LABOUR MARKET FORECAST

AUTOMOTIVE INDUSTRY LABOUR MARKET ANALYSIS

PROVINCIAL AUTOMOTIVE INDUSTRY FORECAST PROFILE: QUEBEC

futureautolabourforce.ca

THIS PAPER was prepared for the Auto Labour Market Information (LMI) Project, now known as the *Future of Canadian Automotive Labourforce (FOCAL) Initiative.*

The goal of the project is to help stakeholders better understand the automotive labour market. The Project will create industry-validated, regional, occupational supply and demand analyses and forecasts and skill profiles for skilled trades and other key skilled occupations in the broader automotive sector including vehicle assemblers, parts manufacturers and technology companies that supply the industry. The project will also examine various labour market trends in the sector and facilitate discussions among stakeholders about how to address any forecasted skills shortages and other labour market challenges. The planned outcome of the project is enhanced regional labour market information that will support colleges, employers, policy makers and other stakeholders in taking practical steps to address skills shortages and other labour market challenges in the automotive sector.

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PROFILE HIGHLIGHTS

- Quebec's broader automotive industry employed an estimated 14,650 workers in 2019. A total of 73% of workers were employed in core automotive industries. 26% of workers were employed in one of Quebec's commercial vehicle assembly plants. An additional 47% of workers were employed in vehicle parts manufacturing through independent parts suppliers.

- The remaining 27% of workers were employed in automotive-associated industries. These industries cover the full automotive supply chain, including employment in metals industries (11% of workers), non-metal materials industries (5%), computer and electronics (6%), and a range of other industries (5%).

- Looking ahead, employment is projected to grow steadily during the decade, rising to over 16,500 workers by 2030, while total employment in the province is projected to grow from 4.3 million in 2022 to 4.7 million by 2030. Industry groups that comprise the broader automotive industry are projected to experience diverging outcomes with respect to employment growth over the next decade, with average annual growth rates ranging from -0.4% to 3.2%.

- The province's broader automotive industry will need to hire 5,710 workers between 2021 and 2030 in order to meet projected labour demands. 3,280 workers will need to be hired to replace workers lost due to retirement or death, a primary consequence of the industry's aging workforce. A further 2,430 workers will need to be hired due to industry growth, a result of a moderate growth forecast for domestic (and North American) commercial vehicle production over the course of the decade.

- The province's broader automotive industry is expected to face a recruitment gap of 4,860 workers between 2021 and 2030, even after taking account of new entrants to the workforce. This would require hiring the equivalent of 33% of the province's current broader automotive industry employment. Recruitment gaps could be significantly higher if the industry fails to recruit new entrants at historic levels.

- Occupations with the largest absolute recruitment gaps include motor vehicle assemblers, inspectors & testers (NOC 9522); mechanical assemblers & inspectors (NOC 9526); and welders & related machine operators (NOC 7237). Occupations with the largest relative recruitment gaps include electronics assemblers, fabricators, inspectors & testers (NOC 9523); electrical & electronics engineers (NOC 2133); and construction millwrights & industrial mechanics (NOC 7311).
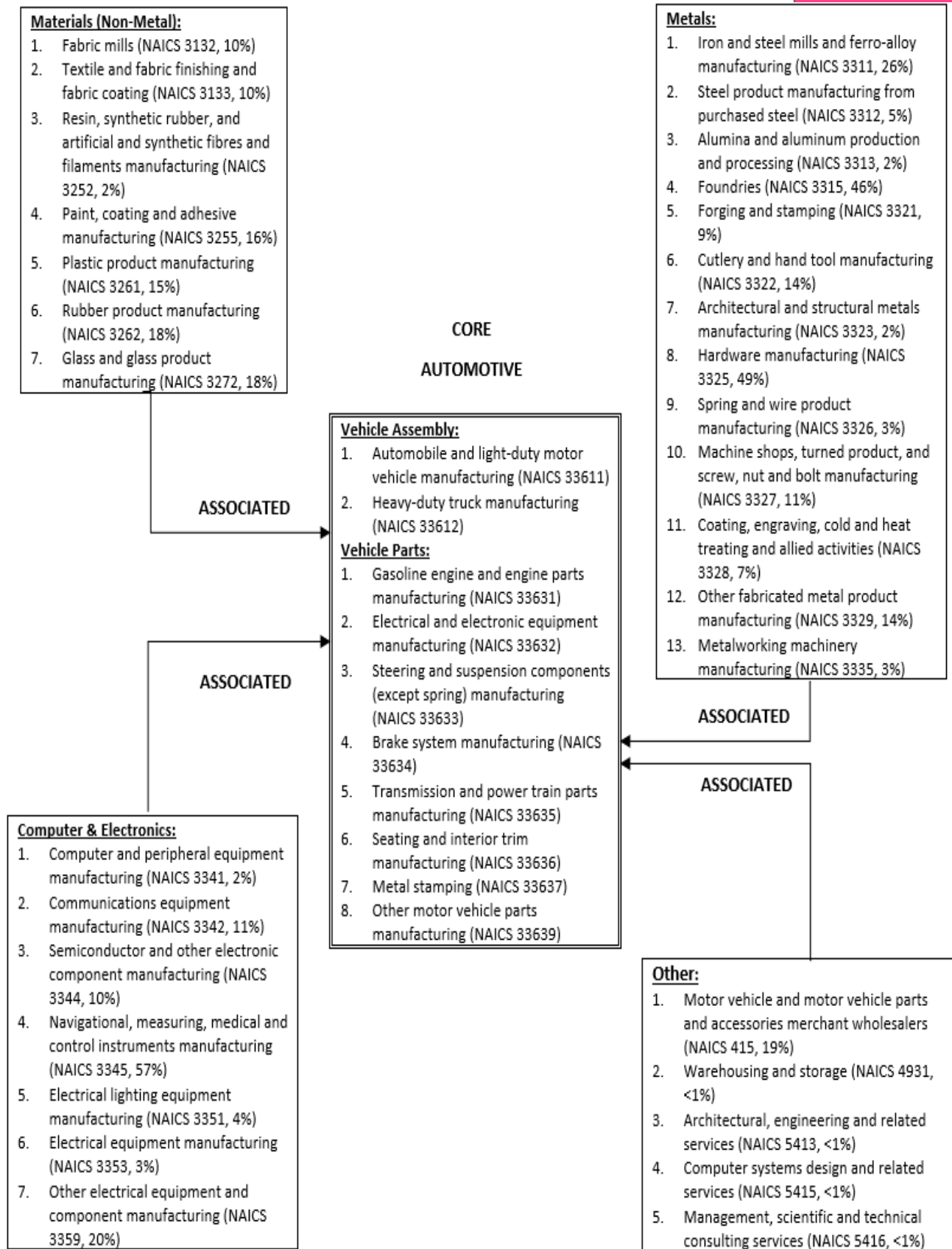
BACKGROUND

This profile summarizes a provincial labour market forecast for the broader automotive industry. The forecast model projects and quantifies trends in labour demand and supply for the industry over the forecast period from 2021 to 2030. The forecast model uses a combination of data sources to generate labour market outlooks. Workforce estimates were based on a two-pronged approach, which consisted of analyzing establishment-level data ("bottom up") and tracing industry production through the economy ("top down").

