sources: Symmetric input-output tables, detail level. Statistics Canada. Table 3610000101.

The GDP of the architecture, engineering, and related services category, of which landscape architecture is a part of, is primarily made up of wages, salaries and gross operating surplus. Gross operating surplus is income that is going towards capital.

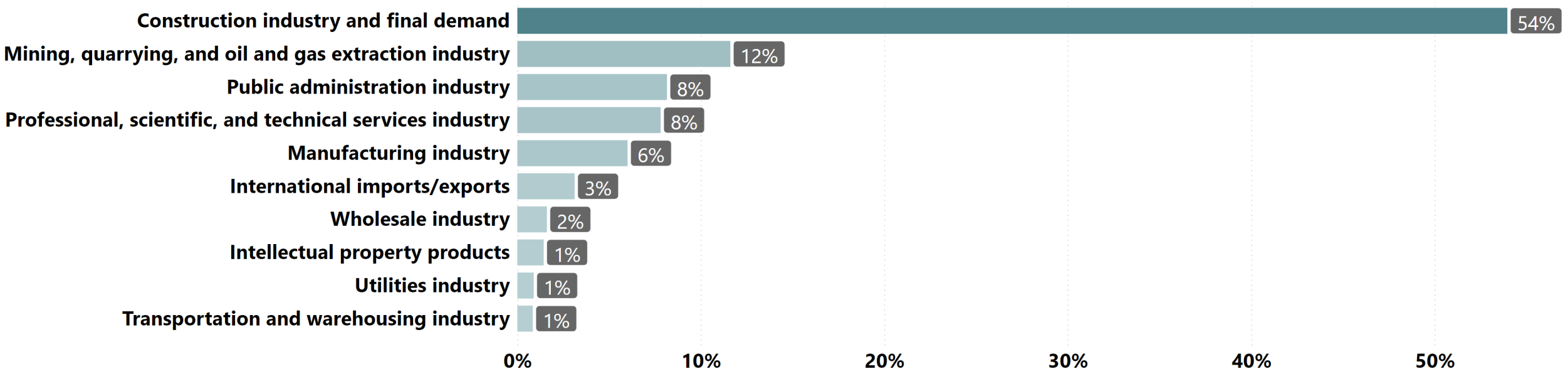
Figure 34: Architecture, Engineering, and Related Services Supply Table (Expenditures) (2019)



Input-output multipliers are calculated by Statistics Canada for the Architectural, engineering, and related services category (NAICS 5413).
Figure includes the top 10 supply categories and industries.
Sources: Symmetric input-output tables, detail level. Statistics Canada. Table 3610000101.

Income, wages, salaries, and social contributions makes up 49% of architecture, engineering, and related services expenditures. The primary industries that landscape architecture uses to supply itself with goods or services includes professional, scientific, and technical services and manufacturing.

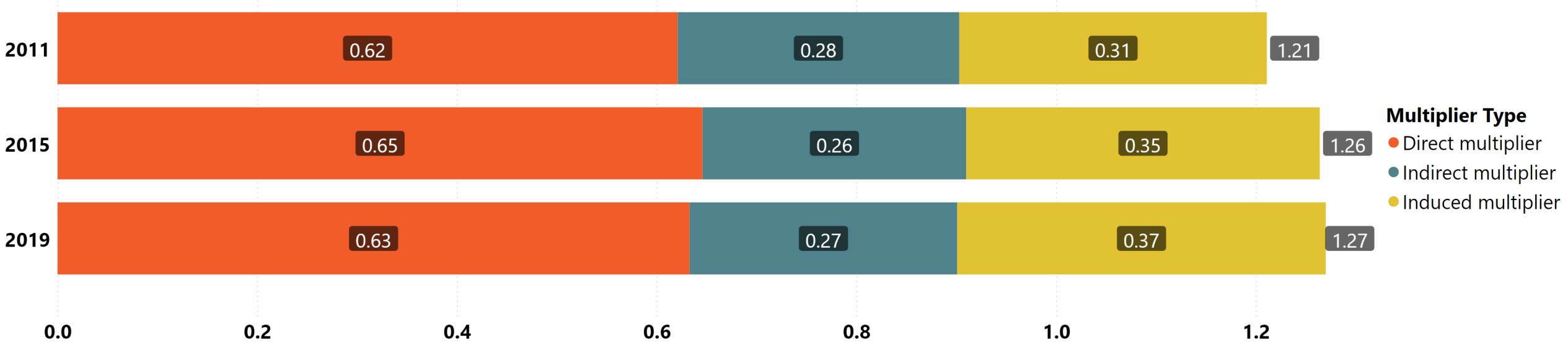
Figure 35: Architecture, Engineering, and Related Services Use Table (Purchasers) (2019)



