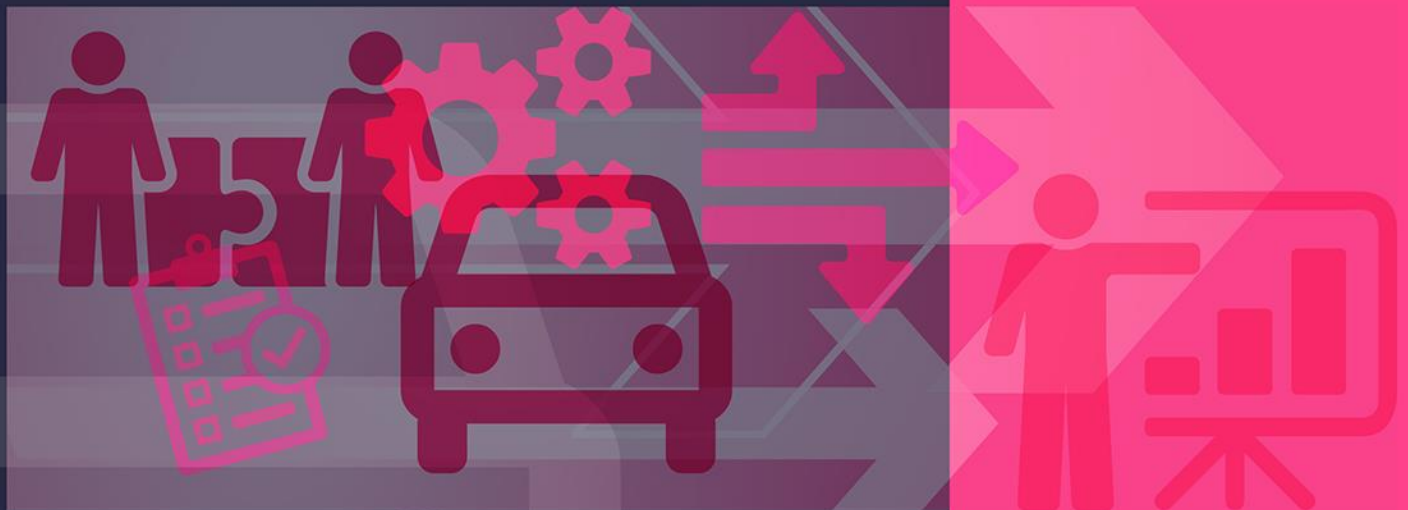


LABOUR MARKET FORECASTS FOR THE AUTOMOTIVE PRODUCTION SECTOR:

The impacts of expanded and
decreased production in Ontario



The project is a collaboration of the Canadian Skills Training and
Employment Coalition, Prism Economics and Analysis, and the
Automotive Policy Research Centre.

March 2021

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 FOCAL Automotive Production Industry, which includes 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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(FOCAL) Initiative, futureautolabourforce.ca

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Automotive Policy Research Centre, automotivepolicy.ca

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EXECUTIVE SUMMARY

The FOCAL project team published baseline labour market forecasts for Ontario's FOCAL Automotive Production Industry in Spring 2020. This report expands the scope of that work by exploring detailed provincial labour market forecasts for scenarios where national motor vehicle production, consisting of light-duty vehicles, buses, and heavy-duty trucks, either increases (upside) or decreases (downside) by 20% from the baseline forecast. Labour market outlooks are contrasted between the baseline and alternative production scenarios, in the process offering valuable insights for industry players, policymakers, and other key stakeholders. Highlights of the report's outlooks include:

- Employment in Ontario's FOCAL Automotive Production Industry is projected to range from an estimated 143,450 workers by 2030 in the downside scenario to 176,280 workers in the upside scenario. In the baseline scenario, employment was projected to reach 160,610 workers by 2030. Unsurprisingly, the largest impacts are seen within the vehicle assembly industry group, where employment ranged from 17% above to 18% below the baseline by 2030. Significant employment impacts are also projected for vehicle parts manufacturing, but only for the portion of output that is not exported, as well as for other primary automotive suppliers associated with computers & electronics.
- Labour demand, referred to as hiring requirement in this report, is projected to range from an estimated 21,720 workers between 2021 and 2030 in the downside scenario to 56,680 workers in the upside scenario. In the baseline scenario, hiring requirement was projected to total 39,870 workers over the forecast period. The largest relative increase in hiring requirement was seen for the engineering & technical occupation group at +60%. The largest relative decrease in hiring requirement was seen for the production occupation group at -59%.
- New entrants, meaning individuals entering the industry's workforce for the first time, are projected to range from an estimated 8,230 workers between 2021 and 2030 in the downside scenario to 11,560 workers in the upside scenario. In the baseline scenario, new entrants were projected to total 9,800 workers over the forecast period. 49% of new entrants are projected to join the sector's workforce between 2026 and 2030 in the baseline scenario; this figure is 64% in the upside scenario but only 37% in the downside scenario.
- Excess labour demand, referred to as the recruitment gap in this report, is projected to range from an estimated 13,500 workers between 2021 and 2030 in the downside scenario to 45,120 workers in the upside scenario. In the baseline scenario, the recruitment gap was projected to total 30,090 workers over the forecast period. The largest relative increase in recruitment gap was seen for the engineering & technical occupation group at +73%. The largest relative decrease in recruitment gap was seen for the production occupation group at -77%.
- The top-ranked occupations by recruitment gap size are similar between the baseline and upside scenarios, with larger gaps projected in the latter case. However, lower activity severely reduces jobs in the downside scenario, leading to lower rankings for production-related occupations. In contrast, the top-ranked occupations by recruitment gap share are similar between the baseline and both alternative production scenarios and are mostly comprised of skilled trades and technical occupations.

BACKGROUND

This report summarizes provincial labour market forecast scenarios for the FOCAL Automotive Production 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 FOCAL Automotive Production 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 FOCAL Automotive Production Industry to be defined.

This analysis broadens the definition of automotive manufacturing to include producers in the supply chain that have previously been classified in non-automotive industries. Industries traditionally thought of as automotive manufacturing are referred to by FOCAL as Vehicle Assembly and Parts Manufacturing; this includes two sub-categories of vehicle assembly (NAICS 3361) and eight sub-categories of vehicle parts manufacturing (NAICS 3363). Thirty-two additional industries are collectively defined as Other Primary Automotive Suppliers, since a portion of their sales go to traditional automotive industries. The degree of connection between these suppliers and traditional automotive industries varies significantly. For instance, nearly half of sales for the foundries and hardware manufacturing industries are to traditional automotive industries. Other industries, particularly those related to electronics manufacturing and professional services, sell less than 5% of their output to traditional automotive industries. These industries are included as Other Primary Automotive Suppliers because of their strategic importance to the sector.

The FOCAL Automotive Production Industry brings together Vehicle Assembly and Parts Manufacturing and Other Primary Automotive Suppliers to create a new entity that more accurately reflects the importance of automotive manufacturing to the Canadian economy. Figure 1 illustrates this broader definition of automotive manufacturing in terms of its primary components and its place within the Canadian economy. Figure 2 provides a diagram of the industry groups used in this report, with each industry listed alongside its classification code (i.e., NAICS) and the proportion of its sales that go to traditional (“core”) automotive industries. While both figures illustrate the national FOCAL Automotive Production Industry, each region has a distinct supply chain dependent on the businesses producing goods and/or services there. The definition of the FOCAL Automotive Production Industry has been adjusted for some regions to reflect this fact.

