STOKES LABOUR MARKET STUDY

COLLEGES ONTARIO

Independent source of economic forecasts, impact analysis, labour market information, and models products and services.

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1. Executive Summary

Colleges Ontario requested Stokes Economics to prepare an analysis of the future demand and supply for college education in the province over the period 2026-2035.

Under the National Occupation Classification (NOC) Training, Education, Experience, and Responsibilities (TEER) system, there are 231 occupations that usually require some college education. This document describes the findings for demand in Ontario as a whole and for 5 subregions of the province. Supply estimates are presented at the provincial level due to labour mobility between regions.

The Stokes Economics September 2025 Ontario Regional Outlook provides the economic backdrop for the forecasts presented in this report.

Stokes took a modelled approach to produce the occupational projections. The models relied on data from the 2021 Census and various datasets from Statistics Canada, including the Labour Force Survey.

Stokes found that a total of at least 946,891 workers will be needed to fill job openings for occupations that usually require a college education over the decade. These positions will become vacant through retirements (and deaths) and economic expansion. Occupations were aggregated into broad occupational categories. The categories with the greatest demand included occupations in the trades, the health sector, and business, finance and administration.

Based on current demographic projections and provincial enrolment trends, Ontario colleges will not meet total college-educated occupational demand requirements. If domestic students were solely used to try to meet all supply needs, the Ontario economy would experience a significant shortage of 335,414 college-educated workers over the next decade.

The most acute of these shortages will be in the Trades, Transport and Equipment Operators and Related Occupations, with nearly 144,000 positions needing to be filled above anticipated supply. The province's 2025 Budget outlines a $223 billion 10-year capital plan focusing on infrastructure expansion, including health, transit, schools and highways. Natural resource development in the northern part of the province is also a key focus. If these shortages go unfilled, the government capital plan as it stands will be put at risk with extended completion times and potential cost overruns.

The second-largest occupational supply deficit will be in the Business Finance and Administration occupations. These occupations are broad and may impact business in all sectors. Smaller communities that have a larger proportion of small and medium sized firms may experience limitations in growth associated with the lack of trained labour in these occupations.

The Ontario government has committed to improving access to primary health care, through the Primary Care Action Plan that aims to connect every Ontarian with a family doctor or team by 2029. Making substantial improvements on this issue, while supporting an aging population, will be a challenge given

that we project that there will be a shortage of nearly 50,000 workers trained in Health Occupations over the decade.

College-educated workers contribute to a significant portion of Ontario's economic output. A shortage of college-educated workers will negatively impact the Ontario economy more so than the direct loss in wages and profits from reduced employment and output. Indirect and induced effects from buying goods and services from suppliers and additional spending from the income earned in that process will be lost as well. With an annual direct loss of 33,541 college-educated workers due to training shortages, we have estimated that the total impact on the Ontario economy will be a loss of 55,250 jobs in one year. Total GDP (wages and profits) losses would be reduced directly by $3.26 billion, with a total loss of $7.3 billion.

The economic forecast driving these projections is presented in Section 3. Demand estimates are provided in Section 4, and supply projections are presented in Section 5. Section 6 presents the economic impacts of a shortage of college-educated workers.

2. Introduction

Colleges Ontario requested Stokes Economics to prepare an analysis of the future supply and demand for college education in the province. This document describes the findings for Ontario and for five sub-provincial regions. These include the Greater Toronto Area and the Northern, Eastern, Southwest and Central regions.

The college system has faced budget pressures for several years. In response, many opened their doors to more international students. This addressed the shortfalls in operating budgets while providing the economy with an adequate supply of trained, skilled workers. Recently, these international student flows have been cut due to federal government policy decisions, and colleges were forced to shutter programs.

There are regular news articles about labour shortages. These reports will often focus on industry sectors or occupations. The unemployment rate is elevated in some regions, however, this will be short-lived, and the province needs to train workers today for tomorrow's jobs.

The aggregate economy is not facing an acute shortage of labour in the short run, though it will still be subject to skill mismatches with workers' skills not adequately matching the demand of employers. Skill mismatches are to be expected over time as the economy evolves due to innovation, and changes in technology and business models. Educators and governments play a role in ensuring that the labour force has the correct educational levels and skills that enable workers to adapt to these changing demands and prevent long-term skills gaps.

Historically, the importance of education has increased as the economy evolves. The proportion of the Ontario population with a college, CEGEP, or other non-university certificate or diploma has risen over time. This share has risen from 22% in 2006[1] to 23.6% in 2021[2] for those aged 25 to 64. It is assumed that this share has risen as people raise their skills to better meet the demands of today's economy.

The adaptability and resilience of a more skilled workforce are important considerations. In both the recent 2020 and 2009 recessions, college-educated workers faced considerably better outcomes than those with a high school or lower education. In 2020, the unemployment rate for those aged 25 and older with a

[1] Statistics Canada, Highest level of educational attainment for the population aged 25 to 64. Last updated 25 November 2009. https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/hlt/97-560/pages/page.cfm?Lang=E&Geo=PR&Code=01&Table=1&Data=Dist&Sex=1&StartRec=1&Sort=2&Display=Page

[2] Statistics Canada, Focus on Geography Series, 2021 Census of Population. Last updated 9 Sept 2025. https://www12.statcan.gc.ca/census-recensement/2021/as-sa/fogs-spg/page.cfm?lang=E&topic=11&dguid=2021A000235

postsecondary certificate or diploma rose from 4.0% to 7.4%, a better outcome than high school graduates that went from 5.3% to 9.5%.[3]

The correct level of training and education for the labour market will depend on the occupations in demand. Using the National Occupational Classification (NOC) and an occupation forecast enables us to estimate future demand for new workers. Stokes Economics estimates that we will need an average of 94,689 college graduates annually over the next decade to fill vacant positions that occur through retirements and economic expansion. The caveats to this are that these numbers don't include extra training requirements for those who move between careers and may require additional education. Furthermore, people may take a temporary leave of absence for reasons such as parental leave or other circumstances that require more trained workers.

[3] Statistics Canada, Unemployment rate, participation rate and employment rate by educational attainment, annual). Last updated 27 Jan. 2025.
https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410002001 (accessed September 10, 2025).

3. Ontario Regional Economic Outlook

The Stokes Economics September 2025 Ontario Regional Outlook provides the economic backdrop for the forecasts presented in this report. The outlook considers the province's 2025 Budget and its policies presented in May 2025. The forecast considers budget announcements and policy initiatives by all levels of government that have been made at the time of forecasting. These include major capital spending on transit and hospitals that will increase the need for construction and health workers.

The outlook points to some near-term weakness in both employment and GDP. Real GDP is expected to increase by just 0.8%, while employment will expand by 1.0% in 2025. U.S. tariffs have introduced growing uncertainty and costs for businesses and households, dampening both trade and investment. At the same time, the Federal Government's reversal on immigration policy is slowing population growth, reducing demand in the economy and limiting the supply of new workers. A third headwind is emerging in the housing market, where elevated construction costs, higher interest rates, and weaker population growth are curbing activity. Within Ontario, manufacturing and education services employment is projected to decline, reflecting these pressures.

Taken together, these developments frame the employment and demographic outlooks that follow. The next section turns to the labour market in greater detail, outlining how these shocks will affect hiring, unemployment, and labour force participation across Ontario's regions.

Labour Markets

Labour markets have softened considerably since late 2024 when the federal government changed their course on immigration policy. Trade tensions impacted business hiring decisions through 2025. There was an initial boost to the economy in the first quarter as firms and business stockpiled material inputs to delay the impacts of tariffs. The number of jobs fell steadily through March to August 2025, shedding nearly 40,000 over the period. Job growth is expected to remain weak into 2026 as the impacts of slower growth weigh on hiring. There have been limited shutdowns in the auto sector, with shifts at several plants being reduced. It is anticipated that tariff-targeted goods-producing sectors (iron and steel, autos, copper, wood products) will see employment weakness as firms recalibrate to the new economic reality.

The slowdown in the residential market is impacting labour demand for construction workers. There are currently a large number of residential structures under construction, however as they are completed and the number of new starts dwindle, layoffs will accelerate over the next 12 months. Uncertainty created by the U.S. tariffs, elevated housing costs, and slower population growth, are resulting in lower housing starts around the province. The degree to which each region will be affected will vary due to a number of factors, such as whether the region was a popular destination for landing migrants, and the exposure of its

economic base to friction in trade. The impacts are broad across the labour market, however, they are anticipated to be short in duration. The economy will return to growth, and the training of new workers will be required as scarcity in some occupations pushes wages higher, attracting more trainees.

Ontario's population has been aging with the impacts of the post-war baby boom. This process will continue over the forecast with the aged dependency rate – people of age 65 and over divided by those of age 15 to 64 years old – rising from 27.3% in 2024 to 33.9% in 2035. The result of the aging population will be a higher loss in experienced and skilled workers through retirements, resulting in a lower aggregate labour force participation rate, and slower labour force growth. This will increase the need to train additional workers. Additionally, as people age, there will be a growing need for healthcare within the economy, raising the demand for healthcare workers.

The recent slowdown in the economy, combined with continued strong migration into late 2024, has pushed the unemployment rate sharply higher. It climbed to 6.9% in 2024 and further in 2025, averaging 7.7%. Youth unemployment has risen even more quickly, jumping from 11.9% in 2023 to 16.1% in 2025. Over the forecast horizon, conditions will gradually improve, with the unemployment rate declining to 5.2% by 2030. Ontario's college system will play a critical role in equipping workers with the skills demanded by employers, supporting the reallocation of labour as industries adjust. Looking ahead, however, the province will face the dual challenge of shifting demographics constraining worker availability and an evolving structural landscape, as the automation of services is expected to accelerate in the coming years.

Employment opportunities will differ significantly between industries. The construction sector employed 578,800 persons in 2024. It will grow by nearly 70,000 positions from 2026-2035. Job gains will largely be focused in speciality trade contracting and building construction.

The manufacturing sector employed 830,000 people in 2025. The sector had shown close to no growth between the financial crisis and the pandemic. The industry appeared to turn the corner recently, however, with U.S. tariffs and healthy productivity the sector is anticipated to shed jobs over the next 10 years.

In the service sector there will be strong growth in the financial and professional services. Computer System Design and Related Services are projected to grow at an average of 2% per year over the forecast. This is significantly below the 8% average annual growth experienced over the last decade. The slowdown is from both a maturing industry and the implementation of AI that will eliminate some jobs.

The Health Care and Social Assistance industry employed 1,007,200 workers in 2024 and is projected to increase by 205,000 over the coming decade. Hospitals employed 330,100 in 2024. Nursing and Residential Care Facilities employed 175,300 in 2024 and employment will rise by 39,900 over the coming decade.

Demographic Outlook

Ontario's population has expanded rapidly in recent years, driven primarily by international migration. Growth in non-permanent residents has been especially strong, reflecting a surge in international students. At the same time, permanent immigration has risen sharply, supported by federal targets aimed at bolstering economic growth and addressing labour market gaps.