Input-output multipliers are calculated by Statistics Canada for the Architectural, engineering, and related services category (NAICS 5413).
Figure includes the top 10 use industries and final users.
Sources: Symmetric input-output tables, detail level. Statistics Canada. Table 3610000101.

The primary industries that purchase from architecture, engineering, and related services include the construction industry and the mining, quarrying, and oil and gas extraction industry.

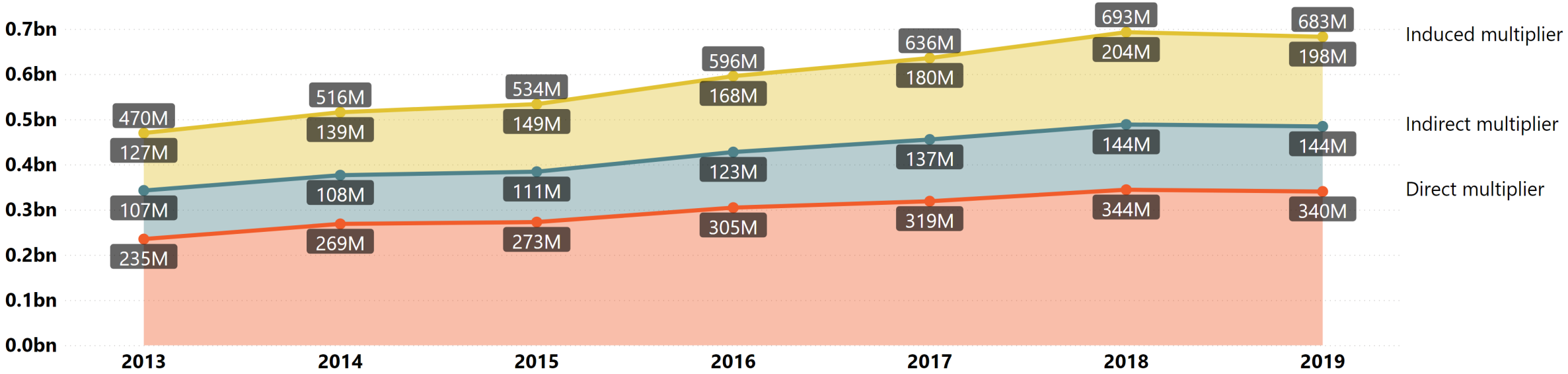
Figure 36: Architecture, Engineering, and Related Services Input/Output GDP Multiplier (Per $M of Output) (2011-2019)



Input-output multipliers are calculated by Statistics Canada for the Architectural, engineering, and related services category (NAICS 5413).
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.

For every million dollars of output produced by architecture, engineering, and related services, $0.63 million results in "value-added" GDP, while $0.27 million in GDP is created in the industries supplying architecture, engineering, and related services and an additional $0.37 million is generated from individuals involved in architecture, engineering, and related services spending income.

Figure 37: Landscape Architecture Input/Output GDP Multiplier (2013-2019)