FIGURE 1. The FOCAL Automotive Production Industry in Canada

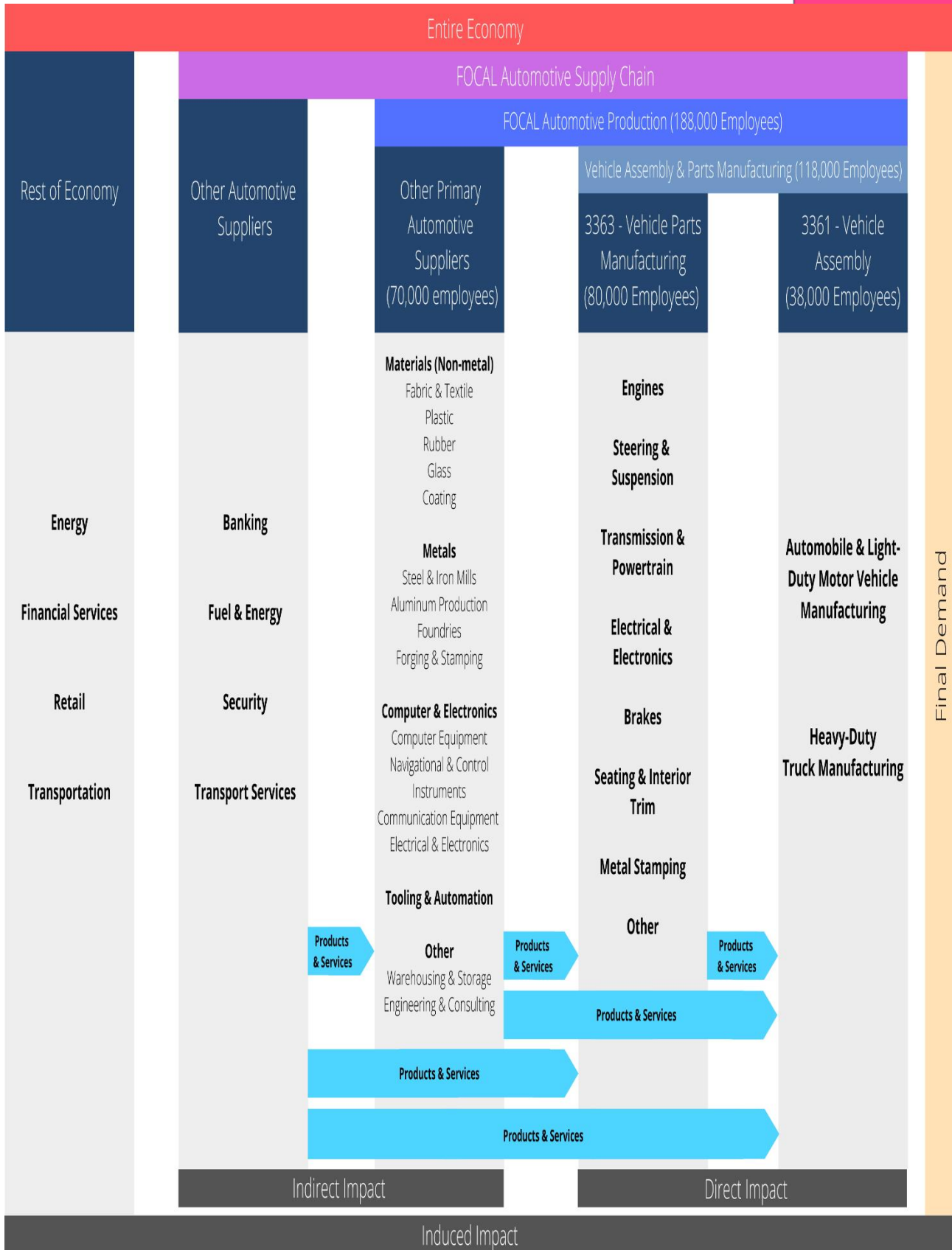
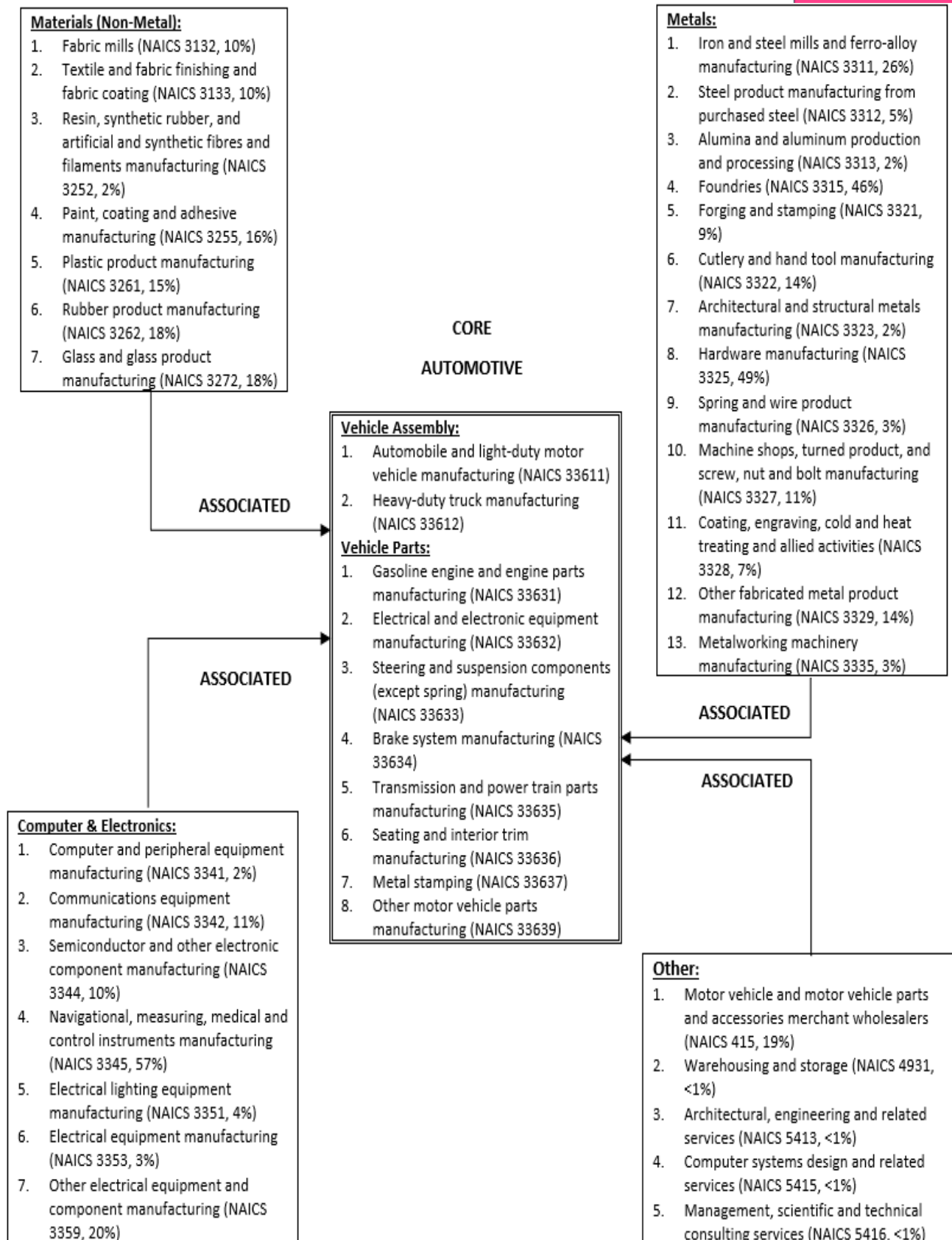


FIGURE 2. Industry Groups in the FOCAL Automotive Production Industry



In addition to providing labour market outlooks for the FOCAL Automotive Production 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 industry' workforce¹. Forecasts were developed for the following occupations, categorized below based on the nature of their role in the workforce:

FIGURE 3. Occupation Groups in the FOCAL Automotive Production Industry

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

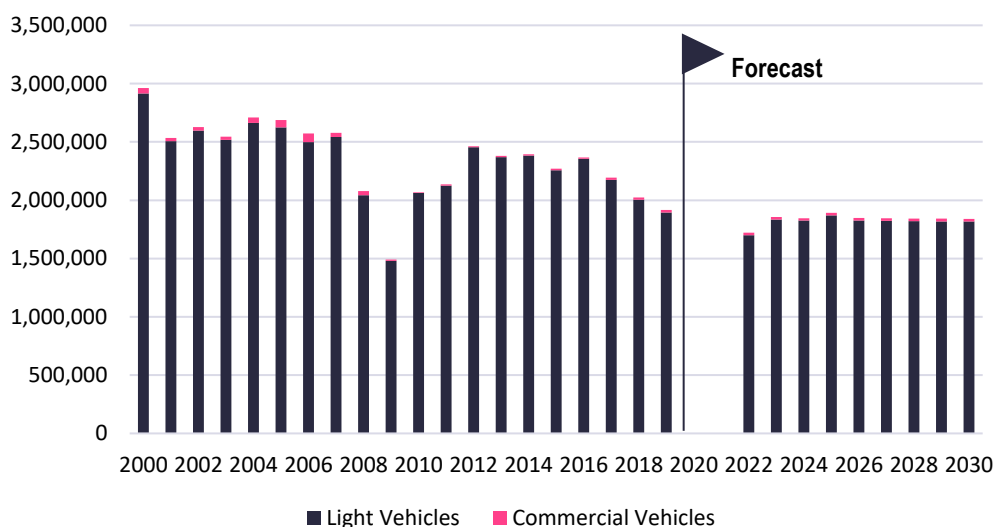
Supervisors, motor vehicle assembling (NOC 9221)
 Supervisors, electronics manufacturing (NOC 9222)
 Supervisors, electrical products manufacturing (NOC 9223)
 Supervisors, furniture and fixtures manufacturing (NOC 9224)
 Supervisors, other mechanical and metal products manufacturing (NOC 9226)
 Supervisors, 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)

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

INTRODUCTION

The FOCAL project team has already examined the labour market impacts for Ontario’s FOCAL Automotive Production Industry, resulting in a set of baseline provincial labour market forecasts for the industry². These forecasts assumed vehicle assembly output in Canada remains relatively stable over the next decade, as seen in Figure 4. Total motor vehicle production, including both light (i.e., passenger or light-duty vehicles) and commercial (i.e., buses and heavy-duty trucks) vehicles, consisted of 1.92 million units in 2019. In the baseline forecast scenario, national vehicle production was projected to fall to 1.72 million units in 2022 before rebounding to a peak of 1.89 million in 2025³. Production levels were then projected to remain stable in the range of 1.85 million units between 2026 and 2030.

FIGURE 4. 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, provincial FOCAL Automotive Production Industry employment, including vehicle assembly and parts manufacturing as well as other primary automotive suppliers, was projected to remain in the range of 160,000 workers over the forecast period. Nationally, labour market challenges for the FOCAL Automotive Production Industry in the baseline scenario were primarily driven by the need to replace retirements from the industry’s aging workforce, with relatively little hiring resulting from industry growth. The same was true in the baseline forecast for Ontario.

This report expands the scope of analysis by considering how a change in the forecasts for light & commercial vehicle assembly would affect the baseline scenario outlooks for labour demand and supply in Ontario. Two additional forecast scenarios were constructed using the following vehicle assembly output assumptions:

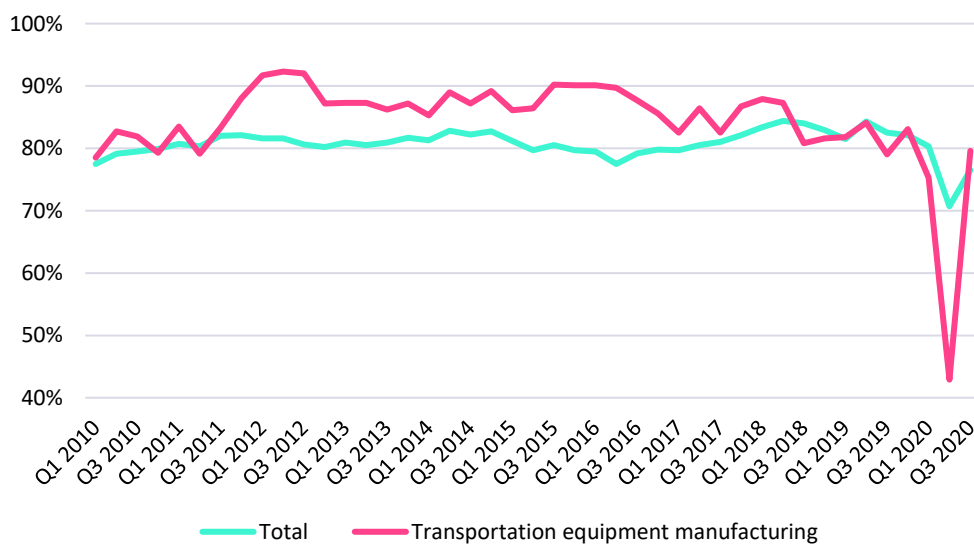
² These forecasts and all other content produced by the FOCAL project team can be found at <https://www.futureautolabourforce.ca/>.

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.

1. National light & commercial motor vehicle production will be 20% higher than the baseline forecast by 2030 (“Production Scenario #1” or “Upside Scenario”)
2. National light & commercial motor vehicle production will be 20% lower than the baseline forecast by 2030 (“Production Scenario #2” or “Downside Scenario”)

The 20% figure was selected by the FOCAL project team based on a review of historic changes in year-to-year production levels and is intended to simulate the addition of one or more new assembly plants. As seen in Figure 4, swings of a similar magnitude are not out of the ordinary; production fell by 14% in 2001 and by 19% and 28% in the recession years of 2008-09, while 2010 saw a 39% increase as production rebounded post-recession and 2012 saw a 15% rise over the year prior. Additionally, industrial capacity utilization rates for Canada’s transportation equipment manufacturing sector, which includes vehicle assembly and parts manufacturing, have been between 80% and 85% in most quarters since the start of 2016 (Figure 5), meaning the 20% figure also works as a proxy for increasing production at existing assembly plants. Capacity utilization rates provide a measure of the intensity with which industries use their production capacity by calculating the percentage of actual output (i.e., real GDP) to potential output (i.e., capital stock). Notably, capacity utilization rates for transportation equipment manufacturing plummeted in the second quarter of 2020 as COVID-19 forced facilities to shut down and/or significantly reduce their operations. However, capacity utilization rates in the sector have returned to a level only moderately below pre-pandemic levels as of Q3 2020.

FIGURE 5. National Industrial Capacity Utilization Rates, 2010-2020



Source: Statistics Canada, Table 16-10-0109-01.