Public pressure has led to a change in pace with the 2025-2027 Federal Immigration Levels Plan. This has reduced targets for permanent migration and, for the first time, explicitly set targets for temporary residents. The motivation to reduce non-permanent resident inflows stemmed from the federal government's goal of reducing the share of temporary residents to 5% of the population. It was estimated that this share was 7.3% of the population by late 2024.

Ontario has one of the largest shares of non-permanent residents and as a result its population growth is slowing faster than elsewhere. The province experienced a net loss of 107,280 non-permanent residents in the third quarter of 2025 and continues to see outflows of residents to other parts of Canada. The first quarter of 2025 saw the province's population decline for only the third time in recorded history. Non-permanent resident reductions are anticipated to accelerate in 2026, resulting in a further slowing of population growth.

Ontario's net-migration is projected to be relatively weak and, in some years, negative, while the international migration plan is in place. Currently, net-interprovincial migration is negative as residents relocate to other provinces due to economic conditions that include poor housing affordability. With fewer international migrants, Ontario's housing market should gradually become more affordable, reducing the pull of other provinces.

Net-migration is projected to turn negative in 2026, with net outflows totalling 35,700 persons. The number of non-permanent resident outflows will slow, and we anticipate that migration will turn positive again in 2027. Population growth will average 0.4% over the first five years of the forecast, accelerating to 1.1% in the next five years to 2035.

Regional Variations

The Ontario regional projections contain sub-geographical area modelling. Different industry makeup and the size of external impacts will result in some divergence in the economies; however, in general, they will all face similar challenges of slower population growth and tightening labour markets.

Greater Toronto Area

The Greater Toronto Area is Ontario's largest regional economy, accounting for 46% of the province, and home to over 7 million residents. It is comprised of five regions: York, Durham, Toronto, Peel and Halton, but does not include the City of Burlington, which is included in the Central region.

The GTA is experiencing a more significant housing correction than the rest of the province, impacting construction activity and employment. The condo market has been overbuilt and is facing its worst performance in recorded history. Currently, there are a large number of units under construction that is helping to maintain employment in the region, however job losses will accelerate in the short term as completed projects are replaced with fewer starts.

The region continues to play catch-up with a significant amount infrastructure investment underway or planned. Major work on transit, utilities, and health care infrastructure will continue to result in the need for construction workers to be trained, helping offset the weakness in the private sector.

The unemployment rate jumped to 7.9% in 2024 and increased further to 8.7% in 2025. Declining labour force participation – due to workers exiting the labour markets as they lose confidence in finding employment – is masking some of the weakness. With a declining population in 2026, the unemployment rate will reverse into a downward trend, though it will not fall below 6% until 2028.

Central Region

The Central Region surrounds the GTA, from Peterborough and Cobourg in the east, to Midland and Barrie in the north, Orangeville and Guelph on the western side, and down toward Brantford and the Niagara region. The region includes the CMAs of St. Catharines-Niagara, Hamilton, and Kitchener-Cambridge-Waterloo.

The Central region has a diverse range of economies that includes the home of large tech companies, post-secondary institutions, steel-making and automotive plants. Manufacturing represents over 14% of total output in the region, down from 20% at the turn of the millennium. With the increased diversity in the economy, the region is less impacted by the tariffs than it previously would have been. Nonetheless, its manufacturing base will face a slowdown in the short term.

The region is key to economic growth in the province. It has both the space to grow and close links to the GTA. It also has some of the largest infrastructure projects and will need a significant amount of new skilled labour to ensure it can continue to grow.

The Central Region experienced a population boom during the pandemic as it was perfectly poised as a location for the work-from-home movement that got underway in 2020. This led to a significant increase in migration from the GTA as workers sought out more space while still being within a manageable

distance of workplaces. The region's colleges expanded rapidly with a significant increase in foreign students. These factors combined to result in a population growth rate of nearly 3% per year over the last 2 years.

The region is home to some of the largest colleges. With the reduction in international students, regional population growth will slow but will still benefit from continued outward movement from the GTA.

Employment growth will slow to 0.1% in 2026, accelerating thereafter to 1% as the impacts of tariffs and population growth rebound. The unemployment rate will increase from 6.1% in 2024 to 7.0% in 2025. With slower population growth and healthy employment gains, the unemployment rate will trend down and remain below 5.5% from 2028 onwards.

Eastern Region

The Eastern Region stretches from the Muskoka-Kawarthas to Ottawa, including the Ottawa CMA. Kingston is also a prominent city in the region.

The Eastern region is anchored by Ottawa, where the federal government remains the dominant employer. Public administration employment has expanded steadily over the past decade, though current restraint is causing some layoffs and a downsizing of the federal civil service over the next few years. Compared to other parts of Ontario, the region is less directly affected by U.S. tariffs as its service-based economy provides insulation from trade shocks. Growth is softer as slower federal spending weighs on local activity. The Professional, Scientific, Managerial industry remains an important industry in the region that is forecast to grow faster than the wider economy over the decade.

Population trends are more stable than elsewhere in the province. Eastern Ontario has historically received fewer temporary foreign residents and immigrants. This cushions it somewhat from the new federal immigration caps. Population growth slows to 0.6% in 2026 but avoids an outright decline, outperforming the province as a whole. Growth will remain modest, averaging under 1% through the forecast as federal hiring restraint dampens inflows.

Labour market conditions are steady but cooling. Employment declined by 1.1% in 2025. Growth will recover and gradually rise to 1.0% by 2029. The unemployment rate edged up to 6.4% in 2025 from 5.7% in 2024 but will decrease to 5.5% across the forecast horizon.

Southwest Region

The Southwest region stretches from the Bruce Peninsula in the north to Lake Erie and the southern tip of Ontario. It includes the London, Windsor-Sarnia, and Stratford-Bruce Peninsula economic regions. It includes the London and Windsor census metropolitan areas.

The region is most acutely at risk to the Trump trade war, with nearly 27% of output coming from manufacturing. The region is home to several auto manufacturing plants and the high-value chemical sector. A 35% duty on Canadian goods is straining Sarnia's petrochemical exports, though many products remain exempt under CUSMA rules of origin.

London had been growing rapidly as both non-permanent residents increased and migration from the GTA and Central regions occurred as families sought out more affordable housing. With lower migration in the GTA and record housing completions, there will be few residents moving to the southwest. This will be exacerbated in the short term as firms reconsider the work-from-home movement. Population growth will slow to 0.1 % in 2026 and 0.3% in 2027, accelerating to just 0.7% over the remainder of the outlook period.

With the more exposed manufacturing sector, the region has experienced significant employment losses in 2025. Employment is anticipated to increase by just 0.5 in 2025. Investment in the electric vehicle (EV) supply chain with the Volkswagen battery plant in St. Thomas, and the NextStarr plant in Windsor is providing some relief to the sector over the medium term. However, demand for the products remains uncertain, as the recent federal government announcement to remove the EV mandate will undoubtedly affect the plants. The unemployment rate increased to 7.0% in 2025 and will decrease thereafter to more historically normal levels of close to 6%.

Northern Ontario Region

The Northern Ontario region spans from the Manitoba-Ontario border to that of Ontario-Quebec, through North Bay, Sault Ste. Marie. It includes Timmins, the Greater Sudbury and Thunder Bay CMAs.

Northern Ontario covers a vast area of the province and is anchored by resource activity. The economy is dominated by mining, with several new and proposed projects in the Northwest boosting growth over the short term. By contrast, Sudbury's economy is seeing a pause as past investment activity winds down, while Thunder Bay and the Northeast experience only modest gains. The region's relatively small manufacturing base shields it from the direct impact of U.S. tariffs. However, the recent increases in softwood lumber duties and copper tariffs will impact wood products and mining. Weaker global growth and trade tensions are weighing on commodity prices, dampening demand for metals and mineral products.

Labour market conditions remain resilient as mine development offsets weaknesses elsewhere. Employment growth is modest overall, with gains concentrated in the Northwest while Sudbury and Thunder Bay stagnate. The unemployment rate rose slightly to 5.3% in 2025 and will hold near 5.5% over the next five years before easing in the long run. The Rural Community Immigration Pilot (RCIP), which began in January 2025, continues the work of the Rural and Northern Immigration Pilot (RNIP) of past

years, to provide some support to local labour pools, though federal cuts to non-permanent residents reduce overall inflows to the region.

Demographic challenges remain acute. Northern Ontario is the oldest region in the province, and its population is stagnant or declining in most subregions. The aged dependency ratio will climb from 35.6% in 2024 to 42.1% by 2035, straining local services and limiting labour force growth. While new mining projects provide near-term momentum, structural headwinds from aging and weak population growth will cap the region's longer-term economic potential.

4. Occupational Demand Projections

Sources of Demand for College Education

The demand for college education comes from both employers and future workers. Education serves as a signal for both possessing the correct skills for the position and for potential workers having the skills to learn. For employers, this is important as it enables the right fit for staff and will ultimately reduce hiring mistakes and increase productivity. There are certain occupations where a college education is a clearly defined requirement, such as a pharmacy technician or many trades.

For potential students, the demand for education largely stems from increased employment outcomes. Persons with a college education will earn more on average and experience lower unemployment over their lifetime. Over the last 35 years, the average unemployment rate for those aged 25 or above with a postsecondary certificate or diploma has averaged 6.0%. This compares favourably to the average unemployment rate for a high school graduate, which averaged 7.0% or the economy-wide average of 6.6%[4].

[4] Statistics Canada, Unemployment rate, participation rate and employment rate by educational attainment, annual). Last updated 27 Jan. 2025.
https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410002001 (accessed September 10, 2025).

Demand Projections

Canada's national system for describing and sorting occupations is known as the National Occupational Classification (NOC). This breaks occupations down into 516 groups of similar jobs. The occupations can then be aggregated into larger groupings for different levels of analysis. The NOC 2021 also contains a skill classification system based on the degree of Training, Education, Experience and Responsibilities (TEER) to categorize occupations. There are 6 groupings for the TEER aggregation as follows:

TEER category	Nature of education, training and experience required and complexity of responsibilities
0	Management responsibilities
1	Completion of a university degree (bachelor's, master's, or doctorate); or Previous experience and expertise in subject matter knowledge from a related occupation found in TEER category 2 (when applicable).
2	Completion of a post-secondary education program of two to three years at community college, institute of technology, or CÉGEP; or Completion of an apprenticeship training program of two to five years; or Occupations with supervisory or significant safety (e.g. police officers and firefighters) responsibilities; or Several years of experience in a related occupation from TEER category 3 (when applicable).
3	Completion of a post-secondary education program of less than two years at community college, institute of technology or CÉGEP; or Completion of an apprenticeship training program of less than two years; or More than six months of on-the-job training, training courses or specific work experience with some secondary school education; or Several years of experience in a related occupation from TEER category 4 (when applicable).
4	Completion of secondary school; or Several weeks of on-the-job training with some secondary school education; or Experience in a related occupation from TEER category 5 (when applicable).
5	Short work demonstration and no formal educational requirements

For the purpose of this study, we are focused on occupations that usually require a college education. These occupations are classified in TEER 2 and 3. Colleges also educate a number of students who are enrolled in bachelor degree programs. These graduates will usually work in occupations classified as TEER 1, with some going on to work in TEER 0.