The "bottom up" approach used a database originally built by the Automotive Policy Research Centre (APRC) through industry contacts, company websites, industry literature and other sources of publicly available data to identify individual employers in each region's broader automotive industry. This database added complexity to the forecast model by providing regionally-specific employment distributions across industries at a level of detail beyond what is available through government statistics. The "top down" approach tracked inter-industry transactions through Statistics Canada's input-output tables, allowing for each industry's contributions to employment and output for the broader automotive industry to be defined.

This analysis broadens the definition of the industry to include producers in the supply chain that have previously been classified in non-automotive industries. Industries traditionally included in the industry are defined here as core automotive industries; this includes two sub-sectors of motor vehicle assembly (NAICS 3361) and eight sub-sectors of motor vehicle parts manufacturing (NAICS 3363). Thirty-two additional industries are defined as associated industries, meaning a portion of their sales come from core automotive industries. The degree of connection between associated industries and core automotive industries varies significantly. For instance, nearly half of sales for the foundries and hardware manufacturing industries are to core automotive industries. Other industries, particularly those related to electronics manufacturing and professional services, sell less than 5% of their output to core automotive industries.

The diagram on the following page illustrates the broader definition of the automotive industry in terms of core and associated industries, grouped by their role in the automotive industry's supply chain. Each industry is listed alongside its classification code (i.e. NAICS) and the proportion of its sales which come from core automotive industries. While Figure 1 illustrates the national broader automotive industry, each region has a distinct supply chain dependent on the businesses producing goods and/or services there. The definition of the broader automotive industry has been adjusted for some regions to reflect this fact.

FIGURE 1. The Broader Automotive Industry in Canada

Materials (Non-Metal):
1. Fabric mills (NAICS 3132, 10%)
2. Textile and fabric finishing and fabric coating (NAICS 3133, 10%)
3. Resin, synthetic rubber, and artificial and synthetic fibres and filaments manufacturing (NAICS 3252, 2%)
4. Paint, coating and adhesive manufacturing (NAICS 3255, 16%)
5. Plastic product manufacturing (NAICS 3261, 15%)
6. Rubber product manufacturing (NAICS 3262, 18%)
7. Glass and glass product manufacturing (NAICS 3272, 18%)

Metals:
1. Iron and steel mills and ferro-alloy manufacturing (NAICS 3311, 26%)
2. Steel product manufacturing from purchased steel (NAICS 3312, 5%)
3. Alumina and aluminum production and processing (NAICS 3313, 2%)
4. Foundries (NAICS 3315, 46%)
5. Forging and stamping (NAICS 3321, 9%)
6. Cutlery and hand tool manufacturing (NAICS 3322, 14%)
7. Architectural and structural metals manufacturing (NAICS 3323, 2%)
8. Hardware manufacturing (NAICS 3325, 49%)
9. Spring and wire product manufacturing (NAICS 3326, 3%)
10. Machine shops, turned product, and screw, nut and bolt manufacturing (NAICS 3327, 11%)
11. Coating, engraving, cold and heat treating and allied activities (NAICS 3328, 7%)
12. Other fabricated metal product manufacturing (NAICS 3329, 14%)
13. Metalworking machinery manufacturing (NAICS 3335, 3%)

CORE AUTOMOTIVE

ASSOCIATED

Vehicle Assembly:
1. Automobile and light-duty motor vehicle manufacturing (NAICS 33611)
2. Heavy-duty truck manufacturing (NAICS 33612)

Vehicle Parts:
1. Gasoline engine and engine parts manufacturing (NAICS 33631)
2. Electrical and electronic equipment manufacturing (NAICS 33632)
3. Steering and suspension components (except spring) manufacturing (NAICS 33633)
4. Brake system manufacturing (NAICS 33634)
5. Transmission and power train parts manufacturing (NAICS 33635)
6. Seating and interior trim manufacturing (NAICS 33636)
7. Metal stamping (NAICS 33637)
8. Other motor vehicle parts manufacturing (NAICS 33639)

ASSOCIATED

ASSOCIATED

ASSOCIATED

Computer & Electronics:
1. Computer and peripheral equipment manufacturing (NAICS 3341, 2%)
2. Communications equipment manufacturing (NAICS 3342, 11%)
3. Semiconductor and other electronic component manufacturing (NAICS 3344, 10%)
4. Navigational, measuring, medical and control instruments manufacturing (NAICS 3345, 57%)
5. Electrical lighting equipment manufacturing (NAICS 3351, 4%)
6. Electrical equipment manufacturing (NAICS 3353, 3%)
7. Other electrical equipment and component manufacturing (NAICS 3359, 20%)

Other:
1. Motor vehicle and motor vehicle parts and accessories merchant wholesalers (NAICS 415, 19%)
2. Warehousing and storage (NAICS 4931, <1%)
3. Architectural, engineering and related services (NAICS 5413, <1%)
4. Computer systems design and related services (NAICS 5415, <1%)
5. Management, scientific and technical consulting services (NAICS 5416, <1%)

In addition to providing labour market outlooks for the broader automotive industry as a whole, the forecast model also provides comprehensive projections for a set of key occupations that play distinct and important roles in the broader automotive industry workforce[1]. Forecasts were developed for the following occupations, categorized based on the nature of their role in the workforce:

Management & Administration
Senior managers – construction, transportation, production and utilities (NOC 0016)
Engineering managers (NOC 0211)
Computer and information systems managers (NOC 0213)
Manufacturing managers (NOC 0911)
Human resource professionals (NOC 1121)

Engineering & Technical
Shippers and receivers (NOC 1521)
Production logistics coordinators (NOC 1523)
Mechanical engineers (NOC 2132)
Electrical and electronics engineers (NOC 2133)
Industrial and manufacturing engineers (NOC 2141)
Metallurgical and materials engineers (NOC 2142)
Computer engineers (except software engineers and designers) (NOC 2147)
Information systems analysts and consultants (NOC 2171)
Database analysts and data administrators (NOC 2172)
Software engineers and designers (NOC 2173)
Computer programmers and interactive media developers (NOC 2174)
Mechanical engineering technologists and technicians (NOC 2232)
Industrial engineering and manufacturing technologists and technicians (NOC 2233)
Electrical and electronics engineering technologists and technicians (NOC 2241)
Industrial instrument technicians and mechanics (NOC 2243)
Computer network technicians (NOC 2281)
Information systems testing technicians (NOC 2283)

