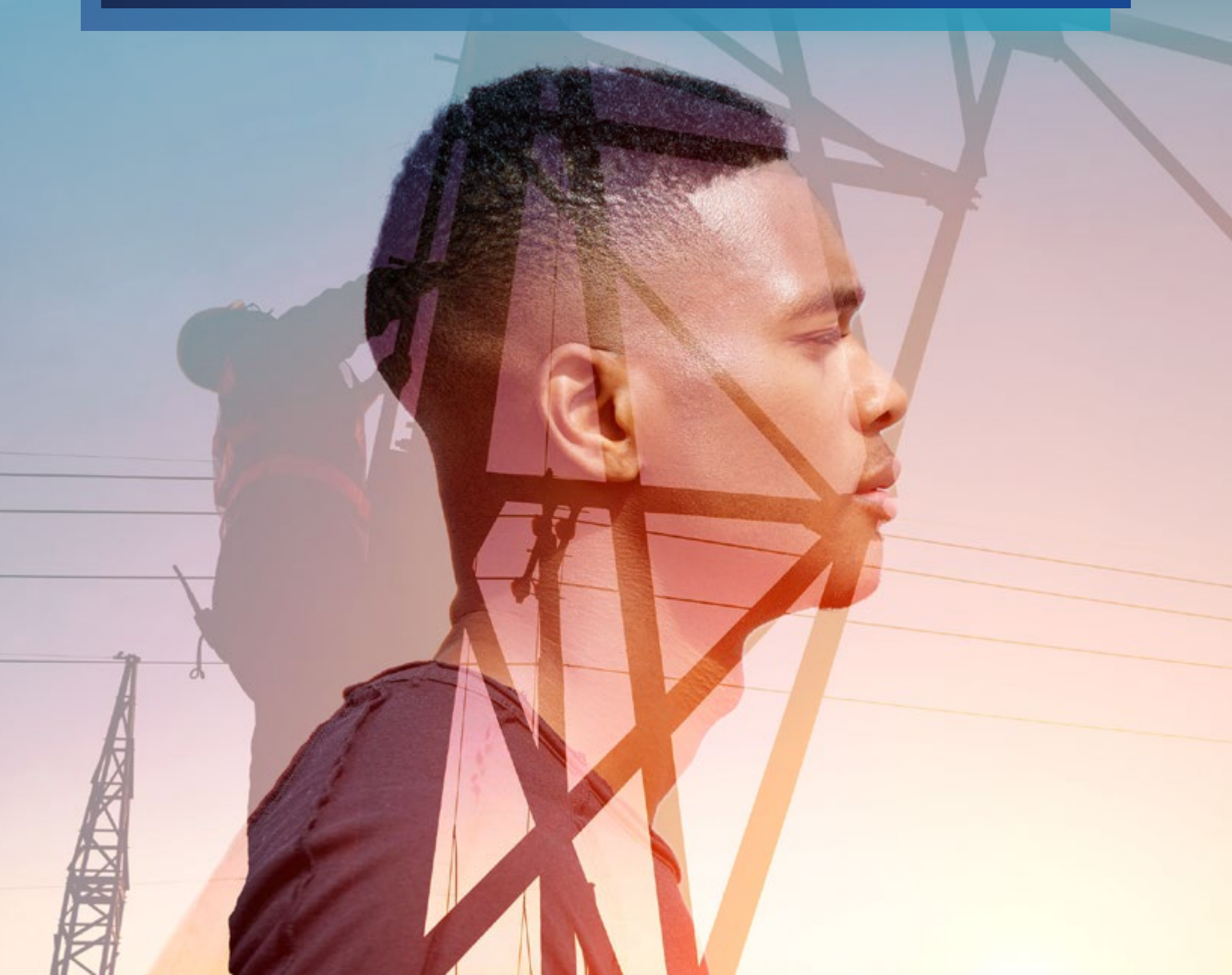
CANADIAN APPRENTICESHIP FORUM

FORUM CANADIEN SUR L'APPRENTISSAGE

Apprentice Demand in the Top Ten Red Seal Trades: A 2019 National Labour Market Information Report



The Apprentice Demand in the Top Ten Red Seal Trades: A 2019 National Labour Market Information Report

Prepared for the Canadian Apprenticeship Forum

Author: Prism Economics and Analysis

The opinions expressed in this report are those of the authors and do not necessarily reflect the views of CAF-FCA.

Canada

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About the Canadian Apprenticeship Forum

The Canadian Apprenticeship Forum – Forum canadien sur l'apprentissage (CAF-FCA) is a national, not-for-profit organization working with stakeholders in all regions of Canada. We influence pan-Canadian apprenticeship strategies through research, discussion and collaboration. We share insights across trades, across sectors and across the country. We do this in order to promote apprenticeship as an effective model for training and education.

Our Board of Directors is comprised of representatives from business, labour, the jurisdictional apprenticeship authorities, education and equity-seeking groups. Through our work, CAF-FCA has shed light on a number of key issues affecting apprenticeship, such as the perceived barriers to accessing and completing apprenticeship, and the business case for apprenticeship training. For more information, visit the CAF-FCA website at www.caf-fca.org.

About the Author

Prism Economics and Analysis (Prism) is an established labour market economics consultancy firm specializing in the analysis of labour markets and human resource planning issues. Prism works with employers, governments, post-secondary institutions, trade unions and professional associations to deliver reliable research that provides practical human resource solutions.

Prism's in-depth knowledge of labour market structures, apprenticeship and training systems, sources, people, institutions, regulations and policies leads to credible and practical research. Prism understands the different interests and perspectives of stakeholder groups and carefully balances its analysis and reporting to respect and reconcile these interests.

Prism developed the Canadian System for Tracking Apprenticeship Qualifications (CANTRAQ) to track demand requirements and supply of trade certifications. CAF-FCA supported the development of the methodology and continues to work in collaboration with Prism to better understand apprentice supply and demand.

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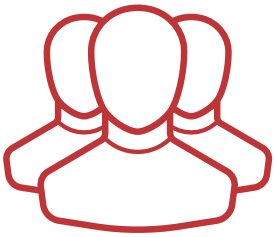

Executive Summary

This report draws together apprenticeship trends data and projections from the Canadian System for Tracking Apprenticeship Qualifications (CANTRAQ) to provide a forward-looking assessment of demand and supply for trade certification across the top 10 Red Seal trades in Canada. National, provincial and trade-specific assessments of demand and supply projections are also provided.

From 2019 to 2023, an estimated 67,000 new journeypersons will be required to sustain workforce certification levels across the 10 largest Red Seal trades in Canada, excluding Quebec and the Territories. Although the pace of employment growth in many skilled trades is expected to slow compared to the rapid expansion over the last decade, workforce retirements continue to rise. Keeping pace with the demand for skills and workforce certification will require attracting 167,739 new apprentices over the next five years.

An anticipated shift in demand between regions and sectors will require a redistribution of training certification requirements and, therefore, shared training resources among trades and provinces. The anticipated slowdown in the pace of construction employment is likely to result in decreased demand from current levels for some trades, such as construction electricians and plumbers, and increased requirements for others, such as millwrights, welders and cooks.

Another challenge is the risk of skilled trades shortages over the long-term due to the decline in new apprentices since 2014, and the potential erosion of training capacity. Annual new registrations in the 10 largest Red Seal trades contracted by 20% between 2014 and 2017, or by 7,100 fewer new registrants. The decline can be directly attributed to the collapse in oil and resource prices in 2014 and subsequent declines in investments in the resource sector. The impact of declines in resource sector investment related to apprenticeship was felt strongest in Alberta, where new registrations dropped by 50%, followed by Saskatchewan, where it dropped by 40%, and Newfoundland and Labrador, where it dropped by 35%. The 2008 to 2009 recession had a similar negative impact on new registrations resulting in a 23% drop in them in 2009, but the decline in 2009 was followed by a relatively quick recovery. There is no evidence, however, of a similar recovery this time round. A downward trend in the annual number of newly certified journeypersons poses potential risks for the future availability of skilled tradespersons as Canada's skilled workforce continues to age and retirement rates accelerate.

An additional risk is a decline in the number of youth entering the workforce as a share of the population. This is due to aging demographics and the rise in competing demands from other sectors of the economy facing common supply challenges. Over the next five years, growth in IT and service sector jobs is expected to outpace several sectors that employ large numbers of skilled tradespeople. Health services-related employment in particular is expected to continue to lead job growth in Canada, especially in provinces with older populations.

Based on the CANTRAQ analysis, Figure 1 below provides a summary of the number of new journeypersons required and the targets for the total number of new apprentices likely needed to meet these requirements by province over the period 2019 to 2023. Figure 2 compares projected completions, target registrations and certification requirements by trade over the same period, 2019 to 2023.

Figure 1- *Summary of Projected New Registrations, Target Registrations and Certification Requirements, by Province, 2019 to 2023*

PROVINCE	CERTIFICATIONS REQUIRED	TARGET REGISTRATIONS
British Columbia	13,964	49,788
Alberta	18,957	48,244
Saskatchewan	3,557	6,462
Manitoba	1,895	5,510
Ontario	24,280	46,413
Atlantic Canada	4,329	11,376
Total	**66,982**	**167,793**

Figure 2- *Summary of Projected Completions, Target Registrations and Certification Requirements, by Trade, 2019 to 2023*

RANK	TRADE	PROJECTED COMPLETIONS	CERTIFICATIONS REQUIRED	TARGET REGISTRATION
●	Cook	2,607	4,990	21,358
●	Industrial Mechanic (Millwright)	5,561	7,336	8,658
●	Welder	5,026	6,301	16,444
●	Heavy Duty Equipment Technician	4,408	4,610	8,253
●	Carpenter	7,477	7,466	34,900
●	Steamfitter/Pipefitter	2,960	2,718	4,872
●	Automotive Service Technician	9,952	8,754	19,908
●	Hairstylist	9,312	7,233	21,512
●	Construction Electrician	24,831	13,279	22,286
●	Plumber	8,872	4,296	9,602
	Total	**81,006**	**66,982**	**167,793**

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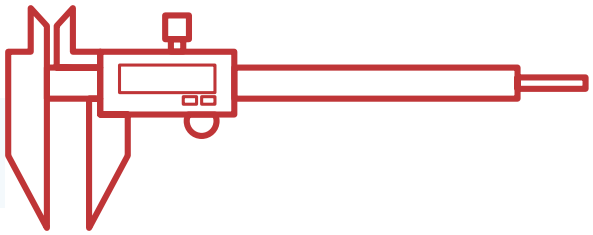

Introduction

The objective of this report is to provide apprenticeship stakeholders with an analysis of apprenticeship trends and projections of training requirements in the top 10 Red Seal trades.

The first section of the report provides an analysis of national and provincial trends in apprenticeship registrations and completion rates based on the latest available data (2017) from Statistics Canada's Registered Apprenticeship Information System (RAIS). The section also provides a summary of the economic and population growth outlook and other factors which are likely to impact the demand and supply for trade certification and apprenticeship training in Canada.

The second section of this report provides a forward-looking assessment of apprenticeship program registrations, completions and workforce certification requirements for the five-year period 2019 to 2023.

The projections and analysis are informed by recent provincial economic forecasts and sectoral labour market studies, including the 2019 BuildForce Canada Construction and Maintenance Outlook, and provincial macroeconomic and occupational hiring projections produced by the Centre for Spatial Economics (C4SE). The detailed qualification-based analysis for individual trade programs is based on CANTRAQ.