To provide some context, the table below shows the top 20 TEER 2 and 3 occupations from the most recent census. Some of the largest occupations include nurse aides, transport truck drivers, carpenters, electricians, elementary and secondary school teacher assistants. Many of these occupations work in areas that are key priorities for the provincial government and will require a substantial number of newly trained workers to sustain occupational demands.

Top 20 Occupational Employment from the 2021 Census

Nurse aides, orderlies and patient service associates	117,005
Transport truck drivers	115,650
Administrative officers	97,890
Administrative assistants	76,635
Social and community service workers	62,100
Early childhood educators and assistants	59,745
Real estate agents and salespersons	55,570
Automotive service technicians, truck and bus mechanics and mechanical repairers	51,780
Accounting technicians and bookkeepers	45,760
Carpenters	42,080
Cooks	41,220
General building maintenance workers and building superintendents	35,215
Graphic designers and illustrators	32,570
Elementary and secondary school teacher assistants	32,305
Insurance agents and brokers	31,350
Electricians (except industrial and power system)	30,645
Bus drivers, subway operators and other transit operators	29,665
Financial sales representatives	29,140
User support technicians	26,665
Welders and related machine operators	26,085

The table below shows estimates of the net demand for workers or job openings from 2026-2035 for TEER 2 and 3 occupations by broad category that result from our forecast modelling. These figures include new labour force requirements due to economic expansion, known as expansion demand, and the demand for workers to fill losses from labour force retirements and deaths, known as replacement demand. For those occupations that are classified in TEER 2, we forecast that there will be a total of 517,066 workers required from 2026 to 2035. Additionally, we forecast that 429,826 workers will be required for TEER 3. This represents a total 946,892 workers over 10 years. The demand for workers is lowest in 2026 as the economic slowdown impacts job creation. It will peak in 2029 at over 103,000 jobs as the economy recovers.

Most job openings will occur in the Trades, Transport and Equipment Operators and Related Occupations with 261,694 required over the next 10 years. The recovery in the housing sector will generate many of these jobs, with support coming from the numerous infrastructure projects.

The Business Finance and Administration sector follows this with 196,631 new workers needed over the next 10 years. Health-related occupations are expected to generate a need for 133,939 workers. This represents 38% of the current labour force, significantly above the average 30% for all occupations.

Job Openings by Broad Occupational Category

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	94,689	946,890
Teer 2	51,707	517,066
Teer 3	42,982	429,824
Business, Finance and Administration Occupations	19,663	196,631
Teer 2	8,069	80,693
Teer 3	11,594	115,939
Natural and Applied Sciences and Related Occupations	7,020	70,203
Teer 2	7,020	70,203
Health Occupations	13,394	133,942
Teer 2	5,499	54,994
Teer 3	7,895	78,949
Occupations in Educaton, Law and Social, Community and Government Services	8,504	85,037
Teer 2	6,510	65,099
Teer 3	1,994	19,939
Occupations in Art, Culture, Recreation and Sport	4,532	45,317
Teer 2	3,208	32,081
Teer 3	1,323	13,234
Sales and Service Occupations	12,903	129,025
Teer 2	4,620	46,198
Teer 3	8,283	82,828
Trades, Transport and Equiment Operators and Related Occupations	26,169	261,694
Teer 2	14,704	147,035
Teer 3	11,466	114,661
Natural Resources, Agriculture and Related Production Occupations	641	6,407
Teer 2	497	4,974
Teer 3	143	1,432
Occupations in Manufacturing and Utilities	1,863	18,632
Teer 2	1,579	15,791
Teer 3	284	2,841

The individual occupational demand forecast for all 231 TEER level 2 and 3 occupations may be seen in Appendix A.

Greater Toronto Area

For those occupations that are classified in TEER 2, we forecast that there will be a total of 226,404 workers required from 2026 to 2035. Additionally, we forecast that 194,333 workers will be required for TEER 3. This represents a total 420,734 workers over 10 years, 44% of Ontario's total job openings for TEER 2 and 3. The region will perform much worse than the province in 2026 with total job openings representing just 68% of their 10-year average compared to the province's 79%.

Most job openings will occur in the Trades, Transport and Equipment Operators and related occupations, with 102,985 required over the next 10 years. This represents 24.4% of this occupational category's current labour force. The GTA has a more significant number of job openings focused on the Business Finance and Administration sector than the province as a whole. It will need 91,567 new trained workers over the next 10 years. Health-related occupations are expected to generate a need for 59,517 workers. This represents 40% of the current health-related occupational labour force, significantly above the average 31% for all occupations.

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	42,073	420,734
Teer 2	22,640	226,404
Teer 3	19,433	194,333
Business, Finance and Administration Occupations	9,157	91,567
Teer 2	3,803	38,034
Teer 3	5,353	53,531
Natural and Applied Sciences and Related Occupations	3,432	34,321
Teer 2	3,432	34,321
Health Occupations	5,952	59,517
Teer 2	2,394	23,943
Teer 3	3,558	35,575
Occupations in Educaton, Law and Social, Community and Government Services	3,364	33,639
Teer 2	2,761	27,614
Teer 3	603	6,025
Occupations in Art, Culture, Recreation and Sport	2,745	27,450
Teer 2	2,014	20,135
Teer 3	732	7,317
Sales and Service Occupations	6,329	63,293
Teer 2	2,204	22,038
Teer 3	4,125	41,253
Trades, Transport and Equiment Operators and Related Occupations	10,299	102,985
Teer 2	5,347	53,465
Teer 3	4,952	49,517
Natural Resources, Agriculture and Related Production Occupations	181	1,808
Teer 2	160	1,602
Teer 3	21	207
Occupations in Manufacturing and Utilities	616	6,155
Teer 2	525	5,249
Teer 3	91	905

Central Region

For those occupations that are classified in TEER 2, we forecast that there will be a total of 137,019 workers required from 2026 to 2035. Additionally, we forecast that 108,182 workers will be required for TEER 3. This represents a total 245,201 workers over 10 years, 26% of Ontario's total job openings for TEER 2 and 3. Job openings for college-educated workers will rise from 19,330 in 2026 to an average of nearly 25,000 per year for the remainder of the outlook.

Most job openings will occur in the Trades, Transport and Equipment Operators and related Occupations, with 75,590 required over the next 10 years. This represents 29% of the category's current labour force and 31% of total job openings for the region. The region also has a significant number of job openings in the Business, Finance, and Administrative Occupations category. It will need 48,183 new trained workers over the next 10 years. Health-related occupations are expected to generate a need for 32,310 workers. This represents 36% of the current health-related occupational labour force.

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	24,520	245,201
Teer 2	13,702	137,019
Teer 3	10,818	108,182
Business, Finance and Administration Occupations	4,818	48,183
Teer 2	1,968	19,678
Teer 3	2,851	28,506
Natural and Applied Sciences and Related Occupations	1,548	15,479
Teer 2	1,548	15,479
Health Occupations	3,231	32,310
Teer 2	1,390	13,895
Teer 3	1,842	18,416
Occupations in Educaton, Law and Social, Community and Government Services	2,269	22,691
Teer 2	1,678	16,776
Teer 3	592	5,915
Occupations in Art, Culture, Recreation and Sport	954	9,536
Teer 2	646	6,463
Teer 3	307	3,072
Sales and Service Occupations	3,404	34,041
Teer 2	1,215	12,149
Teer 3	2,189	21,892
Trades, Transport and Equiment Operators and Related Occupations	7,559	75,590
Teer 2	4,592	45,916
Teer 3	2,968	29,675
Natural Resources, Agriculture and Related Production Occupations	165	1,647
Teer 2	159	1,589
Teer 3	6	59
Occupations in Manufacturing and Utilities	572	5,724
Teer 2	508	5,075
Teer 3	65	649

Eastern Region

For those occupations that are classified in TEER 2, we forecast that there will be a total of 66,989 workers required from 2026 to 2035. Additionally, we forecast that 54,886 workers will be required for TEER 3. This represents a total 121,871 workers over 10 years, 13% of Ontario's total job openings for TEER 2 and 3. The region is the second best performing in 2026 for job openings for college-educated workers, at 97.5% of their 10-year average.

The region has a much higher concentration of occupations located in the Business Finance and Administration sector than the province as a whole. It will need 28,691 new trained workers over the next 10 years.

Most job openings will occur in the Trades, Transport and Equipment Operators and Related Occupations, with 30,237 required over the next 10 years. This represents 27.6% of the occupational category's current labour force and 24.8% of total job openings for the region. Health-related occupations are expected to generate a need for 17,758 workers, representing 37% of the current labour force.

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	12,187	121,871
Teer 2	6,699	66,986
Teer 3	5,489	54,886
Business, Finance and Administration Occupations	2,869	28,691
Teer 2	1,188	11,879
Teer 3	1,681	16,812
Natural and Applied Sciences and Related Occupations	1,021	10,209
Teer 2	1,021	10,209
Health Occupations	1,776	17,758
Teer 2	748	7,483
Teer 3	1,028	10,275
Occupations in Educaton, Law and Social, Community and Government Services	1,450	14,502
Teer 2	957	9,567
Teer 3	494	4,935
Occupations in Art, Culture, Recreation and Sport	430	4,302
Teer 2	295	2,947
Teer 3	135	1,351
Sales and Service Occupations	1,445	14,445
Teer 2	581	5,808
Teer 3	864	8,635
Trades, Transport and Equiment Operators and Related Occupations	3,024	30,237
Teer 2	1,760	17,602
Teer 3	1,264	12,635
Natural Resources, Agriculture and Related Production Occupations	49	488
Teer 2	47	467
Teer 3	2	22
Occupations in Manufacturing and Utilities	124	1,236
Teer 2	102	1,022
Teer 3	22	219

Southwest Region

For those occupations that are classified in TEER 2, we forecast that there will be a total of 62,743 workers required from 2026 to 2035. Additionally, we forecast that 52,238 workers will be required for TEER 3. This represents a total 114,981 workers over 10 years, 12.1% of Ontario's total job openings for TEER 2 and 3. The region is the best performing in 2026 for job openings for college-educated workers.

Most job openings will occur in the Trades, Transport and Equipment Operators and Related Occupations, with 38,129 required over the next 10 years. This represents 28% of the current labour force and 33% of total job openings for the region. A significant number of job openings are in Business Finance and Administration sector. It will need 20,322 new trained workers over the next 10 years. Health-related occupations are expected to generate a need for 17,073 workers. This represents 36% of the current labour force.