Skilled Trades
Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations (NOC 7201)
Machinists and machining and tooling inspectors (NOC 7231)
Tool and die makers (NOC 7232)
Welders and related machine operators (NOC 7237)
Electricians (except industrial and power system) (NOC 7241)
Industrial electricians (NOC 7242)
Contractors and supervisors, mechanic trades (NOC 7301)
Construction millwrights and industrial mechanics (NOC 7311)
Automotive service technicians, truck and bus mechanics and mechanical repairers (NOC 7321)
Material handlers (NOC 7452)
Transport truck drivers (NOC 7511)

Production
Supervisors, motor vehicle assembling (NOC 9221)
Supervisors, electronics manufacturing (NOC 9222)
Supervisors, electrical products manufacturing (NOC 9223)
Supervisors, furniture and fixtures manufacturing (NOC 9224)
Supervisors, other mechanical and metal products manufacturing (NOC 9226)
Supervisors, other products manufacturing and assembly (NOC 9227)
Foundry workers (NOC 9412)
Metalworking and forging machine operators (NOC 9416)
Machining tool operators (NOC 9417)
Plastics processing machine operators (NOC 9422)
Motor vehicle assemblers, inspectors and testers (NOC 9522)
Electronics assemblers, fabricators, inspectors and testers (NOC 9523)
Mechanical assemblers and inspectors (NOC 9526)
Plastic products assemblers, finishers and inspectors (NOC 9535)
Industrial painters, coaters and metal finishing process operators (NOC 9536)
Other labourers in processing, manufacturing and utilities (NOC 9619)

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[1] For details on the process of selecting key occupations for this project, please refer to the Post-secondary Education Report published by this project team in October 2019.

INTRODUCTION

Quebec plays a critical role in Canada's economy, accounting for nearly 20% of total national GDP each year between 1997 and 2017. The province's GDP was an estimated $331 billion in 2018, 14% of which was generated by the manufacturing sector. Manufacturing is also a major employer in the province, accounting for 12% of the total labour force. Quebec has a positive economic outlook, with annual GDP growth of at least 1.9% projected through 2029. However, the province's manufacturing sector is expected to see its GDP growth slow in the coming years.

Quebec has a diverse automotive manufacturing industry that includes bus and heavy truck manufacturers. The province also has a network of vehicle parts manufacturers, with a focus on metals (e.g. aluminum), other materials (e.g. rubber), and electronics. Notably, Quebec is home to an emerging automotive technology cluster that includes electric vehicle component manufacturers, LIDAR technology firms, and software developers. New motor vehicle sales in Quebec have risen slowly since 2010, increasing from under 420,000 in that year to 460,000 in 2018. However, the province's share of all Canadian vehicle sales has fallen from 26% to 23% over the same period. Additionally, Quebec had a trade deficit of $543 million in automotive products in 2018 due to a growing trade deficit in vehicle parts[2].

This provincial profile begins with an overview of the outlook for Canadian vehicle production, followed by estimates of current provincial broader automotive industry employment. The next five sections each describe a different component of the provincial labour market forecast, including employment, hiring requirements, new entrants, and recruitment gaps (with rankings). Detailed tables of hiring requirements, new entrants, and recruitment gaps are included in an appendix following the last profile section.

In addition to this provincial profile, a separate regional profile has also been prepared for the Montreal region, which has an automotive manufacturing presence that is distinct from Quebec as a whole.

[2] For more information on the provincial economy and demographics, please refer to the provincial profile published by this project team in October 2019.

GENERAL AUTOMOTIVE INDUSTRY OUTLOOK

Total motor vehicle production in Canada, including both light and commercial vehicles, consisted of 1.92 million units in 2019. This represents a reduction of over 500,000 units since 2012, when vehicle production recovered to pre-recession levels. Production fell by an average of 3.5% annually during the 2012-2019 period. Looking ahead, national vehicle production is expected to fall to 1.72 million units in 2022 before rebounding to a peak of 1.89 million in 2025[3]. Production levels are then projected to remain stable in the range of 1.85 million units between 2026 and 2030.

FIGURE 2. National Motor Vehicle Production (Units), 2000-2030
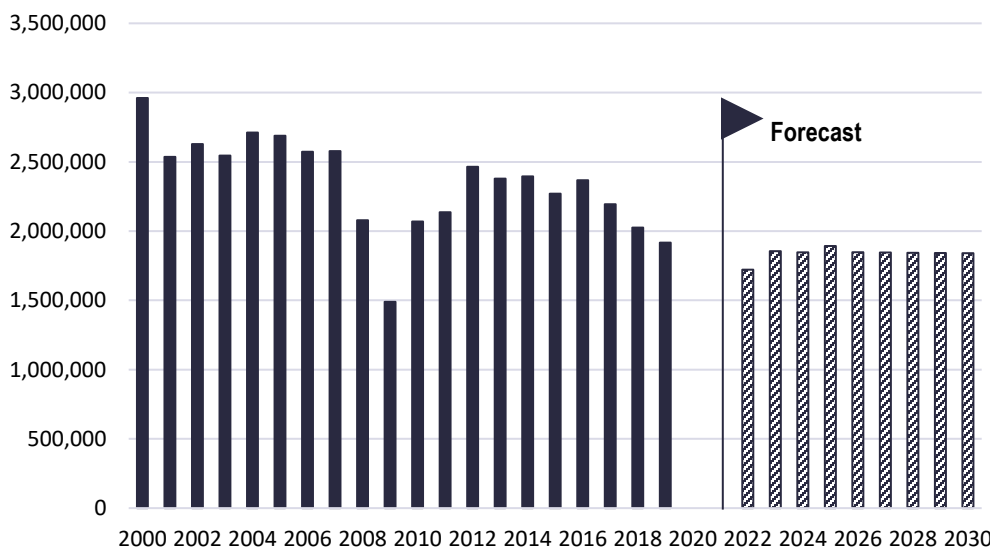
Source: International Organization of Motor Vehicle Manufacturers (2000-2019); LMC Automotive (2022-2030)

As a result of this production forecast, and similar projections for North American vehicle production, Canadian broader automotive industry employment (including workers in both core and associated industries) is expected to remain mostly flat over the forecast period. Nationally, labour market challenges for the broader automotive industry will be driven by the need to replace retirements from the industry's aging workforce, with relatively little hiring resulting from growth.