RAIS compiles data from the provinces and territories based on the number of individuals registered in apprenticeship programs and those who obtain certification. CAF-FCA's report provides statistics and analysis of the trends in new registrations and completions in the top 10 Red Seal apprenticeable programs across Canada, excluding Quebec and the Territories.[1]

Figure 3- *Top 10 Red Seal Programs*

	RED SEAL TRADE	NOC 4
1	Construction Electrician	7,241
2	Carpenter	7,271
3	Welder	7,237
4	Steamfitter/Pipefitter	7,252
5	Automotive Service Technician	7,321
6	Industrial Mechanic (Millwright)	7,311
7	Heavy-Duty Equipment Technician	7,312
8	Plumber	7,251
9	Cook	6,322
10	Hairstylist	6,341

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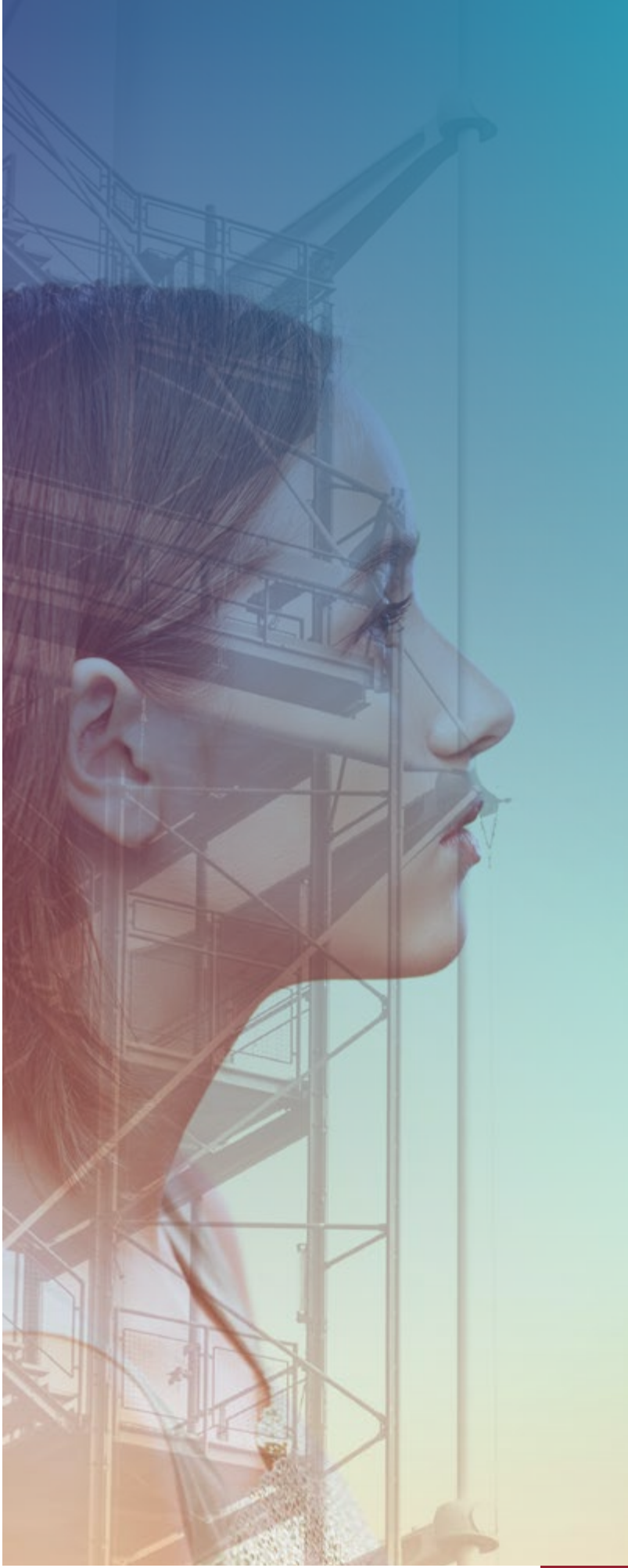
National Trends in Apprenticeship

3.1 Economic and Population Outlook

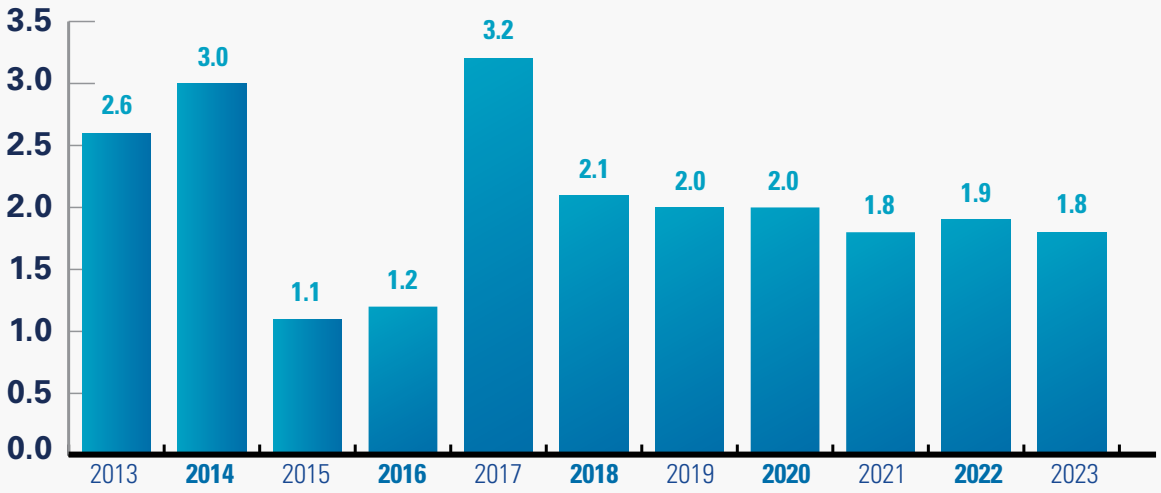
This section describes economic and population trends and other factors likely to impact the demand and supply for trade certification and apprenticeship training in Canada. Economic conditions and fluctuations in employment are among the chief determinants of apprenticeship program registrations and completions. Since employment is a precondition of an apprenticeship, this form of post-secondary education is distinct from college or university and is typically extremely sensitive to the ebb and flow of economic cycles. The correlation is positive with rising employment translating into higher program registrations and increased completions.[2] Periods of rapid expansion in employment requirements, however, can result in a decrease of available resources to take on and mentor apprentices. Tighter labour market conditions can lower employers' qualification requirements and also dissuade workers from seeking a formal apprenticeship due to the opportunity cost associated with attending technical training or lower earnings. During these periods of economic growth, employers will tend to hire from the pool of available (unemployed) skilled and experienced workers first, rather than take on less-experienced new entrants.



Economic cycles tend to result in significant fluctuations in annual program registrations. These fluctuations and the long duration of four to five years for most apprenticeship programs has contributed to cyclical mismatches between the demand for skilled workers and the numbers of qualified certified workers available. This dynamic is evidenced by recent peaks in demand for skilled trades and the emergence of skilled trades shortages, driven by the highs of the resource cycle, followed by a period of rising rates of unemployment and significant declines in new apprentice registrations in many provinces. The anticipated slower growth outlook for Canada's economy, combined with an aging workforce, introduces a potential risk to the future capacity of Canada's skilled workforce.

The pace of economic expansion slowed to 2.1% in 2018, after surpassing a G7-leading 3% in 2017, and averaging 2.4% since the recession of 2008 to 2009. The recent expansion has been driven by high levels of consumer expenditure, increased immigration, rising residential investment and higher levels of exports and manufacturing output. Looking ahead, the pace of growth is expected to slow to an average below 2% per year due to higher interest rates, a cooling real estate market, slowing rates of population growth and weaker growth south of the border. Continued uncertainty surrounding oil and commodity prices has significantly reduced the number of planned major resource development projects limiting potential future growth in Alberta, Saskatchewan and a few Atlantic provinces.

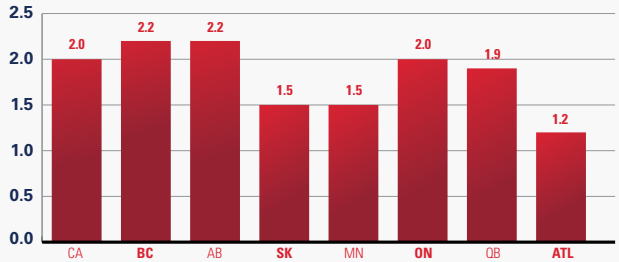
Figure 4- *Real GDP Growth (%) Canada, 2013 to 2023*



Source: Statistics Canada, BuildForce Canada 2019 Outlook

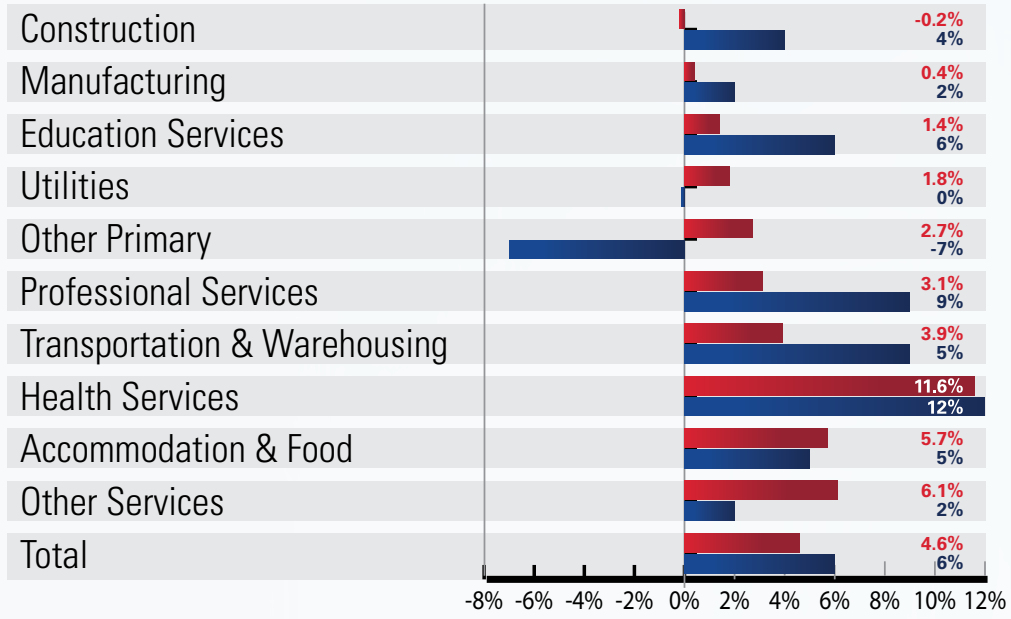
British Columbia, Alberta and Ontario are expected to lead growth over the next five years propelled by steady immigration-driven population growth, recovering manufacturing and major infrastructure and energy sector investments. Weaker growth is expected in Saskatchewan, Manitoba and Atlantic Canada due to declining resource and utility sector investments. The regional divergence in growth will likely contribute to labour market challenges in some provinces as well as opportunities for mobility. Figure 5 shows annual average real GDP growth between 2019 and 2023 by province.

Figure 5- *Average Annual Real GDP Growth, by Province, 2019 to 2023*



Source: Statistics Canada, BuildForce Canada 2019 Outlook

Figure 6- *Employment Change by Sector (%) 2013 to 2018, 2019 to 2023*



Source: Statistics Canada, BuildForce Canada 2019 Outlook

Shifts in Sectoral Employment

The continued transition from resources sector investment-driven growth, emerging technologies and the increasing needs of an aging population are projected to result in shifts in employment growth across sectors. This trend is expected to have a significant impact on both the demand for skilled tradespeople and competition for new workers entering the workforce.

Health services-related employment continues to lead job growth in Canada, especially in provinces with older populations. An aging population is also expected to slow education sector employment. The service, accommodation and food sectors are expected to experience relatively strong gains driven by steady increases in population and tourism. The pace of recovery in the manufacturing sector is expected to slow, in-line with changing global demands and the economy in the United States.

