Talent Strategy & Roadmap

for Ontario's Automotive and Mobility Sector

OVIN

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Ontario

Contents

Foreword

The Ontario Vehicle Innovation Network (OVIN) is Ontario's flagship initiative to ensure our province leads the future of the automotive and mobility sector through connected, autonomous and electric vehicles, and new mobility technologies. OVIN represents a commitment of $56.4 million and is part of an overall investment of $141 million since 2017 from the Government of Ontario targeting Ontario's automotive and mobility cluster, with support for post-secondary, government, private and public sector stakeholders.

Across the sector globally, an unprecedented transformation is occurring as new technologies are making it safer, smarter and cleaner to move people and goods. Not only is the need to keep pace with these rapidly evolving technologies critical to Ontario's economic success, but the skills required to keep pace are also a key priority; without the talent to work with these advanced technologies, our industry would not be able to thrive.

That is why I'm so excited for the launch of this Talent Strategy & Roadmap and the opportunity to secure Ontario's foothold in this space. The program ensures that Ontario's automotive and mobility cluster will ensure our workforce continues to compete globally, create valuable new products and deliver ongoing commercial success, both now and into the future. As we move forward to implement this strategy, OVIN and its partners will continue to support the futureproofing of our automotive and mobility sector by strengthening and diversifying the next generation of talent pipeline, while building critical capacity within all regions of Ontario.

Join us as we drive into Ontario's connected, autonomous and electric future.

Raed Kadri
Head of OVIN

Foreword

The Ministry of Labour, Training and Skills Development has committed to clear priorities: to help people adjust to changes in the economy, retrain and find work, offer resources for career exploration and education planning, support employers and workers interested in hiring and training for skilled trades and apprenticeship careers, and promote skilled immigration to attract international talent needs towards Ontario's economy.

This means supporting the existing and future workforce of Ontario and providing these workers with the resources and opportunities they need to grow and thrive in meaningful and financially sustainable careers.

Among Ontario's most opportunity-rich industries for sustainable career growth is Ontario's automotive and mobility sector. Currently, this industry is facing significant transformations due to the development of advanced automotive technologies and innovative mobility services. In turn, companies and recruiters are facing a significant challenge in preparing to acquire and retain qualified talent. As the sector evolves, a skilled future workforce will be a major focus and enabler to meet these emerging needs. Keeping our talent up-to-date and at the leading-edge of technology will ensure that our industry remains competitive and vibrant for years to come.

That is why I'm proud to announce the creation of this Talent Strategy & Roadmap along with the complementary Skills & Career Navigator tool developed by OVIN. Both the Strategy & Roadmap, and the Skills & Career Navigator platform will ultimately enhance Ontario's capacity to contribute to the growth of Ontario's automotive and mobility ecosystem, and ensure the province's position as an industry leader is secured through the investment in our existing and future talent.

Going forward, our Ministry will work closely with OVIN and the automotive and mobility sector along with key ecosystem stakeholders in research, academia, government, industry and the broader public on the long-term priorities identified in this strategy. We are here to ensure that Ontario continues to advance its leadership position by doubling down on our workforce.

As you read this document, ask how you can contribute to its implementation. Our government looks forward to working with you.

Monte McNaughton
Minister of Labour, Training and Skills Development

Foreword

New and emerging transportation technologies have the potential to change the way we move, making our roads safer, more efficient and environmentally friendly.

Through innovative pilot programs for testing the next generation of electric, connected, autonomous and mobility technologies, our government is boosting Ontario's competitiveness in the automotive sector and solidifying our role as a world leader in automotive manufacturing and innovation.

The Talent Strategy & Roadmap for the Automotive and Mobility Sector will drive collaboration between industry, training institutions and government as we strengthen and diversify the pool of talented workers who will help design and create the next generation of transportation technologies.

Caroline Mulroney
Minister of Transportation

Our government understands that when the automotive sector succeeds, all of Ontario succeeds. This is our chance to embrace new transportation technologies as part of Ontario's plan for growth, renewal, and economic prosperity. Working together, we will build a more resilient and sustainable transportation system that encourages innovation and supports economic growth.

Foreword

Ontario's number one advantage is its people. Some of the best and brightest minds choose to call Ontario their home. They are innovative, collaborative and their generosity to others is what is helping us get through this global pandemic. In what we like to call the Ontario Spirit, the province has made incredible achievements that position us as a North American leader in the automotive and technology sectors.

Ontario is home to over 300 companies and organizations pioneering connected and autonomous vehicle technologies. Our auto ecosystem is now further strengthened by the Ontario Vehicle Innovation Network (OVIN), which connects the province's world-leading auto-tech sector, high-quality post-secondary institutions, first-class talent and regional infrastructure to foster innovation and entrepreneurship.

In 2019, our government announced Driving Prosperity: a 10-year plan that set the foundation for growth in Ontario's innovative auto sector, its workers, and the families and communities it supports.

The recently launched Phase 2 of that ambitious plan underscores our government's continued commitment help grow Ontario's auto sector and secure new investments in electric vehicles and battery manufacturing and position Ontario as a North American automotive innovation hub.

OVIN's Talent Talent Strategy & Roadmap is part of that plan. Along with its complementary Skills & Career Navigator platform, businesses and workers can navigate through our vibrant automotive talent assets quickly and easily to capitalize on new opportunities that will accelerate innovation and growth within the sector.

Our government is proud to support the work of OVIN, including this new strategy and platform to encourage collaboration between small and medium-sized enterprises, academia, the auto industry and the battery sector, including critical minerals development in Northern Ontario. This will ensure stakeholders in the automotive and associated sectors across the province have the talent they need to build the next generation of vehicles.

As our government works to lay the foundation for our economic recovery from COVID-19, we will continue to build collaborative partnerships to keep the auto industry at the forefront of innovation, jobs and exports for years to come.

Victor Fedeli
Minister of Economic Development, Job Creation and Trade

Acknowledgements

The Talent Strategy & Roadmap was developed by the Ontario Vehicle Innovation Network (OVIN), in close collaboration with partners across Ontario's automotive and mobility ecosystem.

OVIN recognizes the tremendous support of the Government of Ontario, in particular, the contributions from the Ministry of Labour, Training and Skills Development, the Ministry of Economic Development, Job Creation and Trade, the Ministry of Transportation and the Ministry of Education for providing their time, insight, and overall project oversight in establishing this forward-looking plan.

As a key project partner, Invest Ottawa has been of immense support by offering rich insights from in-depth research and analysis into the Connected and Autonomous Vehicles (C/AV) segment of the sector, leading the development of a C/AV Talent Strategy and managing a successful C/AV Talent Catalyst pilot initiative, all of which provided central insights to better inform this broader Strategy.

A debt of gratitude is also owed to the project's key industry supporters; the Auto Parts Manufacturers' Association (APMA), the Canadian Association of Mold Makers (CAMM) and the Global Automakers of Canada (GAC), who contributed valuable feedback, ideas and support, particularly by providing insights on key segments of Ontario's automotive and mobility sector.