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[3] Due to uncertainty regarding the impact of COVID-19, forecasts of production have been withheld for 2020 and 2021. Please refer to the "Impact of COVID-19 on Automotive Industry" section for more details.

Impact of COVID-19 on Automotive Industry

COVID-19 has already had significant consequences for the Canadian economy, with many businesses shuttered and a massive surge in unemployment claims. COVID-19's impact is also being felt in the automotive industry as automakers declared temporary closures of all Canadian assembly plants as of March 2020. While vehicle production has been temporarily halted, the industry has nevertheless shown leadership and flexibility in responding to the crisis. Manufacturers across the supply chain quickly pivoted from producing automotive parts to repurposing their operations for the production of critical medical equipment and supplies.

The vehicle production forecasts discussed in the preceding section were developed prior to the COVID-19 outbreak. Actual production levels in 2020 and 2021 are likely to be much different than previously expected due to the aforementioned shutdown. Short-term forecasts should therefore be interpreted with caution. Our project team has decided to withhold forecasts of motor vehicle production (as seen in Figure 2) and industry employment (as seen in Figures 3-5 & Table 1) for 2020 and 2021 as an acknowledgment of the current level of uncertainty surrounding the industry. However, forecasts of labour market conditions for 2021 are still presented in aggregate with the 2022-2025 period.

Due to the nature of the downturn and the experience gained during the 2008-09 recession, we believe COVID-19 will not have long-term impacts on labour supply and demand for the broader automotive industry. The provincial forecasts presented in this profile extend out to 2030; at the time of writing, our project team remains confident they present a reliable picture of labour market dynamics for the broader automotive industry. Our project team will continue to monitor the impact of COVID-19 on the industry going forward.

PROVINCIAL AUTOMOTIVE INDUSTRY EMPLOYMENT

Total broader automotive industry employment in Quebec was an estimated 14,650 workers in 2019[3].
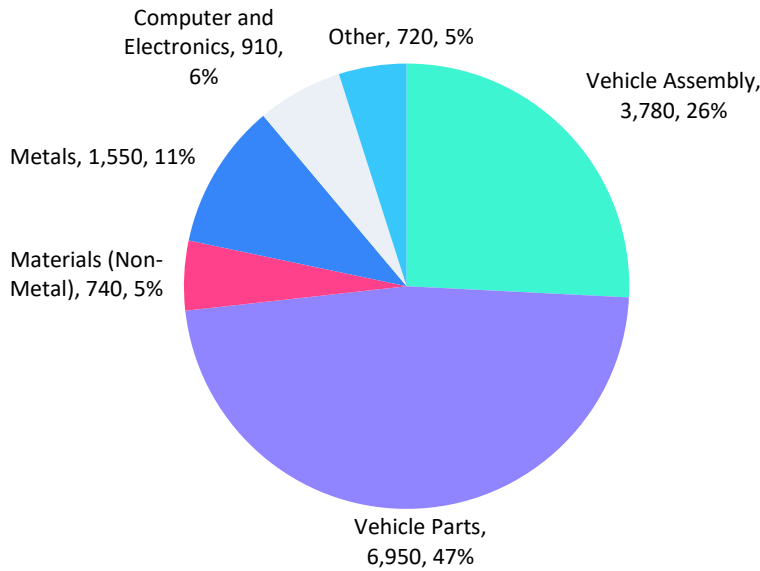
Core automotive industry employment in the province totaled approximately 10,730 workers in 2019. The province is home to several of Canada's major commercial vehicle (e.g. bus and heavy truck) assembly facilities. Quebec's assembly facilities include multiple plants owned by Volvo Group (e.g. Nova Bus Company, Prevost), as well as facilities from Lion Electric Company and Kongsberg Automotive. These plants produce a range of vehicles, such as transit buses, coach buses, electrified school buses, and heavy trucks (e.g. Kenworth, Peterbilt). Total vehicle assembly employment accounted for 26% of the province's broader automotive industry employment in 2019. Vehicle parts manufacturing in Quebec occurs at independent parts suppliers throughout the province. The largest parts segment by employment is electrical & electronic equipment manufacturing (NAICS 33632), followed by seating & interior trim manufacturing (NAICS 33636) and metal stamping (NAICS 33637). Total vehicle parts employment accounted for 47% of the province's broader automotive industry employment in 2019.

Among the region's automotive industry-associated workforce, the largest industry grouping is metals, which accounted for 11% of Quebec's broader automotive industry employment in 2019. The metals grouping includes significant automotive-associated employment from engine, turbine & power transmission equipment manufacturing (NAICS 3336). A further 6% of broader automotive industry employment came from computer and electronics industries, the majority of which is related to semiconductor & other electronic component manufacturing (NAICS 3344). The remaining 10% of broader automotive industry employment was split evenly between non-metal materials industries, such as plastic (NAICS 3361) and rubber (NAICS 3352) product manufacturing, and a collection of miscellaneous key industries. In total, automotive industry-associated employment in Quebec was an estimated 3,920 workers in 2019.

While developing employment estimates for Quebec's broader automotive industry, it became clear that the approach described in the Background section may underestimate the size of the province's emerging automotive technology cluster. Moreover, there is reason to believe the labour market dynamics for technology-focused employers are distinct from the remainder of the broader automotive industry, particularly with respect to labour mobility. In order to investigate these issues further, the project team plans to prepare a separate profile on the technology-focused component of Canada's broader automotive industry.

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[3] Due to uncertainty regarding the impact of COVID-19, forecasts of industry employment have been withheld for 2020 and 2021. Please refer to the "Impact of COVID-19 on Automotive Industry" section for more details.

FIGURE 3. Provincial Automotive Industry Employment by Industry Group, 2019

- Computer and Electronics, 910, 6%
- Other, 720, 5%
- Vehicle Assembly, 3,780, 26%
- Metals, 1,550, 11%
- Materials (Non-Metal), 740, 5%
- Vehicle Parts, 6,950, 47%

An estimated 25% of the province's total broader automotive industry employment worked in key production occupations in 2019. This group includes motor vehicle assemblers, inspectors & testers (NOC 9522) as well as assembly supervisors (NOC 9221). A further 18% of workers were employed in skilled trades, primarily as welders & related machine operators (NOC 7237), construction millwrights & industrial mechanics (NOC 7311), and machinists (NOC 7231). A combined 18% of workers were employed in key engineering & technical (11%) and management & administration (7%) occupations. The former includes mechanical engineers (NOC 2132) and several occupations related to information technology, while the latter includes manufacturing managers (NOC 0911). All other occupations accounted for 39% of employment[4].