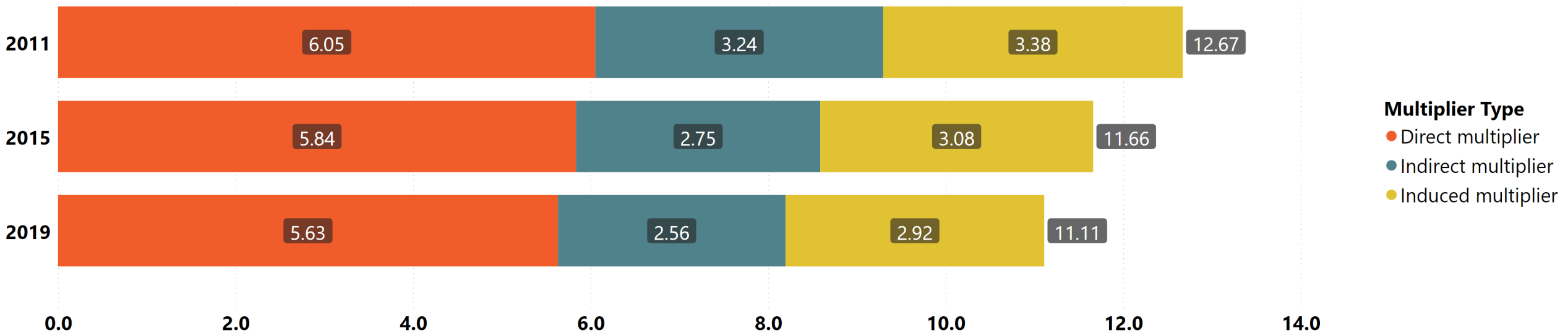


GDP, including direct, indirect, and induced effects, are estimated by InterGroup using Statistics Canada's input-output multipliers for the architectural, engineering, and related services category (NAICS 5413) and total operating revenue for landscape architecture (54132).
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.
Architectural services, summary statistics. Statistics Canada. Table 2110003601.

The GDP generated in the economy from landscape architecture doubles when taking into account estimated indirect and induced effects.

The indirect multiplier effects generate $144 million in GDP in the industries supplying landscape architecture with goods and services, while the induced effects from the income generated from landscape architecture increases the GDP in the economy by another $198 million.

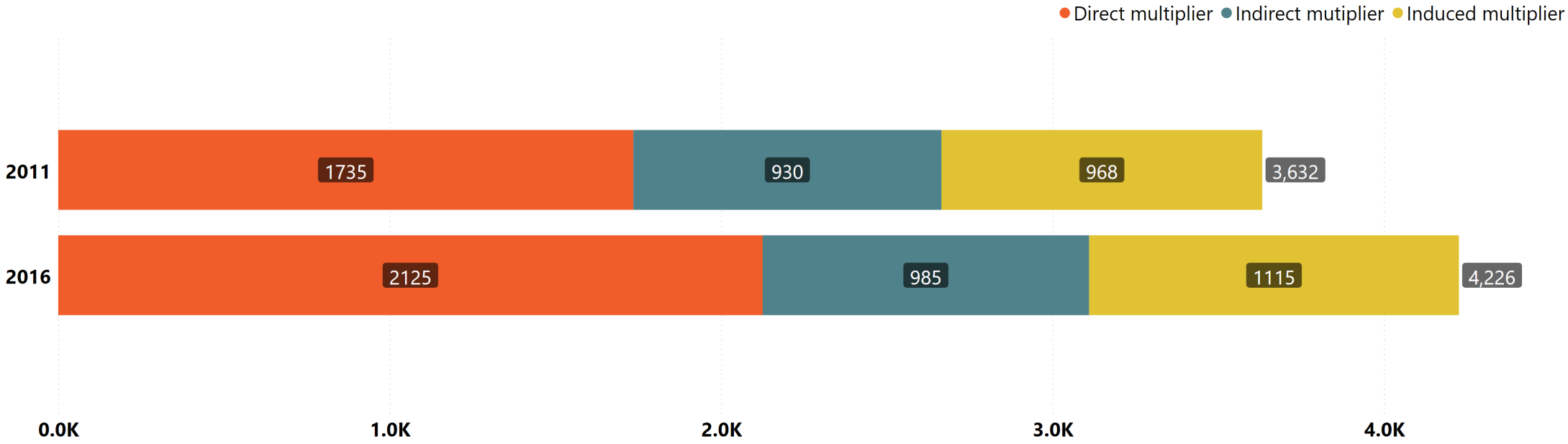
Figure 38: Architectural, Engineering, and Related Services Input/Output Jobs Multiplier (Per $M of Output) (2011-2019)



Input-output multipliers are calculated by Statistics Canada for the Architectural, engineering, and related services category (NAICS 5413).
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.

For every million dollars worth of output produced by architecture, engineering, or related services, an additional 5.63 jobs are created in landscape architecture, 2.56 jobs are produced in downstream industries, and 2.92 jobs are created from landscape architecture workers spending.