We would also like to extend a sincere thanks to all individuals, leaders and organizations that contributed to this project through participation in stakeholder discussions, roundtables, and interviews. Research under this project included input from Ontario post-secondary institutions, educational and training institutions, non-profit organizations, and key industry representatives including automotive, smart mobility, and technology representatives from industry across North America.

Executive Summary

Executive Summary

Ontario has a proud history of more than 100 years of leadership in the automotive manufacturing and supply industry. Ontario is the only Canadian province that builds cars and trucks and is the only subnational jurisdiction in the world with five automotive Original Equipment Manufacturers (OEMs).

The province has one of the most comprehensive automotive clusters globally, with a rapidly growing regional innovation corridor. In Ontario, more than 200 companies develop automotive and smart mobility technologies (e.g., related to connected and autonomous vehicles) to support the enhanced movement of people and things, such as GM, Ford, Google, Uber, Apple, and BlackBerry QNX.[1] This document refers to the ecosystem that supports the enhanced movement of people and things as the automotive and mobility sector, which consists of a mix of stakeholder groups including post-secondary institutions, private training institutions, not-for-profits, and industry and industry associations.

The automotive and mobility sector plays a pivotal role in society, enabling geographic connectivity, and offering an integrated mobility network that helps individuals commute to work and spend time with their family and friends. The sector is also foundational to the provincial and national economy — by moving goods and services to market, it not only ensures that people can access the products they need everyday, but also drives economic and labour market activity and creates sustainable, well-paying jobs across the province.

The automotive and mobility sector is changing quickly due to factors like technological advancement, shifting consumer behaviour, new business models, and the transition to a low-carbon economy. The associated talent base and future of work are also experiencing immense transformation, accelerated by the COVID-19 pandemic. Global competition for top tech talent is intensifying with the rise of an increasingly virtual, flexible, and productive workforce that is less bound than ever to a single location, function, or career path. This creates significant opportunity and risk for Ontario, underscoring the need for a broader talent strategy, action plan, and investment.
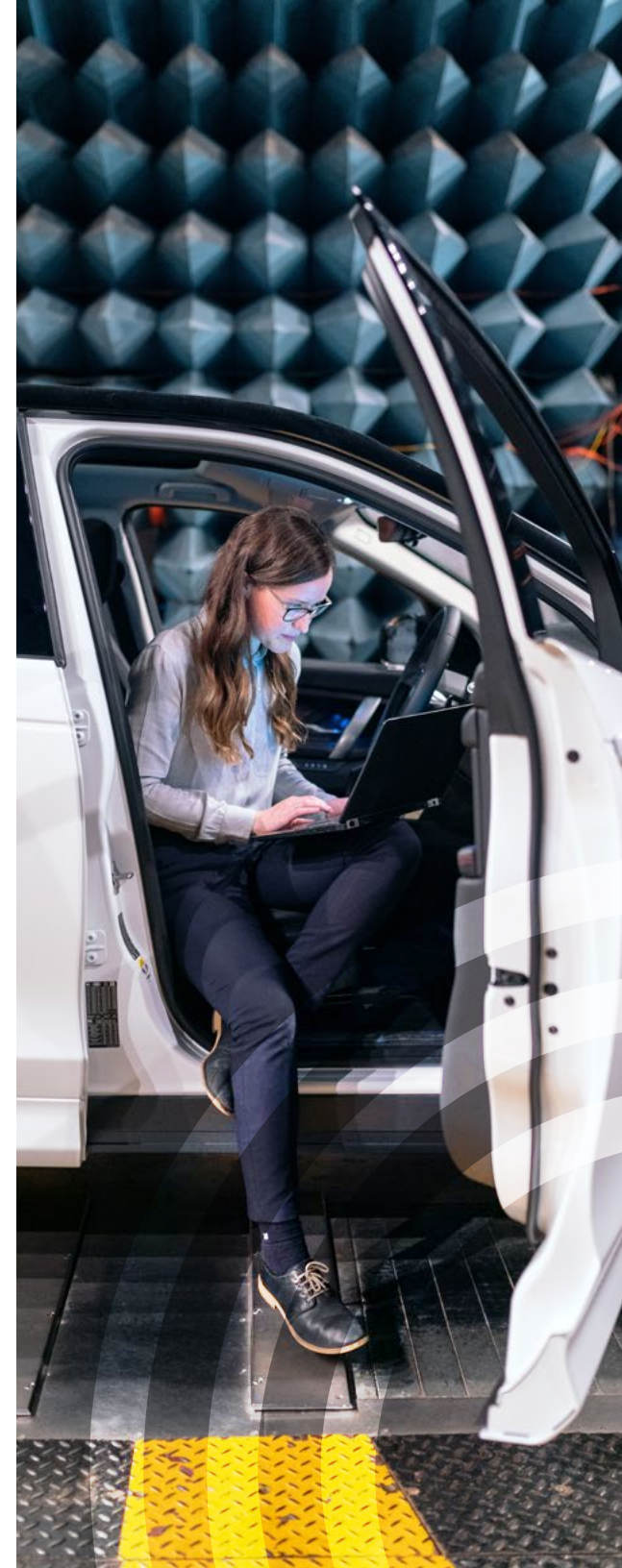
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[1] Government of Ontario. (2021). *Driving Prosperity: The Future of Ontario's Automotive Sector.*
Retrieved from: **https://www.ontario.ca/page/driving-prosperity-future-ontarios-automotive-sector.**

To lead the automotive and mobility sector through ongoing shifts and build on the success of Ontario's Autonomous Vehicle Innovation Network (AVIN), the Ontario Vehicle Innovation Network (OVIN) was announced in Ontario's Budget 2021. OVIN, an initiative of the Government of Ontario and led by the Ontario Centre of Innovation (OCI), works to:

- Foster the commercialization of Ontario-made advanced automotive technologies and smart mobility solutions;

- Showcase Ontario as the leader in the development, testing, piloting and adoption of the latest transportation and infrastructure technologies;

- Drive innovation and collaboration among the growing network of stakeholders at the convergence of automotive and technology;

- Leverage and retain Ontario's highly skilled talent; and

- Harness Ontario's regional strengths and capabilities and support its clusters of automotive and technology.

Of central focus to OVIN is talent development, and this Talent Strategy & Roadmap has been developed to ensure that Ontario's automotive and mobility sector remains globally competitive and continues to grow and thrive within the context of the sector's transformation. Specifically, the document aims to support the following 2030 vision for Ontario's automotive and mobility sector workforce:

2030 Vision
for Ontario's Automotive and Mobility Workforce:

Ontario's automotive and mobility sector has a highly skilled, adaptable, and diverse workforce reinforced by a global leading network that provides tailored and responsive initiatives that meet the evolving needs of the workforce.