Both forecast scenarios include an additional assumption related to vehicle parts manufacturing. In the upside scenario, vehicle parts manufacturing output is set to increase by 10% from the baseline forecast by 2030. In the downside scenario, vehicle parts manufacturing output is set to decrease by 10% from the baseline forecast by 2030. These figures reflect the fact that a sizeable share of Canadian vehicle parts manufacturing output is exported, primarily for use in the U.S. and Mexico, meaning shifts in domestic vehicle production will only impact a portion of the total business activity related to parts. Data from Statistics Canada’s input-output tables indicate that exports accounted for over 60% of

Canada's vehicle parts manufacturing output in 2015³. Because the volume of import leakages fluctuates on an annual basis, a conservative estimate of 50% was assumed as the portion of parts manufacturing output that is dependent on trade. For this reason, only half of the change to vehicle production levels was applied to vehicle parts manufacturing in each scenario, resulting in the 10% assumption. Both the vehicle and parts-related assumptions were validated during stakeholder consultation sessions.

In each scenario the adjustments to vehicle assembly and parts manufacturing are implemented linearly over the course of the forecast period rather than as a single year shock. This was done in order to understand how the labour force will react to these changes over time. A separate study detailing the employment and output impacts of a single year shock to either vehicle production or parts exports, entitled "*The Importance of the FOCAL Automotive Production Industry*", has also been prepared by the FOCAL project team as a complement to this report.

This report follows the structure of the provincial baseline forecast profile for Ontario. The five main sections each describe a different component of the provincial labour market forecast, including employment, hiring requirements, new entrants, and recruitment gaps (with rankings). In each section, outlook projections are provided for both alternative production scenarios and compared with the previously published baseline scenario estimates. A brief conclusion summarizes the major insights for stakeholders gained from this exercise. Detailed occupational tables of hiring requirements, new entrants, and recruitment gaps are provided for all three scenarios in an appendix following the report's conclusion.

Impact of COVID-19 on Automotive Industry

COVID-19 has had significant consequences for the Canadian economy over the past year, with many businesses permanently closing and a massive surge in unemployment claims. COVID-19's impact has also been felt in the automotive industry, as automakers declared temporary closures of all Canadian assembly plants in March 2020. The automotive industry showed tremendous leadership and flexibility in responding to the crisis, even as vehicle production was temporarily halted. Manufacturers across the supply chain quickly pivoted from producing automotive parts to repurposing their operations to 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. Although vehicle production eventually resumed, actual production levels in 2020 and 2021 are likely to be much different than previously expected due to the temporary shutdown and additional workplace healthy and safety measures. Short-term forecasts should therefore be interpreted with caution. Our project team has decided to withhold estimates and forecasts of motor vehicle production (as seen in Figure 4) and industry employment (as seen in Figure 6) 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 elsewhere in the report.

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 FOCAL Automotive Production Industry. The provincial forecasts presented in this report 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 industry. We will continue to monitor the impact of COVID-19 on the industry going forward and adjust our research scope as needed.

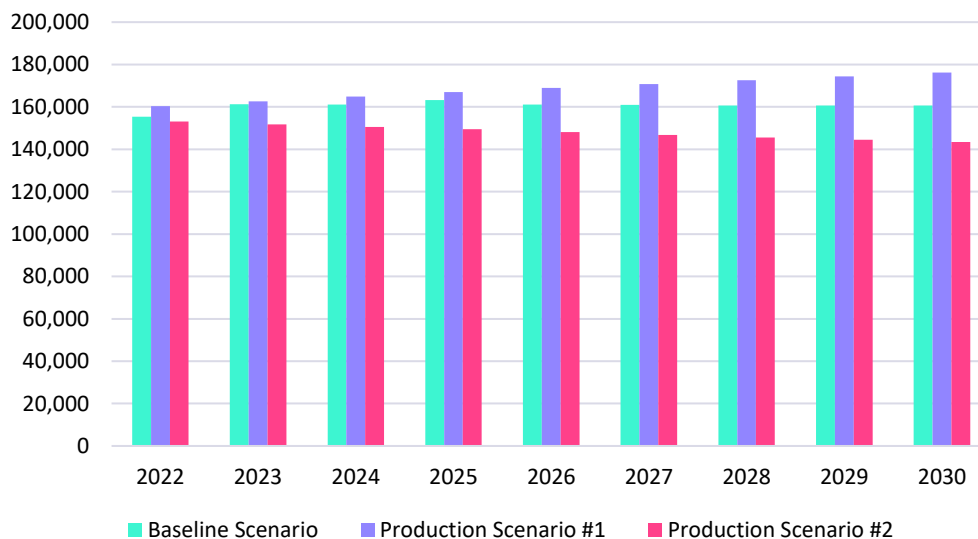
³ Exact estimates can be obtained from Statistics Canada's Symmetric Input-Output Tables (2015).

PROVINCIAL AUTOMOTIVE INDUSTRY EMPLOYMENT OUTLOOK

Figure 6 illustrates employment outlooks for the baseline, upside (i.e., Production Scenario #1), and downside (i.e., Production Scenario #2) scenarios between 2022 and 2030. While employment levels are similar between the baseline and upside scenarios through 2025, differences in long-term growth trends create a sizable employment gap over the 2026-2030 period. In the baseline scenario, FOCAL Automotive Production Industry employment is expected to experience a period of growth between 2022 and 2025 before plateauing over the latter half of the decade at an estimated 161,610 workers. In contrast, the upside scenario projects consistent employment growth in the FOCAL Automotive Production Industry, reaching 176,280 workers in Ontario. This is equivalent to a 10% increase in employment over the baseline scenario by 2030.

The opposite trend is observed when comparing the baseline to the downside scenario. In this case, the gap in employment between these scenarios grows rapidly, from roughly 2,000 workers in 2022 to nearly 14,000 by 2025. However, as employment growth in the baseline scenario slows so to does growth in the gap between scenarios. The employment gap rises by fewer than 4,000 workers between 2025 and the end of the forecast period. As of 2030, employment in the downside scenario is projected to total 143,450 workers in Ontario, equivalent to an 11% decrease in employment compared to the baseline scenario.

FIGURE 6. Provincial Automotive Industry Employment Outlook, 2022-2030



Although total employment is 10% larger in the upside scenario and 11% smaller in the downside scenario, employment changes are not spread evenly among the industry groups that comprise the FOCAL Automotive Production Industry. These divergent outcomes are driven by the strength of the economic linkages between industries, the role of imports, and assumptions regarding changes in the productivity of workers over the forecast period. In both scenarios, the level and change in employment in the Other Primary Suppliers industries capture only the proportion of their activity that is tied to vehicle assembly and/or parts

manufacturing (see Figure 2). Table 1 breaks down the change in 2030 employment between scenarios by industry group.

Vehicle assembly, as expected, saw the largest percentage change in employment in the upside scenario, growing 17% from the baseline. Vehicle parts manufacturing, which employed the most workers of any industry group in the baseline scenario, saw an employment gain of nearly 6,500 workers in the upside scenario. While this is the largest gain of any industry group, it represents only a 9% increase over the baseline. Among Other Primary Automotive Suppliers, the computer & electronics industry group saw strong employment growth of 10% between scenarios. This industry group includes manufacturers of navigational and guidance instruments who make a majority of their sales to traditional automotive manufacturing industries in Ontario. The remaining industry groups, including metals (5%), non-metal materials (6%), and other (4%), saw lower employment growth, in part because they include industries with relatively weaker economic linkages to Ontario’s traditional automotive manufacturing industries.

Similar outcomes are seen for the downside scenario, with vehicle assembly employment falling 18% and vehicle parts manufacturing employment declining by 11%. In this scenario, the computer & electronics industry group sees employment contract by 12%, reflecting a decline in the volume of sales to Ontario’s traditional automotive manufacturing industries from manufacturers associated with this group. Employment changes for the metals (-6%), non-metal materials (-7%), and other (-4%) industry groups also mirror those seen in the upside scenario. Employment changes are slightly larger for all groups in the downside scenario due to the additional impact of assumed productivity gains, which mean fewer workers will be required to produce the same output over time. Overall, the scenarios illustrate how employment can rise or fall as a result of alternative production assumptions.

TABLE 1. Provincial Automotive Industry Employment by Scenario, 2030

Industry Group	Baseline Scenario	Production Scenario #1	Empl. Change (%)	Production Scenario #2	Empl. Change (%)
Vehicle Assembly	30,170	35,200	+17%	24,670	-18%
Vehicle Parts Mfg.	68,770	75,220	+9%	61,390	-11%
Materials (Non-Metals)	17,340	18,360	+6%	16,210	-7%
Metals	22,090	23,300	+5%	20,680	-6%
Computer & Electronics	14,250	15,630	+10%	12,600	-12%
Other	8,220	8,570	+4%	7,890	-4%
TOTAL	160,840	176,280	+10%	143,440	-11%

PROVINCIAL AUTOMOTIVE INDUSTRY HIRING REQUIREMENT OUTLOOK

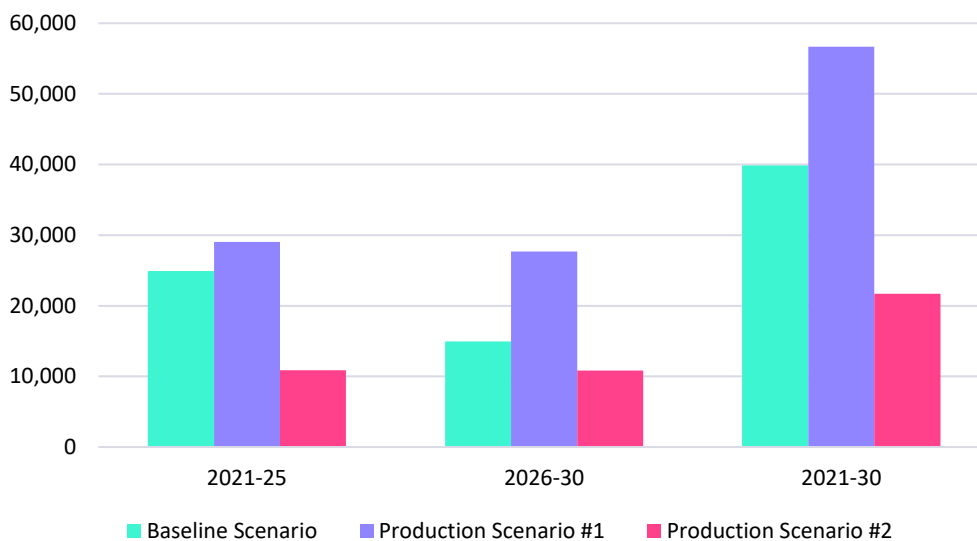
Hiring requirement represents the demand for labour across employers in the FOCAL Automotive Production Industry. Estimated hiring requirements cover the needs of all employers within Vehicle Assembly and Parts Manufacturing industries, but only the portion of employment connected with these traditional industries for employers in Other Primary Automotive Suppliers industries. Hiring requirements consist of two components:

1. **Replacement demand** – labour demand driven by the need to replace workers exiting the FOCAL Automotive Production Industry workforce due to retirement or death⁶
2. **Expansion demand** – labour demand driven by output growth in the FOCAL Automotive Production Industry (referred to as retraction demand when negative)

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

Changes in production levels have clear impacts on labour demand in the FOCAL Automotive Production Industry, as seen in Figure 7:

FIGURE 7. Provincial Automotive Hiring Requirement (HR) Outlook, 2021-2030



In the baseline scenario, Ontario’s FOCAL Automotive Production Industry was projected to require 39,870 new workers between 2021 and 2030. 24,940 workers were expected to be needed in the near-term (i.e., between 2021 and 2025), compared with 14,960 workers in the medium to long-term (i.e., between 2026 and 2030). The total projected hiring requirement

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

during the forecast period represented 25% of the province's FOCAL Automotive Production Industry employment as of 2019.