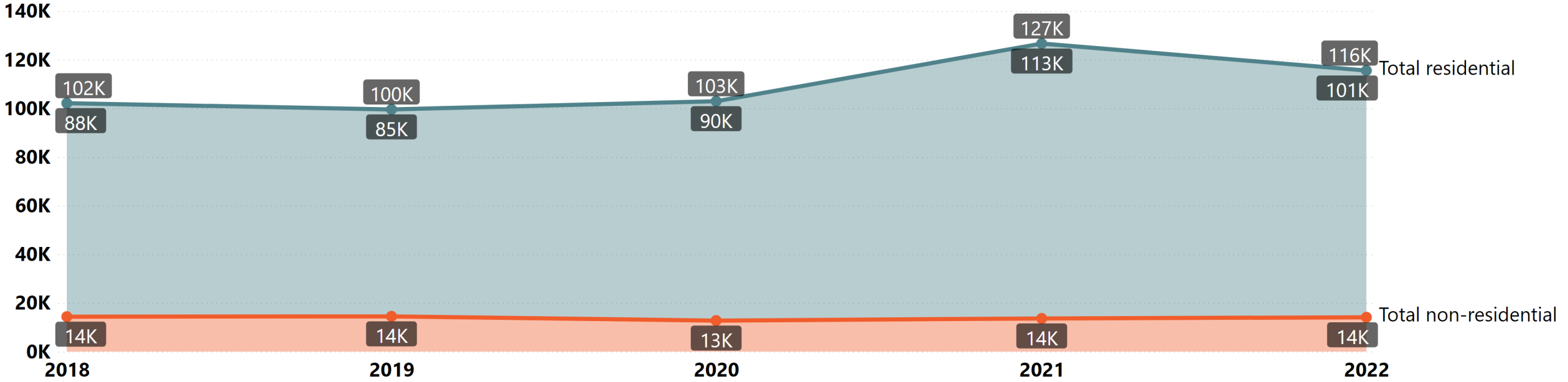
Figure 39: Landscape Architecture Input/Output Employment Multiplier (2011-2016)



Employment estimates, including direct, indirect, and induced effects, were calculated by InterGroup using Statistics Canada's input-output multipliers for the architectural, engineering, and related services category (NAICS 5413) and employment numbers for landscape architecture (54132).
Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.
Statistics Canada 2011 and 2016 Census. Tables 98-400-X2016295 and 99-012-X2011033.

Landscape architecture generated 2,125 jobs in 2016. Multiplier effects from the industries supplying landscape architecture with goods and services maintain 985 jobs (indirect effects), while the multiplier effects from the income generated from landscape architecture adds 1,115 jobs (induced effects).

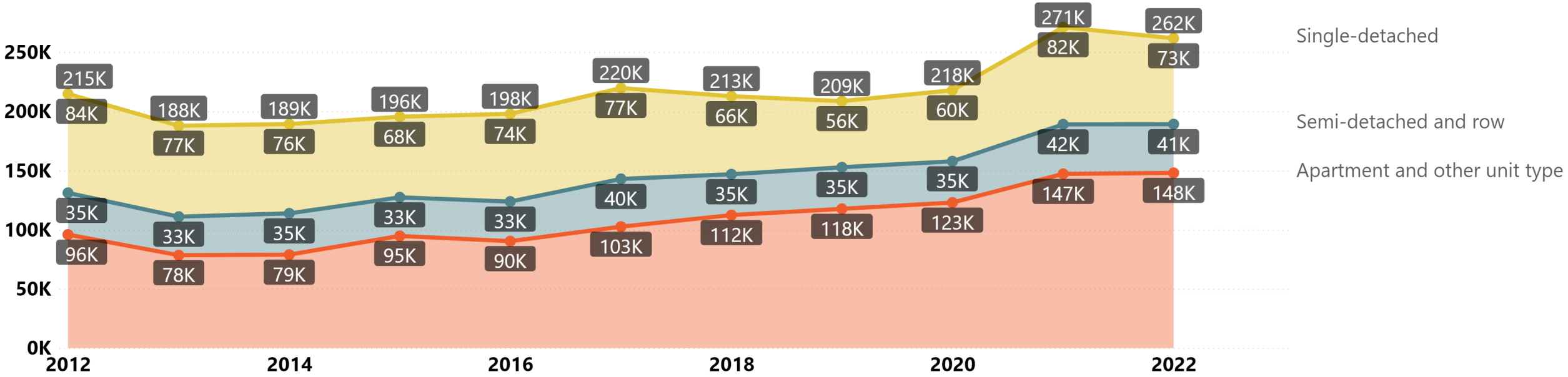
Figure 40: Building Permits Issued for New Construction (2018-2022)