This document highlights four objectives and nine initiatives to grow and prepare Ontario's automotive and mobility workforce for the future of the sector as it undergoes transformation, promote Ontario's automotive and mobility sector as a leader in the global automotive and mobility industry, and support the competitiveness of the sector:

Executive Summary
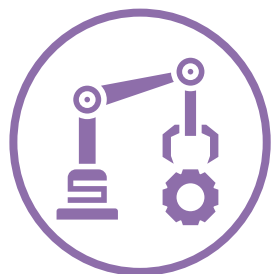
Objective 1

Collaboration & Coordination Across the Province: Strengthen collaboration and coordination between industry, educational and training institutions, and government to support responsive skills planning and development for tomorrow's workforce needs. Leverage the regional strengths of local economies to cultivate a complementary and coordinated approach to talent development and availability across Ontario.

Initiative 1: Launch an Automotive & Mobility Curriculum Collaboration Committee for the automotive and mobility sector to support proactive curriculum development that reflects the rapidly evolving industry, and its corresponding talent and critical skills needs and requirements.

Initiative 2: Leverage existing automotive and mobility clusters to provide targeted skills and talent support and engage with areas outside of these clusters to enhance regional integration.
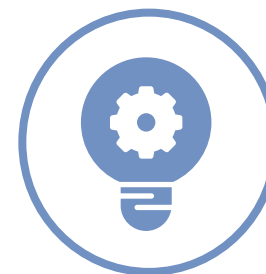
Objective 2

Talent Sourcing & Attraction: Continue building a strong, agile, and diversified talent pool in Ontario with the right skills for the sector now, and into the future through talent identification and engagement.

Initiative 3: Enhance industry's engagement with elementary, secondary, and post-secondary students to support greater awareness of automotive and mobility sector career opportunities and reduce stigmas associated with working in the sector.

Initiative 4: Support the identification, attraction, and redeployment of talent from other sectors and jurisdictions that possess the transferrable skills needed in Ontario's automotive and mobility sector.

Objective 3

Workforce Development & Retention: Support Ontario's workforce to adapt and advance their skills and knowledge to the pace and scale of the automotive and mobility sector's transformation.

Initiative 5: Elevate awareness of and enhance work-integrated learning (WIL) opportunities within the automotive and mobility sector based on the needs of students, faculty, and employers.

Initiative 6: Provide a digital Upskilling Platform through which Ontario's talent can access short-term courses, micro-credentials, and learning resources developed by educational institutions and industry and understand how to upgrade their skillset to match those required for available jobs.

Initiative 7: Use knowledge about the transformation of the automotive and mobility sector to inform the development and continued evolution of a Reskilling Framework for the sector and the design of responsive programs and initiatives to support worker reskilling.

Objective 4

Equity, Diversity, & Inclusion (EDI): Support groups who experience barriers to entry to enter the automotive and mobility sector and enable industry access to diverse talent.

Initiative 8: Develop an EDI Advisory Committee for the sector to support the coordination and development of EDI-related initiatives, programs, and opportunities to ensure representative guidance and support for the automotive and mobility industry as it strives to achieve increased equity, diversity, and inclusion.

Initiative 9: Collaborate with underrepresented communities to evaluate existing programs (e.g., related to talent attraction, learning and development) and develop approaches to program and initiative co-design to address community-specific barriers. Ensure that intersectional identities are appropriately represented and acknowledged in the design of EDI-related initiatives.

Objectives and initiatives were developed through extensive research, including (but not limited to) more than 175 stakeholder interviews and consultations with industry, academia, government, and the broader public sector, labour market analysis, and pilot implementation and evaluation. Objectives and priorities are not intended to exist in isolation and have instead been designed to complement and elevate one another. As such, this Talent Strategy & Roadmap should be considered in its totality.

The Talent Strategy & Roadmap was developed to support OVIN's partners in industry, academia, government, and the broader public sector as they work together to recruit, retain, grow, and diversify the talent that positions Ontario at the forefront of the global automotive and mobility sector.

The Talent Strategy & Roadmap builds upon strong existing partnerships within Ontario's automotive and mobility ecosystem and identifies new areas in which to foster collaboration across the province.

Executive Summary

OVIN and the Talent Strategy & Roadmap
Background

The Ontario Vehicle Innovation Network (OVIN) is a Government of Ontario initiative led by the Ontario Centre of Innovation (OCI). OVIN represents Ontario's $56.4 million investment in accelerating the development of the next generation of electric, connected, and autonomous vehicle and mobility technologies that was announced in the **2021 Ontario Budget: Ontario's Action Plan — Protecting People's Health and Our Economy**.

Building on the momentum generated by Ontario's $85 million investment in the Autonomous Vehicle Innovation Network (AVIN), OVIN capitalizes on the economic potential of automotive technologies and smart mobility solutions.

03
Drive innovation and collaboration among the growing network of stakeholders at the convergence of automotive and technology.

02
Showcase Ontario as the leader in the development, testing, piloting and adoption of the latest transportation and infrastructure technologies.

04
Leverage and retain Ontario's highly skilled talent.

01
Foster the commercialization of Ontario-made advanced automotive technologies and smart mobility solutions.

05
Harness Ontario's regional strengths and capabilities and support its clusters of automotive and technology.

OVIN brings knowledge, expertise, and thought leadership to the sector and has 5 main objectives

Background

OVIN is a key part of Ontario's **Driving Prosperity: The Future of Ontario's Automotive Sector** initiative, specifically the Talent Pillar for Action.