In the upside scenario, Ontario's FOCAL Automotive Production Industry is projected to require 56,680 new workers between 2021 and 2030. 29,030 workers are expected to be needed in the near-term, compared with 27,660 workers in the medium to long-term. The total projected hiring requirement during the forecast period represents 35% of the province's FOCAL Automotive Production Industry employment as of 2019.

In the downside scenario, Ontario's FOCAL Automotive Production Industry is projected to require 21,720 new workers between 2021 and 2030. 10,900 workers are expected to be needed in the near-term, compared with 10,830 workers in the medium to long-term. The total projected hiring requirement during the forecast period represents 14% of the province's FOCAL Automotive Production Industry employment as of 2019.

Overall, the cumulative nature of hiring requirements means they present a much wider range of outcomes between scenarios than were seen for the employment outlooks. The impact of the production assumptions in each scenario are observed in changes to labour demand in each forecast year, which are then added together to determine the total hiring requirement for the forecast period. The total hiring requirement in the upside scenario is 42% larger than that of the baseline. In the downside scenario, total hiring requirement is 46% smaller than the baseline.

Hiring requirements can also be examined by occupation group for each scenario to gain insights into which types of work would be most affected by a change in expected production. As production levels change over time, causing industry growth (upside scenario) or contraction (downside scenario), the forecast model reacts to these changes by drawing in the needed labour force through adjustments to occupation-level unemployment rates. Occupations where unemployment levels have historically been low will have fewer industry workers to draw from in the upside scenario, leading to greater increases in hiring from outside the industry relative to the baseline. The opposite effect is observed in the downside scenario, where low unemployment results in greater decreases in labour demand. These impacts, coupled with differences in retirement rates based on the age profiles of occupations by industry, lead to distinct impacts between occupation groups in each scenario.

In the baseline scenario, the proportion of total hiring requirement to current employment was highest among skilled trades (29%) and management & administration occupations (28%). These occupation groups have the highest shares in the upside scenario as well at 39% each. *However, engineering & technical occupations saw the largest relative increase in hiring requirement, rising 60% from the baseline (3,390) to the upside (5,410) scenario. This group, which includes various engineering disciplines and occupations related to computer software and hardware, is primed to play a critical role in driving growth for the FOCAL Automotive Production Industry.* These occupations also tend to have relatively low unemployment rates when compared with other groups which contributes to their strong growth. The smallest relative increase in hiring requirement was seen for the group capturing all other occupations in the workforce, which grew only 36% from the baseline. This category includes occupations that are less strongly associated with automotive manufacturing and thus are less affected by changes in output.

Unsurprisingly, labour demand for production workers saw the largest decline between the baseline and downside scenarios. Hiring requirement fell from 15,640 workers in the former to 6,420 in the latter, a decrease of 59%. These occupations account for the largest share of employment in vehicle assembly and parts manufacturing industries and are dependent on output from these industries to generate labour demand. *Notably, hiring requirement for management & administration occupations declined by only 33%. This was the smallest decrease of any occupation group and may reflect the seniority of these positions as well as their function within businesses.* Management occupations have higher retirement rates due to the typical age profile for these roles, which require significant professional experience, meaning that replacement workers will still be needed even in the event of industry contraction. The ‘Other’ occupation group saw a below-average 35% decline, providing further evidence of its stability with respect to output changes.

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

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	HR Change (%)	Production Scenario #2	HR Change (%)
Management & Administration	2,150	28%	3,150	+47%	1,430	-33%
Engineering & Technical	3,390	22%	5,410	+60%	1,900	-44%
Skilled Trades	7,270	29%	9,910	+36%	4,510	-38%
Production	15,640	22%	22,700	+45%	6,420	-59%
Other	11,420	28%	15,520	+36%	7,450	-35%
TOTAL	39,870	25%	56,680	+42%	21,720	-46%

Most of the total hiring requirement change in each scenario occurs as a result of shifts in expansion/retraction demand. Projections of expansion/retraction demand for Ontario are strongly tied to the forecasts of national light vehicle production in each scenario. As seen in Table 3, the alternative production assumptions result in increasingly different production levels over the course of the forecast period. While expansion/retraction demand accounted for just under 5,000 workers over the forecast period in the baseline scenario, this figure rises to 20,600 workers in the upside scenario; new job openings are created as the industry grows due to rising production levels. Conversely, expansion/retraction demand is negative in the downside scenario, as declining production is projected to cost the FOCAL Automotive Production Industry over 12,000 jobs between 2021 and 2030.

TABLE 3. National Light Vehicle Production (Units x 1,000), 2022-2030

Scenario	2022	2023	2024	2025	2026	2027	2028	2029	2030
Baseline Scenario	1,701	1,834	1,826	1,871	1,826	1,824	1,821	1,819	1,817
Production Scenario #1	1,855	1,892	1,930	1,969	2,008	2,048	2,089	2,131	2,173
Production Scenario #2	1,712	1,678	1,645	1,612	1,579	1,548	1,517	1,487	1,457

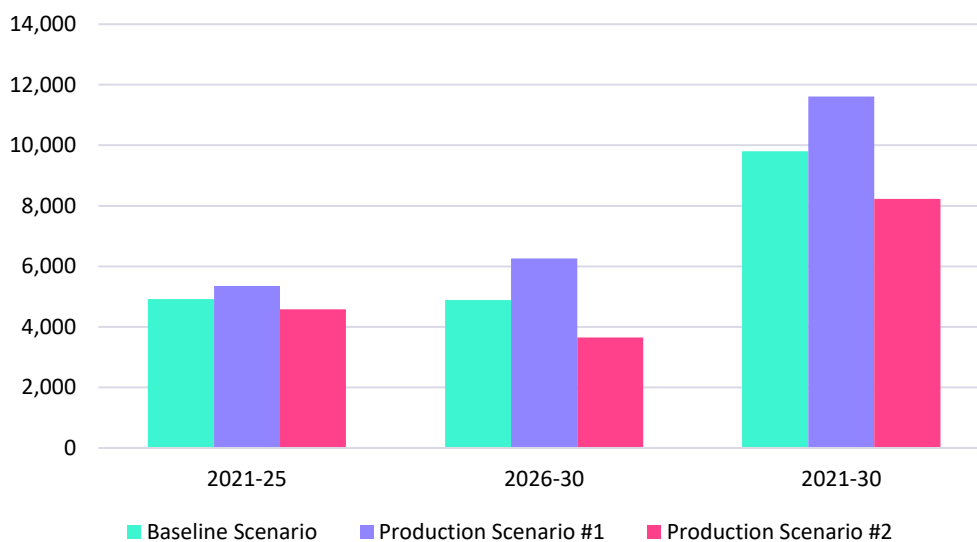
Source: Canadian Skills Training & Employment Coalition; LMC Automotive

PROVINCIAL AUTOMOTIVE INDUSTRY NEW ENTRANTS OUTLOOK

In order to meet hiring requirements, employers in Ontario’s FOCAL Automotive Production 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 FOCAL Automotive Production Industry are based on the industry’s historic share of new entrants, as well as provincial projections of changes in the labour force over time, including labour force participation by age-year and workforce by age-year and occupation.

The alternative production scenarios illustrate how supply dynamics in the labour market for the FOCAL Automotive Production Industry are impacted by changes in output, as seen in Figure 8:

FIGURE 8. Provincial Automotive New Entrants (NE) Outlook, 2021-2030



In the baseline scenario, Ontario’s FOCAL Automotive Production Industry was expected to recruit 9,800 new entrants to its workforce between 2021 and 2030, based on the industry’s historic rate of entry. The forecast for new entrants was relatively evenly split between the 2021-2025 (51%) and 2026-2030 (49%) periods. The projected number of new entrants across all occupations was equivalent to 6% of estimated FOCAL Automotive Production Industry employment in 2019 but was lowest for management & administration roles; these occupations rely the least on new entrants due to the experience typically required for these positions.

In the upside scenario, industry growth generates new job openings which act as a signal of opportunity for individuals entering the workforce, thereby attracting additional new entrants. This occurs because the forecast model reacts to industry growth by drawing in additional labour, leading to lower unemployment rates which increase the share of new entrants allocated to the industry. The result is an 18% increase in the projection for new entrants over the forecast period. The impact on new entrants builds over the forecast period as the industry continues to grow, with 64% of new entrants projected to enter the workforce between 2026 and 2030. Most occupations groups see somewhat similar changes in their projections for new entrants in this scenario, with gains ranging from 21% to 27%. However, projected new entrants for production workers increase just 13% from the baseline. Recruitment and retention issues with youth employment in automotive manufacturing, as outlined by the FOCAL project team⁴, limit gains for the production occupation group even in this optimistic scenario.

In the downside scenario, industry contraction leads to job losses which in turn push new entrants away from the industry. The same mechanism that attracts new entrants in the upside scenario has the opposite effect in this case; job losses lead to higher unemployment rates that reduce the share of new entrants allocated to the industry. This results in a 16% decrease in the projection for new entrants over the forecast period. The impact of contraction on new entrants is strongest towards the end of the forecast period. Specifically, just 37% of the total projection for new entrants occurs in the years between 2026 and 2030. Most occupation groups see relatively similar declines in their projections for new entrants, with a 13% to 14% decrease projected for three of the primary groups. As in the upside scenario, production workers (-20%) are again an exception, further illustrating the potential for recruitment challenges.

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

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	NE Change (%)	Production Scenario #2	NE Change (%)
Management & Administration	150	2%	190	+27%	130	-13%
Engineering & Technical	940	6%	1,160	+23%	810	-14%
Skilled Trades	1,200	5%	1,450	+21%	1,030	-14%
Production	5,080	7%	5,720	+13%	4,040	-20%
Other	2,430	6%	3,090	+27%	2,220	-9%
TOTAL	9,800	6%	11,560	+18%	8,230	-16%

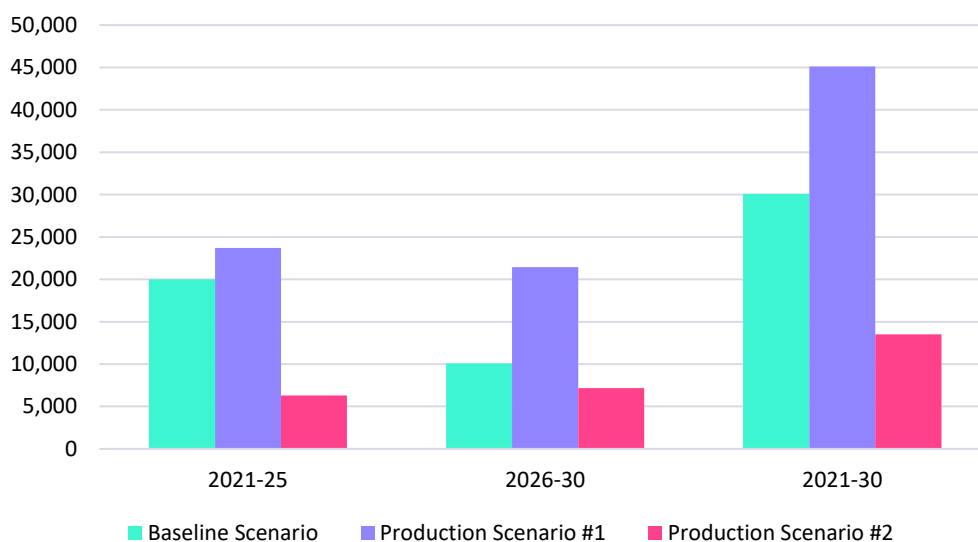
⁴ For details, please refer to the “Youth Employment in Canada’s Automotive Manufacturing Industry” trend report published by the FOCAL project team in June 2020.