The building permits survey covers all Canadian municipalities that issue permits (currently totaling 2,400) account for 95% of the Canadian population. Data may not be strictly comparable over time due to continuing improvement in coverage and modifications to the geographic areas required to reflect most recent census definitions.
Sources: Building permits, by type of structure and type of work. Statistics Canada. Table 3410006601.

The number of building permits issue for new constructions peaked in 2021, decreasing slightly in 2022. New building construction can spur new landscape architecture work activity.

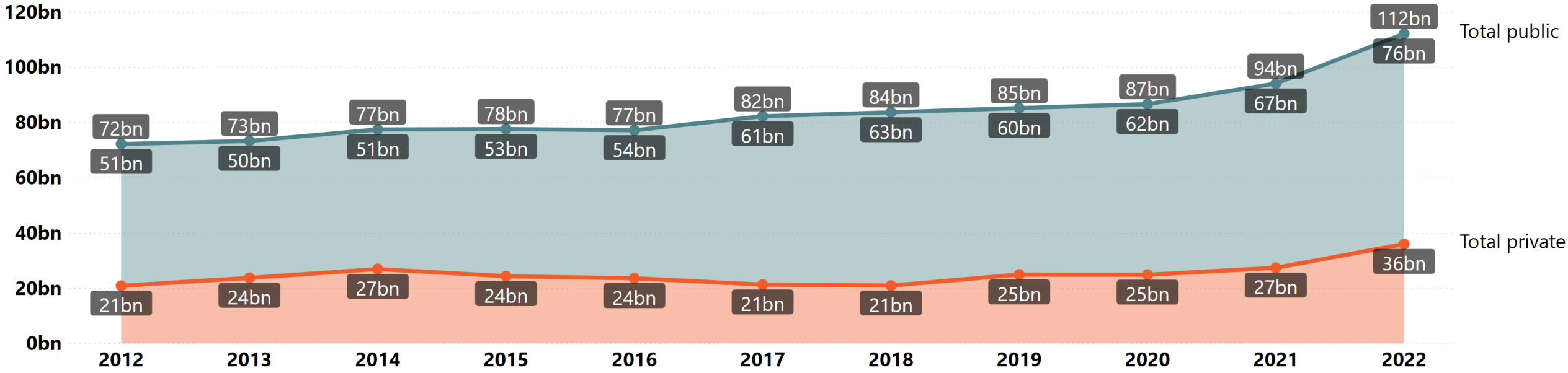
Figure 41: Housing Starts (2012-2022)



Dwellings excluded include trailers or any other movable dwelling (the larger often referred to as a mobile home) with no permanent foundation; renovations and/or alterations within an existing structure; seasonal dwellings, such as: summer cottages, hunting and ski cabins, trailers and boat houses; hostel accommodations, such as: hospitals, nursing homes, penal institutions, convents, monasteries, military and industrial camps; and collective types of accommodation such as: hotels, clubs, and lodging homes.
Sources: Canada Mortgage and Housing Corporation, housing starts, under construction and completions, all areas, quarterly. Statistics Canada. Table 3410013501.

The total number of housing starts reached a new high in 2021, mainly due to increasing construction of apartments and other unit types. New housing construction can spur new landscape architecture work activity.