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	11,498	114,981
Teer 2	6,274	62,743
Teer 3	5,224	52,238
Business, Finance and Administration Occupations	2,032	20,322
Teer 2	776	7,757
Teer 3	1,256	12,563
Natural and Applied Sciences and Related Occupations	777	7,774
Teer 2	777	7,774
Health Occupations	1,707	17,073
Teer 2	657	6,569
Teer 3	1,050	10,501
Occupations in Educaton, Law and Social, Community and Government Services	960	9,604
Teer 2	754	7,540
Teer 3	206	2,064
Occupations in Art, Culture, Recreation and Sport	330	3,301
Teer 2	204	2,037
Teer 3	127	1,265
Sales and Service Occupations	1,373	13,729
Teer 2	491	4,908
Teer 3	882	8,818
Trades, Transport and Equiment Operators and Related Occupations	3,813	38,129
Teer 2	2,198	21,979
Teer 3	1,615	16,150
Natural Resources, Agriculture and Related Production Occupations	79	785
Teer 2	67	674
Teer 3	11	112
Occupations in Manufacturing and Utilities	426	4,264
Teer 2	351	3,506
Teer 3	76	757

Northern Ontario Region

For those occupations that are classified in TEER 2, we forecast that there will be a total of 23,916 workers required from 2026 to 2035. Additionally, we forecast that 20,187 workers will be required for TEER 3. This represents a total of 44,103 workers over 10 years, 4.6% of Ontario's total job openings for TEER 2 and 3. In 2026 the region will require just 3,843 new college-educated workers. The region is the only one to experience further weakening in 2027, due to the economy slowing. Job creation will accelerate thereafter as the economy improves, and job creation peaks in 2031 at 4,964 positions.

Most job openings will occur in the Trades, Transport and Equipment Operators and Related Occupations, with 14,755 required over the next 10 years, double any other occupation category. Business Finance and Administration sector will follow at 7,868. This is closely matched by health-related occupations that are expected to generate a need for 7,285 workers.

	Average Annual Demand	Total Demand 2026-2035
TOTAL JOB OPENINGS	4,410	44,103
Teer 2	2,392	23,916
Teer 3	2,019	20,187
Business, Finance and Administration Occupations	787	7,868
Teer 2	334	3,343
Teer 3	452	4,523
Natural and Applied Sciences and Related Occupations	242	2,420
Teer 2	242	2,420
Health Occupations	729	7,285
Teer 2	310	3,103
Teer 3	418	4,181
Occupations in Educaton, Law and Social, Community and Government Services	460	4,599
Teer 2	360	3,600
Teer 3	100	998
Occupations in Art, Culture, Recreation and Sport	73	726
Teer 2	50	502
Teer 3	23	227
Sales and Service Occupations	352	3,520
Teer 2	129	1,291
Teer 3	223	2,229
Trades, Transport and Equiment Operators and Related Occupations	1,476	14,755
Teer 2	807	8,071
Teer 3	669	6,685
Natural Resources, Agriculture and Related Production Occupations	168	1,677
Teer 2	64	642
Teer 3	104	1,035
Occupations in Manufacturing and Utilities	125	1,252
Teer 2	94	940
Teer 3	31	312

5. Occupational Supply Projections

College Graduate Supply

Several steps and assumptions were required to estimate the future supply of college-educated workers discussed in this section. The supply estimate produced in this analysis considers most graduates from all post-secondary programs in colleges; it does not account for secondary accreditation and should be considered an upper estimate of the actual supply. Additionally, apprenticeships were not considered in the data, however pre-apprenticeship programs are included.

Estimating the future supply of college-educated workers required the use of historical information on the number of domestic (Canadian National) enrolments and credentials awarded to compute the throughput rate of graduates. The length of time it takes to graduate depends on credential type (diploma, degree, etc.) and student status (full-time vs part-time). We have used a weighted average of credentials taken to the usual time of completion, which results in an average of just over two years to graduation; therefore, this lag is assumed in the estimate. The result of these estimates is presented below in Table 5.1. The rate of graduate throughput has risen slightly over the last few cohorts, averaging around 40% since the pandemic, up from 38.5%. A 40% graduate throughput rate is expected based on the 2 to 3-year assumption for completing these credentials.

Table 5.1
Graduate Throughput Rates for College Credentials

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Canadian Student Enrolments*	195,969	198,253	194,403	187,860	177,653	168,998	155,946	160,671	170,690
College Graduates	79,865	77,549	75,689	76,641	73,934	73,991	75,903	66,730	67,646
Graduation Throughput Rates	39.6%	38.6%	38.1%	38.9%	37.7%	38.7%	41.5%	38.5%	41.6%

*Does not include apprenticeships

The next task is to develop a projection of Canadian student enrolments. Historical population data was used to calculate enrolment/population ratios. In this measurement, the focus was centered on the age group 18 to 24 years, the period when people are most likely to be in higher education.

It was necessary to isolate the stock of non-permanent residents in Ontario by age to ensure that the analysis focused only on permanent Ontario residents. Historically, census shares were used to estimate the stock of non-permanent residents by age. Data provided by Statistics Canada on the change in non-permanent residents by age was then used post-census to estimate the stock by age. In the forecast, the total change in non-permanent residents is driven by short-term policy announcements by the federal government, and long-run assumptions were based on historical migration rates.

The domestic undergraduate student enrolment/population ratio dipped significantly during the pandemic; this was likely due to changes in delivery and uncertainty about the student experience, the difficulty of relocating and other factors. Enrolment as the proportion of the population has risen in recent years. The number of enrolments has averaged 15.5% of the population over the past 10 years. For modelling purposes, a 10-year average is used to mitigate the cyclical impacts of the economy and those of the pandemic.

Table 5.2 displays anticipated enrolments and the corresponding graduates.

Table 5.2
Baseline Domestic Enrolment and Graduation

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Canadian Student Enrolments	166,937	169,681	171,662	173,213	178,239	183,782	186,025	186,565	187,027	187,417
College Graduates	67,617	65,566	64,159	63,551	64,658	65,721	66,488	67,089	69,035	71,182

On average, over the next 10 years, the colleges are anticipated to produce 66,507 domestic graduates a year. This falls far short of the projected demand for 94,689 workers per year over the forecast period. This appears to be consistent with various media reports that suggested Ontario firms have faced shortages. Similar reports have been noted across Canada.

Impacts of International Student Policy Changes

With both Ontario and Canada failing to provide enough trained domestic workers, the government made changes to the Post-Graduation-Work Permit Program (PGWPP) in 2015 to encourage foreign students to pursue Canadian education as a means of immigrating, boosting the skilled workforce. This closed the gap between the demand and supply for college-educated workers, while simultaneously boosting college revenues to help fund domestic programs. Recent changes to policies surrounding foreign students, and their subsequent reduction, are raising funding challenges, leading to cuts in programs that include domestic students. Data collected from the colleges is displayed in Table 5.3. It indicates that there are currently 5,359 fewer domestic graduates expected each year due to the cuts, representing a 7.5% reduction in the average number of graduates over the last 5 years.

Table 5.3
Five-Year Average Domestic Graduates and Reductions

Program	Average Graduates 2020-2024	Projected Graduate Loss	% Reduction
STEM	10,407	758	7.3%
Business & Administration	11,219	1,526	13.6%
Arts & Humanities	6,714	1,139	17.0%
Social & Behahivoural Science	7,176	618	8.6%
Legal Professions and Studies	1,541	131	8.5%
Healthcare	15,124	209	1.4%
Education & Training	475	85	17.9%
Trades	18,890	841	4.5%
Misc	384	52	13.5%
Total	71,641	5,359	7.5%

Cuts are not spread evenly across program types. While health care remains relatively unscathed, it is an area of increasing demand and remains a provincial priority due to the aging of the population. Similarly, the trades, while less affected, remain key to the planned economic and infrastructure growth.

Table 5.4 below shows the supply gap after the anticipated program closures. Over the next decade, it is projected that there will be a shortage of 335,414 college graduates provided from domestic sources.

Table 5.4
Supply and Demand Projections

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total 2026-2035
Canadian Graduates After Reductions	62,258	60,207	58,800	58,192	59,299	60,362	61,129	61,730	63,676	65,823	611,477
Demand for College-Educated Workers	75,308	90,429	98,690	103,007	101,225	95,549	92,620	95,716	97,458	96,889	946,891
Shortage	13,050	30,222	39,890	44,815	41,926	35,187	31,491	33,986	33,782	31,066	335,414

Occupational Supply of Domestic Students

To better understand the supply and demand of labour, we need to link educational programs to likely occupational outcomes. Many programs will have a direct linkage to occupations. However, many will have looser linkages with students having opportunities in many different fields.

Education programs are classified using the Classification of Instructional Programs (CIP), which doesn't directly correlate with the NOC system. Even those with direct linkages are classified differently. For

example, the CIP code 51.26 Health aides/attendants/orderlies is regarded as a health educational program. These programs often result in employment in the NOC area 44101 *Home support workers, caregivers* and related occupations. On a NOC basis, this falls outside of NOC 3 Health Occupations and instead is categorized as NOC 4 Occupations in Education, Law and Social, Government Services.

To better map occupational outcomes with education, we used table 98-10-0405-01 (Occupation by major field of study) from Statistics Canada. It provides a snapshot of the occupations where graduates are employed, based on CIP codes. For this analysis, we use the major field of study groupings from CIP and the single-digit NOC to estimate where graduates from each program work. Caution should be exercised with this analysis, as workers will ultimately find employment where job opportunities exist; however, there are strong linkages.

Stokes used this data for Ontario to map anticipated graduates by program to a single-digit NOC. The results are shown below in Table 5.5.

Table 5.5
Supply and Demand Projections for Single-Digit NOC

	Total Supply 2026-2035	Total Demand 2026-2035	Shortage (-) Surplus (+)
Business, Finance and Administration Occupations	102,582	196,631	-94,049
Natural and Applied Sciences and Related Occupations	43,553	70,203	-26,650
Health Occupations	84,285	133,942	-49,657
Occupations in Education, Law and Social, Community and Government Services	63,033	85,037	-22,004
Occupations in Art, Culture, Recreation and Sport	23,544	45,317	-21,773
Sales and Service Occupations	134,998	129,025	5,973
Trades, Transport and Equipment Operators and Related Occupations	117,739	261,694	-143,955
Natural Resources, Agriculture and Related Production Occupations	10,207	6,407	3,800
Occupations in Manufacturing and Utilities	25,265	18,632	6,633

The table shows that most occupational groups will experience significant shortages over the next 10 years. The most acute of these shortages will be in the Trades, Transport and Equipment Operators and Related Occupations, with nearly 144,000 positions needing to be filled from sources outside of domestic graduates. These shortages may put large infrastructure projects at risk due to the possibility of cost and time overruns.

In addition to the shortages in the trades, it is anticipated that there will be 26,650 fewer graduates supplied in the Natural and Applied Sciences and Related Occupations. These occupations include construction estimators and many occupations that assist engineers and manufacturing occupations, potentially restricting growth.