FIGURE 4. Provincial Automotive Industry Employment by Occupation Group, 2019

- Management & Administration, 970, 7%
- Engineering & Technical, 1,600, 11%
- Other, 5,770, 39%
- Skilled Trades, 2,600, 18%
- Production, 3,710, 25%

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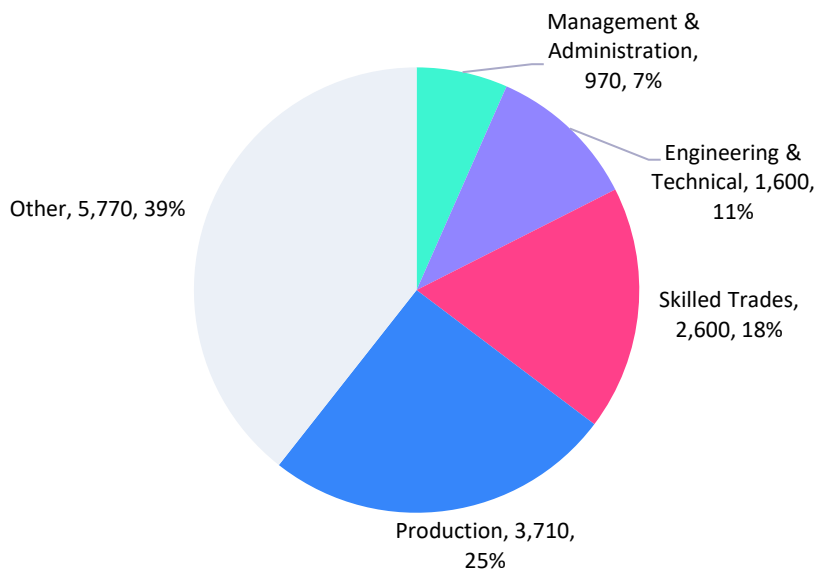
[4] "Other" includes all 4-digit NOCs excluding the 49 key occupations identified on pg. 6.

PROVINCIAL AUTOMOTIVE INDUSTRY EMPLOYMENT OUTLOOK

Looking ahead, broader automotive industry employment is expected to experience a consistent growth trend between 2022 and 2030. Employment growth will be slightly lower over the first half of the period, at 1.4% annually, before rising to 1.9% annually over the latter half. Broader automotive industry employment in Quebec is projected to surpass 16,500 workers by 2030, while total employment in the province is expected to grow from 4.3 million in 2022 to 4.7 million by 2030.

FIGURE 5. Provincial Automotive Industry Employment Outlook, 2022-2030
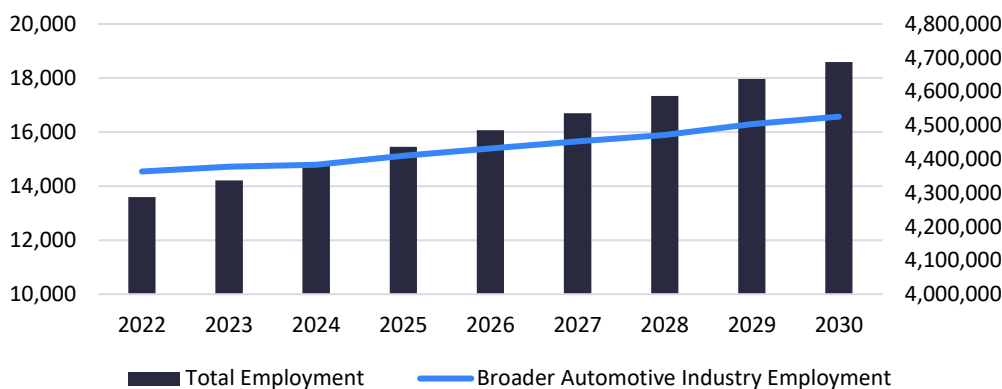
Source: Canadian Skills Training & Employment Coalition; Metro Economics

Industry groups that comprise the broader automotive industry are projected to experience diverging outcomes with respect to employment growth over the next decade. The core automotive and metals industry groups are expected to see moderate to strong employment growth, likely resulting from healthy demand for heavy trucks both domestically and abroad. In contrast, little employment growth is expected within the non-metal materials and computer and electronics industries due to productivity gains.

TABLE 1. Provincial Automotive Industry Employment Outlook, 2022-2030

Industry Group	2022	2023	2024	2025	2026	2027	2028	2029	2030
Vehicle Assembly	3,460	3,510	3,400	3,460	3,490	3,520	3,490	3,600	3,710
Vehicle Parts	7,060	7,110	7,270	7,500	7,700	7,900	8,110	8,330	8,430
Materials (Non-Metals)	740	740	740	740	740	740	740	740	750
Metals	1,650	1,720	1,750	1,800	1,840	1,890	1,930	1,990	2,070
Computer & Electronics	920	920	920	920	920	920	920	920	920
Other	710	710	710	700	700	700	690	690	690
TOTAL	14,540	14,710	14,790	15,120	15,390	15,670	15,880	16,270	16,570

PROVINCIAL AUTOMOTIVE INDUSTRY HIRING REQUIREMENT OUTLOOK

Hiring requirement represents the demand for labour across employers in core and associated automotive industries. Estimated hiring requirement covers the needs of all employers among core automotive industries but only the portion of employment connected with core industries for employers in associated industries. Hiring requirement consists of two components:

1. **Replacement demand** – labour demand driven by the need to replace workers exiting the broader automotive industry workforce due to retirement or death[6]
2. **Expansion demand** – labour demand driven by output growth in the broader automotive industry

The provincial outlook for replacement demand is driven by provincial projections of mortality rates and annual changes in labour force participation rates by age-year. The provincial outlook for expansion demand is driven by forecasts of motor vehicle production.

Overall, Quebec's broader automotive industry is projected to require 5,710 new workers between 2021 and 2030. 2,530 workers are expected to be needed in the near-term (i.e. between 2021 and 2025), compared with 3,170 workers in the medium to long-term (i.e. between 2026 and 2030). The total projected hiring requirement during the decade represents 39% of the province's broader automotive industry employment as of 2019.

The proportion of total hiring requirement to current employment is highest among skilled trades (39%) and management & administration occupations (37%). Conversely, it is below average among production (36%) and engineering & technical (32%) occupations. Total hiring requirement represents 43% of current employment for all other occupations in Quebec's broader automotive industry workforce.