OVIN's programs support small- and medium-sized enterprises (SMEs) to develop, test, and commercialize new automotive and transportation products and technologies, and cultivate the capacity of a province-wide network to drive future mobility solutions, reinforcing Ontario's position as a global leader. The OVIN Central Hub is the driving force behind programming, province-wide 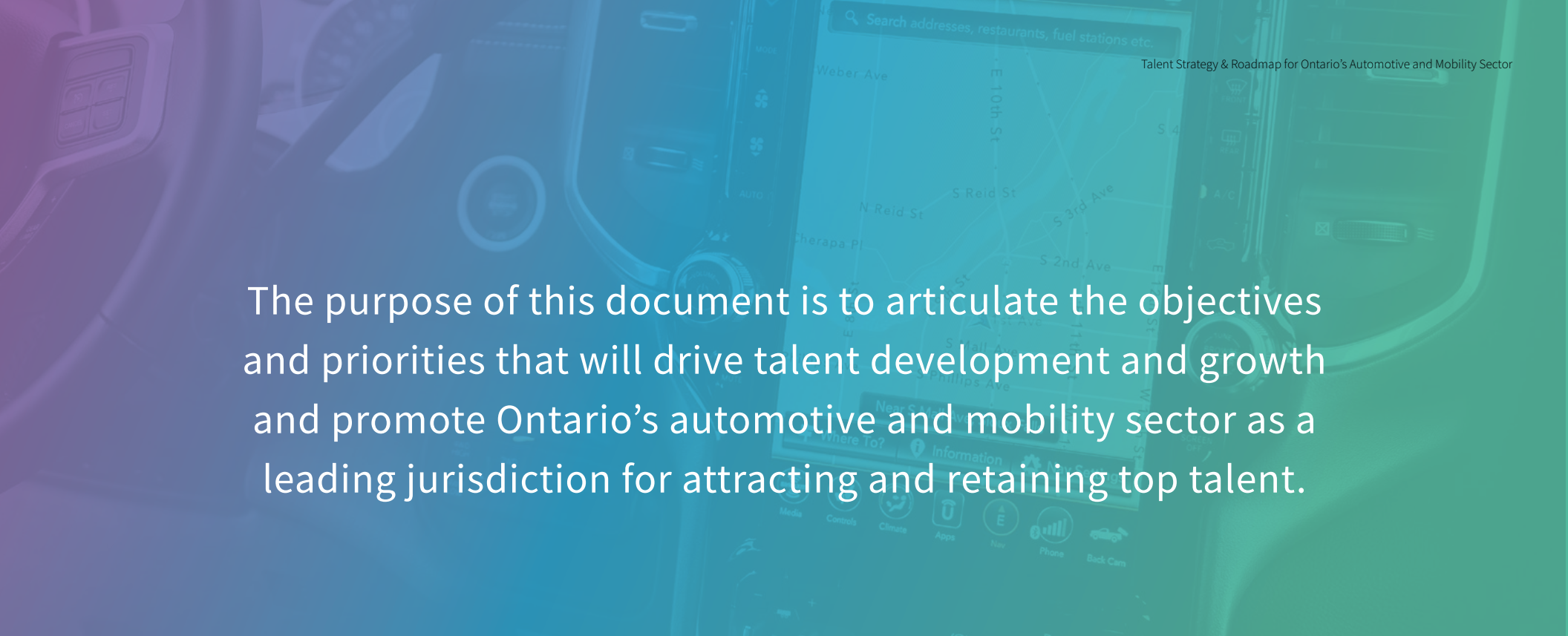coordination of activities and resources, and Ontario's push to lead in the future of the automotive and mobility sector globally. Talent development is of central focus to OVIN and this Talent Strategy & Roadmap will ensure that Ontario's automotive and mobility sector remains competitive and continues to grow and thrive.

This document sets out OVIN's Talent Strategy & Roadmap for Ontario's automotive and mobility sector from 2021 to 2030, covering the following six sector segments*:

Six Sector Segments

- Connected and Autonomous Vehicles (C/AV)
- Auto and Parts Manufacturing
- Aftermarket, Maintenance, and Repair
- Freight and Goods Movement
- Mobility Planning and Infrastructure
- Tool, Die, and Mold
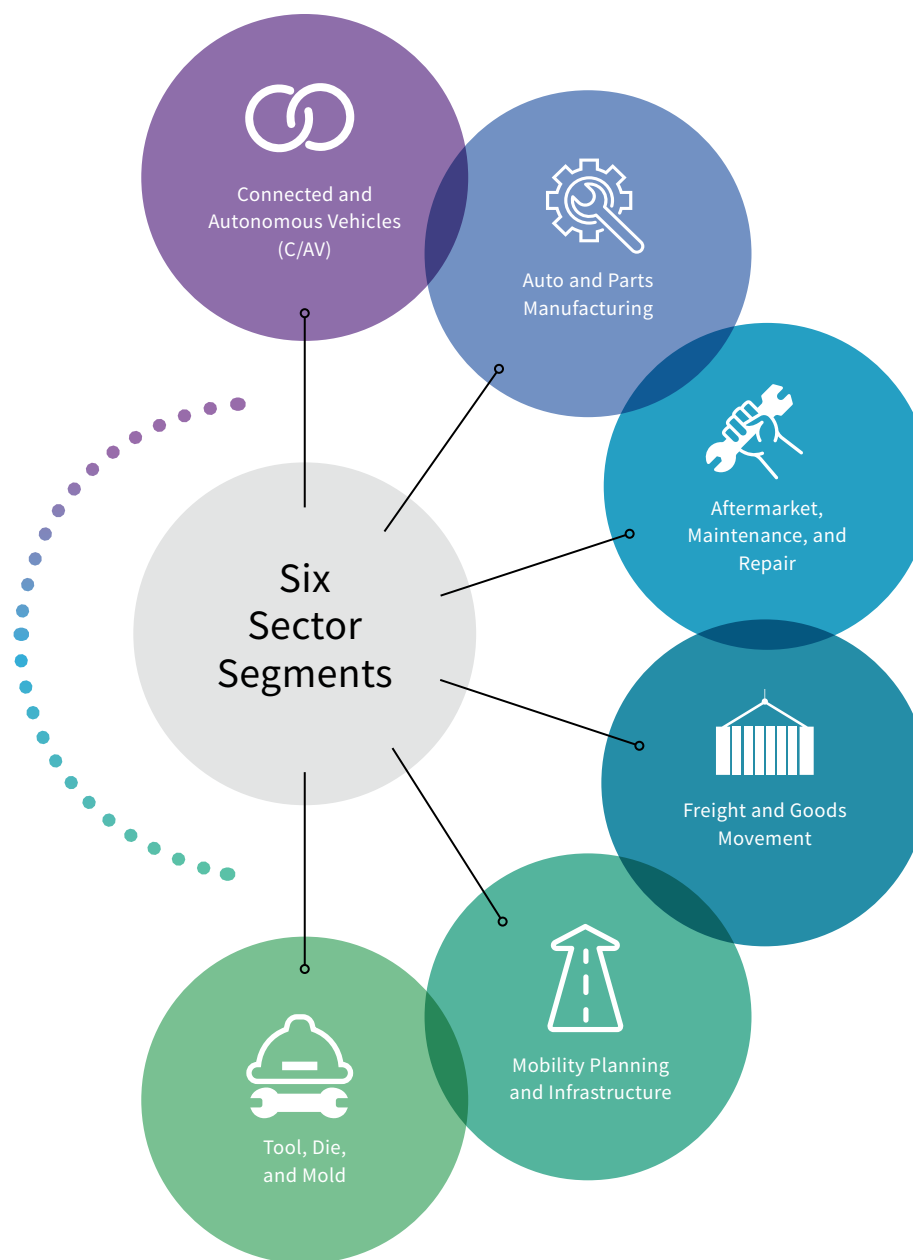
* Electric vehicles and lightweighting to be included in the next version of Ontario's Talent Strategy & Roadmap for the Automotive and Mobility Sector.

The purpose of this document is to articulate the objectives and priorities that will drive talent development and growth and promote Ontario's automotive and mobility sector as a leading jurisdiction for attracting and retaining top talent.

The Talent Strategy & Roadmap also supports the long-term objectives of Ontario's Ministry of Transportation, including enabling economic opportunity, improving safety and preparing for the future, as outlined in its regional transportation plans.

This work is also made possible by the Ministry of Labour, Training and Skills Development (MLTSD). Through OVIN, there will continue to be a focus on skills, talent , and workforce development in collaboration with partners going forward, as these focus areas are integral components of the broader OVIN initiative.