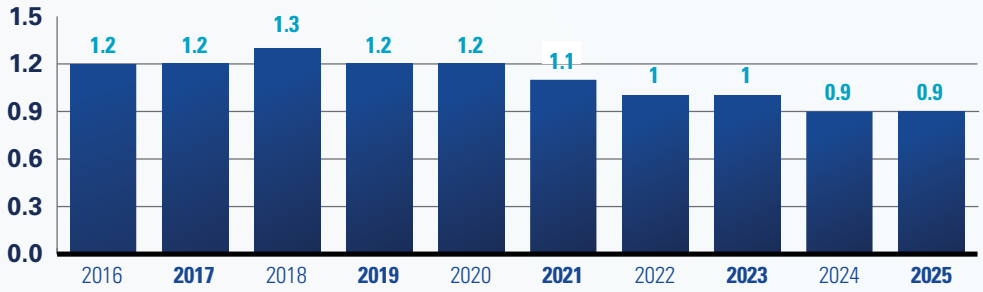
The most important change in the demand for skilled trades is the slowing pace of construction employment. The 2019-2028 BuildForce Canada Construction and Maintenance Outlook suggests that "construction activity is expected to plateau after 2020 following two decades of almost uninterrupted growth."[3] Although the shift in focus from resource sector investment towards infrastructure renewal and expansion and maintenance is expected to sustain construction sector employment at historical high levels, it is likely that the pace of hiring will slow compared to the rapid expansion experienced over much of the last decade. The BuildForce Outlook also suggests that reaching the peak will require the recruitment and training of thousands of additional skilled workers to meet the needs of anticipated major energy, public transportation and other infrastructure projects. The greatest challenges are expected in British Columbia and Ontario. These provinces will continue to grapple with record levels of construction project activity and recruiting challenges over the next few years. Growth will then decline as projects wind down and investment decreases.

3.2 Population Growth

Slowing population growth and aging demographics are projected to limit the pace of economic growth across Canada, but also to increase the number of new workers needed to replace retirement and age-related exits from the workforce. The rate of population growth is expected to fall below 1% by 2025 as natural population growth (births-deaths) slows and population growth is increasingly dependent on augmenting immigration levels.

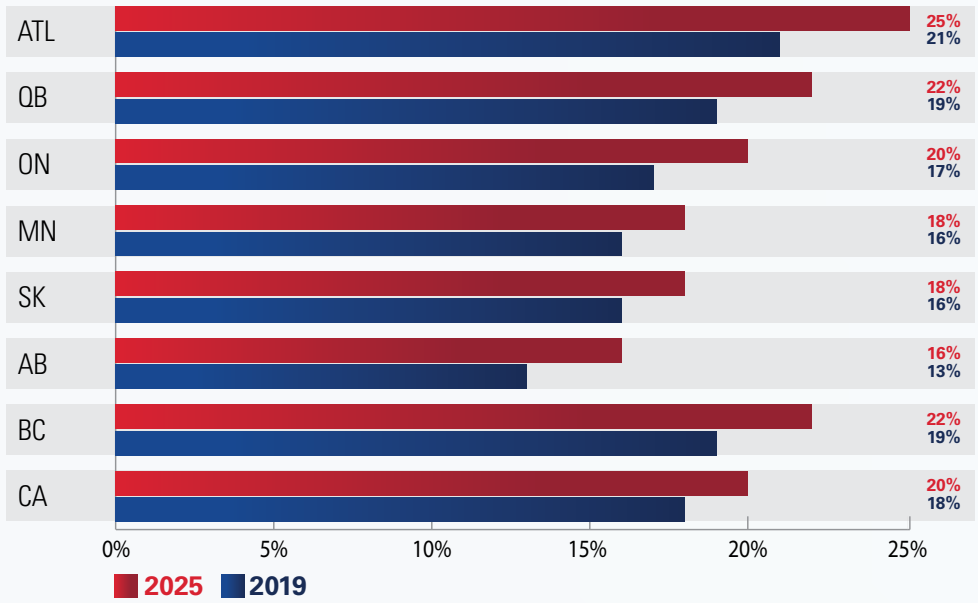
From 2019 to 2025, the share of Canada's population aged 65 and over is expected to increase from 18% to 20%, increasing the rate of workforce retirements. In Atlantic Canada that share is 25%, which is significantly higher than Alberta, where it is 16%. Alberta has one of the youngest populations in the country.

Figure 7- *Population Growth (%), Canada, 2016 to 2025*



Source: Stokes Economic Consulting, July 2018 Forecast

Figure 8- *Share of the Population aged 65 and over by Province, 2019 and 2025*



Source: Stokes Economic Consulting, July 2018 Forecast

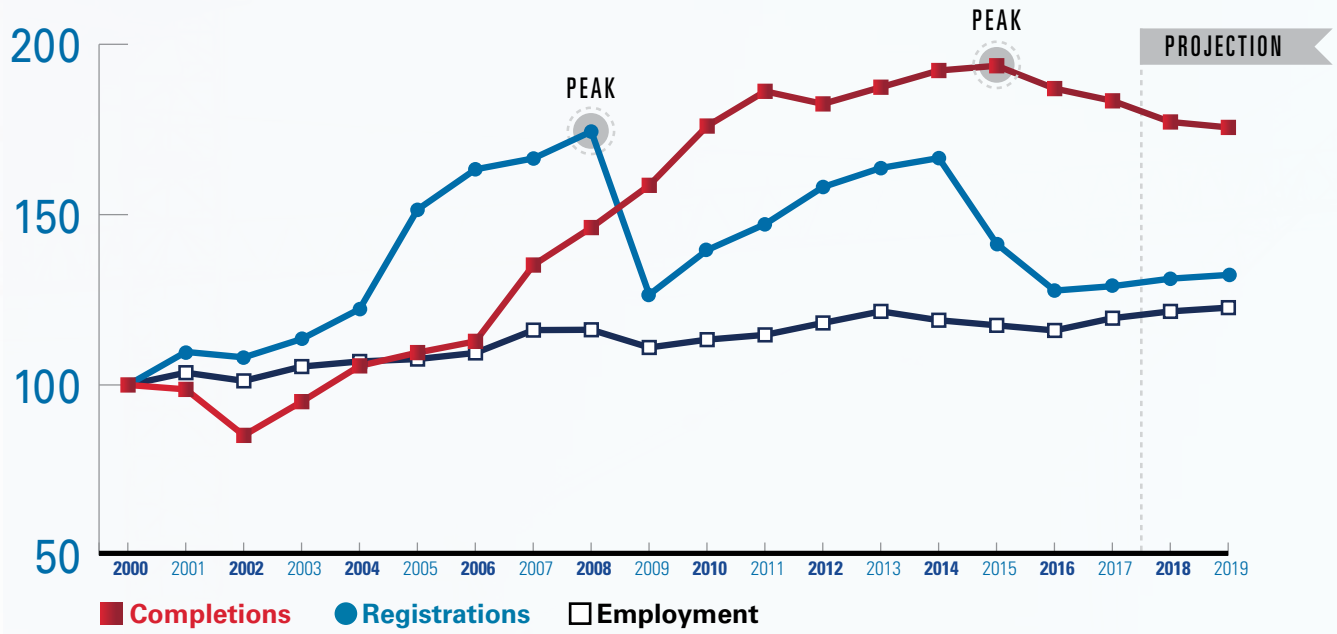
3.3 Trends in Apprenticeship

The number of apprentices swelled across Canada in the first decade of this century, a period of prolonged resource-driven expansion. The number of registered apprentices in the top 10 Red Seal trades increased by 50% over 6 years from 99,500 in 2004 to 145,300 in 2010. From 2010 to 2018, the overall number of apprentices remained relatively flat, despite significant growth in employment for a number of apprenticeable skilled trades. A downward trend in the annual number of newly certified journeypersons poses potential risks for the future availability of skilled tradespeople as Canada's skilled workforce continues to age and retirements accelerate. The following section provides an analysis of trends in apprenticeship registrations and completions in the top 10 Red Seal trades.

Between 2014 and 2017, annual new registrations for the 10 largest Red Seal trades contracted by 20%. There were 7,100 fewer new registrants. The decline can be directly attributed to the collapse in oil and other commodity prices in 2014 which resulted in declining resource sector investments.

The 2008-2009 recession had a similar negative impact on new registrations resulting in a 23% drop in new registrations in 2009. This 2009 decline, however, was followed by a relatively quick recovery driven by a rebound in oil and commodity prices, significant infrastructure investment and an increase in new housing construction. New registrations rose steadily from 2009 and recovered to 2008 levels by 2014. The current economic outlook suggests that new registrations are unlikely to record any significant gains and will remain near current levels, close to 2009, over the coming decade. The chart below shows the trends in new registrations, completions and trades employment.

Figure 9- *New Registrations, Completions and Employment in Top 10 Red Seal Trades, Canada, 2000 to 2019*



Source: Statistics Canada, RAIS, Custom Aggregation, Top 10 Red Seal Trades; LFS
*Notes: *2018 and 2019 estimates*

3.4 Provincial Trends

Based on 2017 RAIS data, Alberta still accounts for the largest number of apprentices (54,160) registered in the top 10 Red Seal trades in Canada. Alberta apprentices represent 32% of the total apprentice population. Ontario follows with 28% and Quebec with 23%.

The impact of declines in resource sector investments were felt strongest in Alberta, Saskatchewan and Newfoundland and Labrador where new registrations dropped by 50%, 40%, and 35% respectively. A decline of 8,141 new registrations in Alberta between 2014 and 2017 represents 76% of the total declines across all provinces, excluding Quebec. Most provinces experienced declines over the same period, with Nova Scotia and Prince Edward Island notable exceptions. Alberta's share of new registrations fell from 39% in 2014 to 26% in 2017, while in the same time period, Ontario's share rose from 26% to 34%.

Figure 10- *Change (%) in New Registrations by Province, Top 10 Red Seal Trades, 2014 to 2017, Canada (excluding Quebec and the Territories)*

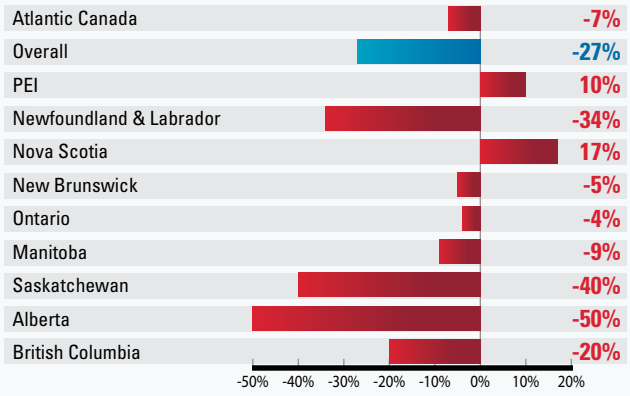


Figure 11- *Distribution (%) of New Registrations by Province, 2017*

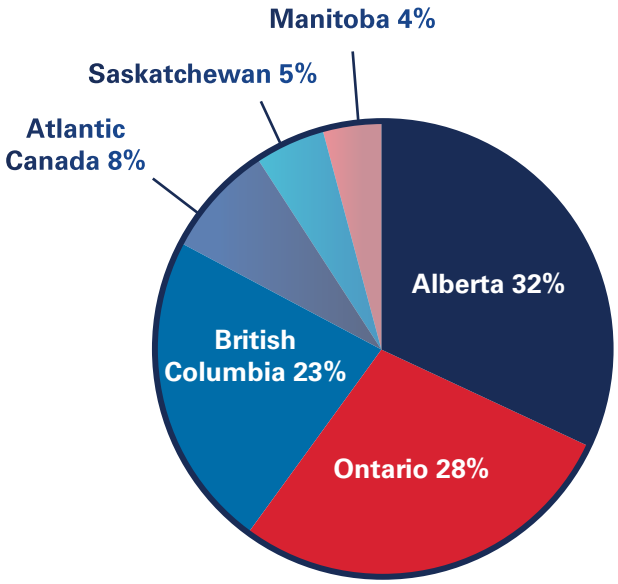
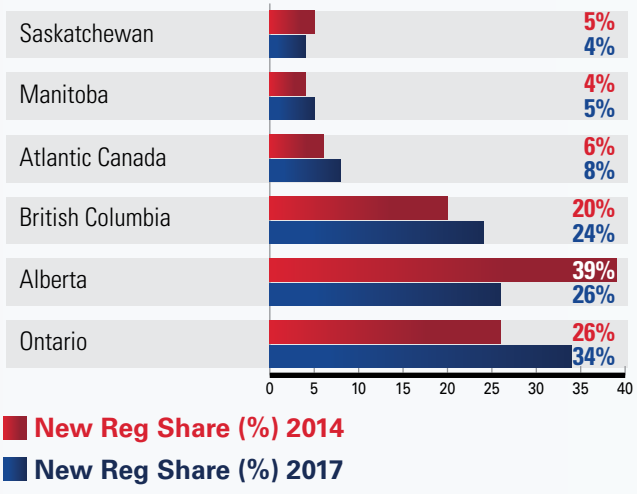


Figure 12- *Distribution (%) of New Registrations by Province, 2014, 2017*



3.5 Trade Trends

New registrations fell in every Red Seal trade between 2014 and 2017 with declines most pronounced among the following trade programs: steamfitter/pipefitter (-58%), welder (-55%) and heavy-duty equipment technician (-39%). Employment in these trades is highly concentrated in the engineering, construction, industrial and oil and gas sectors.