PROVINCIAL AUTOMOTIVE INDUSTRY RECRUITMENT GAP OUTLOOK

Recruitment gaps are a measure of the excess demand that exists in the labour market after accounting for in unemployment and other supply. In the baseline and alternative production scenarios, recruitment gaps are calculated by subtracting projections of new entrants from the hiring requirement outlooks seen above. It should be noted that recruitment gaps could therefore be significantly higher if the industry fails to recruit new entrants at historic levels.

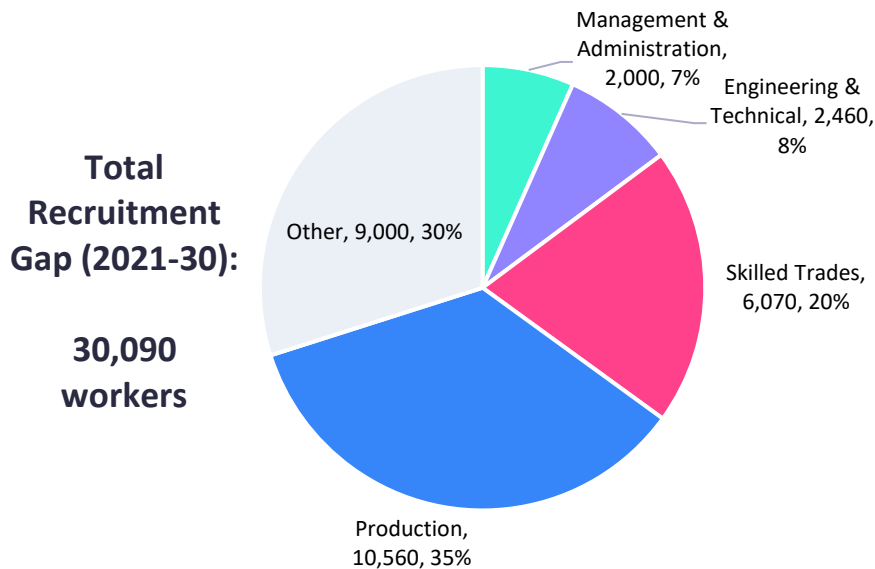
The outlook for recruitment gaps in the FOCAL Automotive Production Industry vary significantly between scenarios, as seen in Figure 9:

FIGURE 9. Provincial Automotive Recruitment Gap (RG) Outlook, 2021-2030



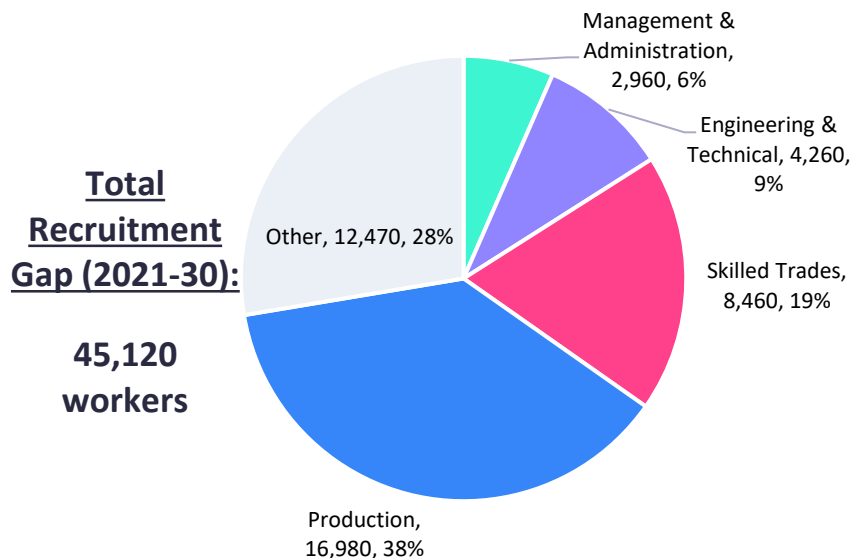
In the baseline scenario, Ontario’s FOCAL Automotive Production Industry was projected to face a recruitment gap of 30,090 workers during the forecast period. Most of the shortfall, totaling approximately 20,000 workers, was projected between 2021 and 2025. Employers in the province would need to hire the equivalent of 19% of their current workforce over the forecast period to meet labour demand, even after accounting for new entrants. Among the primary occupation groups in the industry, the recruitment gap was expected to be largest for production workers (35% of total) followed by skilled trades (20%).

FIGURE 10. Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030⁵



In the upside scenario, Ontario’s FOCAL Automotive Production Industry is projected to face a recruitment gap of 45,120 workers during the forecast period. This is equal to a 50% increase from the baseline. Employers in the province would need to hire the equivalent of 28% of their current workforce over the forecast period to meet labour demand, even after accounting for the addition of new entrants to the workforce. Among the primary occupation groups in the industry, the recruitment gap is expected to be largest for production workers (38% of total) followed by workers outside the most common roles (28%).

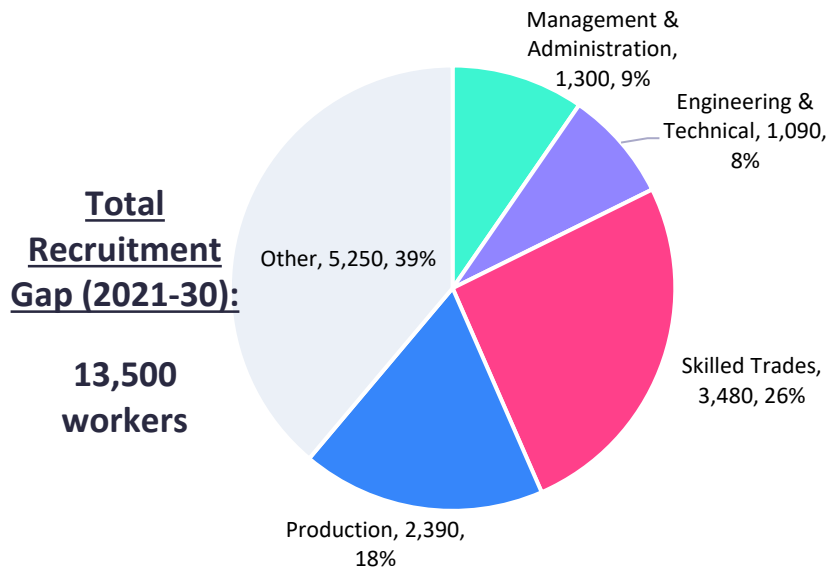
FIGURE 11. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030



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.

In the downside scenario, Ontario’s FOCAL Automotive Production Industry is projected to face a recruitment gap of 13,500 workers during the forecast period. This is equal to a 55% decrease from the baseline. *Employers in the province would need to hire the equivalent of 8% of their current workforce over the forecast period to meet labour demand, even after accounting for lower activity and the addition of new entrants to the workforce.* Among the primary occupation groups in the industry, the recruitment gap is expected to be largest for workers outside the most common roles (39% of total) followed by skilled trades (26%).

FIGURE 12. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030



Taken together, the baseline and alternative production scenarios reveal the severity of the labour market challenges that employers in the FOCAL Automotive Production Industry may face going forward. Specifically, the downside scenario illustrates that recruitment gaps could persist even if domestic production levels decline over the next decade, while the upside scenario indicates that labour supply may be a limiting factor that hinders the industry’s potential for growth. This analysis makes it clear that recruiting and retaining qualified personnel should be a primary concern for the industry’s key stakeholders.

Trends in recruitment gap outlooks by occupation group, detailed below, follow those observed for hiring requirements in Table 2. In the baseline scenario, recruitment gap as a proportion of current employment was highest for management & administration occupations at 26%, followed by skilled trades at 24%. Engineering & technical occupations and production workers are projected to see the most significant recruitment gap growth of any occupation group in the upside scenario. Recruitment gaps for each group saw increases of over 60% from the baseline. Both groups also saw strong growth in hiring requirements in the upside scenario. Management & administration sees the next largest growth at nearly 50%, while skilled trades see their recruitment gap grow by nearly 40%. Recruitment gap growth for all occupation groups is driven primarily by the need to hire new workers as the industry grows.

Production workers saw the largest decline in recruitment gap in the downside scenario. The decline in labour demand for this group outpaced the decline in the projection for new entrants, causing the recruitment gap to shrink by 77% from the baseline. However, retirements are still a major driver of replacement demand for these occupations, leading to a recruitment gap of nearly 2,400 workers despite the decrease in production causing job losses. Results from the downside scenario also highlight the importance of labour supply availability to minimizing recruitment gaps, even when production levels are well below current levels. Both the engineering & technical group and management & administration occupation groups saw declines in their recruitment gaps that were much smaller than the increases observed in the upside scenario. The former saw its recruitment gap shrink by 56% while the latter saw a 35% decrease. Engineering & technical group and management & administration occupations also have the lowest total projections of new entrants across all three scenarios. Although labour demand is reduced in the downside case, the low expected levels of new entrants still leave recruitment gaps for these groups.

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

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	RG Change (%)	Production Scenario #2	RG Change (%)
Management & Administration	2,000	26%	2,960	+48%	1,300	-35%
Engineering & Technical	2,460	16%	4,260	+73%	1,090	-56%
Skilled Trades	6,070	24%	8,460	+39%	3,480	-43%
Production	10,560	15%	16,980	+61%	2,390	-77%
Other	9,000	22%	12,470	+39%	5,250	-42%
TOTAL	30,090	19%	45,120	+50%	13,500	-55%

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 ten occupations using each ranking method are presented for the baseline and alternative production scenarios in the following sections. Recruitment gaps and employment shares for all occupations in each scenario can be found in the Appendix (see Tables 14, 17, and 20).

Recruitment Gap Size Rankings

In the baseline scenario, the top-ranked occupation by recruitment gap size was motor vehicle assemblers, inspectors and testers (NOC 9522), with a projected recruitment gap of 6,190 workers between 2021 and 2030. A number of skilled trades - including construction millwrights & industrial mechanics (NOC 7311), tool & die makers (NOC 7232), and industrial electricians (NOC 7242) - also had large projected recruitment gaps. A similar set of occupations also appears at the top of the ranking in the upside scenario, albeit with a change in the magnitude of their recruitment gaps. For instance, motor vehicle assemblers, inspectors and testers (NOC 9522) is still the top-ranked occupation, in this case with a recruitment gap that exceeds 10,400 workers over the forecast period. In the downside scenario, however, production-related occupations are either ranked lower or entirely absent. Motor vehicle assemblers, inspectors and testers (NOC 9522) has only the sixth-largest recruitment gap in this scenario. Instead, the top-ranked occupation is manufacturing managers (NOC 0911), with a recruitment gap of just 730 workers, which is followed by several skilled trades.