TABLE 2. Provincial Automotive Industry Hiring Requirement Outlook, 2021-2030

Occupation Group	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
Management & Administration	160	200	360	37%
Engineering & Technical	220	280	510	32%
Skilled Trades	440	570	1,010	39%
Production	600	750	1,350	36%
Other	1,110	1,370	2,480	43%
TOTAL	**2,530**	**3,170**	**5,710**	**39%**

This provincial forecast focuses only on the auto-dependent portion of associated industries, based on the proportion of each associated industry's sales which come from core automotive industries. However, it is useful to consider how provincial hiring requirements are projected across the full workforce of associated industries since many employers in associated industries make hiring decisions based on their total business activity. To do so, a modified

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[6] This measure of replacement demand does not account for workers exiting as part of turnover.

version of the labour market forecast model (referred to as the "full workforce" model) was created based on total provincial employment for all core automotive and associated industries in the broader automotive industry.

Total projected hiring requirement between 2021 and 2030 increased to 41% of current employment using the full workforce model. This indicates that the primary forecast model may underestimate the hiring needs of provincial employers in associated industries. The largest gains were seen among the skilled trades and management & administration occupation groups, which saw hiring requirements increase to 43% and 41% of current employment respectively.

Replacement Demand Outlook

The forecast for replacement demand among the province's broader automotive industry employers is the result of an expected increase in retirements as the industry's workforce continues to age. The region's core automotive industry workforce consists of more mid-career workers, with higher than average proportions of the workforce belonging to the 45-54 and 55-64 age cohorts. Over the coming decade, workers from these cohorts will exit the workforce and must be replaced.

Total replacement demand is projected at 3,280 workers between 2021 and 2030, which is equivalent to approximately 60% of total hiring requirement for the broader automotive industry. Trends in replacement demand as a proportion of current employment for occupation groups track with those seen for the overall hiring requirement, with replacement demand representing 20-25% of current employment for most groups.

Expansion Demand Outlook

Total expansion demand is projected at 2,430 workers for the province's broader automotive industry workforce between 2021 and 2030. This is equivalent to approximately 40% of total hiring requirement for the broader automotive industry. Expansion demand projections represent between 16% and 17% of current employment among all occupation groups in the broader automotive industry.

The forecast for expansion demand among the province's broader automotive industry employers is the result of the forecast for national commercial vehicle production, which projects production to grow steadily over the course of the decade. Production levels are expected to increase by 17% domestically and 10% for North America as a whole between 2022 and 2030. More workers will be needed in both core automotive and associated industries to support these rising production levels.

TABLE 3. National & North American Commercial Vehicle Production (Units), 2022-2030

Industry Group	2022	2023	2024	2025	2026	2027	2028	2029	2030
Canada	20,400	20,900	20,500	21,000	21,500	21,900	21,900	22,900	23,900
North America	566,000	625,000	498,000	569,000	628,000	567,000	610,000	615,000	619,000

Source: Canadian Skills Training & Employment Coalition; LMC Automotive

PROVINCIAL AUTOMOTIVE INDUSTRY NEW ENTRANTS OUTLOOK

In order to meet hiring requirements, employers in Quebec's broader automotive industry must be able to recruit new entrants to the workforce. New entrants are defined as individuals between the ages of 15 and 30 who are entering the workforce for the first time. Forecasts of new entrants to the provincial broader automotive industry are based on the industry's historic share of new entrants, as well as provincial projections of labour force participation by age-year and workforce by age-year and occupation.

Overall, Quebec's broader automotive industry is expected to recruit 840 new entrants to its workforce between 2021 and 2030, based on the industry's historic rate of entry. The forecast for new entrants is evenly split between the 2021-2025 and 2026-2030 periods. The projected number of new entrants across all occupations is equivalent to 6% of estimated provincial broader automotive industry employment in 2019. This share is between 5% and 7% for most occupation groups. However, the projected number of new entrants among management & administration roles is equal to just 1% of current employment. Occupations in this group rely the least on new entrants due to the experience typically required for these positions.

TABLE 4. Provincial Automotive Industry New Entrants Outlook, 2021-2030

Occupation Group	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
Management & Administration	<10	<10	10	1%
Engineering & Technical	40	50	90	6%
Skilled Trades	60	80	140	5%
Production	120	130	250	7%
Other	160	190	350	6%
TOTAL	**380**	**450**	**840**	**6%**

PROVINCIAL AUTOMOTIVE INDUSTRY RECRUITMENT GAP OUTLOOK

Quebec's broader automotive industry is projected to face a recruitment gap of 4,860 workers during the 2021-2030 period. A recruitment gap of 2,150 workers is projected between 2021 and 2025, with a further shortfall of 2,720 workers expected between 2026 and 2030. Employers in the province will need to hire the equivalent of one-third (33%) of their current workforce over the forecast period to meet labour demand, even after accounting for new entrants. Furthermore, the recruitment gap could be significantly higher if the industry fails to recruit new entrants at historic levels.

FIGURE 6. Provincial Automotive Industry Recruitment Gap Outlook, 2021-2030[5]
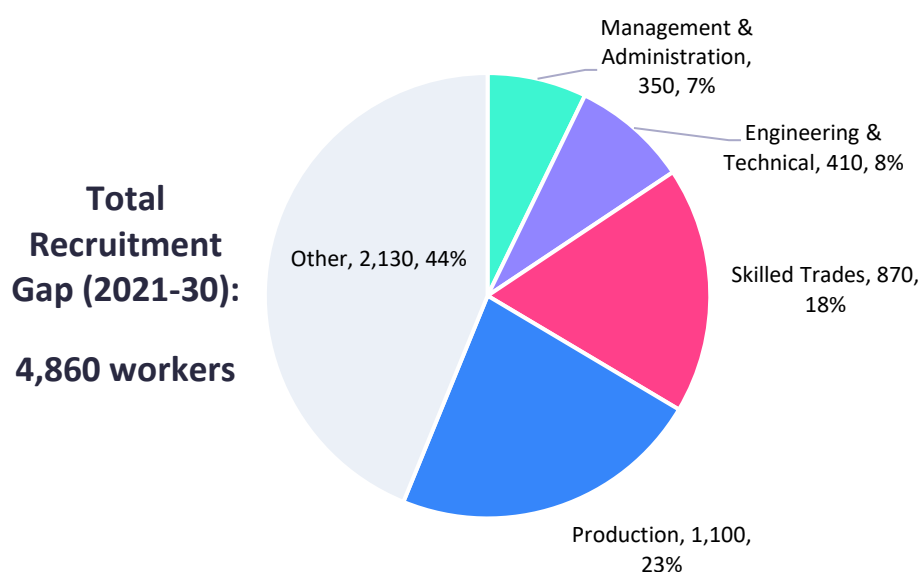
Among the primary occupation groups in the industry, the recruitment gap is largest for key production occupations at an estimated 1,100 workers. This is equal to 23% of the province's total recruitment gap. The next largest grouping is skilled trades, at approximately 870 workers or 18% of the provincial gap. The management & administration and engineering & technical groupings are expected to face recruitment gaps of 350 and 410 workers respectively. The recruitment gap for all other occupations is projected to total over 2,000 workers.