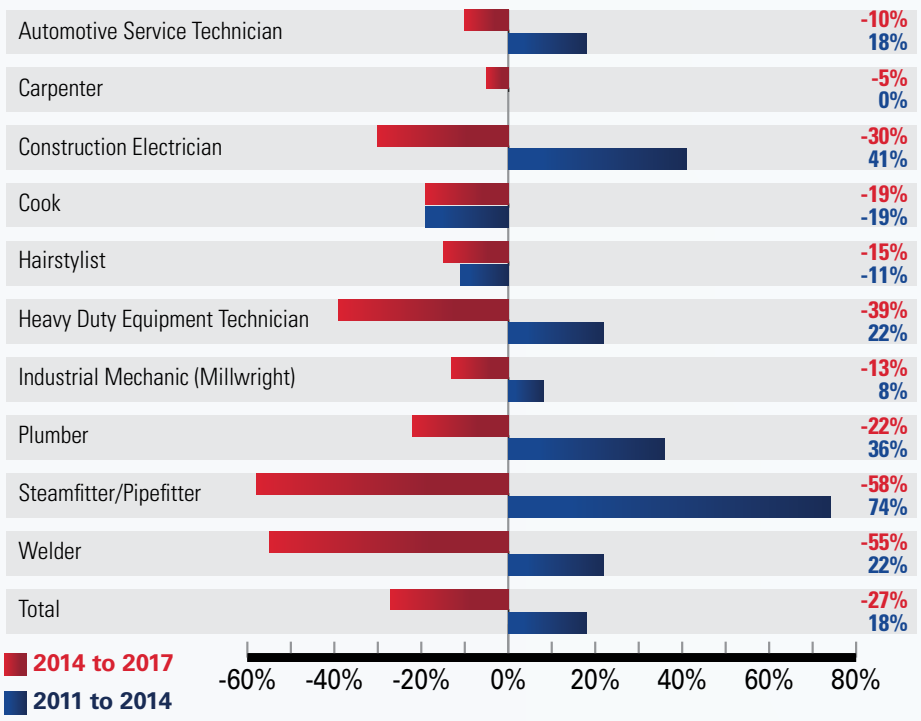
The significant decline in new registrations follows significant increases for most trades during the expansion period from 2011 to 2014, especially for the steamfitter/pipefitter, construction electrician and plumber trades which increased by 74%, 41%, and 36% respectively. The rapid increase reflects the rise in resource sector-driven demand, but also the strengthening of non-residential and residential construction requirements. Larger increases were also recorded for trades with compulsory certification.

Cook and hairstylist programs have experienced an extended downward trend in new registrations since 2010. Demand for service sector professionals is reliant on consumer spending, which experienced declines following the 2008-2009 downturn. As a result, employment and training demands in these trades have been slower to recover.

Figure 13- *New Apprenticeship Registrations by Trade, 2014 to 2017*

TOP 10 RED SEAL TRADES	2014	2015	2016	2017	% CHANGE (2014-17)
Automotive Service Technician	4,837	4,579	4,149	4,358	-10%
Carpenter	4,985	5,278	4,707	4,749	-5%
Construction Electrician	10,571	8,849	7,479	7,351	-30%
Cook	2,533	2,364	2,273	2,058	-19%
Hairstylist	3,459	3,108	2,927	2,953	-15%
Heavy-Duty Equipment Technician	2,762	1,753	1,327	1,674	-39%
Industrial Mechanic (Millwright)	2,025	1,846	1,520	1,771	-13%
Plumber	3,935	3,548	3,280	3,086	-22%
Steamfitter/Pipefitter	3,045	2,083	1,594	1,269	-58%
Welder	4,992	3,118	2,214	2,271	-55%
Total	**43,144**	**36,526**	**31,470**	**31,540**	**-27%**

Figure 14- *Change (%) in Average Annual New Registrations by Trade, 2011 to 2014, and 2014 to 2017*



3.6 Outcome Trends

This section provides an overview of trends in apprentice completions, completion rates and earnings.

Program Completions

The number of apprentices completing programs and awarded a Certificate of Qualification (C of Q) tends to be much less volatile compared to new registrations. The proportion of apprentices going on to complete their respective programs remains generally stable. But the time taken to complete and the completion rates can be impacted by overall labour market conditions. For example, it may take longer to complete an apprenticeship program if an apprentice experiences layoffs during an economic downturn.

Figure 15 outlines how the number of apprentices completing their apprenticeship programs and obtaining a C of Q nearly doubled from 10,926 in 2006 to a record high of 20,682 in 2013. This 2013 high reflects both the peak in registrations in 2008 and also the surge in completions (primarily carpenters and plumbers) in Ontario.[4] The significant drop-off in new registrations after 2008 constrained the number of new journeypersons to below 19,000 per year between 2014 and 2017. The downward trend in program completions since 2013 reflects weakening economic conditions that translated to fewer hours, longer times to complete programs and an increase in discontinuations. The recent decline and flattening in new registrations is expected to result in a lower number of new journeypersons in the future.

Figure 15- *Trends in New Registrations and Completion, 2003 to 2018, Canada (excluding Quebec and the Territories)*

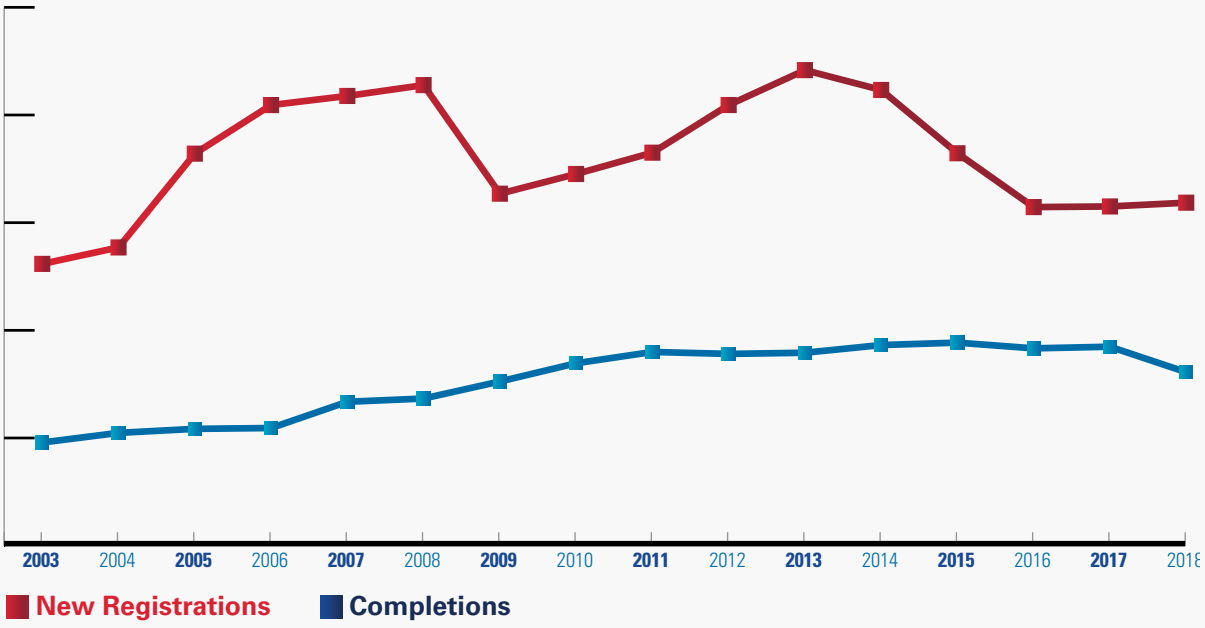


Figure 16- *Distribution of Completions by Provinces, 2011 to 2012, Canada (excluding Quebec and the Territories)*

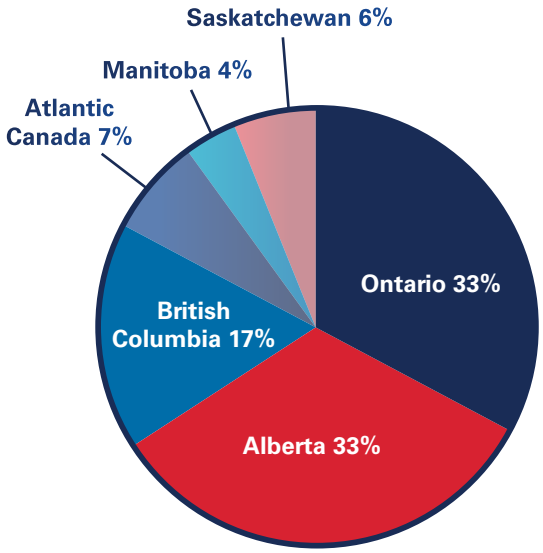
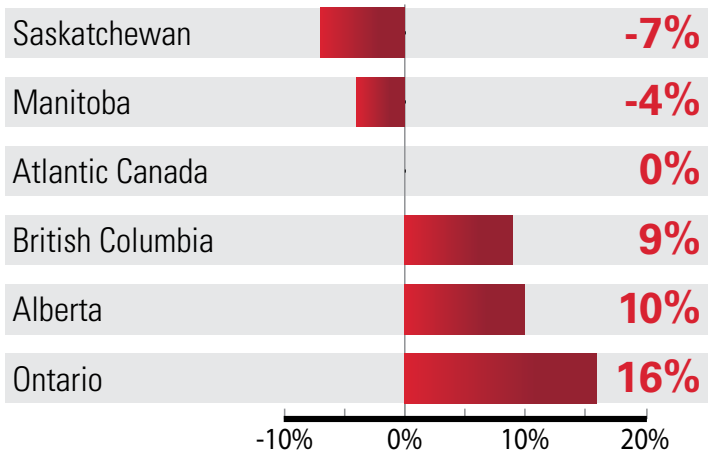


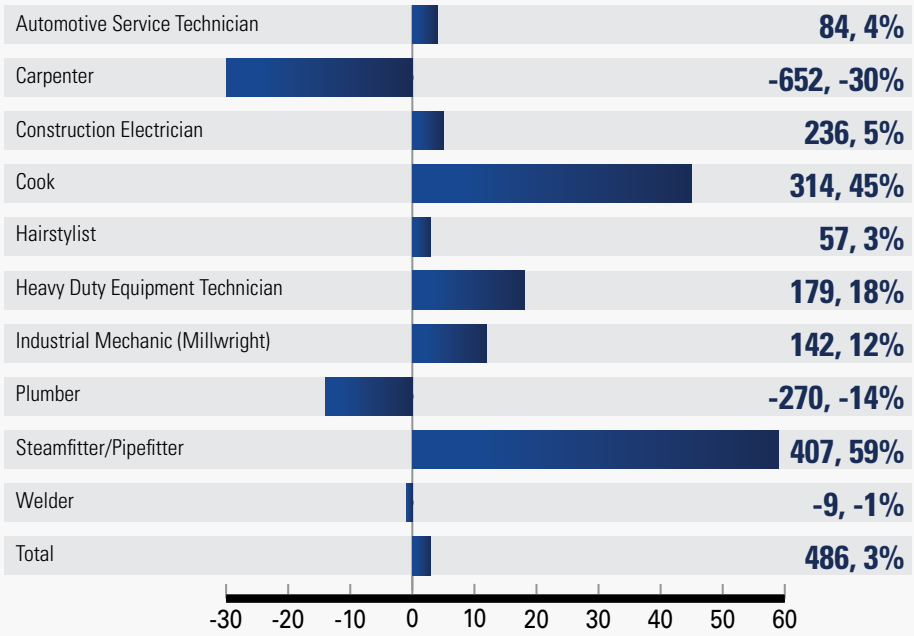
Figure 17- *Change in Completions, 2011 to 2012, Canada (excluding Quebec and the Territories)*