TABLE 6. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	6,190	13%
2	Material handlers (NOC 7452)	1,250	18%
3	Manufacturing managers (NOC 0911)	1,220	25%

4	Construction millwrights and industrial mechanics (NOC 7311)	1,030	31%
5	Supervisors, motor vehicle assembling (NOC 9221)	970	16%
6	Tool and die makers (NOC 7232)	820	31%
7	Machinists and machining and tooling inspectors (NOC 7231)	770	27%
8	Industrial electricians (NOC 7242)	660	30%
9	Welders and related machine operators (NOC 7237)	630	17%
10	Shippers and receivers (NOC 1521)	500	22%

TABLE 7. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	10,410	24%
2	Material handlers (NOC 7452)	1,900	28%
3	Manufacturing managers (NOC 0911)	1,810	35%
4	Construction millwrights and industrial mechanics (NOC 7311)	1,330	41%
5	Tool and die makers (NOC 9522)	1,170	42%
6	Supervisors, motor vehicle assembling (NOC 9221)	1,110	28%
7	Machinists and machining and tooling inspectors (NOC 7231)	1,080	36%
8	Welders and related machine operators (NOC 7237)	1,040	26%
9	Other labourers in processing, manufacturing and utilities (NOC 9619)	870	24%
10	Shippers and receivers (NOC 1521)	810	31%

TABLE 8. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Manufacturing managers (NOC 0911)	760	15%
2	Construction millwrights and industrial mechanics (NOC 7311)	640	20%
3	Machinists and machining and tooling inspectors (NOC 7231)	620	21%
4	Tool and die makers (NOC 7232)	600	22%
5	Material handlers (NOC 7452)	540	8%
6	Senior managers - construction, transportation, production and utilities (NOC 0016)	410	34%
7	Motor vehicle assemblers, inspectors and testers (NOC 9522)	410	1%
8	Plastics processing machine operators (NOC 9422)	370	13%
9	Shippers and receivers (NOC 1521)	360	14%
10	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	360	22%

Recruitment Gap Share Rankings

In the baseline scenario, the top-ranked occupation by recruitment gap share was senior managers in construction, transportation, production and utilities (NOC 0016), with a recruitment gap equal to over 40% of current occupational employment. This ranking holds true for both alternative production scenarios, though with differences in the share itself; in the upside scenario, recruitment gap rises to 55% of current employment, while in the downside scenario it falls to 34%. Overall, the top-ranked occupations are broadly similar in all three scenarios and are mostly comprised of skilled trades and technical occupations. This provides evidence of the potentially severe recruiting challenges for occupations that require certification and/or professional experience, and that these challenges could persist whether the FOCAL Automotive Production Industry grows or shrinks over the next decade.

TABLE 9. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Senior managers - construction, transportation, production and utilities (NOC 0016)	480	43%
2	Industrial instrument technicians and mechanics (NOC 2243)	30	36%
3	Supervisors, electrical products manufacturing (NOC 9223)	30	33%
4	Tool and die makers (NOC 7231)	820	31%
5	Construction millwrights and industrial mechanics (NOC 7311)	1,030	31%
6	Industrial electricians (NOC 7242)	660	30%
7	Database analysts and data administrators (NOC 2172)	30	30%
8	Foundry workers (NOC 9412)	210	30%
9	Transport truck drivers (NOC 7511)	250	30%
10	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	440	30%

TABLE 10. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Senior managers - construction, transportation, production and utilities (NOC 0016)	660	55%
2	Supervisors, electrical products manufacturing (NOC 9223)	50	50%
3	Industrial instrument technicians and mechanics (NOC 2243)	30	50%
4	Electronics assemblers, fabricators, inspectors and testers (NOC 9253)	780	47%
5	Supervisors, electronics manufacturing (NOC 9222)	70	45%
6	Supervisors, other products manufacturing and assembly (NOC 9227)	70	42%
7	Tool and die makers (NOC 7232)	1,170	42%
8	Industrial electricians (NOC 7242)	760	42%
9	Construction millwrights and industrial mechanics (NOC 7311)	1,330	41%
10	Database analysts and data administrators (NOC 2172)	40	39%

TABLE 11. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Senior managers - construction, transportation, production and utilities (NOC 0016)	410	34%
2	Supervisors, electrical products manufacturing (NOC 9223)	30	31%
3	Industrial instrument technicians and mechanics (NOC 2243)	20	26%
4	Supervisors, other products manufacturing and assembly (NOC 9227)	40	23%
5	Tool and die makers (NOC 7232)	600	22%
6	Electronics assemblers, fabricators, inspectors and testers (NOC 9253)	360	22%
7	Foundry workers (NOC 9412)	160	21%
8	Machinists and machining and tooling inspectors (NOC 7231)	620	21%
9	Construction millwrights and industrial mechanics (NOC 7311)	640	20%
10	Supervisors, electronics manufacturing (NOC 9222)	30	19%

CONCLUSION

This report provides several key findings related to labour market conditions in Ontario's FOCAL Automotive Production Industry:

First, changes in domestic motor vehicle production can have major impacts on employment in the industry. While the baseline scenario projected provincial employment of an estimated 160,610 workers by 2030, employment in the alternative production scenarios ranged from 176,280 workers in the upside scenario to 143,450 workers in the downside scenario. Employment impacts were most significant for Ontario's traditional automotive manufacturing industries, including vehicle assembly and parts manufacturing, as well as for other primary automotive suppliers associated with computers & electronics.

Second, these employment outlooks lead to different levels of forecasted hiring requirement (i.e., labour demand). In the baseline scenario, hiring requirement from employers in the industry was projected to total an estimated 39,870 workers over the 2021-2030 forecast period. In the upside scenario, labour demand rises to 56,680 workers, a 42% increase from the baseline. The largest relative increase was seen for the engineering & technical occupation group at 60% from the baseline. This group, which includes various engineering disciplines and occupations related to computer software and hardware, is primed to play a critical role in driving growth for the FOCAL Automotive Production Industry. In the downside scenario, labour demand falls to 21,720 workers, a 46% decrease from the baseline. The largest relative decrease was seen for the production workers occupation group at 59% from the baseline. While most occupation groups saw hiring requirement fall by 35% or more in this case, it declined by only 33% for management & administration occupations. This was the smallest decrease of any occupation group and may reflect the seniority of these positions as well as their function within businesses.

Third, labour supply dynamics are also impacted by changes in production and export levels. In the baseline scenario, employers in the industry were projected to recruit an estimated 9,800 new entrants (i.e., individuals between 15 and 30 years old entering the workforce for the first time) over the forecast period based on historic trends. The forecast for new entrants rises to 11,560 workers (+18%) in the upside scenario and falls to 8,230 workers (-16%) in the downside scenario. Trends in the forecasts of new entrants for each alternative production scenario reflect how industry growth, or lack thereof, can influence the availability of labour supply over time. In the baseline scenario, 49% of the total projected new entrants occurs between 2026 and 2030; this figure is 64% in the upside scenario but only 37% in the downside scenario.

Fourth, each forecast scenario projects a recruitment gap (i.e., hiring requirements less new entrants) in the industry, though the magnitude of the gap differs. In the baseline scenario, employers were projected to face a recruitment gap estimated at 30,090 workers over the forecast period. In the upside scenario, the recruitment gap rises to 45,120 workers, a 50% increase from the baseline. The largest relative increase was seen for engineering & technical occupations at 73%. In the downside scenario, the recruitment gap falls 13,500 workers, a 55% decrease from the baseline. The largest relative decrease was seen for production occupations at 77%. The persistence of the recruitment gap, even in the scenario where production levels experience a significant decline, illustrates the severity of the labour market challenges employers in the industry may face going forward.

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). A separate table is provided for of the baseline and alternative production scenarios. 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 12. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	24,940	14,950	39,890	25%
0016 Senior managers - construction, transportation, production and utilities	280	210	480	44%
0211 Engineering managers	110	70	180	25%
0213 Computer and information systems managers	40	20	60	17%
0911 Manufacturing managers	810	500	1,310	26%
1121 Human resources professionals	80	40	130	20%
1521 Shippers and receivers	370	230	600	27%
1523 Production logistics co-ordinators	120	70	190	24%
2132 Mechanical engineers	430	220	660	19%
2133 Electrical and electronics engineers	220	130	350	25%
2141 Industrial and manufacturing engineers	210	110	320	20%
2142 Metallurgical and materials engineers	20	10	30	19%
2147 Computer engineers (except software engineers and designers)	40	20	60	23%
2171 Information systems analysts and consultants	110	60	170	22%
2172 Database analysts and data administrators	20	10	30	31%
2173 Software engineers and designers	50	20	70	15%
2174 Computer programmers and interactive media developers	40	10	60	12%
2232 Mechanical engineering technologists and technicians	140	70	220	19%
2233 Industrial engineering and manufacturing technologists and technicians	180	100	270	22%
2241 Electrical and electronics engineering technologists and technicians	180	110	300	27%
2243 Industrial instrument technicians and mechanics	20	10	30	40%
2281 Computer network technicians	30	10	40	13%
2283 Information systems testing technicians	10	<10	10	24%
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	90	60	150	26%
7231 Machinists and machining and tooling inspectors	540	360	910	32%
7232 Tool and die makers	520	360	890	34%
7237 Welders and related machine operators	570	340	920	24%
7241 Electricians (except industrial and power system)	50	30	80	34%
7242 Industrial electricians	420	290	710	32%

7301 Contractors and supervisors, mechanic trades	50	30	80	28%
7311 Construction millwrights and industrial mechanics	690	480	1,160	34%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	300	180	480	25%
7452 Material handlers	1,030	600	1,630	24%
7511 Transport truck drivers	160	110	270	32%
9221 Supervisors, motor vehicle assembling	760	380	1,140	19%
9222 Supervisors, electronics manufacturing	20	10	40	28%
9223 Supervisors, electrical products manufacturing	20	10	30	38%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	40	20	70	23%
9227 Supervisors, other products manufacturing and assembly	20	20	40	31%
9412 Foundry workers	150	110	250	36%
9416 Metalworking and forging machine operators	360	220	580	26%
9417 Machining tool operators	280	170	450	26%
9422 Plastics processing machine operators	360	220	580	27%
9522 Motor vehicle assemblers, inspectors and testers	6,480	3,480	9,960	21%
9523 Electronics assemblers, fabricators, inspectors and testers	300	200	500	34%
9526 Mechanical assemblers and inspectors	170	90	270	21%
9535 Plastic products assemblers, finishers and inspectors	230	150	380	29%
9536 Industrial painters, coaters and metal finishing process operators	360	200	570	22%
9619 Other labourers in processing, manufacturing and utilities	500	300	800	24%
Other occupations	6,970	4,450	11,420	28%