Because the Talent Strategy & Roadmap spans until 2030, the document will undergo periodic reviews to ensure objectives and initiatives continuously reflect the changing skills and talent landscape in Ontario. Province-wide collaboration is critical to the success of this Talent Strategy & Roadmap. Ontario has

developed a rich ecosystem of automotive and mobility partners across the province, particularly through **Regional Technology Development Sites** (RTDS) that harness Ontario's clusters of innovation and its regional strengths and capabilities to support SMEs in accelerating innovation and the commercialization of made-in-Ontario mobility solutions. This Talent Strategy & Roadmap builds upon strong partnerships already underway and identifies new areas across which to foster provincial collaboration. It is intended for stakeholders in industry, academia, government, and the broader public sector as they work together to recruit, retain, and grow the talent that positions Ontario at the forefront of the global automotive and mobility sector.

Approach and Methodology

The Talent Strategy & Roadmap was developed through a review, assessment, and prioritization of a comprehensive set of inputs, including:

Primary research

Over 175 consultations and interviews, conducted in partnership with Invest Ottawa, with industry, academia, government, and the broader public sector.

Secondary research

Literature reviews, leading practice identification, environmental scanning, and labour market analysis. These inputs build upon extensive research efforts, including various **reports** and other publications produced through OVIN.

Pilot research

Lessons learned and insights derived from OVIN-led pilots and pilots led by Invest Ottawa.

For example, feedback gathered from students during OVIN's **Driving Your Career 24-Hour Smart Mobility Competition** for middle school and high school students informed the identification of Talent Strategy & Roadmap initiatives (e.g., desired opportunities and resources to "kickstart their career" in the sector). Insights from the C/AV Talent Catalyst Pilot Program, which involved hands-on industry workshops with a broad range of smart mobility and C/AV stakeholders (e.g., developers, post-secondary students, SMEs etc.) to explore and validate a new skills development program to help create a globally competitive, future-ready workforce in Ontario, also informed the Talent Strategy & Roadmap.

Through these inputs, and with the support of third-party facilitators, a series of opportunity areas were identified, reviewed, assessed, and prioritized based on evidence for consideration within the Talent Strategy & Roadmap.

Talent Strategy & Roadmap inputs also informed the development of the **OVIN Skills & Career Navigator**. The Skills & Career Navigator is an informational tool intended for early learners, post-secondary students, parents, and other stakeholders interested in or currently working within Ontario's automotive and mobility sector to explore careers in automotive and mobility, as well as provide information and resources to organizations within the automotive and mobility ecosystem. The Skills & Career Navigator will complement the Talent Strategy & Roadmap. For more details on the Skills & Career Navigator, see page 102.

Ontario's Automotive and Mobility Sector

The automotive and mobility sector plays a pivotal role in the day-to-day lives of Ontarians. The sector enables geographic connectivity and offers an integrated mobility network, helping people get to work, move goods and services to market, and visit family and friends. Building automotive and mobility solutions also drives the economy and the creation and sustainability of desirable jobs in communities across the province.

Ontario has a deep history of more than 100 years of leadership in the automotive manufacturing and supply industry. The province is the only subnational jurisdiction in the world with five Original Equipment Manufacturers (OEMs), including Stellantis (formerly Fiat Chrysler Automobiles), Ford Motor Company, General Motors, Honda Motor Company, and Toyota Motor Corporation. Ontario is also home to more than 700 automotive supplier companies and 500 tool and die makers, making it one of the most comprehensive automotive clusters globally.

Ontario's automotive industry supports more than 160,000 jobs in automotive production,[2] and more than 730,000 jobs in industries associated with the automotive and mobility sector.[3] The automotive and mobility industry is a key driver of Ontario's economy, generating an estimated $64B of gross domestic product (GDP) in Ontario in 2019.[4] The industry accounted for 9% of Ontario's total GDP in that year.[5] Notably, GDP generated by these industries has grown 28% over the past 10 years and is expected to continue to grow.[6] Looking to 2030, McKinsey & Company anticipates that shared mobility, connectivity services, feature upgrades, and new business models could expand automotive and mobility revenues by ~30%.[7] Furthermore, up to 15% of new cars sold in 2030 could be fully autonomous.[8]

Today, the automotive and mobility industry is facing major disruption. Rapid technological advancements, changing consumer behaviours, new business models, and the transition to a low-carbon economy are creating financial and operational efficiencies, allowing people and goods to move differently, and enabling cleaner and more sustainable infrastructure.[9] Ontario is well-positioned to lead the way during this transformation and has a clear competitive advantage through developments in legislation and policy, the economy, research, and talent.

2 Future of Canadian Automotive Labourforce. (2020). *Automotive Industry Labour Market Analysis Provincial Automotive Industry Forecast Profile: Ontario*. Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Ontario_May2020_FINAL.pdf**.
3 Statistics Canada (2018) and EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysi*s.
4 Ibid.
5 Ibid.
6 Ibid.

7 McKinsey & Company. (2016). *Automotive revolution — perspective towards 2030*. Retrieved from **https://www.mckinsey.com/~/media/mckinsey/industries/automotive%20and%20assembly/our%20insights/disruptive%20trends%20that%20will%20transform%20the%20auto%20industry/auto%202030%20report%20jan%202016.pdf**
8 Ibid.
9 Autonomous Vehicle Innovation Network. (2021). *Workforce Transformation: Realities and Future Outlook for the Automotive and Mobility Sector*. Retrieved from: **https://www.avinhub.ca/wp-content/uploads/2021/04/ST-monthly-insights-series-Workforce-Transformation-Jan-2021.pdf**.
10 Deloitte. (2020). *OVIN Ecosystem Analysis & Roadmap 2020*. Retrieved from **https://www.avinhub.ca/wp-content/uploads/2021/04/FY2018-2019-OCE-AVIN-Annual-Report_FINAL-2019-06-28.pdf**.

Approach and Methodology

160,000 jobs

in automotive production

730,000 jobs

in industries associated with the automotive and mobility sector

28%

growth in the automotive and mobility sector over the past 10 years

$64B

of gross domestic product (GDP) in Ontario in 2019

9%

of Ontario's total GDP in that year

Table 1 **Strengths in Ontario's Automotive and Mobility Ecosystem**

Legislation and Policy	Economic Development	Research and Development	Talent Development
Ontario's legislative and policy environment is a global leader in creating the important collaboration and forward-thinking policies that enable innovation, testing, and the translation of these developments into practice. Policies like the **Ontario Regulation 306/15** is one of the leading autonomous vehicle (AV) testing laws globally.	Ontario is recognized nationally and globally for economic investments – such as the $85 million committed as part of Ontario's Driving Prosperity plan and $56.4 million for OVIN – that attracts the talent and organizations needed to fuel economic development in the automotive and mobility space. The concentration of technology talent across Ontario is one of the highest in North America. This sizeable concentration of tech talent creates an environment conducive to innovation and is also a determinant of economic growth potential.	Ontario's expansive R&D investments cultivate a favourable environment for developing the technology and capabilities that drive the sector forward. In that context, OVIN's programs like the WinterTech Development Program and the Regional Technology Development Sites (RTDS) emerge as key catalysts to innovation in Ontario's growing automotive and mobility ecosystem.	Ontario's talent development ecosystem has a unique mix of initiatives and programs – including **OVIN's Talent Development program**, public education institutions, the Ontario government, and industry to foster leading talent.