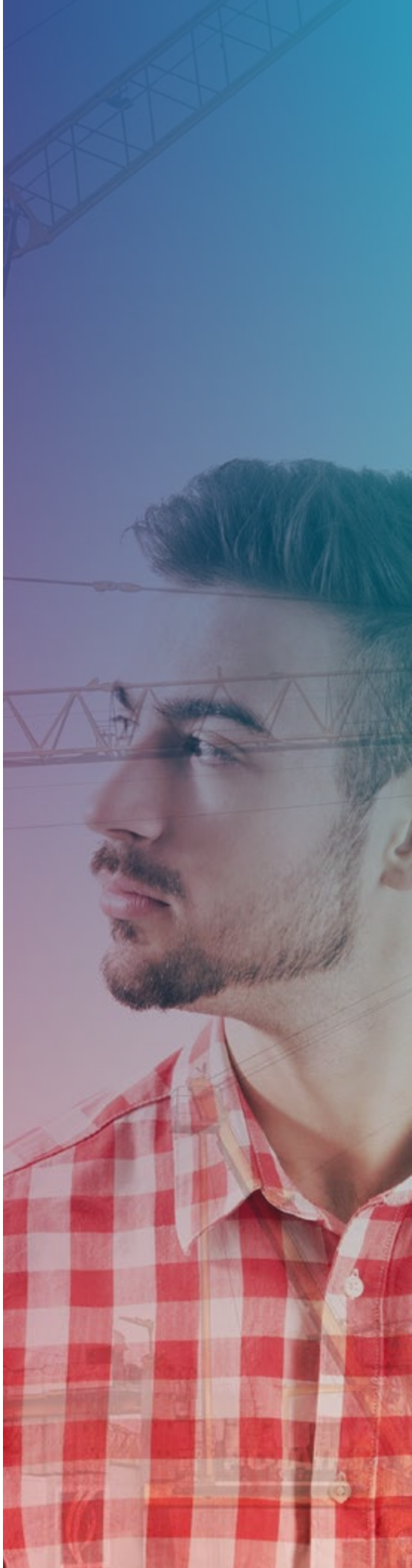


In 2017, Ontario with 6,165 and Alberta with 6,021 accounted for two-thirds (66%) of the 18,477 newly certified journeypersons in Canada, excluding Quebec and Territories. Ontario reported the largest increase (16%) in completions since 2011, an increase driven by continued expansion in construction and service sector employment. Alberta's completions were 10% higher in 2017 compared to 2011, reflecting significant increases during the peak of the province's resource expansion. These rates were down 5% from 2016. This trend is expected to continue due to much slower growth compared with the previous decade.

The following trades: steamfitter/pipefitter (+407, 59%), cook (+314, 45%) and construction electrician (+236, 5%) experienced the largest increases in completions between 2011 and 2017. Gains were largely driven by increases within individual provinces, notably Alberta, BC and Ontario. Over the same period, completions declined in the carpenter (-652, -30%) and plumber (-270, -14%) trades. Figure 18 illustrates the change in completions between 2011 and 2017 by trade.

Figure 18- *Percent Change (%) in Program Completions, Canada (excluding Quebec and the Territories), 2011 to 2017*





Completion Rates

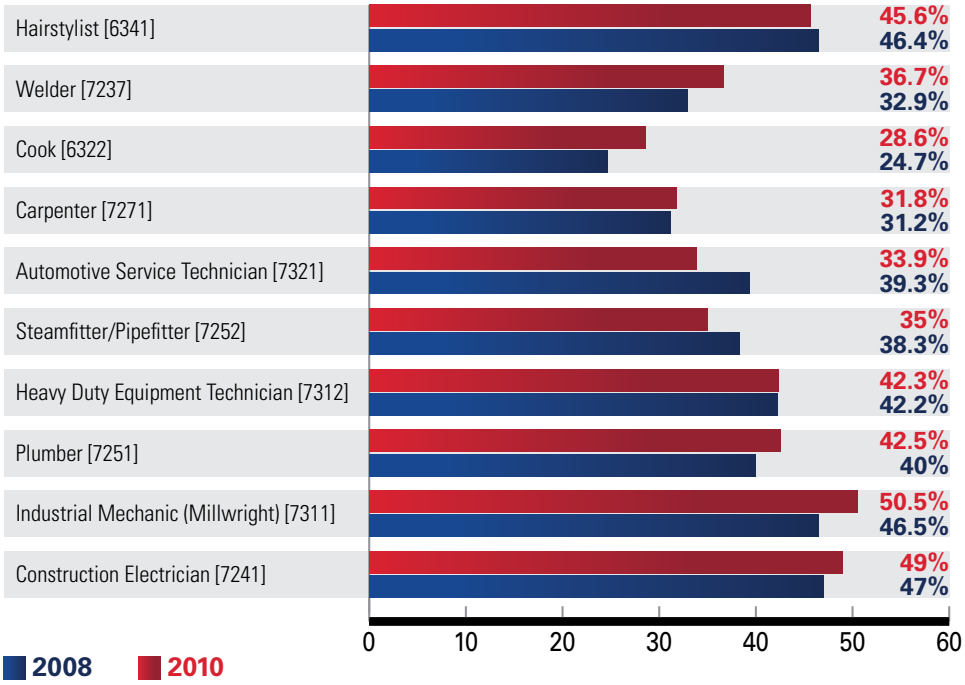
The completion rate represents the percentage of apprentices that successfully complete their apprenticeship programs and receive a C of Q. Calculating completion rates is useful for tracking outcomes for apprentices. The role that apprenticeship and trade certification plays in the labour market depends on many factors, including regulations and market conditions.

Historically, completion rates have remained around 50% in Canada, but these vary by trade and by region.[5] Several factors impact completion rates:

- **Compulsory Certification:** In order to work in a compulsory trade, a worker must be a registered apprentice who is progressing towards certification in the trade or a certified journeyperson.
- **Income:** According to the National Apprenticeship Survey, completion is associated with higher pay after certification.[6]
- **Employer Requirements:** Industrial sector employers tend to demand a C of Q.
- **Sectoral Differences:** Individuals in service sector trades may use entry into an apprenticeship to gain knowledge and "get a foot in the door," but there tends to be less incentive to complete because the employer is satisfied with a Level 2 apprentice.
- **Economic Conditions:** Economic conditions impact apprentices' abilities to progress. If they are laid off, it is difficult to earn hours towards their apprenticeship. In tight labour markets, employers may not want to release their apprentices to go to technical training.
- **Technical Training:** Some apprentices feel they cannot afford to go back to technical training and receive Employment Insurance instead of their full wages. These apprentices stay at their current level and do not progress in their apprenticeship. Statistics Canada has recently started to compile cohort-based measures of completion rates by trade and tracking certification rates for apprentices that complete their programs within 1.5x program duration. New data suggest that despite the 2009 recession, completion rates among the top 10 Red Seal trades have remained relatively stable between the 2008 and 2010 cohorts.[7]

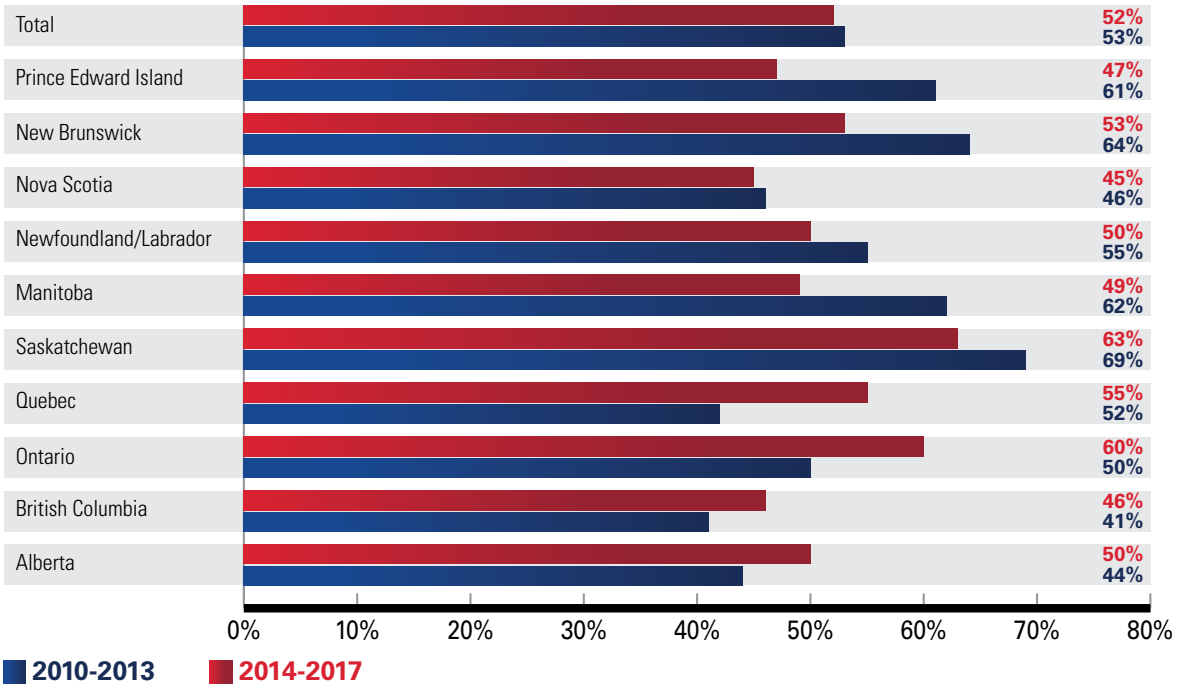
The proportion of apprentices in Canada that registered in 2010 and completed their programs within 1.5x of the program duration ranged between 49% for construction electricians and 28.6% for cooks. The completion rates for individual programs are outlined in Figure 19. Each trade indicates changes in completion rate within 5.5 percentage points. Between 2008 and 2010, hairstylist (-0.8%), automotive service technician (-5.4%) and steamfitter-pipefitter (-3.3%) all saw modest declines in their completion rates. During the same period, welder (3.8%), cook (3.9%), carpenter (0.6%), plumber (2.5%), industrial mechanic (millwright) (4.0%) and construction electrician (2.0%) experienced modest increases in their completion rates. Automotive service technician saw the largest change in completion rate with a 5.4% decrease between 2008 and 2010. The heavy-duty equipment technician trade saw virtually no change during this period (0.1%) with a 42% completion rate.

Figure 19- *Completion Rate (%) within 1.5x Program Duration by Trade, 2008 and 2010*



Completion rates at the provincial level were measured as a ratio of completions to registrations in the past period equal to the expected duration of a specific program. Completion rates decreased in the Atlantic Provinces, Saskatchewan and Manitoba. The rates increased in Quebec, Ontario, Alberta and British Columbia. Saskatchewan has maintained the highest rate at 63%, but even this "high" of 2013 is a decline from the province's rate of 69% in 2010.