The Ontario government has committed to improving access to health care. This has been through commitments to increase long-term care beds in the 2025 Budget, with a total of 58,000 new and upgraded beds planned by 2028. Hospital expansions are underway, with more planned, along with recent announcements to increase access to primary care. These initiatives will raise demand for staff that would usually be filled by the local education systems first. It is projected that there will be a shortage of nearly 50,000 health workers over the next decade. While there isn't any significant program cuts anticipated in the health care related programs, increased retirements and an aging population is resulting in a shortage of health care workers over the forecast period.

The second-largest occupational supply deficit will be in the Business, Finance and Administration occupations. These occupations are broad and may impact business in all sectors. Smaller communities that have a larger proportion of small and medium sized firms may experience restrictions in growth associated with the lack of trained labour in these occupations.

Some areas are expected to have an excess supply of workers. However, it is likely that with shortages in other occupations, there will be significant competition to retain workers as labour seeks out higher wages. For instance, many occupations in the manufacturing and utilities sectors may be able to switch into the trades and transport sector, which could create shortages in those sectors.

6. Economic Contribution of College-Educated Workers

College-educated workers contribute to a significant portion of Ontario's economic output. In this section of the study, we estimated the impact on GDP and employment if the gap between projected demand and the supply of TEER 2 & 3 workers were to go unfilled.

The approach adopted to assess the economic impacts of a shortage of college-educated workers in the Ontario economy is to conduct a "base case" scenario in which those workers are present and then compare the results to a scenario with a shortage of workers, referred to as a "shock" to the model.

A shock was applied to the Ontario Economy, assuming that the average projected supply gap for college-educated workers over the next ten years remains unfilled by other sources in 2026. This gap represents a shortage of 33,541 workers in TEER 2&3 occupations. The shortages were assumed to occur evenly across all TEER 2 & 3 occupancies. The reductions in occupations were then mapped backwards through the occupational model to the industries in which these occupations are employed. This method results in an estimate of reductions in industry employment. Average industry productivity was then applied to these employment losses to estimate direct output losses to the economy.

A shortage of college-educated workers will have direct, indirect, and induced impacts on the economy. The direct impacts are those that are directly associated with the reduction. In this example, fewer workers and less production are associated with this loss. The indirect impacts result from fewer inputs being purchased and sold between firms as they scale back production due to reduced output. Finally, the induced impacts are the result of less income and profits from production, which in turn lead to fewer purchases by households in the economy.

The summation of the direct, indirect and induced impacts relative to the direct impacts is known as a Type II multiplier. The employment and GDP multipliers were estimated at 1.56 and 2.25, respectively, as shown in Table 6.1 below. This means that for every single job lost, another 0.56 was lost in the economy. For every $1 direct reduction in GDP, another $1.25 was reduced from the indirect and induced sources. A reduction of 33,541 college-educated workers will result in a direct GDP loss of $3.26 billion. This direct job and GDP loss amounts to a total loss in employment and GDP of 55,250 and $7.3 billion respectively.

Table 6.1
Impact of a Shortage in College-Educated Workers in a Single Year

	Direct Impact	Total Impact	Type II Multiplier
Employment	-33,541	-52,250	1.56
GDP ($2017 Millions)	-3,262	-7,348	2.25

Several factors can explain the greater impact on GDP. College-educated workers will earn higher wages than those with lower levels of education and will be relatively more productive. This results in a disproportionately larger impact on output due to relatively higher productivity, and as household income is reduced more so than in relatively lower-paying occupations.

It is important to note that the economic loss scenario is a one-year impact analysis. Longer-term effects of continued loss of educated and skilled individuals are not considered due to the complexities in calculating the appropriate externalities. The loss of innovation is hard to predict or measure.

A continued shortage of skilled individuals may cause potential investors to look outside of Ontario, further affecting the economy over time.

7. Conclusion

Historically, the Ontario and Canadian economy have had a shortage of domestic, trained, college-educated workers. With the changes in 2015 to the Post-Graduation-Work Permit Program, colleges have been able to attract and train international students to help fill this gap.

Public policy changes to international migration will limit the labour market's ability to fill the gap between domestic college-educated graduates and the demand for college-educated workers. This gap is further compounded by recent college program closures that also affect the supply of domestic students.

The demand for college-educated workers over the next 10 years is estimated to be at least 946,892 workers. This far exceeds the estimated domestic supply of 611,417 workers. Without other sources to fill these gaps, the economy may experience widespread labour shortages across many occupational groupings.

The most acute of these shortages will be in the Trades, Transport and Equipment Operators and Related Occupations, with nearly 144,000 positions needing to be filled from sources outside of domestic graduates. The province's 2025 Budget outlines a $223 billion 10-year capital plan focusing on infrastructure expansion, including health, transit, schools and highways. Natural resource development in the northern part of the province is also a key focus. If these shortages go unfilled, the government capital plan as it stands will be put at risk with extended completion times and potential cost overruns.

The second-largest occupational supply deficit will be in the Business, Finance and Administration occupations. These occupations are broad and may impact business in all sectors. Smaller communities that have a larger proportion of small and medium sized firms may experience limitations in growth associated with the lack of trained labour in these occupations.

The Ontario government has committed to improving access to health care. This has been through commitments to increase long-term care beds in the 2025 Budget. Additionally, the Ontario government has committed to improving access to primary health care, through the Primary Care Action Plan that aims to connect every Ontarian with a family doctor or team by 2029. Making substantial improvements on these goals will be a challenge given that we project that there will be a shortage of nearly 50,000 workers trained in Health over the decade.

A shortage of college-educated workers will have impacts beyond the direct loss of employment and output. In a single year, the economic impact of a shortage of 33,541 college-educated workers will result in total loss of 55,250 jobs. This will amount to a $7.3 billion reduction in GDP, a significant loss to the Ontario economy.

8. High-Priority Program Expansion

After the completion of this report, the Ontario government announced $6.4 billion in support for the postsecondary education sector, including expanding post-secondary seats by 40,000[5]. Stokes estimated the impact of an additional 20,000 seats in the college sector, assuming they will be allocated to high-priority programs as determined by government parameters. These high-priority programs include STEM, Trades & Transportation, Health, and Education.

The Ontario government would like to expand activity in the mining sector, including the development of the Ring of Fire. The government also plans to expand highways, transit, health and other infrastructure projects. There will be additional demand for college-educated workers in the trades & transportation as well as the health care area to meet the growing needs of an aging population. The expansion of postsecondary education will be key to meeting these objectives.

To estimate the economic impact of the extra 20,000 seats, Stokes assumed that each high-priority program would receive a proportional increase in seats. The programs were then totalled by 2-digit CIP. Three-digit NOC occupation data was used to assess the likely occupational outcomes for each educational program. Stokes then translated this back to the industries where these workers are employed.

The additional college-educated workers will have direct, indirect and induced impacts on the economy. The direct impacts are those directly associated with the increase in jobs. In this example, additional employment and production. The secondary impacts are indirect and induced impacts and result from increased inputs being purchased and sold between firms as well as higher incomes (wages and profits) from production, which in turn lead to increased expenditures in the economy.

The summation of the indirect and induced impacts relative to the direct impact is known as a Type II multiplier. The employment and GDP multipliers were estimated at 1.48 and 2.16, respectively, as shown in Table 8.1 below. This means that for every additional job, another 0.48 jobs are created. For every $1 direct increase in GDP, another $1.16 was created from indirect and induced sources. An increase of 20,000 college-educated jobs will result in a direct increase in GDP of $2.14 billion. This direct job and GDP gain amounts to a total increase in employment and GDP of 29,690 and $4.62 billion in GDP, respectively.

[5] https://news.ontario.ca/en/release/1007034/ontario-investing-64-billion-to-support-postsecondary-sectors-long-term-success-and-sustainability

Table 8.1
Impact of Additional College-Educated Workers in High-Priority Programs in a Single Year

	Direct Impact	Total Impact	Type II Multiplier
Employment	20,000	29,690	-1.48
GDP ($2017 Millions)	2,136	4,619	-2.16

The Ontario government is expanding the number of seats in higher education. It remains uncertain as to exactly what programs these seats will be located in. The provincial government has listed several priorities in the 2026 Budget. These identified priorities will benefit from college-educated workers trained in high-priority programs. Our estimations show that college-educated high-priority programs have an outsized impact on GDP per worker. Every additional college-educated worker employed raises Ontario's GDP by $230,095 annually.