Talent Needs in the Automotive and Mobility Sector

To ensure Ontario stays at the forefront of transformation within the automotive and mobility sector, the province will need to be proactive in addressing the future talent needs of the sector. As the needs of Ontario's talent development landscape grow and evolve, some skills for current and future workers will remain the same, while others will change. New skillsets will be required to keep up with the sector's growth and transformation. This Talent Strategy & Roadmap has been developed to equip Ontario in better accessing and developing talent with the right skills, in the right place, at the right time (e.g., when required by employers).

Labour market analysis found that a mix of technical and non-technical skills are currently in-demand across each segment within the automotive and mobility sector. At present, in-demand practical skills for the sector include those related to machining and milling activities, power tools, and heavy equipment operation. In-demand digital skills for the sector include knowledge of the Microsoft Office Suite and programs for computer-aided design and enterprise resource planning. Technical skills gaps for both practical and digital skills are highly dependent on key occupations within each sector segment. Non-technical skills like communication, critical thinking, and complex problem solving are also in-demand, with communication, teamwork, and attention to detail emerging as the most common skill gaps. [11]

Future state analysis indicates that occupational demand in the sector will be primarily driven by a need to replace existing workers (e.g., retirees). However, sector growth or expansion driven by factors like increased government investment and consumer demand can also raise the demand for talent. Talent supply within the sector is expected to come from either students completing their studies or from immigration and talent attracted from other segments or sectors (e.g., talent looking to reskill or start a new chapter in a different focus area). The skills demand outlook demonstrates a common emphasis on strengthening digital skills for the future workforce, such as knowledge of programming, data science, cybersecurity, and software engineering, as well as some non-technical skills like project management, critical thinking, and emotional intelligence when dealing with others. The skills supply is dependent on occupation and segment, but skills like communication, management, operations, critical thinking, and reading comprehension emerge as cross-cutting skill gaps to address. [12] [13]

This Talent Strategy & Roadmap has been developed to support Ontario's automotive and mobility sector in better accessing and developing talent with the right skills, in the right place, at the right time.

[11] EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*
[12] Ibid.
[13] Accenture (2020). *Ontario's C/AV Talent Strategy & Roadmap Report.* Prepared for Invest Ottawa.

Table 2 summarizes key insights with respect to current skill demands and gaps, as well as the future needs of the industry by each segment [14]

Table 2 **Labour Market Research Insights** [*]

	Connected and Autonomous Vehicles (C/AV)[15]**	Auto and Parts Manufacturing	Aftermarket, Maintenance, and Repair	Freight and Goods Movement	Mobility Planning and Infrastructure	Tool, Die, and Mold
Current Top Skills In-Demand [16]	Functional safety, automated driving trajectory, software development, communication, interpersonal skills, and attention to detail.	Machining and heavy equipment operation, computer-aided design, critical thinking, and complex problem solving.	Machining and milling activities, computer-aided design, enterprise resource planning, and knowledge of the retail industry.	Supply chain and warehousing operations, including knowledge of heavy equipment operation and inventory systems, project management software, scheduling, and inventory management.	Knowledge of project management, data analysis (including related software), and critical thinking.	Skills related to machining and milling activities, Microsoft Office suite software, and good manufacturing practices.
Current Skills Supply [17]***	Functional safety, quality control, systems management, responsibility, communication, and customer service skills.	Heavy equipment operation, computer-aided design, and communication.	Experience with forklifts, testing automation tools, customer service and communication.	Experience with forklifts, Microsoft Office suite software, and customer service.	Knowledge of database and mapping software, computer-aided design, project management and business analysis.	Experience with forklifts, computer-aided design, and teamwork.
Current Top Skills Gaps [18]	Functional safety, cybersecurity, computer science and non-technical skills including communication, interpersonal skills, attention to detail, and prioritization.	Troubleshooting, computer-aided design, and lean manufacturing.	Computer-aided design software and troubleshooting, as well as non-technical skills such as teamwork, sales skills, customer service, and attention to detail.	Non-technical skills, such as scheduling, teamwork, attention to detail, and organization.	Programming and software design (e.g., cloud computing, SQL, Python, and Linux), communication, teamwork, planning, and leadership.	Troubleshooting, computer-aided design programs, communication, and attention to detail.

[14] EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*
[15] SkyHive and Accenture Analysis. (2020). *Ontario's C/AV Talent Strategy & Roadmap Report.* Prepared for Invest Ottawa.
[16] LMIC, O*NET and EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*
[17] Vicinity Jobs and EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*
[18] Ibid.

Talent Needs in the Automotive and Mobility Sector

	Connected and Autonomous Vehicles (C/AV)[15]**	Auto and Parts Manufacturing	Aftermarket, Maintenance, and Repair	Freight and Goods Movement	Mobility Planning and Infrastructure	Tool, Die, and Mold
Future Outlook**	The segment is expected to see high demand and need to upskill for industrial engineer and mechanical engineer occupations. Other occupations that will be in high demand are software developer, electrical engineer, production supervisor, and systems integrator.	The segment is expected to see its largest occupational gap over the forecast period for motor vehicle assemblers, inspectors, and testers, which is the most common occupation among current workers in the segment. Demand for this occupation is driven by both industry growth and the need to replace existing workers (i.e., retirees).	The segment is expected to see its largest occupational gap for retail salespersons, which is expected to see strong expansion demand in the near-term as consumer spending returns to pre-COVID levels.	The segment is expected to see its largest occupational gap for transport truck drivers, however the impact of driverless vehicles and automated delivery (e.g., drones) could shift the demand over the forecast period significantly.	The segment is expected to see its largest occupational gap for taxi and limousine drivers and chauffeurs because of relatively low projected supply levels.	The segment is expected to see its largest occupational gap for foundry workers, although the size of the gap is much smaller than those observed for other segments.
Emerging Top Skills In-Demand [19]	Computer science, artificial intelligence, machine learning, deep learning, and mechatronics engineering.	Knowledge of 3D printers as well as cybersecurity and systems engineering software.	Knowledge of digital diagnostic and EV systems as well as programming and electronic design software.	Knowledge of cybersecurity tools, IoT devices, and enterprise resource planning software.	Knowledge of data science, artificial intelligence, programming, and software development.	Knowledge of enterprise resource planning, business analytics, and project management software.
Future Top Skills Gaps [20]	N/A. The labour market study for the C/AV sector segment did not involve an evaluation of future top skills gaps across the same timeframe as other sector segments.	Mix of technical skills, such as quality control analysis and database software, as well as non-technical skills, such as reading comprehension and critical thinking.	Mix of technical skills, such as database software and computer-aided design, and non-technical skills, such as speaking and social perceptiveness.	Relevant nontechnical skills, such as time management and operation monitoring, as well as basic digital skills (e.g., spreadsheets, operating system software).	Primarily technical skills, such as computer-aided design, data analysis, and graphic design.	Repair, quality control analysis, and equipment maintenance.