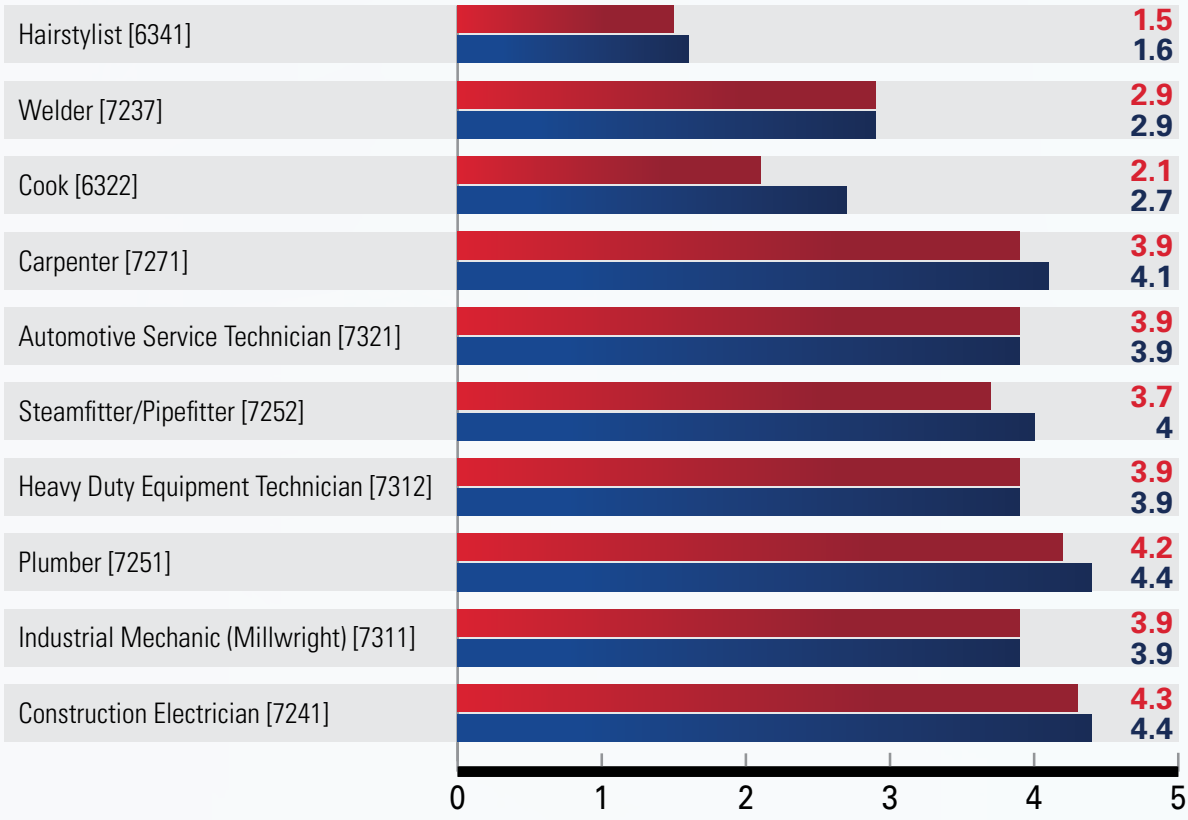
Figure 20- *Average Completion Rates, Top 10 Red Seal Trades by Province 2010 to 2013 and 2014 to 2017*



Average Time to Program Completion

Statistics Canada estimates apprentices take, on average, approximately 3.5 years to complete a program. This varies widely, however, depending on individual trade program requirements. Hairstylists take the least time to complete (1.5 years). Plumbers and construction electricians each take about 4.4 years to become certified. The time to complete is also impacted by economic and labour market conditions. Weaker economic conditions lengthen the time it takes to become certified and reduce the likelihood an individual will complete. For example, apprentices who registered following the 2008-2009 recession took less time to complete than those who registered in 2008. During periods of slower growth, increased layoffs and reduced work opportunities make it more difficult for apprentices to reach work hour requirements. This increases the risk of them discontinuing their training programs. This trend was a key factor in the declining completion rates and increased time to complete in provinces most negatively impacted by the economic downturn. Alberta, Saskatchewan and Newfoundland and Labrador were the provinces most impacted.

Figure 21- *Median Time to Certification within 1.5x Program Duration, Canada, 2008 and 2010*



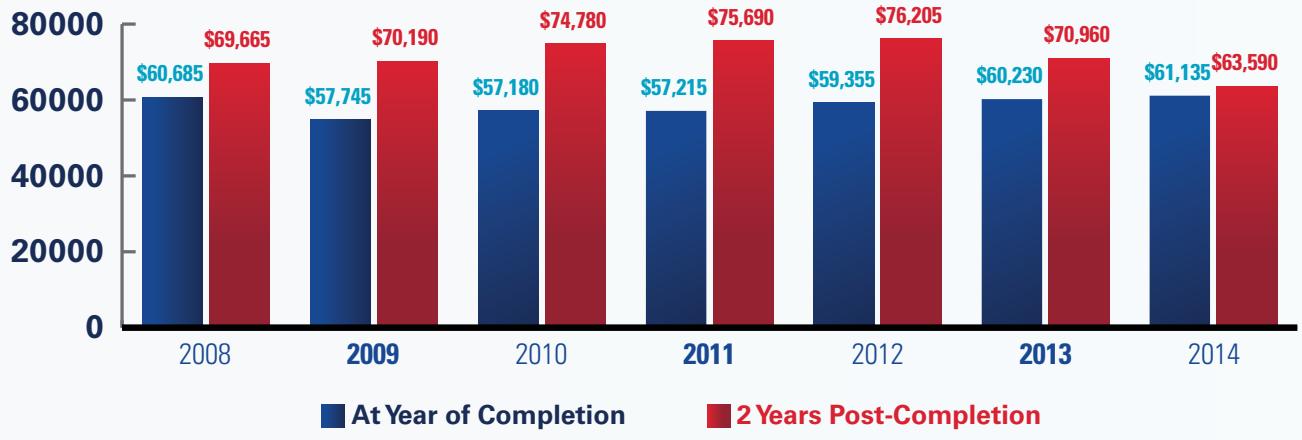
Trends in Earnings

Statistics Canada recently began tracking earnings of apprentices after certification by linking RAIS data to tax files, resulting in better tracking of apprentice labour market outcomes. The data show that earnings at certification have been increasing, especially two years post-certification. Income increases peaked in 2011, when completers earned $18,000 more than they did the year they completed their programs. This trend occurred during a period of peak employment in Canada following the recession in 2009, where employees worked a higher number of hours and earned increased wages. Those who completed apprenticeship programs in 2014 caught the end of this growth wave and are now seeing modest changes in income two years after completing their program.

Figure 22- *Income and Percent Change after Completion, 2008-2014*

COMPLETION YEAR	MEDIAN EMPLOYMENT INCOME (AT COMPLETION YEAR)	MEDIAN EMPLOYMENT INCOME (2 YEARS POST-COMPLETION)	% CHANGE
2008	60,685	69,665	14.8%
2009	54,745	70,190	28.2%
2010	57,180	74,780	30.8%
2011	57,215	75,690	32.3%
2012	59,355	76,205	28.4%
2013	60,230	70,960	17.8%
2014	61,135	63,590	4.0%

Figure 23- *Median Employment Income ($) at Certification and 2 years after Certification, 2008 to 2014*



4.0

Certification Requirements and Completions: A National Outlook

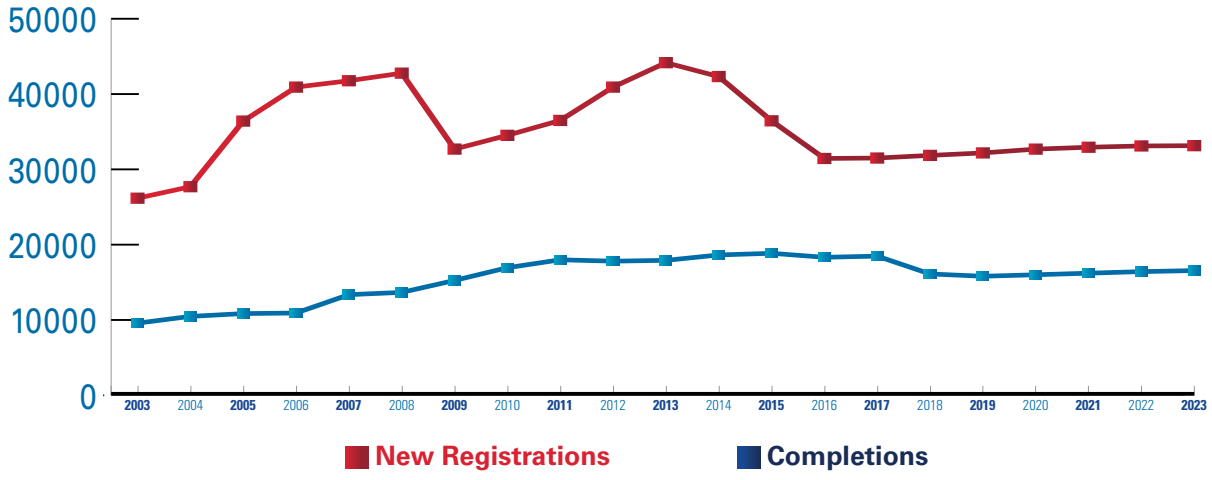
The following section provides a forward-looking assessment of apprenticeship program registrations, completions and workforce certification requirements for the five-year period from 2019 to 2023. A more in-depth provincial analysis of trade-specific training and certification requirements and supply of new journeypersons is provided in separate provincial and regional reports.

Certification requirements for skilled trades and estimates of the required number of new journeypersons are determined by many inter-related factors. The supply of new certified workers is met by either apprenticeship completers or trade qualifiers. Completers are individuals who complete an apprenticeship program and are awarded a C of Q. Trade qualifiers are workers who have significant work experience and, if they pass the C of Q exam, are awarded certification. Although trade qualifiers contribute positively to the supply of certified workers, a significant proportion hold multiple tickets or are existing skilled workers who move between provinces or countries. Consequentially, they do not represent an addition of skills in the workforce or an increase in demand for apprenticeship training. The analysis in this report focuses on apprentice completers. Estimates of new journeypersons are based on projections of new registrations and completions.

Figure 24 outlines projections of registrations based on anticipated changes in employment, age demographics and completions assuming that recent trends in completion rates for individual trade and provinces remain consistent.

The economic and employment growth outlook suggests that between 2019 and 2023, new registrations in Red Seal programs will increase modestly from 32,184 to 33,150. Completions are expected to remain flat, hovering below 17,000.

Figure 24- *Trends in Apprenticeship Program Registrations and Completions, Top 10 Red Seal Trades, 2008 to 2023*



4.1 Workforce Certification Requirements

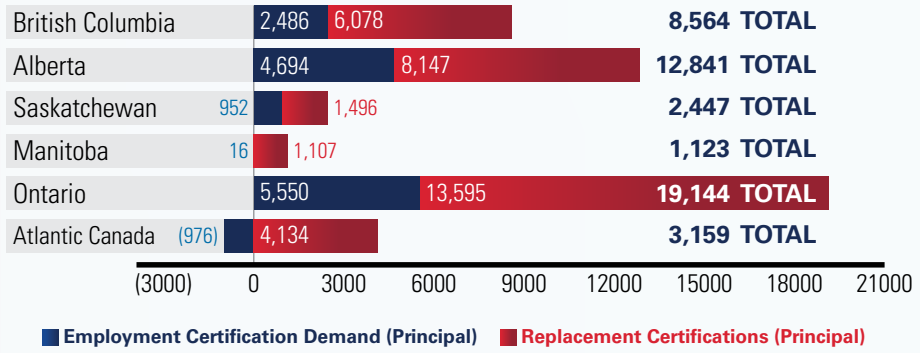
The skilled trades workforce is composed of certified and non-certified workers. The proportion varies across trades, sectors and provinces due, in part, to differences in regulations and industry requirements. The central question posed in the assessment of workforce certification requirements is: How many newly certified journeypersons are required to maintain the current share of certified workers for a skilled trade in the workforce? Because a C of Q is held by individuals as they move between jobs and progress in their careers, the analysis must also consider certification rates of related trades and occupations. A related trade or occupation is an occupation that requires or benefits from the skills and qualifications as represented by a C of Q but does not have an apprenticeship program attached to it. Most often, these related occupations are managerial or supervisor positions. The total trade certification and training requirement is the sum of journeypersons required to maintain stable certification rates in both the principal and related trades and occupations. Future requirements are driven by the following variables:

1. Changes in employment for the apprenticeable (or principal) trade;
2. Labour force retirements and deaths of individuals employed in the apprenticeable (or principal) trade;
3. Changes in employment for related trades and occupations;
4. Retirements of certified workers in related trades and occupations.