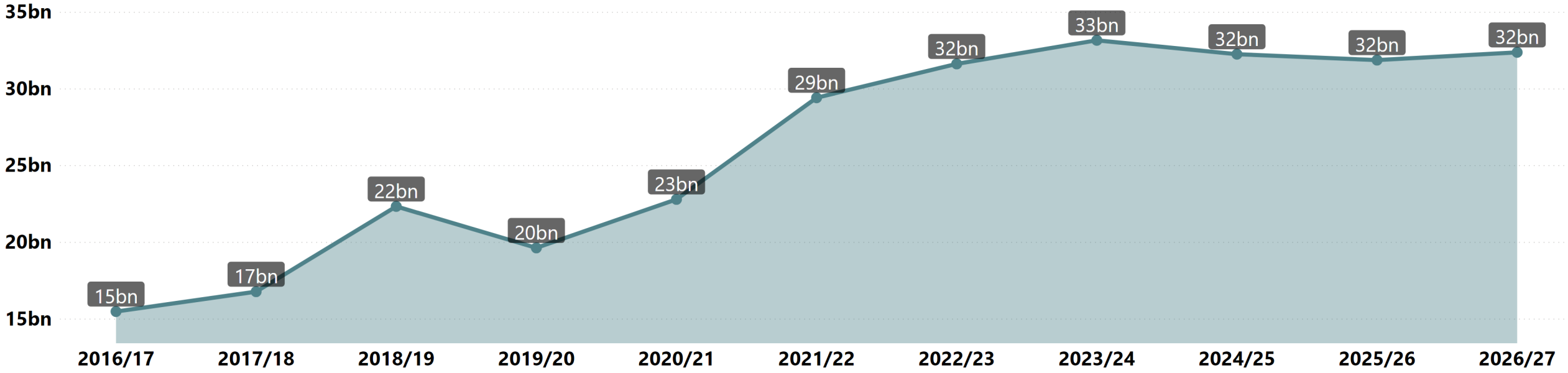
Figure 42: Infrastructure Investment



Source: Infrastructure Economic Accounts, investment and net stock by asset, industry, and asset function. Table 3610060801.

Infrastructure investment has increased by $40 billion since 2012, from $72 billion to $112 billion. Private sector infrastructure declined from 2014 to 2018 but has seen strong increases since 2019. Public sector investment declined for one year, 2019, but has otherwise seen steady increases.

Figure 43: Total Federal Government Infrastructure Investment (2016/17-2026/27) (Projected)

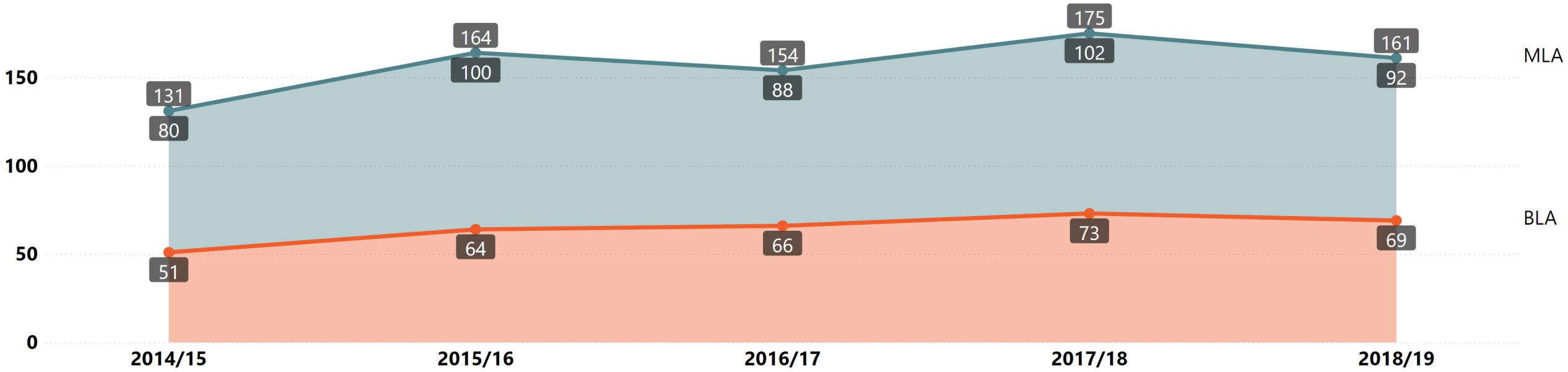


Annual total federal infrastructure spending between 2016-17 and 2020-21 on tangible capital assets on an accrual basis. Spending from 2021-22 onwards are projections.
Source: Office of the Parliamentary Budget Officer 2022.