*Note: For additional details on each sector segment, see Appendix A: Glossary. For additional details regarding data limitations of labour market research insights, see Appendix B: Labour Market Research Insights — Data Limitations.
**Note: The Connected and Autonomous Vehicles (C/AV) labour market study involved quantum labour market analysis conducted by SkyHive.
***Note: Data on certifications and skill supply (job seekers) were collected from job seeker profiles. Supply data were obtained from Vicinity Jobs. Due to data limitations supply analysis was conducted for overall segments and not by occupation categories within segments.
****Note: Outlooks for skills demand based on occupational demand projections, including identification of emerging technical and non-technical skills in 2021, 2025, and 2030.

[19] LMIC, O*NET and EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*
[20] Vicinity Jobs, O*NET and EY Analysis. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*

Labour market research also emphasized that more work needs to be done to foster equity, diversity, and inclusion (EDI) in the sector. EDI contributes to improved organizational performance, including financial profitability, learning and creativity cultivation, organizational and individual growth, and the improved ability to adapt to market dynamics.[21] Currently, women, Indigenous Peoples, and racialized groups are consistently underrepresented across segments of Ontario's automotive and mobility sector. Table 3 provides a breakdown by five sector segments.

The overall share of visible minorities in all industries in Ontario is 27% and for Indigenous Peoples is 2%, which is consistent with their overall employment in the automotive and mobility sector.[22] However, representation varies significantly across sector segments. For example, in tool, die, and mold, visible minorities represent 12% of total employment, significantly lower than their overall employment share.[23] Additionally, educational attainment of Indigenous Peoples and Black people, specifically in fields such as engineering, mathematics, and computer science is lower than that of the total visible minority group. Table 4 provides a breakdown of employment by visible minority group across five sector segments.[24] With respect to representation of women, the overall share of female employment in all industries in Ontario is 44%, which is significantly higher than their share in the automotive and mobility sector.[25]

In the tool, die, and mold sector segment, visible minorities represent 12% of total employment, significantly lower than their overall employment share.

[21] Harvard Business Review. (1996). *Making Differences Matter: A New Paradigm for Managing Diversity.* Retrieved from **https://hbr.org/1996/09/making-differences-matter-a-new-paradigm-for-managing-diversity**.
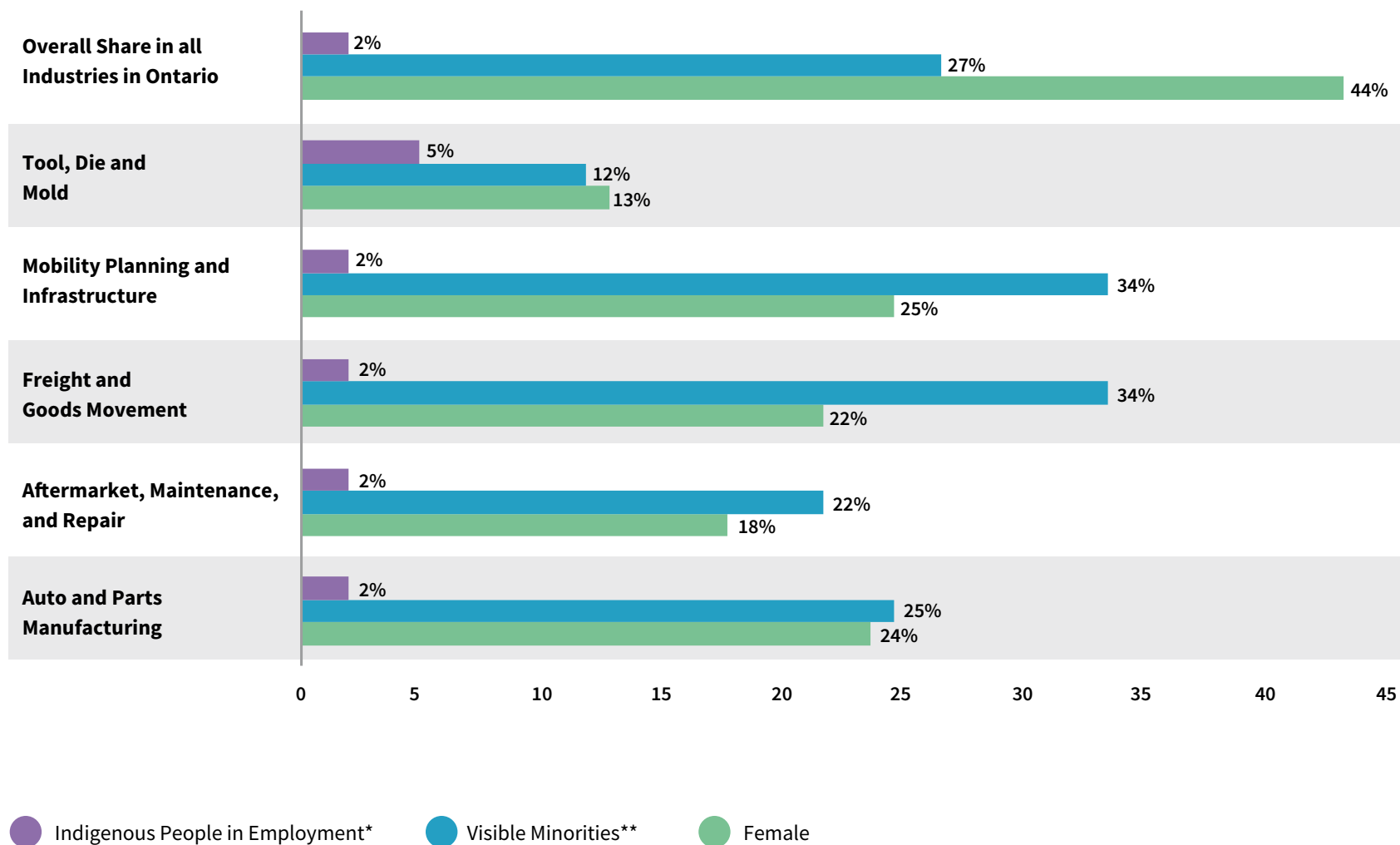[22] Statistics Canada. (2016). *Census 2016*. Retrieved from **https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E**.
[23] Ibid.
[24] Ibid.
[25] Ibid.

Table 3 **Share of Underrepresented Groups in Sector Segment Labour Force (Ontario, 2016)**

Talent Needs in the Automotive and Mobility Sector

Overall Share in all Industries in Ontario
- Indigenous People in Employment: 2%
- Visible Minorities: 27%
- Female: 44%

Tool, Die and Mold
- Indigenous People in Employment: 5%
- Visible Minorities: 12%
- Female: 13%

Mobility Planning and Infrastructure
- Indigenous People in Employment: 2%
- Visible Minorities: 34%
- Female: 25%

Freight and Goods Movement
- Indigenous People in Employment: 2%
- Visible Minorities: 34%
- Female: 22%

Aftermarket, Maintenance, and Repair
- Indigenous People in Employment: 2%
- Visible Minorities: 22%
- Female: 18%

Auto and Parts Manufacturing
- Indigenous People in Employment: 2%
- Visible Minorities: 25%
- Female: 24%

0   5   10   15   20   25   30   35   40   45

● Indigenous People in Employment*   ● Visible Minorities**   ● Female

*Note: The term 'Aboriginal' or 'Indigenous' is used by Statistics Canada to refer to individuals identifying themselves as 'First Nations people, Métis or Inuit.'