In the next five years, an estimated 47,278 newly certified journeypersons will be required to maintain certification requirements for skilled workers in the top 10 Red Seal trades. Nearly three-quarters (73%) of this requirement is attributed to the expected age-related exits of 34,556 certified workers from the workforce through retirement or death.

Ontario is projected to lead demand for journeypersons over the next five years requiring an estimated 19,144 newly certified journeypersons working directly in the top 10 Red Seal trades. Alberta and British Columbia follow Ontario with requirements of 12,841 and 8,564 new journeypersons respectively. The employment levels will remain stable in Atlantic Canada, but there will still be a need for 3,159 new journeypersons due to retirements. Certification requirements are partly constrained in Atlantic Canada due to employment declines in Newfoundland and Labrador.

Figure 25- *Certification Requirements for Top 10 Red Seal Trades between 2019 and 2023 by Province*



In addition to the certification requirements represented by hiring requirements for the top 10 Red Seal trades, an additional 19,704 new journeypersons will be required to meet the hiring requirements represented by related trades and occupations. These related occupations tend to draw from the existing pool of certified workers and hire these individuals as managers, supervisors and contractors. It is estimated that over the next five years, 67,000 new journeypersons will be required for the top 10 Red Seal trades across Canada, excluding Quebec and the Territories.

Figure 26- *Total Certification Requirements for Top 10 Red Seal Trades between 2019 and 2023 by Province*

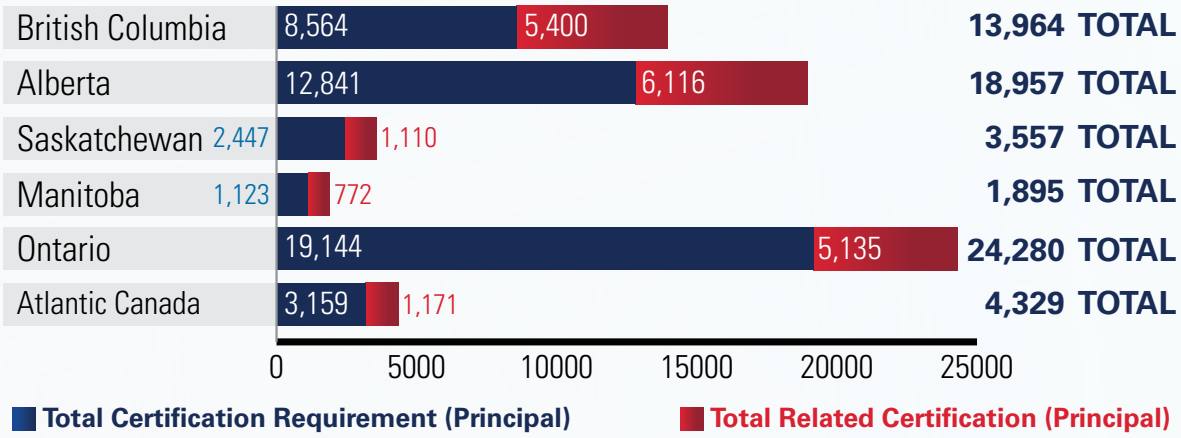


Figure 27 provides a breakdown of national certification requirements by trade, including changes in employment and replacement demand (retirements and deaths), for the top 10 Red Seal trades. Principal and related trades and occupations are considered. It is worth noting that a larger proportion of certification requirements for the carpenter and cook trades are driven by demand in the related trades and occupations.

Figure 27- *Certification Requirements for Top 10 Red Seal Trades between 2019 and 2023 by Trade*

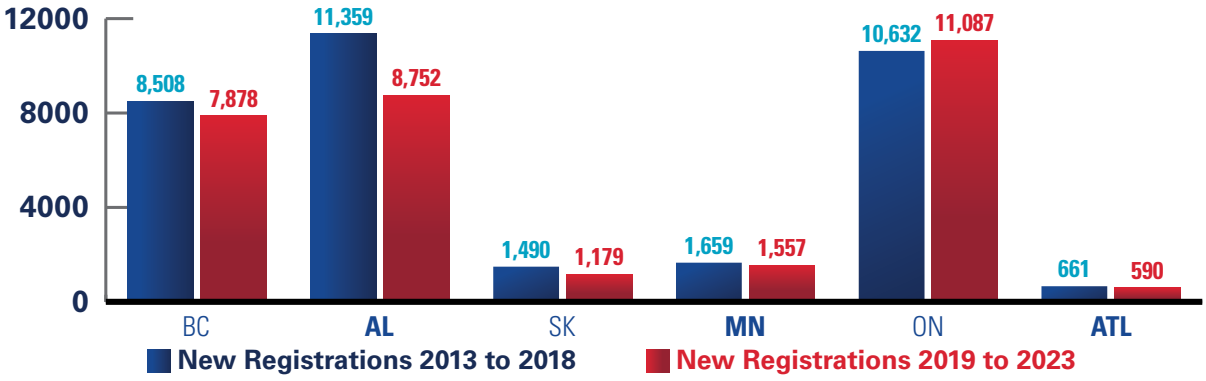
TRADE	EMPLOYMENT CERTIFICATION DEMAND (PRINCIPAL TRADE)	REPLACEMENT CERTIFICATION DEMAND (PRINCIPAL TRADE)	RELATED CERTIFICATION DEMAND	TOTAL CERTIFICATION DEMAND
Auto Service Technician	1,796	4,519	2,438	8,754
Carpenter	(643)	4,449	3,661	7,466
Construction Electrician	2,553	6,472	4,254	13,279
Cook	768	1,147	3,075	4,990
Hairstylist	2,048	4,117	1,068	7,233
Heavy-Duty Equipment Technician	653	2,387	1,578	4,610
Industrial Mechanic (Millwright)	2,411	4,182	743	7,336
Plumber	889	2,267	1,140	4,296
Steamfitter/Pipefitter	692	1,375	651	2,718
Welder	1,555	3,651	1,096	6,301
Total	**12,722**	**34,556**	**19,704**	**66,982**

4.2 Future Supply of New Journeypersons

Nearly 164,100 apprentices are expected to register in the top 10 Red Seal trades between 2019 and 2023. This figure is down approximately 9% compared with registrations over the past five years when new registrations averaged about 36,000 per year. This period spanned the peak in 2014 as well as the significant declines in 2015 and 2016. Looking ahead, total new registrations are expected to decline to an average just over 32,800 per year over the next five years, reflecting a period of projected slower employment growth. Declines are expected in every province, except Ontario where average annual registrations are projected to rise by 9% to just over 11,000 per year. Alberta is projected to experience the most significant decline. New registrations are expected to average 8,750, representing a decrease of 23% compared with the average over the previous 5 years.

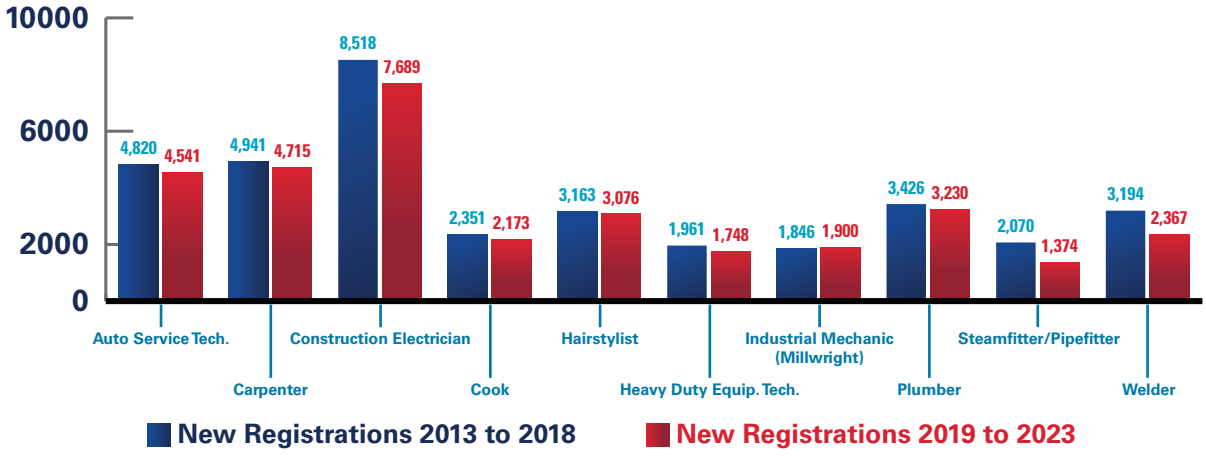
Figures 28 and 29 illustrate the average total registrations for the top 10 Red Seal trades by province and by trade respectively for the last five years, 2013 to 2018, and then from the 2019 to 2023 forecast period. At the trade level, the largest declines are expected in the welder, steam-fitter/pipefitter and construction electrician programs.

Figure 28- *Average Annual New Registrations in Top 10 Red Seal Trades by Province, Historic (2013 to 2018) and Projected (2019 to 2023)*



Source: Statistics Canada, RAIS, CANTRAQ Prism Economics (2019)

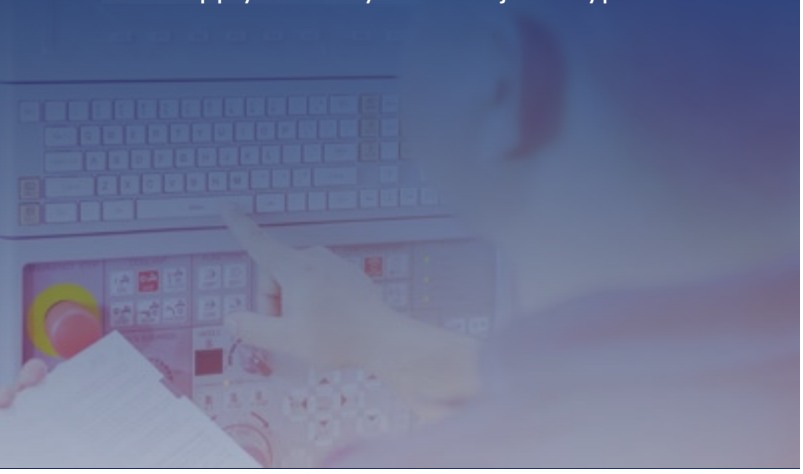
Figure 29- *Average Annual New Registrations in Top 10 Red Seal Trades, Historic (2013 to 2018) and Projected (2019 to 2023)*



Source: Statistics Canada, RAIS, CANTRAQ Prism Economics (2019)

Gaps in Supply and Demand

The build up in new registrations to peak levels in 2014 has translated to high completion levels for several trades through to 2018. The recent declines, however, in construction sector employment in Alberta and Newfoundland and Labrador have resulted in an "overshoot" in the number of newly certified workers relative to demand. There is a downside risk to projected completions during a period of generally weaker labour market conditions. Fewer job opportunities and declines in available work hours will likely extend the average time to complete as well as lower completion rates among those apprentices who registered after 2015. In British Columbia, the analysis suggests that completions lagged behind certification requirements. Continued expansion appears to have driven demand for certified workers ahead of the supply of newly certified journeypersons.



Looking ahead, completions are expected to decline from an annual average of nearly 18,050 between 2013 and 2018, to 16,200 per year between 2019 to 2023. Certification requirements are expected to recover. The largest share of declines and recovery in certification requirements are expected in Alberta. This is driven by the significant drop in new registrations that occurred between 2014 and 2016, followed by the anticipated recovery ahead. The analysis suggests that given the current level of new registrations, any significant acceleration of demand requirements could pose significant recruiting challenges. In British Columbia, the average annual completions are expected to increase over the next 5 years, just as demands are no longer at their peak level after 2021. A similar divergence in trends, though on a smaller scale, is expected in Manitoba as major hydro and utilities sector projects wind down. In Atlantic Canada, certification requirements are expected to remain stable over the near term as declines in employment in Newfoundland and Labrador are offset by more stable levels of employment across the other Atlantic provinces. Rising retirements will be a key driver of training needs. There is a potential risk of completions falling behind certification requirements as demand recovers in Newfoundland and Labrador in 2025 and beyond.