Appendix A

TEER Level 2 and 3 Occupational Demand	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Cumlative 2026-2035
TOTAL JOB OPENINGS	75,308	90,429	98,690	103,007	101,225	95,549	92,620	95,716	97,458	96,889	946,891
Business Finance and Administration Occupations	15,802	18,200	19,485	20,913	20,978	20,143	19,743	19,393	20,987	20,987	196,631
#12010 Supervisors, general office and administrative support workers	208	263	286	311	320	318	318	332	341	346	3,043
#12011 Supervisors, finance and insurance office workers	315	359	381	401	400	387	381	371	414	418	3,827
#12012 Supervisors, library, correspondence and related information workers	48	50	48	49	49	52	52	52	54	54	508
#12013 Supervisors, supply chain, tracking and scheduling coordination occupations	441	520	550	567	572	551	537	572	576	578	5,464
#12100 Executive assistants	825	960	1,025	1,101	1,121	1,101	1,093	1,129	1,167	1,175	10,697
#12101 Human resources and recruitment officers	466	491	552	649	696	651	648	737	727	746	6,363
#12102 Procurement and purchasing agents and officers	645	794	872	903	884	880	870	919	931	937	8,635
#12103 Conference and event planners	242	300	343	397	439	423	429	439	476	484	3,972
#12104 Employment insurance and revenue officers	408	463	452	494	501	556	571	596	602	610	5,253
#12110 Court reporters, medical transcriptionists and related occupations	141	142	141	154	159	143	137	131	139	136	1,423
#12111 Health information management occupations	55	100	110	120	118	121	124	121	122	121	1,112
#12112 Records management technicians	20	22	24	26	26	26	25	26	26	26	247
#12113 Statistical officers and related research support occupations	26	46	55	64	66	65	64	53	70	69	578
#12200 Accounting technicians and bookkeepers	2,122	2,325	2,305	2,335	2,197	2,009	1,887	1,476	1,960	1,885	20,501
#12201 Insurance adjusters and claims examiners	570	490	477	459	441	414	403	422	421	414	4,511
#12202 Insurance underwriters	378	336	328	316	303	280	274	289	288	285	3,077
#12203 Assessors, business valuators and appraisers	140	144	150	157	162	147	141	136	152	150	1,479
#13100 Administrative officers	4,339	4,901	5,361	5,878	6,022	5,875	5,808	6,029	6,165	6,227	56,605
#13101 Property administrators	738	726	759	779	806	738	716	753	760	754	7,529
#13102 Payroll administrators	324	408	470	523	524	490	472	425	505	500	4,641
#13110 Administrative assistants	1,600	2,181	2,513	2,846	2,884	2,720	2,644	2,699	2,820	2,840	25,747
#13111 Legal administrative assistants	574	639	636	682	640	579	556	53	675	660	5,694
#13112 Medical administrative assistants	551	712	741	802	804	805	823	822	810	806	7,676
#13200 Customs, ship and other brokers	27	87	111	108	99	103	100	102	98	94	929
Natural and applied Sciences and Related Occupations	4,924	6,769	7,729	7,918	7,290	7,104	6,779	7,947	6,922	6,821	70,203
#13201 Production and transportation logistics coordinators	599	738	796	792	747	710	670	708	687	673	7,120
#22100 Chemical technologists and technicians	111	163	176	162	136	135	128	126	133	127	1,397
#22101 Geological and mineral technologists and technicians	6	34	54	44	33	35	36	41	39	39	361
#22110 Biological technologists and technicians	32	54	64	70	67	69	69	60	78	77	640
#22111 Agricultural and fish products inspectors	31	33	32	33	32	34	33	34	33	33	328
#22112 Forestry technologists and technicians	22	23	23	22	21	23	22	23	22	21	222
#22113 Conservation and fishery officers	14	15	16	16	16	18	17	18	17	17	164
#22114 Landscape and horticulture technicians and specialists	206	206	230	280	314	270	261	282	288	284	2,621
#22210 Architectural technologists and technicians	85	183	220	250	225	218	209	217	225	221	2,053
#22211 Industrial designers	73	142	163	168	145	142	135	137	144	143	1,392
#22212 Drafting technologists and technicians	174	279	318	321	283	271	254	266	268	262	2,696
#22213 Land survey technologists and technicians	8	13	14	16	13	14	14	14	15	15	136
#22214 Technical occupations in geomatics and meteorology	53	70	77	85	85	88	87	94	92	91	822
#22220 Computer network and web technicians	697	1,016	1,184	1,254	1,160	1,191	1,164	1,473	1,149	1,136	11,424
#22221 User support technicians	702	988	1,142	1,214	1,117	1,144	1,117	1,503	1,094	1,082	11,103
#22222 Information systems testing technicians	120	202	233	239	200	216	212	329	197	193	2,141
#22230 Non-destructive testers and inspectors	29	44	50	50	45	45	43	45	44	42	437
#22231 Engineering inspectors and regulatory officers	64	82	89	88	82	80	77	80	79	77	798
#22232 Occupational health and safety specialists	182	199	217	239	237	228	217	230	224	225	2,198
#22233 Construction inspectors	179	199	200	220	210	201	192	197	195	193	1,986
#22300 Civil engineering technologists and technicians	129	171	193	219	199	196	193	209	206	203	1,918
#22301 Mechanical engineering technologists and technicians	301	485	598	516	445	441	415	465	427	411	4,504
#22302 Industrial engineering and manufacturing technologists and technicians	186	272	320	254	212	204	188	209	198	190	2,233
#22303 Construction estimators	325	358	396	425	389	311	249	278	276	287	3,294
#22310 Electrical and electronics engineering technologists and technicians	435	573	639	631	573	545	510	559	526	515	5,506
#22311 Electronic service technicians (household and business equipment)	680	853	953	984	942	875	832	953	850	839	8,761
#22312 Industrial instrument technicians and mechanics	39	50	55	52	46	49	45	47	45	43	471
#22313 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	38	64	72	67	60	62	59	60	58	56	596
Health Occupations	8,610	11,808	12,564	13,990	14,464	14,220	14,548	14,528	14,621	14,589	133,942
#32100 Opticians	159	169	164	174	173	167	162	164	161	157	1,650
#32101 Licensed practical nurses	534	922	1,028	1,170	1,222	1,225	1,267	1,278	1,273	1,280	11,199
#32102 Paramedical occupations	316	427	447	494	503	517	542	547	545	549	4,887
#32103 Respiratory therapists, clinical perfusionists and cardiopulmonary technologists	57	152	174	196	195	205	217	219	218	220	1,853
#32104 Animal health technologists and veterinary technicians	94	154	147	175	168	161	168	22	222	221	1,532
#32109 Other technical occupations in therapy and assessment	160	254	275	308	314	318	332	336	337	340	2,974
#32110 Denturists	32	37	37	40	39	39	39	39	38	38	378
#32111 Dental hygienists and dental therapists	496	588	602	656	669	671	691	698	692	692	6,455
#32112 Dental technologists and technicians	61	99	99	105	100	97	95	97	93	91	937
#32120 Medical laboratory technologists	196	321	349	379	375	383	392	387	385	383	3,550
#32121 Medical radiation technologists	133	291	330	364	360	376	392	393	389	390	3,418
#32122 Medical sonographers	136	187	197	213	214	216	221	222	219	219	2,044
#32123 Cardiology technologists and electrophysiological diagnostic technologists	35	53	56	61	60	62	64	64	63	63	581
#32124 Pharmacy technicians	205	320	342	378	372	380	383	389	387	383	3,539
#32129 Other medical technologists and technicians	42	78	84	90	89	90	92	93	91	90	839
#32200 Traditional Chinese medicine practitioners and acupuncturists	95	100	98	104	104	101	101	101	100	99	1,003
#32201 Massage therapists	519	638	657	710	725	721	743	752	748	747	6,960
#32209 Other practitioners of natural healing	109	120	120	125	125	121	121	121	119	116	1,197
#33100 Dental assistants and dental laboratory assistants	514	615	633	694	709	712	737	747	739	740	6,840
#33101 Medical laboratory assistants and related technical occupations	200	291	311	344	345	349	361	348	363	363	3,275

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#32103 Respiratory therapists, clinical perfusionists and cardiopulmonary technologists	57	152	174	196	195	205	217	219	218	220	1,853
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#33100 Dental assistants and dental laboratory assistants	514	615	633	694	709	712	737	747	739	740	6,840
#33101 Medical laboratory assistants and related technical occupations	200	291	311	344	345	349	361	348	363	363	3,275
#33102 Nurse aides, orderlies and patient service associates	3,933	5,142	5,521	6,219	6,619	6,321	6,428	6,496	6,436	6,409	59,524
#33103 Pharmacy technical assistants and pharmacy assistants	235	310	314	355	346	348	344	359	355	348	3,314
#33109 Other assisting occupations in support of health services	350	541	577	637	639	641	658	655	650	649	5,997
Occupations in Educaton, Law and Social, Community and Government Services	5,177	7,011	7,743	8,877	9,244	8,864	8,925	9,283	9,806	10,107	85,037
#42100 Police officers (except commissioned)	384	535	548	751	873	911	936	977	995	1,008	7,918
#42101 Firefighters	250	311	310	397	442	461	467	481	487	490	4,096
#42102 Specialized members of the Canadian Armed Forces	9	9	9	9	9	10	10	11	11	11	98
#42200 Paralegals and related occupations	239	336	330	432	467	482	489	377	536	538	4,226
#42201 Social and community service workers	1,564	1,965	2,198	2,523	2,684	2,591	2,612	2,655	2,688	2,708	24,188
#42202 Early childhood educators and assistants	1,324	1,758	2,112	2,353	2,379	2,278	2,286	2,406	2,478	2,561	21,935
#42203 Instructors of persons with disabilities	65	103	119	134	137	124	125	135	144	154	1,240
#42204 Religion workers	102	141	142	147	154	140	141	148	145	141	1,401
#43100 Elementary and secondary school teacher assistants	572	1,092	1,196	1,226	1,102	821	807	997	1,196	1,356	10,365
#43109 Other instructors	66	93	107	119	119	103	96	108	112	121	1,044
#43200 Sheriffs and bailiffs	32	42	45	62	71	73	72	64	76	77	614
#43201 Correctional service officers	141	160	160	202	232	236	239	249	252	254	2,125
#43202 By-law enforcement and other regulatory officers	66	85	89	120	140	143	145	151	153	155	1,247
#43203 Border services, customs, and immigration officers	97	110	100	114	117	135	138	136	145	146	1,238
#43204 Operations members of the Canadian Armed Forces	265	272	279	290	317	358	361	387	388	389	3,306
Occupations in Art, Culture, Recreation and Sport	3,941	4,648	4,851	5,060	4,867	4,599	4,412	3,573	4,730	4,636	45,317
#52100 Library and public archive technicians	54	79	91	101	101	92	88	91	98	101	896
#52110 Film and video camera operators	85	87	88	86	83	81	79	75	80	78	822
#52111 Graphic arts technicians	95	126	133	136	124	124	119	133	119	115	1,224
#52112 Broadcast technicians	69	73	74	72	69	66	64	65	63	61	676
#52113 Audio and video recording technicians	302	313	324	329	320	310	298	299	299	290	3,084
#52114 Announcers and other broadcasters	101	113	118	116	111	109	105	104	102	97	1,076
#52119 Other technical and coordinating occupations in motion pictures, broadcasting and the performing arts	556	631	676	678	654	637	618	659	616	601	6,326
#52120 Graphic designers and illustrators	998	1,300	1,383	1,488	1,409	1,354	1,307	957	1,448	1,430	13,074
#52121 Interior designers and interior decorators	422	562	570	597	551	500	466	167	543	528	4,906
#53100 Registrars, restorers, interpreters and other occupations related to museum and art galleries	10	21	24	26	23	26	26	25	27	27	235
#53110 Photographers	154	186	184	201	188	172	167	1	214	211	1,678
#53111 Motion pictures, broadcasting, photography and performing arts assistants and operators	175	186	188	182	172	169	165	161	167	162	1,727
#53120 Dancers	17	15	17	19	22	19	17	18	19	20	183
#53121 Actors, comedians and circus performers	218	188	187	191	200	179	171	175	177	174	1,860
#53122 Painters, sculptors and other visual artists	318	273	266	272	285	245	230	218	239	234	2,580
#53123 Theatre, fashion, exhibit and other creative designers	126	165	167	182	173	161	152	90	170	167	1,553
#53124 Artisans and craftspersons	212	243	239	239	228	208	195	189	198	191	2,142
#53125 Patternmakers - textile, leather and fur products	2	4	4	5	4	3	3	2	3	3	33
#53200 Athletes	0	19	30	34	37	34	34	36	38	39	301
#53201 Coaches	27	62	87	101	108	105	103	104	106	104	907
#53202 Sports officials and referees	0	2	4	5	6	4	4	4	5	5	39
Sales and Service Occupations	11,039	12,437	13,151	13,578	13,802	12,910	12,643	13,198	13,225	13,042	129,025
#62010 Retail sales supervisors	444	593	593	678	705	685	673	714	728	733	6,546
#62020 Food service supervisors	624	743	850	895	949	946	964	1,020	1,042	1,049	9,082
#62021 Executive housekeepers	40	31	32	35	40	36	35	37	37	37	360
#62022 Accommodation, travel, tourism and related services supervisors	49	46	50	54	60	55	55	59	60	60	548
#62023 Customer and information services supervisors	98	122	139	156	161	153	152	157	169	171	1,478
#62024 Cleaning supervisors	187	185	200	225	242	207	200	219	231	240	2,136
#62029 Other services supervisors	121	110	125	154	175	149	145	160	165	167	1,471
#62100 Technical sales specialists - wholesale trade	595	801	862	914	909	875	855	883	921	924	8,539
#62101 Retail and wholesale buyers	346	461	473	519	524	505	491	507	525	526	4,877
#62200 Chefs	677	857	940	1,006	1,054	1,009	992	1,025	1,015	993	9,568
#62201 Funeral directors and embalmers	61	96	98	105	115	107	111	118	116	112	1,039
#62202 Jewellers, jewellery and watch repairers and related occupations	47	61	58	63	62	57	53	51	53	51	556
#63100 Insurance agents and brokers	1,630	1,386	1,324	1,256	1,191	1,109	1,071	1,116	1,101	1,076	12,260
#63101 Real estate agents and salespersons	2,686	2,570	2,634	2,565	2,590	2,255	2,131	2,222	2,199	2,149	24,001
#63102 Financial sales representatives	717	1,006	1,188	1,221	1,159	1,104	1,088	1,152	1,158	1,152	10,945
#63200 Cooks	1,461	1,607	1,752	1,808	1,869	1,788	1,761	1,796	1,774	1,727	17,343
#63201 Butchers - retail and wholesale	69	86	83	93	94	88	85	87	87	86	858
#63202 Bakers	422	535	574	575	553	524	492	514	504	487	5,180
#63210 Hairstylists and barbers	462	665	679	718	767	715	729	764	750	724	6,973