Federal government infrastructure spending decreased from 2018/19 to 2019/20, recovering in 2020/21. The Office of the Parliamentary Budget Officer projects that federal government infrastructure investment will see a share increase to 2022/23 where it will remain relatively stable until 2026/27

Appendix A-4: Program Graduates

Figure 44: Landscape Architecture University Graduates By Year (2014/15 – 2018/19)

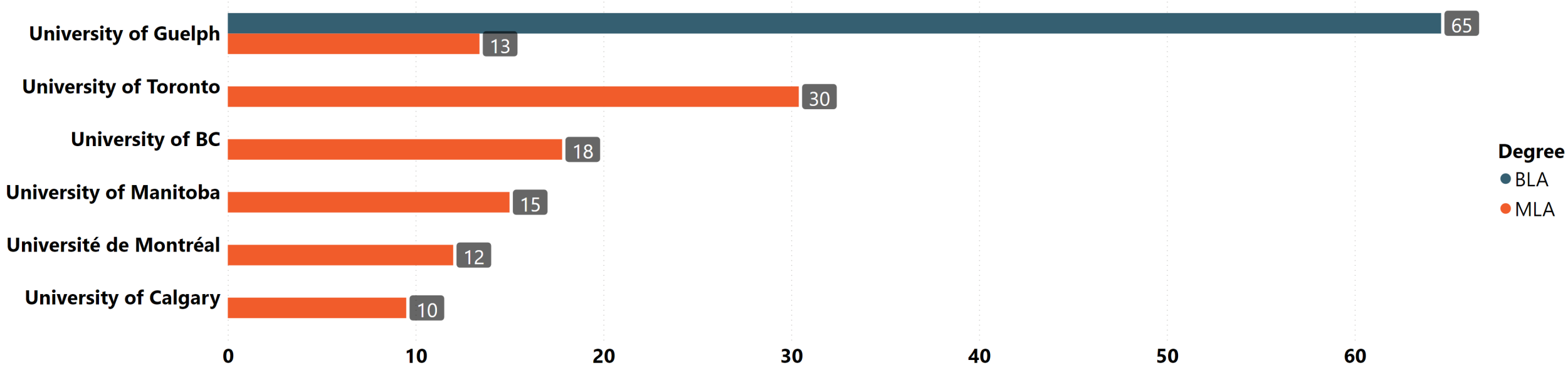


Source: CSLA 2022

The number of students graduating from university-level landscape architecture programs has increased from 2014/15 to 2018/19 from 131 to 161, peaking in 2017/18 at 175.

Based off of projected job data, the landscape architecture professional alone will not be able to absorb the total number of students graduating from university programs.

Figure 45: Landscape Architecture Average Annual University Graduates by Program (2014/15 – 2018/19)



Source: CSLA 2022

The University of Guelph has the largest accredited landscape architecture program, averaging a total of 78 BLA and MLA graduates per year. The University of Toronto graduates the highest number of MLA graduates, averaging 30 per year.

Appendix A-5:
Statistics Canada Data Limitations

Statistics Canada Data Limitations: Time Series

Statistics Canada Data should be interpreted with caution due to issues concerning:

- Comparability across years;
- Confidentiality;
- Data quality; and
- Response error.

In 2011, changes occurred in how the Census was administered, with the National Household Survey (NHS) replacing the long-form census questionnaire. With this change, survey responses were made voluntary. This resulted in reduced survey response rates and variability of response rates at lower geographic levels. As a result, time series data that incorporates 2011 NHS data should be interpreted with caution. (Smith 2015)

Limitations relative to specific indicators are provided as notes to figures.

Statistics Canada Data Limitations: Data Suppression

The Census of Population suppresses data for concerns relating to confidentiality and data quality.

Confidentiality: Data suppression for confidentiality reasons is meant to prevent the disclosure of data that could be used to identify individuals, particularly in small communities. The Census of Population also relies on a random rounding procedure, where actual values are randomly rounded up or down to a multiple of 5 or 10 to enhance confidentiality.