At the trade level, the analysis suggests there is a potential risk that certification requirements may run ahead of completions for a number of trades including welders, millwrights and cooks.

Figure 30- *Average Total Completions in the Top 10 Red Seal Trades by Province*

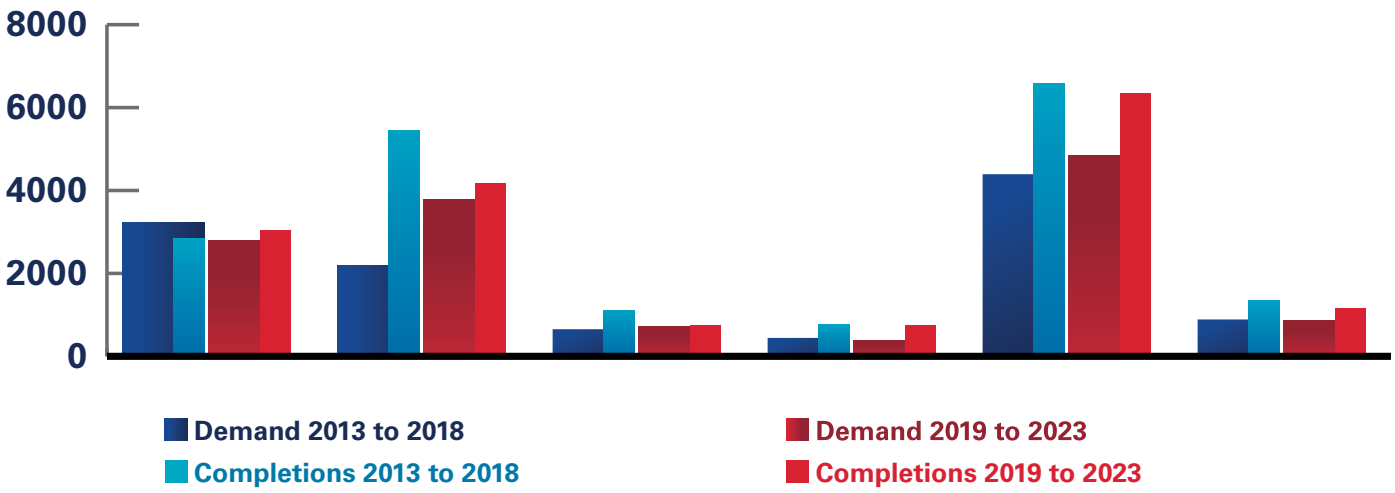
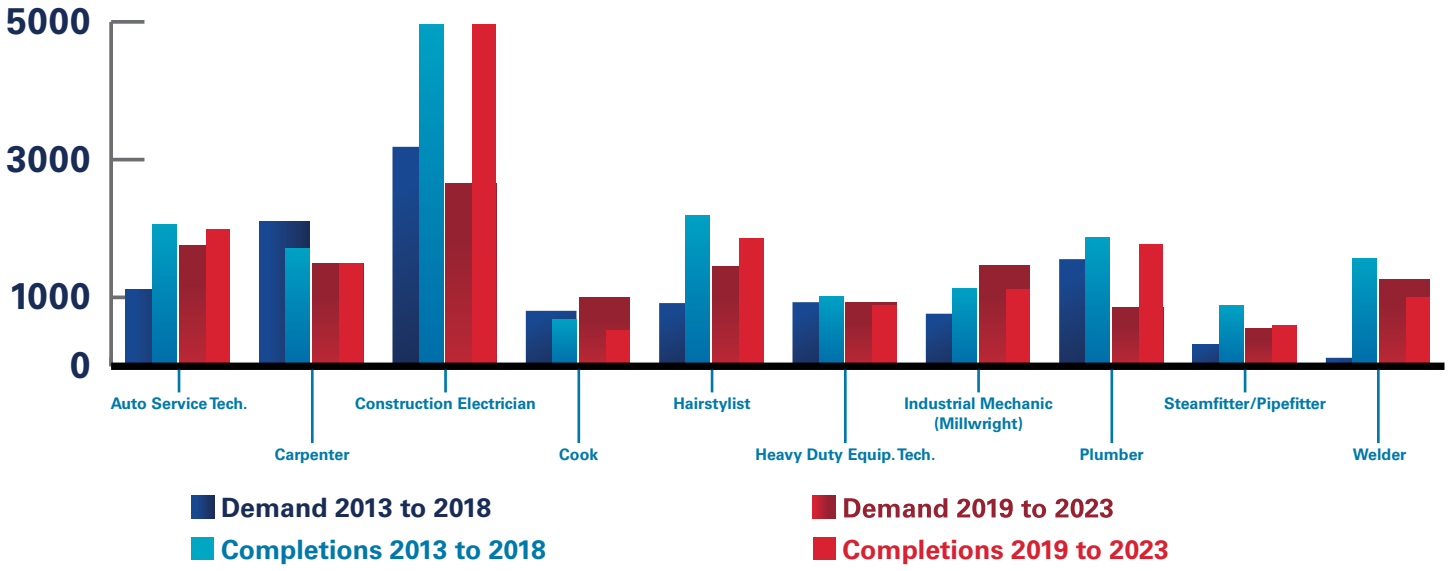


Figure 31- *Average Annual Certification Demand by Red Seal Trade, Canada, 2013 to 2018 and 2019 to 2023*



Target Registrations

To meet certification requirements, an estimated 167,800 apprentices are likely to be required over the next five years. Although this trend is similar to the projected number of apprentices (164,100) at the national level, there are significant differences between projections and requirements for individual trades and by province. For more information, see the provincial and regional reports.

Figure 32- *Average Annual Registration Targets by Trade*

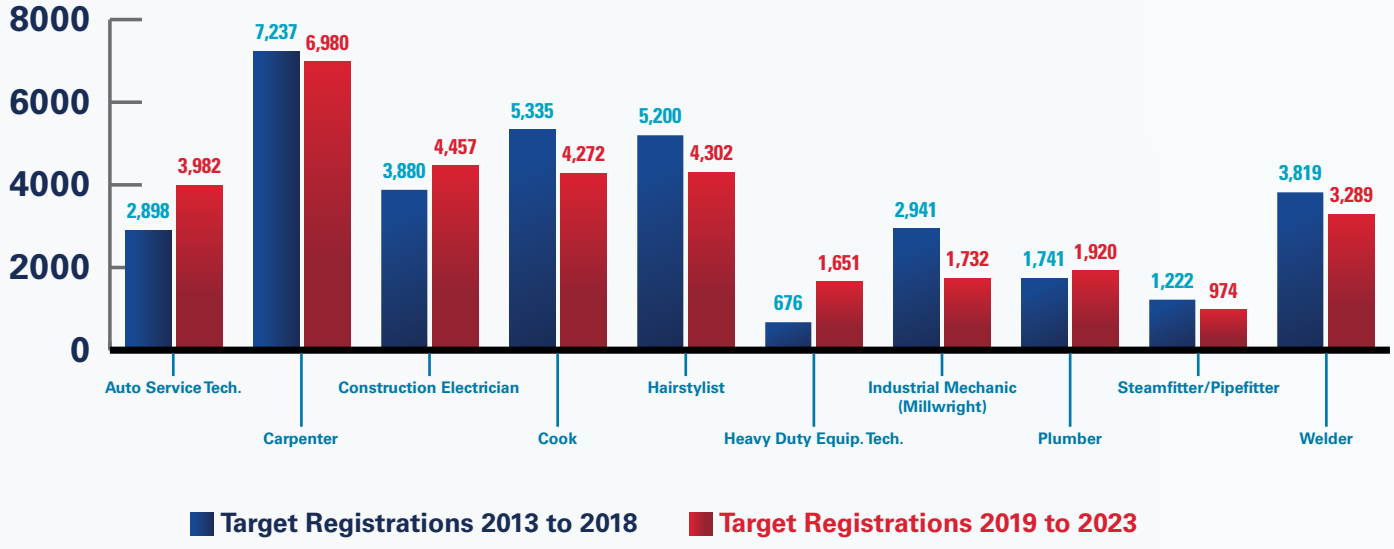


Figure 33- *Projected Registrations, Projected Completions, Certifications Required and Target Registrations by Province*

PROVINCE	PROJECTED REGISTRATIONS	PROJECTED COMPLETIONS	CERTIFICATIONS REQUIRED	TARGET REGISTRATIONS
British Columbia	39,389	15,164	13,964	49,788
Alberta	43,760	20,863	18,957	48,244
Saskatchewan	5,896	3,717	3,557	6,462
Manitoba	7,784	3,801	1,895	5,510
Ontario	55,436	31,701	24,280	46,413
Atlantic Canada	11,803	5,759	4,329	11,376
TOTAL	**164,068**	**81,006**	**66,982**	**167,793**

Figure 34- *Projected Registrations, Projected Completions, Certifications Required and Target Registrations by Trade*

TRADE	PROJECTED REGISTRATIONS	PROJECTED COMPLETIONS	CERTIFICATIONS REQUIRED	TARGET REGISTRATIONS
Auto Service Technician	22,705	9,952	8,754	19,908
Carpenter	23,577	7,477	7,466	34,900
Construction Electrician	38,444	24,831	13,279	22,286
Cook	10,863	2,607	4,990	21,358
Hairstylist	15,381	9,312	7,233	21,512
Heavy-Duty Equipment Technician	8,740	4,408	4,610	8,253
Industrial Mechanic (Millwright)	9,501	5,561	7,336	8,658
Plumber	16,151	8,872	4,296	9,602
Steamfitter/Pipefitter	6,872	2,960	2,718	4,872
Welder	11,834	5,026	6,301	16,444
TOTAL	**164,068**	**81,006**	**66,982**	**167,793**

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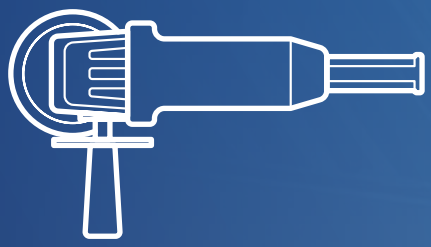

Conclusion

This report summarizes apprenticeship trends data and projections from the CANTRAQ system providing an assessment of demand and supply for trade certification across the top 10 Red Seal trades in Canada. The results indicate that over the next five years, an estimated 66,982 new journeypersons will be required as well as 167,793 new apprentices. Helping apprentices to progress and complete their programs remains important given the demand for certification. A downward trend in the annual number of newly certified journeypersons poses potential risks for the future availability of skilled tradespersons as Canada's skilled workforce continues to age and retirement rates accelerate.

1. Quebec programs are not included in the trade-specific analysis due to differences in program classifications and inconsistencies in historical data series.
2. Andrew Sharpe and James Gibson, Centre for the Study of Living Standards (CSLS), The Apprenticeship System in Canada: Trends and Issues (Ottawa: CSLS Research Report, September 2005).
3. BuildForce, Construction and Maintenance Looking Forward National Highlights, 2019-2028 (Ottawa: BuildForce Canada, 2019).
4. The implementation of the Ontario College of Trades may have impacted the increase in completions in Ontario.
5. See Sandrine Prasil, Registered Apprentices: The Class of 1992, A Decade Later (Ottawa: Statistics Canada, 2005); Denis Morissette, Registered Apprentices: The Cohort of 1993, A Decade Later, Comparisons with the 1992 Cohort (Ottawa: Statistics Canada, 2008); and Louise Desjardins and Nicole Paquin, Registered Apprentices: The Cohorts of 1994 and 1995, One Decade Later (Ottawa: Statistics Canada, 2010).
6. Kristyn Frank and Emily Jovic, National Apprenticeship Survey Canada Overview Report 2015, (Ottawa: Statistics Canada, 2017).
7. Due to the variance in program duration and the measure of completions using 1.5x program duration, the completion rates for new registrants in 2010 are the most recent available.

CANADIAN **APPRENTICESHIP** FORUM

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