#63211 Estheticians, electrologists and related occupations	242	396	421	465	508	475	494	531	527	516	4,575
#63220 Shoe repairers and shoemakers	4	8	8	9	10	9	9	10	9	9	85
#63221 Upholsterers	56	71	68	67	65	59	57	57	56	53	609
Trades, Transport and Equiment Operators and Related Occupations	23,985	27,134	30,286	29,977	28,053	25,197	23,146	25,169	24,581	24,166	261,694
#72010 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	224	250	276	253	242	230	216	235	234	232	2,392
#72011 Contractors and supervisors, electrical trades and telecommunications occupations	349	371	465	474	447	393	359	398	402	421	4,079
#72012 Contractors and supervisors, pipefitting trades	94	96	121	126	120	104	92	105	106	111	1,075
#72013 Contractors and supervisors, carpentry trades	128	271	304	328	294	254	227	270	264	261	2,601
#72014 Contractors and supervisors, other construction trades, installers, repairers and servicers	624	825	1,001	1,028	967	844	761	848	857	876	8,631
#72020 Contractors and supervisors, mechanic trades	398	456	521	520	510	481	463	498	494	502	4,843
#72021 Contractors and supervisors, heavy equipment operator crews	757	587	575	657	615	577	555	592	611	621	6,147
#72022 Supervisors, printing and related occupations	3	29	31	34	30	30	28	28	30	29	272
#72023 Supervisors, railway transport operations	1	11	16	15	15	16	16	16	16	16	138
#72024 Supervisors, motor transport and other ground transit operators	163	178	193	197	207	203	197	210	209	210	1,967
#72025 Supervisors, mail and message distribution occupations	44	97	119	112	98	112	112	115	111	109	1,029
#72100 Machinists and machining and tooling inspectors	356	445	545	375	310	301	269	298	278	258	3,435
#72101 Tool and die makers	281	337	421	279	239	221	206	214	204	188	2,590
#72102 Sheet metal workers	176	190	229	231	209	170	141	172	171	172	1,861
#72103 Boilermakers	31	22	27	26	23	19	19	25	27	26	245
#72104 Structural metal and platework fabricators and fitters	47	64	71	62	55	52	45	48	45	43	532
#72105 Ironworkers	92	93	105	124	116	92	72	96	95	98	983
#72106 Welders and related machine operators	527	762	905	757	682	640	590	672	651	625	6,811
#72200 Electricians (except industrial and power system)	782	848	1,181	1,223	1,102	876	732	868	886	934	9,432
#72201 Industrial electricians	176	269	329	270	229	222	197	216	204	194	2,306
#72202 Power system electricians	57	47	50	53	50	47	47	52	52	50	505
#72203 Electrical power line and cable workers	91	73	79	84	78	72	77	92	95	93	834
#72204 Telecommunications line and cable installers and repairers	152	144	168	176	157	140	134	139	142	146	1,498
#72205 Telecommunications equipment installation and cable television service technicians	231	256	293	292	275	255	240	257	244	244	2,587
#72300 Plumbers	388	426	611	643	578	450	372	452	460	491	4,871
#72301 Steamfitters, pipefitters and sprinkler system installers	138	145	184	189	174	144	121	144	147	150	1,536
#72302 Gas fitters	90	95	123	130	119	100	91	105	105	108	1,066
#72310 Carpenters	985	1,762	2,029	2,171	1,880	1,547	1,347	1,639	1,599	1,556	16,515
#72311 Cabinetmakers	145	179	184	151	106	104	87	97	91	88	1,232
#72320 Bricklayers	216	298	342	356	321	263	219	261	258	256	2,790
#72321 Insulators	65	69	83	93	87	71	63	76	77	75	759
#72400 Construction millwrights and industrial mechanics	692	848	964	844	752	724	652	713	674	639	7,502
#72401 Heavy-duty equipment mechanics	215	243	270	262	242	237	231	253	243	236	2,432
#72402 Heating, refrigeration and air conditioning mechanics	377	404	559	567	514	412	351	413	416	442	4,455
#72403 Railway carmen/women	-39	-2	13	12	12	17	18	20	18	18	87
#72404 Aircraft mechanics and aircraft inspectors	88	157	183	167	146	156	149	155	147	144	1,492
#72405 Machine fitters	16	28	35	26	22	22	21	21	20	18	229
#72406 Elevator constructors and mechanics	70	80	122	116	102	79	64	72	71	81	857
#72410 Automotive service technicians, truck and bus mechanics and mechanical repairers	1,627	2,161	2,191	2,281	2,404	2,252	2,271	2,402	2,356	2,289	22,234
#72411 Auto body collision, refinishing and glass technicians and damage repair estimators	315	446	451	466	492	457	460	480	468	449	4,484
#72420 Oil and solid fuel heating mechanics	14	11	13	13	12	10	9	11	10	10	113
#72421 Appliance servicers and repairers	70	91	93	95	97	87	86	91	87	84	881
#72422 Electrical mechanics	31	41	44	44	43	39	37	40	39	37	395
#72423 Motorcycle, all-terrain vehicle and other related mechanics	54	85	91	91	93	92	92	95	93	89	875
#72429 Other small engine and small equipment repairers	43	50	48	48	48	45	44	45	43	41	455
#72500 Crane operators	105	131	141	151	140	124	102	117	114	115	1,240
#72501 Water well drillers	20	6	5	4	5	4	5	5	4	2	60
#72600 Air pilots, flight engineers and flying instructors	222	246	269	224	201	215	205	204	193	184	2,163
#72601 Air traffic controllers and related occupations	-4	27	42	40	36	41	41	44	42	42	351
#72602 Deck officers, water transport	26	29	32	30	30	29	28	28	27	26	285
#72603 Engineer officers, water transport	-4	2	5	4	4	5	5	5	4	4	34
#72604 Railway traffic controllers and marine traffic regulators	0	6	8	8	9	9	9	10	9	9	77
#72999 Other technical trades and related occupations	66	78	83	87	85	79	70	75	71	68	762
#73100 Concrete finishers	84	95	109	123	108	85	70	79	83	87	923
#73101 Tilesetters	66	132	167	163	145	119	95	103	98	102	1,190
#73102 Plasterers, drywall installers and finishers and lathers	257	380	477	495	450	361	298	338	329	341	3,726
#73110 Roofers and shinglers	216	198	235	252	236	205	194	214	222	227	2,199
#73111 Glaziers	54	67	84	84	75	61	53	60	60	62	660
#73112 Painters and decorators (except interior decorators)	499	585	726	723	651	533	450	489	484	491	5,631
#73113 Floor covering installers	120	155	198	201	182	149	124	140	138	143	1,550
#73200 Residential and commercial installers and servicers	453	641	753	784	707	585	515	594	592	586	6,210
#73201 General building maintenance workers and building superintendents	1,637	1,855	1,919	1,959	1,963	1,746	1,604	1,646	1,586	1,521	17,436
#73202 Pest controllers and fumigators	56	40	40	52	61	47	43	48	49	48	484
#73209 Other repairers and servicers	65	90	91	94	95	88	85	88	87	84	867
#73300 Transport truck drivers	6,436	5,934	6,037	5,920	5,376	5,004	4,665	4,836	4,631	4,450	53,289
#73301 Bus drivers, subway operators and other transit operators	1,125	1,044	1,040	959	1,141	1,058	967	990	935	906	10,165
#73310 Railway and yard locomotive engineers	2	49	70	65	57	70	72	75	73	72	605
#73311 Railway conductors and brakemen/women	-9	41	66	62	54	66	69	72	70	70	561
#73400 Heavy equipment operators	974	706	741	764	695	645	606	662	634	587	7,014
#73401 Printing press operators	98	244	265	242	213	197	177	183	172	159	1,950
#73402 Drillers and blasters - surface mining, quarrying and construction	35	13	22	24	19	13	14	19	21	19	199
Natural Resources, Agriculture and Related Production Occupations	429	525	729	696	686	637	627	697	690	691	6,407
#82010 Supervisors, logging and forestry	22	34	42	39	38	37	35	37	36	36	356
#82020 Supervisors, mining and quarrying	7	61	111	93	77	82	80	87	85	84	767