Data quality: There are a number of potential non-sampling errors that can affect Statistics Canada data including coverage errors, non-response errors, response errors, processing errors, and sampling errors. Data may be released conditionally or with restrictions if Statistics Canada suspects there are issues, or on rare occasions can be deleted for quality reasons. (Statistics Canada 2022a; Statistics Canada 2022b)

Statistics Canada Data Limitations: Sex and Gender

Statistics Canada Census data from 2006, 2011, and 2016 disaggregates information by sex (male and female) while the 2021 Census disaggregates information by gender (men+ and women+). Although sex and gender refer to two different concepts, the introduction of gender is not expected to have a significant impact on data analysis and historical comparability, given the small size of the transgender and non-binary populations. Given that the non-binary population is small, data aggregation to a two-category gender variable is sometimes necessary to protect the confidentiality of responses. In these cases, individuals in the category "non-binary persons" are distributed into the other two gender categories (men+ and women+) and are denoted by the "+" symbol. (Statistics Canada 2022)

The terms men+ and women+ are used throughout the report. Footnotes will expand on explanation, where relevant, within sections.

Statistics Canada Data Limitations: Indigenous Survey

The 2021 Indigenous Peoples Survey has not been released by Statistics Canada. Accordingly Indigenous identity disaggregation may rely on the 2016 Indigenous Peoples Survey, the 2011 Aboriginal Peoples Survey, and the 2006 Aboriginal Peoples Survey, where applicable.

A-6: Notes

Note 1: Employment Location Quotients

Location quotients (LQ) measure a region's specialization in a particular industry relative to a larger area (the nation as a whole).

An employment location quotient is calculated as the industry's share of employment at a regional level (municipal or provincial) divided by the industry's share of employment at the national level.

A higher location quotient means that the region is more specialized in that industry. (BEA, 2008)

Note 2: Public Administration Classification

Public administration is comprised of “establishments primarily engaged in activities of a governmental nature“. This includes those who enact and interpret laws and regulations and administer programs based on them.

Government owned establishments engaged in activities that are not governmental in nature are classified to the applicable non-public administration NAICS category. (Statistics Canada, 2018)

Note 3: Input/Output Multipliers

Input/output multipliers measure the effect of an exogenous change in final demand for the output of a given industry. Direct effects measures the initial change in output on the industry itself. Indirect effects measure the chain reaction up the production stream due to the increase production of various inputs. Induced effects measure changes due to increased consumer expenditures caused by the direct and indirect effects. (Statistics Canada, 2021)

Note 4: GDP Estimates

The GDP estimate was calculated by InterGroup using landscape architecture operating revenue (NAICS 54132) as a proxy for output and estimating the value-added portion of the operating revenue using the direct input/output multipliers provided by Statistics Canada for the architectural, engineering and related services (NAICS 5413) category. The numbers used for the calculation are shown below:

Year ▲	Input/Output Multiplier (Direct)	Operating Revenue	Landscape Architecture GDP (Estimated)
2013	0.62	379,800,000	235,096,200
2014	0.65	413,300,000	268,645,000
2015	0.65	422,200,000	272,741,200
2016	0.65	469,400,000	304,640,600
2017	0.64	502,100,000	318,833,500
2018	0.64	540,500,000	344,298,500
2019	0.63	537,600,000	340,300,800

Sources: Input-output multipliers, provincial and territorial, detail level. Statistics Canada. Table 3610059401.
Architectural services, summary statistics. Statistics Canada. Table 2110003601.

Note 4: GDP Estimates

The GDP estimate was verified using a second method, by estimating the proportion of GDP that landscape architecture (NAICS 54132) makes up of architectural, engineering and related services (NAICS 5413) using the proportion of operating revenue that landscape architecture (NAICS 54132) makes up of architectural, engineering and related services (NAICS 5413). This ranges from 0.97% to 1.47% over the time period from 2013-2019. The numbers used for the calculation are shown below:

Year ▲	Proportion of Architecture, Engineering, and Related Services Operating Revenue	Architecture, Engineering, and Related Services GDP	Landscape Architecture GDP
2013	0.97%	23,214,000,000	226,050,678
2014	1.04%	25,078,000,000	259,829,719
2015	1.13%	23,715,000,000	268,276,275
2016	1.31%	22,996,000,000	301,863,095
2017	1.42%	23,749,000,000	337,066,642
2018	1.47%	24,691,000,000	363,720,456
2019	1.31%	26,239,000,000	343,779,218

Sources: Gross domestic product (GDP) at basic prices, by industry (x 1,000,000). Statistics Canada. Table 3610040101.
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CONTACT US

300-259 Portage Ave,
Winnipeg, MB, R3B 2A9
(204) 942-0654
ig@intergroup.ca
www.intergroup.ca

InterGroup

CONSULTANTS