TABLE 13. Detailed Provincial Automotive Industry New Entrants Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	4,920	4,880	9,800	6%
0016 Senior managers - construction, transportation, production and utilities	<10	<10	10	1%
0211 Engineering managers	<10	<10	10	1%
0213 Computer and information systems managers	<10	<10	10	2%
0911 Manufacturing managers	40	40	90	2%
1121 Human resources professionals	20	20	40	7%
1521 Shippers and receivers	50	50	100	4%
1523 Production logistics co-ordinators	20	20	30	4%
2132 Mechanical engineers	130	120	250	8%
2133 Electrical and electronics engineers	40	40	90	6%
2141 Industrial and manufacturing engineers	40	40	70	5%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	10	10	10	4%
2171 Information systems analysts and consultants	10	10	30	4%
2172 Database analysts and data administrators	<10	<10	<10	N/A

2173 Software engineers and designers	10	10	20	5%
2174 Computer programmers and interactive media developers	20	10	30	6%
2232 Mechanical engineering technologists and technicians	70	70	140	13%
2233 Industrial engineering and manufacturing technologists and technicians	40	40	80	7%
2241 Electrical and electronics engineering technologists and technicians	40	40	70	7%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	10	10	10	3%
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	2%
7231 Machinists and machining and tooling inspectors	70	70	130	5%
7232 Tool and die makers	30	30	60	3%
7237 Welders and related machine operators	140	140	290	8%
7241 Electricians (except industrial and power system)	10	10	20	7%
7242 Industrial electricians	20	20	40	2%
7301 Contractors and supervisors, mechanic trades	<10	<10	10	4%
7311 Construction millwrights and industrial mechanics	60	60	130	4%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	60	50	110	6%
7452 Material handlers	190	190	380	6%
7511 Transport truck drivers	10	10	20	3%
9221 Supervisors, motor vehicle assembling	90	90	170	3%
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	3%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	20	20	40	6%
9416 Metalworking and forging machine operators	70	70	140	7%
9417 Machining tool operators	40	40	90	5%
9422 Plastics processing machine operators	60	60	120	6%
9522 Motor vehicle assemblers, inspectors and testers	1,890	1,870	3,770	8%
9523 Electronics assemblers, fabricators, inspectors and testers	30	30	60	4%
9526 Mechanical assemblers and inspectors	50	50	100	8%
9535 Plastic products assemblers, finishers and inspectors	50	50	110	8%
9536 Industrial painters, coaters and metal finishing process operators	80	80	160	6%
9619 Other labourers in processing, manufacturing and utilities	160	160	320	10%
Other occupations	1,220	1,210	2,430	6%

TABLE 14. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	20,010	10,070	30,080	19%
0016 Senior managers - construction, transportation, production and utilities	270	200	480	43%
0211 Engineering managers	110	60	170	24%
0213 Computer and information systems managers	40	10	50	15%
0911 Manufacturing managers	760	460	1,220	25%
1121 Human resources professionals	60	20	80	13%
1521 Shippers and receivers	320	180	500	22%
1523 Production logistics co-ordinators	100	50	150	20%
2132 Mechanical engineers	310	100	410	12%
2133 Electrical and electronics engineers	170	90	260	19%
2141 Industrial and manufacturing engineers	170	70	250	15%
2142 Metallurgical and materials engineers	10	10	20	17%
2147 Computer engineers (except software engineers and designers)	30	20	50	19%
2171 Information systems analysts and consultants	100	50	150	19%
2172 Database analysts and data administrators	20	10	30	30%
2173 Software engineers and designers	40	10	40	10%
2174 Computer programmers and interactive media developers	30	<10	30	5%
2232 Mechanical engineering technologists and technicians	80	10	80	7%
2233 Industrial engineering and manufacturing technologists and technicians	140	60	200	16%
2241 Electrical and electronics engineering technologists and technicians	150	80	220	21%
2243 Industrial instrument technicians and mechanics	20	10	30	36%
2281 Computer network technicians	30	10	30	10%
2283 Information systems testing technicians	<10	<10	10	16%
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	90	50	140	24%
7231 Machinists and machining and tooling inspectors	470	300	770	27%
7232 Tool and die makers	490	330	820	31%
7237 Welders and related machine operators	430	200	630	17%
7241 Electricians (except industrial and power system)	40	30	70	27%
7242 Industrial electricians	400	270	660	30%
7301 Contractors and supervisors, mechanic trades	40	20	70	24%
7311 Construction millwrights and industrial mechanics	620	410	1,030	31%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	240	120	370	19%
7452 Material handlers	840	420	1,250	18%
7511 Transport truck drivers	150	100	250	30%
9221 Supervisors, motor vehicle assembling	670	300	970	16%
9222 Supervisors, electronics manufacturing	20	10	40	26%
9223 Supervisors, electrical products manufacturing	20	10	30	33%

9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	40	20	60	20%
9227 Supervisors, other products manufacturing and assembly	20	20	40	30%
9412 Foundry workers	130	80	210	30%
9416 Metalworking and forging machine operators	290	150	440	20%
9417 Machining tool operators	230	130	360	21%
9422 Plastics processing machine operators	290	160	450	21%
9522 Motor vehicle assemblers, inspectors and testers	4,580	1,610	6,190	13%
9523 Electronics assemblers, fabricators, inspectors and testers	260	170	440	30%
9526 Mechanical assemblers and inspectors	130	50	170	13%
9535 Plastic products assemblers, finishers and inspectors	180	100	280	21%
9536 Industrial painters, coaters and metal finishing process operators	280	130	410	16%
9619 Other labourers in processing, manufacturing and utilities	340	140	480	14%
Other occupations	5,750	3,240	9,000	22%

TABLE 15. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	29,030	27,660	56,680	35%
0016 Senior managers - construction, transportation, production and utilities	340	330	670	56%
0211 Engineering managers	140	130	270	37%
0213 Computer and information systems managers	50	50	100	28%
0911 Manufacturing managers	980	930	1,920	38%
1121 Human resources professionals	100	90	190	30%
1521 Shippers and receivers	480	460	940	36%
1523 Production logistics co-ordinators	140	140	280	35%
2132 Mechanical engineers	520	490	1,010	31%
2133 Electrical and electronics engineers	280	270	550	40%
2141 Industrial and manufacturing engineers	270	250	520	32%
2142 Metallurgical and materials engineers	20	20	40	29%
2147 Computer engineers (except software engineers and designers)	50	50	110	39%
2171 Information systems analysts and consultants	120	120	240	33%
2172 Database analysts and data administrators	20	20	40	40%
2173 Software engineers and designers	70	60	130	30%
2174 Computer programmers and interactive media developers	60	50	110	23%
2232 Mechanical engineering technologists and technicians	190	170	360	31%
2233 Industrial engineering and manufacturing technologists and technicians	230	220	440	33%
2241 Electrical and electronics engineering technologists and technicians	250	250	500	43%

2243 Industrial instrument technicians and mechanics	20	20	40	53%
2281 Computer network technicians	40	40	80	23%
2283 Information systems testing technicians	10	10	10	40%
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	110	110	220	35%
7231 Machinists and machining and tooling inspectors	640	610	1,250	41%
7232 Tool and die makers	630	610	1,250	45%
7237 Welders and related machine operators	720	680	1,400	36%
7241 Electricians (except industrial and power system)	50	50	110	45%
7242 Industrial electricians	410	400	810	44%
7301 Contractors and supervisors, mechanic trades	50	50	100	38%
7311 Construction millwrights and industrial mechanics	750	730	1,470	45%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	330	310	640	34%
7452 Material handlers	1,210	1,150	2,350	34%
7511 Transport truck drivers	160	160	320	38%
9221 Supervisors, motor vehicle assembling	630	620	1,250	31%
9222 Supervisors, electronics manufacturing	40	40	70	47%
9223 Supervisors, electrical products manufacturing	30	30	60	56%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	60	60	120	35%
9227 Supervisors, other products manufacturing and assembly	40	40	70	44%
9412 Foundry workers	150	150	300	39%
9416 Metalworking and forging machine operators	460	430	890	37%
9417 Machining tool operators	360	350	710	37%
9422 Plastics processing machine operators	470	450	920	32%
9522 Motor vehicle assemblers, inspectors and testers	7,430	7,050	14,490	33%
9523 Electronics assemblers, fabricators, inspectors and testers	440	430	870	52%
9526 Mechanical assemblers and inspectors	190	180	370	33%
9535 Plastic products assemblers, finishers and inspectors	300	290	600	34%
9536 Industrial painters, coaters and metal finishing process operators	350	340	690	32%
9619 Other labourers in processing, manufacturing and utilities	670	630	1,290	35%
Other occupations	7,970	7,550	15,520	35%

TABLE 16. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	5,330	6,230	11,560	7%
0016 Senior managers - construction, transportation, production and utilities	<10	10	10	1%
0211 Engineering managers	<10	<10	10	1%
0213 Computer and information systems managers	<10	10	10	3%
0911 Manufacturing managers	50	60	110	2%

1121 Human resources professionals	20	30	50	8%
1521 Shippers and receivers	60	70	130	5%
1523 Production logistics co-ordinators	20	20	40	5%
2132 Mechanical engineers	130	160	290	9%
2133 Electrical and electronics engineers	50	60	110	8%
2141 Industrial and manufacturing engineers	40	50	90	5%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	10	10	10	5%
2171 Information systems analysts and consultants	10	20	30	4%
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	10	20	30	6%
2174 Computer programmers and interactive media developers	20	20	40	7%
2232 Mechanical engineering technologists and technicians	80	90	170	14%
2233 Industrial engineering and manufacturing technologists and technicians	50	60	100	8%
2241 Electrical and electronics engineering technologists and technicians	40	50	100	8%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	10	10	10	4%
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	2%
7231 Machinists and machining and tooling inspectors	80	90	170	6%
7232 Tool and die makers	40	40	80	3%
7237 Welders and related machine operators	170	190	360	9%
7241 Electricians (except industrial and power system)	10	10	20	8%
7242 Industrial electricians	20	20	40	2%
7301 Contractors and supervisors, mechanic trades	10	10	10	4%
7311 Construction millwrights and industrial mechanics	70	80	150	5%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	60	70	130	7%
7452 Material handlers	210	240	450	7%
7511 Transport truck drivers	10	10	30	3%
9221 Supervisors, motor vehicle assembling	60	70	140	3%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	10	6%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	10	4%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	20	30	50	6%
9416 Metalworking and forging machine operators	80	100	180	8%
9417 Machining tool operators	50	60	120	6%
9422 Plastics processing machine operators	90	100	200	7%
9522 Motor vehicle assemblers, inspectors and testers	1,880	2,200	4,080	9%
9523 Electronics assemblers, fabricators, inspectors and testers	40	50	90	5%

9526 Mechanical assemblers and inspectors	50	50	100	9%
9535 Plastic products assemblers, finishers and inspectors	80	90	180	10%
9536 Industrial painters, coaters and metal finishing process operators	70	80	160	7%
9619 Other labourers in processing, manufacturing and utilities	190	230	420	11%
Other occupations	1,430	1,660	3,090	7%