#82021 Contractors and supervisors, oil and gas drilling and services	-2	4	5	4	2	4	4	4	4	4	33
#82030 Agricultural service contractors and farm supervisors	18	14	14	15	14	14	14	16	15	15	149
#82031 Contractors and supervisors, landscaping, grounds maintenance and horticulture services	347	292	309	371	428	365	354	389	404	408	3,667
#83100 Underground production and development miners	11	87	205	132	88	99	106	120	113	113	1,074
#83101 Oil and gas well drillers, servicers, testers and related workers	19	26	30	31	28	27	25	35	24	24	269
#83110 Logging machinery operators	2	6	13	10	9	9	7	8	7	7	78
#83120 Fishing masters and officers	0	0	0	0	0	0	0	0	0	0	0
#83121 Fishermen/women	4	2	1	1	1	1	1	1	1	1	14
Occupations in Manufacturing and Utilities	1,400	1,897	2,151	1,999	1,841	1,874	1,798	1,929	1,895	1,848	18,632
#92010 Supervisors, mineral and metal processing	88	99	100	92	88	91	81	88	85	84	896
#92011 Supervisors, petroleum, gas and chemical processing and utilities	176	200	209	213	202	203	199	210	213	211	2,036
#92012 Supervisors, food and beverage processing	101	178	225	205	188	184	181	195	195	192	1,844
#92013 Supervisors, plastic and rubber products manufacturing	71	81	89	79	73	70	67	72	70	68	740
#92014 Supervisors, forest products processing	42	55	56	59	52	60	47	54	49	48	522
#92015 Supervisors, textile, fabric, fur and leather products processing and manufacturing	5	14	14	15	14	13	13	13	13	13	127
#92020 Supervisors, motor vehicle assembling	129	302	396	316	289	288	288	306	304	294	2,912
#92021 Supervisors, electronics and electrical products manufacturing	38	58	63	62	57	54	51	56	54	53	546
#92022 Supervisors, furniture and fixtures manufacturing	22	26	27	23	20	19	18	19	19	19	212
#92023 Supervisors, other mechanical and metal products manufacturing	26	43	52	43	39	40	38	41	40	39	401
#92024 Supervisors, other products manufacturing and assembly	17	41	43	46	38	38	35	37	38	37	370
#92100 Power engineers and power systems operators	340	327	349	345	336	345	324	348	338	331	3,383
#92101 Water and waste treatment plant operators	161	169	181	183	183	179	177	193	192	185	1,803
#93100 Central control and process operators, mineral and metal processing	20	31	35	29	25	32	27	30	28	27	284
#93101 Central control and process operators, petroleum, gas and chemical processing	114	203	244	223	182	206	205	218	214	207	2,016
#93102 Pulping, papermaking and coating control operators	10	7	5	5	5	7	4	5	4	4	56
#93200 Aircraft assemblers and aircraft assembly inspectors	40	62	65	60	50	46	42	43	40	37	485

Appendix B

Stokes Economics is Canada's leading detailed occupational labour market information provider, macroeconomic model builder, and forecast data centre. Stokes maintains national, provincial and regional economic models that are used to develop economic outlooks and customized impact studies ranging from economic and fiscal projections to occupational human resource planning. The models are updated semi-annually and calibrated to the latest economic and demographic data available. Stokes also closely tracks major construction projects for a more accurate estimate of investment and economic growth.

Macroeconomic Model - Ontario

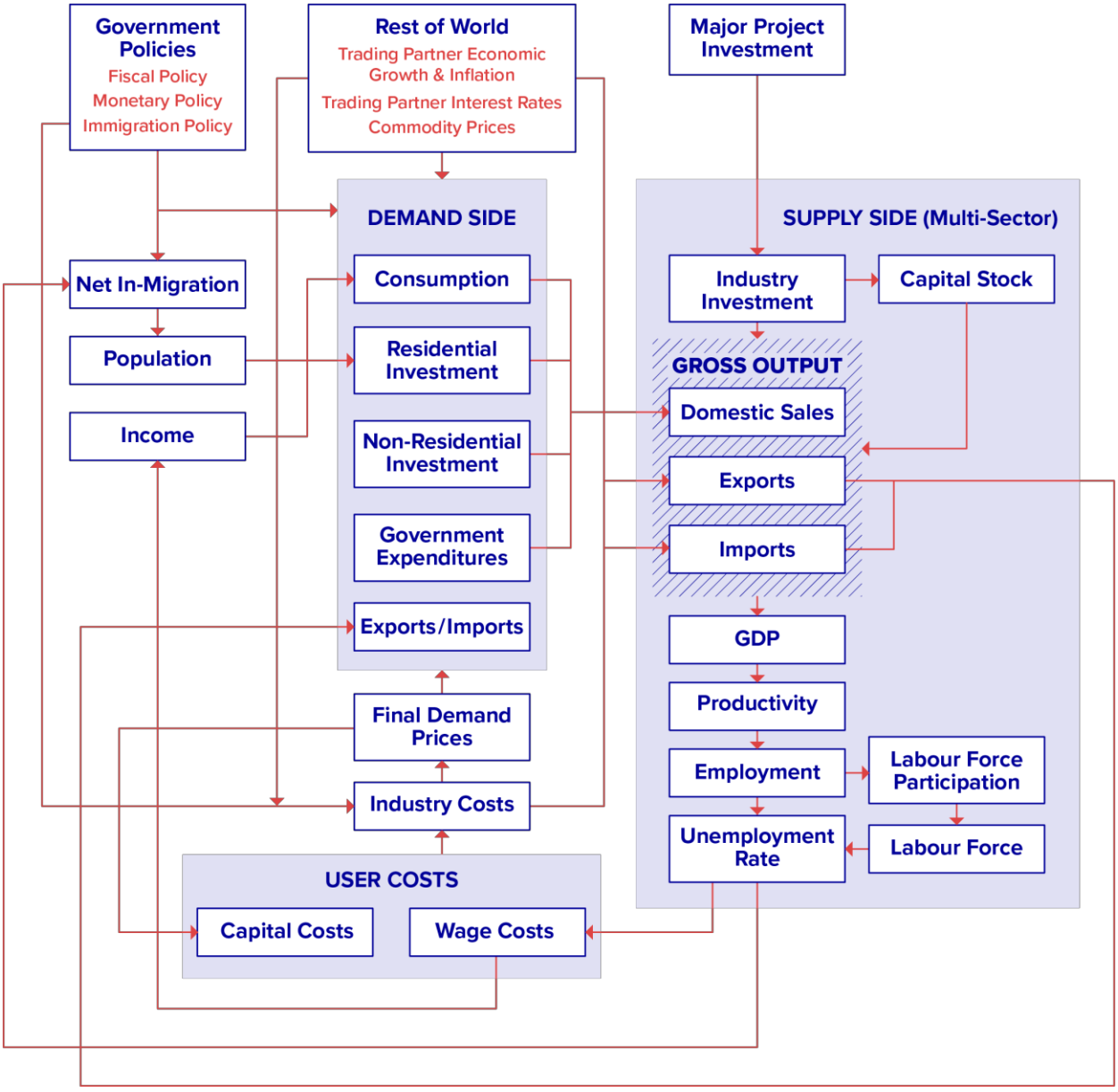
The projections are prepared using the Stokes Economics multi-sector macroeconomic model of the Ontario economy and its regions. The model is made up of 14 regions that cover the whole province. Each regional model is large and covers close to 2,000 variables – more than 600 of these are endogenous variables that are determined within the model. Over 25 industries are modelled, with about two-thirds of the sector detail focused on the goods-producing industries, which include a strong level of detail in the manufacturing sector. The aggregate demand side of the model is supplemented by an extensive inventory of major capital projects, which is a key driver of the provincial economy. These are KLEM models in which capital (K), labour (L), energy (E) and non-energy materials (M) are combined to produce gross output for each industry. They rely heavily on input-output table information from Statistics Canada to inform inter-industry and intra-industry supply and demand relationships (i.e. total demand by each sector from all other sectors and from an industries' own sector).

Population is an endogenous variable in the model and very detailed demographic projections are produced using a cohort-survival projection method. This approach forecasts what the future population will be based on the survival of the existing population and the births that will occur. Stokes supplements this approach with interregional and international migration that responds to economic opportunities and adjusts to allow for labour market balancing – known as optimal immigration. International migration is also supplemented with national immigration policies. Both interregional and international migration account for the age structure of migrants. Population growth and the age structure of the population guide the demand for housing as the model estimates housing starts by structure type. This approach to demographic projections is employed in all Stokes' provincial and regional economic models.

The models employ a stage of process pricing approach in which raw material prices are linked to producer prices and final demand prices through input-output relationships. This cost-push approach allows the model to capture the pass-through of changes in energy and non-energy commodity prices to the cost structure of industries. Industry cost and price relationships inform the model's trade sectors to determine how local costs compare against industry prices to estimate changes in industry exports and imports. The industry cost model aids in modelling the cost of capital relative to labour and energy, which allows for

substitution between the factors of production. This approach generates economic cycles as relative prices between the factors of production change. While the model involves the simultaneous decisions of various factors, its basic workings can be seen in Figure A.1 on the next page.

Figure A.1: Macroeconomic Model



Ontario Regional Occupational Modelling System (OROMS)

The Stokes OROMS produces information that can be used to help Labour Market Information (LMI) analysts and decision makers identify significant supply-demand gaps across the occupations and the

possible sources of supply to remove these gaps. The analysis presented in this paper focuses solely on the demand-side results of the OROMS model. A description of the OROMS methodology for estimating demand is provided below. The Employment and Social Development Canada (ESDC) National Occupational Classification (NOC) system of occupation definitions is adopted for the modelling system – https://noc.esdc.gc.ca/

There are 5 levels of NOC occupations. An example of these levels is:

- 3 Health occupations – 1 digit
- 32 Technical occupations in health – 2 digit
- 321 Technical occupations in health (except practitioners of natural healing) – 3 digit
- 3210 Technical occupations in therapy and assessment – 4 digit
- 32100 Opticians – 5 digit

The occupational modelling system works at the 5-digit level of occupation aggregation where there are 512 occupations. The occupation concepts described above are measured on a Place of Residence basis and refer to persons living in a region. Persons living in a region may have a Place of Work in the region or commute outside the region. The occupation modelling system focuses on the demand for workers in the region. To the extent that occupations work largely outside the region or are dominated by workers living outside the region, it will present a less accurate picture of Place of Residence measures for the region.

The data for the modelling system are sourced from the Census of Canada and the Labour Force Survey (LFS). They are measured on an LFS basis for the occupations as a whole. That is, the total labour force and total employment are equal to the LFS values each year. Nevertheless, the occupation data do not match the LFS occupation data published by Statistics Canada. Statistics Canada occupation data generally has too small a sample size to provide reliable estimates of the occupations, particularly on a regional basis.

To estimate occupation demand for a given occupation, an occupation's share of Census employment of Census total employment in an industry is applied to the corresponding LFS industry employment. Labour force demand for a specific occupation is then estimated in a two-step procedure. In the first step the ratio of Census labour force to Census employment share is applied to the LFS equivalent employment created above. Next, the resulting labour force estimates are normalized to total LFS labour force. The employment share coefficients for the occupation employment part of the model were estimated as the ratio of an occupation's employment in an industry to the industry's total employment for the latest Census year.

The occupation modelling system on the demand side focuses on the workforce required by private and public organizations in the economy. The total occupational demand requirements are changes

in employment, people retiring from the workforce, and people dying. The key demand side concepts for an occupation are as follows: • Job Openings (flow): the summation of Expansion Demand and Replacement Demand; • Expansion Demand (flow): the change in labour force demand (stock) as defined above, in a given year; • Replacement Demand (flow): the number of retirements (flow) and deaths (flow) from an occupation in a given year; The above concepts are of interest in describing the sources of change in the demand for an occupation. These concepts similarly extend to the demand for a group of occupations – in the case of this study, college-educated occupations – by summing these occupational demand components.