Recruitment gap as a proportion of current employment is highest for management & administration occupations. Employers in the province will need to hire the equivalent of 36% of the current management & administration workforce over the forecast period to meet labour demand. Because these roles cannot rely on new entrants, employers must be able to draw in workers from other sectors or regions to meet labour demand for these roles. The skilled trades occupation group also has a relatively high recruitment gap share at 33%. In contrast, recruitment gap shares are below average for the engineering & technical (26%) and

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[5] Please note that the shares seen in this figure represent each occupation group's recruitment gap as a proportion of the total recruitment gap.

production (30%) groupings. The recruitment gap share for all other occupations is projected at 37%.

TABLE 5. Provincial Automotive Industry Recruitment Gap Outlook, 2021-2030

Occupation Group	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
Management & Administration	160	200	350	36%
Engineering & Technical	180	230	410	26%
Skilled Trades	380	490	870	33%
Production	480	620	1,100	30%
Other	950	1,180	2,130	37%
TOTAL	**2,150**	**2,720**	**4,860**	**33%**

As with hiring requirements, recruitment gaps can also be considered based on total employment for all core automotive and associated industries. This comparison is useful because many employers in associated industries compete for workers with businesses unrelated to the broader automotive industry.

The total projected provincial recruitment gap between 2021 and 2030 grew to 34% of current employment using the full workforce version of the labour market forecast model, indicating that the primary forecast model may slightly underestimate recruiting challenges for provincial employers in associated industries. The larger recruitment gap share occurs in part because of competition between employers in the broader automotive industry and those outside it. The largest gains are seen in the management & administration and skilled trades groups, where recruitment gaps increased to 39% and 37% of current employment respectively. This reflects the view that competition to fill these types of roles will be especially strong.

PROVINCIAL AUTOMOTIVE INDUSTRY RECRUITMENT GAP RANKINGS

Ranking recruitment gaps at the level of individual occupations can illustrate specific areas of the workforce that are expected to face more severe challenges in recruiting and retaining qualified workers. In order to understand the full scope of these challenges, occupations were ranked in two distinct ways.

First, occupations were ranked by recruitment gap size, meaning the total number of workers comprising each occupation's projected provincial recruitment gap between 2021 and 2030. This *absolute* ranking method identifies occupations that will require the largest number of hires to meet labour demand, even after accounting for new entrants. Next, occupations were ranked by recruitment gap share, meaning the total number of workers comprising each occupation's projected provincial recruitment gap between 2021 and 2030 divided by estimated provincial employment for that occupation in 2019. This *relative* ranking method identifies occupations that will need to replace a relatively high proportion of existing workers to meet labour demand, even after accounting for new entrants.

Every key occupation was ranked using both methods, excluding those occupations with insufficient provincial employment. The top occupations using each ranking method are presented in the following sections.

Recruitment Gap Size Rankings

The occupations with the largest absolute recruitment gaps include many of the most common occupations in the broader automotive industry. The top occupation is motor vehicle assemblers, inspectors and testers (NOC 9522), which is also the largest occupation in the industry by employment. It has a projected recruitment gap of 360 workers between 2021 and 2030. It is followed closely by mechanical assemblers & inspectors (NOC 9526). Several skilled trades - including construction millwrights & industrial mechanics (NOC 7311) and welders & related machine operators (NOC 7237) - also have large projected recruitment gaps. Overall, the top ten occupations have a cumulative recruitment gap of approximately 1,900 workers, equal to nearly 40% of the broader automotive industry's total provincial recruitment gap.

TABLE 6. Provincial Automotive Industry Recruitment Gap Size Rankings, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	360	28%
2	Mechanical assemblers and inspectors (NOC 9526)	330	36%
3	Welders and related machine operators (NOC 7237)	240	35%
4	Manufacturing managers (NOC 0911)	210	36%
5	Construction millwrights and industrial mechanics (NOC 7311)	160	49%
6	Automotive service technicians, truck and bus mechanics and mechanical repairers (NOC 7321)	130	32%
7	Machinists and machining and tooling inspectors (NOC 7231)	120	31%
8	Material handlers (NOC 7452)	110	32%
9	Senior managers - construction, transportation, production	110	47%

| 10 | and utilities (NOC 0016) | | |
| 10 | Other labourers in processing, manufacturing and utilities (NOC 9619) | 100 | 32% |

Recruitment Gap Share Rankings

Notably, most of the top occupations by recruitment gap share have relatively low absolute recruitment gaps; only four occupations on this list also appeared among the top occupations by recruitment gap size. The occupation with the largest relative recruitment gap is electronics assemblers, fabricators, inspectors & testers (NOC 9523). While only an estimated 60 additional workers will need to be hired on top of new entrants to meet labour demand for this occupation, that would be the equivalent of replacing over 80% of the current provincial workforce. This is well above the average recruitment gap share across all occupations of 33%. The recruitment gap share for electrical & electronics engineers (NOC 2133) is similarly high at 73%. All other top occupations also have above average recruitment gap shares, ranging from 36% to 49%. Several skilled trades and technical occupations are found among the top occupations, again illustrating the potentially severe recruiting challenges for occupations that require certification and/or professional experience.

TABLE 7. Provincial Automotive Industry Recruitment Gap Share Rankings, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	60	82%
2	Electrical and electronics engineers (NOC 2133)	80	73%
3	Construction millwrights and industrial mechanics (NOC 7311)	160	49%
4	Senior managers - construction, transportation, production and utilities (NOC 0016)	110	47%
5	Contractors and supervisors, mechanic trades (NOC 7301)	20	41%
6	Shippers and receivers (NOC 1521)	90	40%
7	Electrical and electronics engineering technologists and technicians (NOC 2241)	40	39%
8	Tool and die makers (NOC 7232)	40	36%
9	Manufacturing managers (NOC 0911)	210	36%
10	Mechanical assemblers and inspectors (NOC 9526)	330	36%

APPENDIX

The following tables include detailed data on projected hiring requirements, new entrants and recruitment gaps at the level of individual occupations (4-digit NOC). Note that summing the data for individual occupations may not equal the corresponding data for occupational groups presented in the profile due to rounding.