TABLE 17. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	23,690	21,430	45,120	28%
0016 Senior managers - construction, transportation, production and utilities	330	330	660	55%
0211 Engineering managers	140	130	270	36%
0213 Computer and information systems managers	50	40	90	25%
0911 Manufacturing managers	930	880	1,810	35%
1121 Human resources professionals	70	60	140	22%
1521 Shippers and receivers	420	390	810	31%
1523 Production logistics co-ordinators	120	110	240	30%
2132 Mechanical engineers	390	340	730	22%
2133 Electrical and electronics engineers	230	210	450	32%
2141 Industrial and manufacturing engineers	230	210	440	27%
2142 Metallurgical and materials engineers	20	20	30	26%
2147 Computer engineers (except software engineers and designers)	50	40	90	34%
2171 Information systems analysts and consultants	110	100	210	28%
2172 Database analysts and data administrators	20	20	40	39%
2173 Software engineers and designers	50	50	100	23%
2174 Computer programmers and interactive media developers	40	30	80	15%
2232 Mechanical engineering technologists and technicians	110	80	190	16%
2233 Industrial engineering and manufacturing technologists and technicians	180	160	340	26%
2241 Electrical and electronics engineering technologists and technicians	210	190	400	35%
2243 Industrial instrument technicians and mechanics	20	20	30	50%
2281 Computer network technicians	40	30	70	20%
2283 Information systems testing technicians	10	<10	10	29%
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	100	100	200	32%
7231 Machinists and machining and tooling inspectors	560	520	1,080	36%
7232 Tool and die makers	600	570	1,170	42%
7237 Welders and related machine operators	550	490	1,040	26%
7241 Electricians (except industrial and power system)	40	40	90	37%
7242 Industrial electricians	390	380	760	42%
7301 Contractors and supervisors, mechanic trades	40	40	90	33%

7311 Construction millwrights and industrial mechanics	680	650	1,330	41%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	270	250	510	27%
7452 Material handlers	1,000	910	1,900	28%
7511 Transport truck drivers	150	150	300	35%
9221 Supervisors, motor vehicle assembling	570	550	1,110	28%
9222 Supervisors, electronics manufacturing	40	30	70	45%
9223 Supervisors, electrical products manufacturing	30	20	50	50%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	60	50	110	31%
9227 Supervisors, other products manufacturing and assembly	40	30	70	42%
9412 Foundry workers	130	120	250	33%
9416 Metalworking and forging machine operators	380	340	710	30%
9417 Machining tool operators	310	280	590	31%
9422 Plastics processing machine operators	380	340	720	25%
9522 Motor vehicle assemblers, inspectors and testers	5,560	4,850	10,410	24%
9523 Electronics assemblers, fabricators, inspectors and testers	400	380	780	47%
9526 Mechanical assemblers and inspectors	140	130	270	24%
9535 Plastic products assemblers, finishers and inspectors	220	200	420	24%
9536 Industrial painters, coaters and metal finishing process operators	280	260	540	25%
9619 Other labourers in processing, manufacturing and utilities	470	400	870	24%
Other occupations	6,550	5,920	12,470	28%

TABLE 18. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	10,900	10,830	21,720	14%
0016 Senior managers - construction, transportation, production and utilities	210	210	420	35%
0211 Engineering managers	50	50	100	14%
0213 Computer and information systems managers	10	10	20	6%
0911 Manufacturing managers	420	420	840	16%
1121 Human resources professionals	20	20	50	7%
1521 Shippers and receivers	230	220	460	17%
1523 Production logistics co-ordinators	60	50	110	14%
2132 Mechanical engineers	120	130	250	8%
2133 Electrical and electronics engineers	110	100	210	15%
2141 Industrial and manufacturing engineers	80	80	150	9%
2142 Metallurgical and materials engineers	10	10	20	11%
2147 Computer engineers (except software engineers and designers)	20	20	40	15%
2171 Information systems analysts and consultants	40	40	80	11%
2172 Database analysts and data administrators	10	10	20	16%

2173 Software engineers and designers	10	10	30	6%
2174 Computer programmers and interactive media developers	10	<10	10	2%
2232 Mechanical engineering technologists and technicians	60	60	110	10%
2233 Industrial engineering and manufacturing technologists and technicians	90	80	170	13%
2241 Electrical and electronics engineering technologists and technicians	110	110	220	19%
2243 Industrial instrument technicians and mechanics	10	10	20	28%
2281 Computer network technicians	10	10	10	3%
2283 Information systems testing technicians	<10	<10	10	18%
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	60	60	110	18%
7231 Machinists and machining and tooling inspectors	380	370	740	25%
7232 Tool and die makers	330	330	660	24%
7237 Welders and related machine operators	300	300	600	15%
7241 Electricians (except industrial and power system)	30	30	50	21%
7242 Industrial electricians	160	160	320	17%
7301 Contractors and supervisors, mechanic trades	20	20	40	15%
7311 Construction millwrights and industrial mechanics	380	370	750	23%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	110	110	210	11%
7452 Material handlers	430	430	860	13%
7511 Transport truck drivers	80	80	160	19%
9221 Supervisors, motor vehicle assembling	<10	<10	<10	N/A
9222 Supervisors, electronics manufacturing	20	20	30	20%
9223 Supervisors, electrical products manufacturing	20	20	30	35%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	30	30	60	16%
9227 Supervisors, other products manufacturing and assembly	20	20	40	24%
9412 Foundry workers	100	100	200	26%
9416 Metalworking and forging machine operators	210	210	420	18%
9417 Machining tool operators	170	170	340	18%
9422 Plastics processing machine operators	260	250	520	18%
9522 Motor vehicle assemblers, inspectors and testers	1,580	1,700	3,280	7%
9523 Electronics assemblers, fabricators, inspectors and testers	220	210	420	25%
9526 Mechanical assemblers and inspectors	40	40	80	7%
9535 Plastic products assemblers, finishers and inspectors	190	180	370	21%
9536 Industrial painters, coaters and metal finishing process operators	80	80	160	7%
9619 Other labourers in processing, manufacturing and utilities	280	270	550	15%
Other occupations	3,790	3,670	7,450	17%

TABLE 19. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	4,580	3,640	8,230	5%
0016 Senior managers - construction, transportation, production and utilities	<10	<10	10	1%
0211 Engineering managers	<10	<10	10	1%
0213 Computer and information systems managers	<10	<10	10	2%
0911 Manufacturing managers	40	30	80	2%
1121 Human resources professionals	20	20	30	6%
1521 Shippers and receivers	50	40	100	4%
1523 Production logistics co-ordinators	20	10	30	4%
2132 Mechanical engineers	110	90	200	6%
2133 Electrical and electronics engineers	40	30	70	5%
2141 Industrial and manufacturing engineers	30	30	60	4%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	10	<10	10	3%
2171 Information systems analysts and consultants	10	10	20	3%
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	10	10	20	4%
2174 Computer programmers and interactive media developers	10	10	30	5%
2232 Mechanical engineering technologists and technicians	70	50	120	10%
2233 Industrial engineering and manufacturing technologists and technicians	40	30	70	5%
2241 Electrical and electronics engineering technologists and technicians	40	30	70	6%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	10	<10	10	3%
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	2%
7231 Machinists and machining and tooling inspectors	70	60	120	4%
7232 Tool and die makers	30	30	60	2%
7237 Welders and related machine operators	140	110	260	7%
7241 Electricians (except industrial and power system)	10	10	10	6%
7242 Industrial electricians	20	10	30	2%
7301 Contractors and supervisors, mechanic trades	<10	<10	10	3%
7311 Construction millwrights and industrial mechanics	60	50	100	3%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	50	40	90	5%
7452 Material handlers	180	140	320	5%
7511 Transport truck drivers	10	10	20	2%
9221 Supervisors, motor vehicle assembling	50	40	90	2%
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	3%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	20	20	40	5%
9416 Metalworking and forging machine operators	70	60	130	5%
9417 Machining tool operators	50	40	80	4%
9422 Plastics processing machine operators	80	60	140	5%
9522 Motor vehicle assemblers, inspectors and testers	1,600	1,270	2,870	7%
9523 Electronics assemblers, fabricators, inspectors and testers	30	30	60	4%
9526 Mechanical assemblers and inspectors	40	30	70	6%
9535 Plastic products assemblers, finishers and inspectors	70	60	130	7%
9536 Industrial painters, coaters and metal finishing process operators	60	50	110	5%
9619 Other labourers in processing, manufacturing and utilities	170	130	300	8%
Other occupations	1,240	990	2,220	5%

TABLE 20. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	6,310	7,180	13,500	8%
0016 Senior managers - construction, transportation, production and utilities	210	200	410	34%
0211 Engineering managers	50	50	100	14%
0213 Computer and information systems managers	10	10	20	4%
0911 Manufacturing managers	380	380	760	15%
1121 Human resources professionals	<10	10	10	2%
1521 Shippers and receivers	180	180	360	14%
1523 Production logistics co-ordinators	40	40	80	10%
2132 Mechanical engineers	10	40	50	1%
2133 Electrical and electronics engineers	60	70	130	10%
2141 Industrial and manufacturing engineers	40	50	90	6%
2142 Metallurgical and materials engineers	10	10	10	9%
2147 Computer engineers (except software engineers and designers)	10	20	30	11%
2171 Information systems analysts and consultants	30	30	60	8%
2172 Database analysts and data administrators	10	10	20	16%
2173 Software engineers and designers	<10	<10	10	2%
2174 Computer programmers and interactive media developers	<10	<10	<10	N/A
2232 Mechanical engineering technologists and technicians	<10	<10	<10	N/A
2233 Industrial engineering and manufacturing technologists and technicians	50	50	100	7%

2241 Electrical and electronics engineering technologists and technicians	70	80	150	13%
2243 Industrial instrument technicians and mechanics	10	10	20	26%
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	50	50	100	16%
7231 Machinists and machining and tooling inspectors	310	310	620	21%
7232 Tool and die makers	300	300	600	22%
7237 Welders and related machine operators	160	180	350	9%
7241 Electricians (except industrial and power system)	20	20	40	16%
7242 Industrial electricians	140	140	290	16%
7301 Contractors and supervisors, mechanic trades	20	20	30	12%
7311 Construction millwrights and industrial mechanics	320	330	640	20%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	50	70	120	6%
7452 Material handlers	250	290	540	8%
7511 Transport truck drivers	70	70	140	17%
9221 Supervisors, motor vehicle assembling	<10	<10	<10	N/A
9222 Supervisors, electronics manufacturing	20	10	30	19%
9223 Supervisors, electrical products manufacturing	20	20	30	31%
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	20	20	50	14%
9227 Supervisors, other products manufacturing and assembly	20	20	40	23%
9412 Foundry workers	80	80	160	21%
9416 Metalworking and forging machine operators	140	150	290	12%
9417 Machining tool operators	130	130	260	14%
9422 Plastics processing machine operators	180	190	370	13%
9522 Motor vehicle assemblers, inspectors and testers	<10	430	410	1%
9523 Electronics assemblers, fabricators, inspectors and testers	180	180	360	22%
9526 Mechanical assemblers and inspectors	<10	10	10	1%
9535 Plastic products assemblers, finishers and inspectors	120	120	240	13%
9536 Industrial painters, coaters and metal finishing process operators	20	30	50	2%
9619 Other labourers in processing, manufacturing and utilities	110	140	250	7%
Other occupations	2,560	2,680	5,250	12%