TABLE 8. Detailed Provincial Automotive Industry Hiring Requirement Outlook, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	2,540	3,170	5,710	40%
0016 Senior managers - construction, transportation, production and utilities	50	60	110	47%
0211 Engineering managers	10	10	20	34%
0213 Computer and information systems managers	<10	10	10	32%
0911 Manufacturing managers	90	120	210	36%
1121 Human resources professionals	10	10	20	38%
1521 Shippers and receivers	50	60	100	48%
1523 Production logistics co-ordinators	10	20	30	29%
2132 Mechanical engineers	50	70	120	24%
2133 Electrical and electronics engineers	40	40	80	76%
2141 Industrial and manufacturing engineers	10	10	20	22%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	10	10	10	21%
2232 Mechanical engineering technologists and technicians	20	30	50	28%
2233 Industrial engineering and manufacturing technologists and technicians	10	20	30	27%
2241 Electrical and electronics engineering technologists and technicians	20	20	40	42%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	10	21%
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	20	30	31%
7231 Machinists and machining and tooling inspectors	60	80	140	38%
7232 Tool and die makers	20	20	40	40%
7237 Welders and related machine operators	130	170	310	44%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	10	10	24%
7301 Contractors and supervisors, mechanic trades	10	10	20	42%
7311 Construction millwrights and industrial mechanics	70	90	160	51%

7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	60	80	140	37%
7452 Material handlers	50	70	120	36%
7511 Transport truck drivers	10	10	20	32%
9221 Supervisors, motor vehicle assembling	40	60	100	31%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	10	20%
9227 Supervisors, other products manufacturing and assembly	<10	<10	10	34%
9412 Foundry workers	<10	<10	10	23%
9416 Metalworking and forging machine operators	10	10	20	24%
9417 Machining tool operators	20	30	60	38%
9422 Plastics processing machine operators	20	20	40	37%
9522 Motor vehicle assemblers, inspectors and testers	200	250	450	36%
9523 Electronics assemblers, fabricators, inspectors and testers	30	40	70	86%
9526 Mechanical assemblers and inspectors	170	210	390	42%
9535 Plastic products assemblers, finishers and inspectors	10	10	20	37%
9536 Industrial painters, coaters and metal finishing process operators	20	30	50	29%
9619 Other labourers in processing, manufacturing and utilities	60	70	130	41%
Other occupations	1,110	1,370	2,480	45%

TABLE 9. Detailed Provincial Automotive Industry New Entrants Outlook, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	**390**	**450**	**840**	**6%**
0016 Senior managers - construction, transportation, production and utilities	<10	<10	<10	N/A
0211 Engineering managers	<10	<10	<10	N/A
0213 Computer and information systems managers	<10	<10	<10	N/A
0911 Manufacturing managers	<10	<10	<10	N/A
1121 Human resources professionals	<10	<10	<10	N/A
1521 Shippers and receivers	10	10	20	8%
1523 Production logistics co-ordinators	<10	<10	10	9%
2132 Mechanical engineers	10	10	20	4%
2133 Electrical and electronics engineers	<10	<10	<10	N/A
2141 Industrial and manufacturing engineers	<10	<10	10	5%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	10	10%
2232 Mechanical engineering technologists and technicians	10	10	20	10%
2233 Industrial engineering and manufacturing technologists and technicians	<10	<10	10	7%
2241 Electrical and electronics engineering technologists and technicians	<10	<10	<10	N/A
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	<10	<10	<10	N/A
7231 Machinists and machining and tooling inspectors	10	10	20	6%
7232 Tool and die makers	<10	<10	<10	N/A
7237 Welders and related machine operators	30	40	60	9%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	10	10	22%
7301 Contractors and supervisors, mechanic trades	<10	<10	<10	N/A
7311 Construction millwrights and industrial mechanics	<10	<10	10	2%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	10	10	20	4%
7452 Material handlers	10	10	10	4%
7511 Transport truck drivers	<10	<10	<10	N/A
9221 Supervisors, motor vehicle assembling	10	10	10	4%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A

9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	<10	N/A
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	<10	10	10	28%
9416 Metalworking and forging machine operators	<10	<10	<10	N/A
9417 Machining tool operators	<10	<10	<10	N/A
9422 Plastics processing machine operators	<10	<10	10	5%
9522 Motor vehicle assemblers, inspectors and testers	40	50	90	7%
9523 Electronics assemblers, fabricators, inspectors and testers	<10	<10	<10	N/A
9526 Mechanical assemblers and inspectors	30	30	60	6%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	10	10%
9536 Industrial painters, coaters and metal finishing process operators	10	10	20	14%
9619 Other labourers in processing, manufacturing and utilities	10	20	30	9%
Other occupations	160	190	350	6%

TABLE 10. Detailed Provincial Automotive Industry Recruitment Gap Outlook, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	2,150	2,710	4,860	34%
0016 Senior managers - construction, transportation, production and utilities	50	60	110	47%
0211 Engineering managers	10	10	20	34%
0213 Computer and information systems managers	<10	10	10	32%
0911 Manufacturing managers	90	120	210	36%
1121 Human resources professionals	10	10	10	29%
1521 Shippers and receivers	40	50	90	40%
1523 Production logistics co-ordinators	10	10	20	20%
2132 Mechanical engineers	40	60	100	20%
2133 Electrical and electronics engineers	40	40	80	73%
2141 Industrial and manufacturing engineers	10	10	20	18%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	10	10%
2232 Mechanical engineering technologists and technicians	10	20	40	18%
2233 Industrial engineering and manufacturing technologists and technicians	10	10	20	20%
2241 Electrical and electronics engineering technologists and technicians	20	20	40	39%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	20	30	30%
7231 Machinists and machining and tooling inspectors	50	70	120	31%
7232 Tool and die makers	20	20	40	36%
7237 Welders and related machine operators	110	140	240	35%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	<10	<10	N/A
7301 Contractors and supervisors, mechanic trades	10	10	20	41%
7311 Construction millwrights and industrial mechanics	70	90	160	49%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	50	70	130	32%
7452 Material handlers	50	60	110	32%
7511 Transport truck drivers	10	10	20	32%
9221 Supervisors, motor vehicle assembling	40	50	90	27%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A

Occupation			
9226 Supervisors, other mechanical and metal products manufacturing	10	10	10	20%
9227 Supervisors, other products manufacturing and assembly	<10	<10	10	31%
9412 Foundry workers	<10	<10	<10	N/A
9416 Metalworking and forging machine operators	<10	10	10	17%
9417 Machining tool operators	20	30	50	35%
9422 Plastics processing machine operators	20	20	30	32%
9522 Motor vehicle assemblers, inspectors and testers	160	200	360	28%
9523 Electronics assemblers, fabricators, inspectors and testers	30	40	60	82%
9526 Mechanical assemblers and inspectors	150	180	330	36%
9535 Plastic products assemblers, finishers and inspectors	10	10	20	27%
9536 Industrial painters, coaters and metal finishing process operators	10	20	30	16%
9619 Other labourers in processing, manufacturing and utilities	40	60	100	32%
Other occupations	950	1,180	2,130	38%