**Note: The Employment Equity Act defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour." The visible minority population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean, and Japanese.

Source: Statistics Canada, Census 2016

Table 4 **Share of Visible Minority Group in Overall Employment By Segment** *Source: Statistics Canada, Census 2016*

Visible Minority Group	Auto and Parts Manufacturing		Aftermarket, Maintenance and Repair		Freight and Goods Movement		Mobility Planning and Infrastructure		Tool, Die and Mold		Overall Employment
	Share of Visible Minority in Total Employment	Share of Visible Minority from Total Female Employment	Share of Visible Minority in Total Employment	Share of Visible Minority from Total Female Employment	Share of Visible Minority in Total Employment	Share of Visible Minority from Total Female Employment	Share of Visible Minority in Total Employment	Share of Visible Minority from Total Female Employment	Share of Visible Minority in Total Employment	Share of Visible Minority from Total Female Employment	
Total	25%	28%	22%	22%	34%	29%	34%	27%	12%	18%	27%
South Asian	7%	7%	6%	6%	19%	12%	14%	8%	3%	3%	8%
Chinese	4%	5%	4%	5%	2%	3%	6%	7%	2%	5%	5%
Black	3%	3%	3%	3%	6%	5%	6%	4%	2%	0%	4%
Filipino	3%	4%	2%	2%	2%	3%	1%	1%	2%	5%	3%
Latin American	2%	2%	1%	1%	1%	2%	1%	1%	1%	5%	2%
Arab	1%	1%	1%	1%	1%	1%	2%	1%	1%	-	1%
Southeast Asian	3%	4%	1%	1%	<1%	<1%	1%	1%	-	-	1%
West Asian	1%	<1%	1%	1%	1%	1%	2%	1%	-	-	1%
Korean	<1%	<1%	<1%	1%	<1%	1%	<1%	<1%	-	-	1%
Japanese	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	-	-	<1%
Visible minority	1%	1%	1%	1%	1%	1%	1%	1%	-	-	1%
Multiple visible minority groups	1%	1%	1%	1%	1%	1%	1%	1%	1%	3%	1%

To address barriers faced by individuals from diverse backgrounds, such as women, Black, Indigenous and people of colour (BIPOC), people who identify as Two-Spirit, Lesbian, Gay, Bisexual, Trans, Queer or Questioning, and Intersex (2SLGBTQI+), and people with disabilities among others, a focus on EDI in the Talent Strategy & Roadmap is critical. Meaningful collaboration within Ontario's talent development ecosystem is required to ensure a talent pool is built to meet future demand in a thoughtful and inclusive way.

Ontario's Talent Development Ecosystem and Roadmap Partners

Ontario's talent development ecosystem for the automotive and mobility sector consists of a mix of stakeholder groups including post-secondary institutions, private training institutions, not-for-profits, industry, and industry associations.

Learning and development options range from short-term micro-credentials and certificates to four-year degrees.[26] OVIN and Invest Ottawa initiated an in-depth analysis of Ontario's talent development ecosystem to identify areas of strength and opportunities for consideration in the Talent Strategy & Roadmap.

The following factors set Ontario's talent development ecosystem apart from others:

Unique talent programs by the Ontario government, OVIN, and post-secondary institutions. Programs like OVIN's Talent Development Program, the Ontario government's Career Ready Fund's Auto Stream program, Ryerson's Rogers Cybersecure Catalyst, and Invest Ottawa's Talent Program are recognized nationally and internationally for their role in talent development. [27]

High quality public educational institutions with industry connections. Ontario has a strong quality of education in Science, Technology, Engineering, and Mathematics (STEM), with top schools like the University of Toronto and the University of Waterloo emerging as global STEM leaders.[28] Additionally, Ontario's 36 automotive-related research initiatives, training programs at leading academic institutions, and world-class R&D infrastructure are a key strength for the ecosystem.

Investment by industry in Ontario's talent. Investment by the private sector supports the attraction and growth of technical talent and the advancement of research and development in the sector. Since 2016, the private sector has invested $1 billion+ in Ontario's automotive and mobility landscape, including funding automotive R&D centres.[29] Recent examples of industry investment include the Canadian Technical Centre established by General Motors, the Ottawa Research and Engineering Centre (REC) established as part of Ford's $1.2 billion investment in Canada, and Uber's US$150 million investment in a Toronto Advanced Technology Group, among others.

Strong immigration and work-visa programs that attract global skilled talent to Ontario. Since 2017, Ontario has seen an influx of highly skilled talent moving from the US, in part due to more appealing work-visa and immigration programs in Ontario and Canada and Ontario's support for integrating skilled and professional foreign workers and international students. One such example is the Ontario Immigration Nominee Program (OINP) introduced in 2019, which attracts STEM occupations like software engineers and designers, data analysts, and professions related to computer and information systems.[30]

Highly liveable cities. Factors such as high-quality healthcare, education, and infrastructure have led Toronto to be ranked as one of the top 10 most livable cities in the world for three years in a row, creating a competitive advantage for the province in attracting automotive and mobility talent.[31]

Ontario's global smart mobility and C/AV leadership, innovation expertise, and technological capabilities. Ontario boasts a wealth of innovative entrepreneurs, startups, SMEs, and globally recognized industry leaders that are developing, implementing, and exporting smart mobility solutions, including C/AVs and related technologies. These companies are buoyed by a strong and integrated provincial innovation ecosystem that leverages forward-thinking and well-structured programs such as OVIN, world class universities that are driving the development of Ontario's next generation of smart mobility, C/AV and technology talent, a growing pool of internationally recognized tech talent, and an interconnected network of Research Innovation Centres.

[26] Deloitte. (2020). *OVIN Ecosystem Analysis & Roadmap 2020*. Retrieved from https://www.avinhub.ca/wp-content/uploads/2021/04/FY2018-2019-OCE-AVIN-Annual-Report_FINAL-2019-06-28.pdf.

[27] Ibid.

[28] Top Universities. (2020). *Engineering and Technology*. Retrieved from https://www.topuniversities.com/university-rankings/university-subject-rankings/2020/engineering-technology.

[29] Deloitte. (2020). O*VIN Ecosystem Analysis & Roadmap 2020*. Retrieved from https://www.avinhub.ca/wp-content/uploads/2021/04/FY2018-2019-OCE-AVIN-Annual-Report_FINAL-2019-06-28.pdf.

[30] Government of Ontario. (2020). *OINP tech draws*. Retrieved from https://www.ontario.ca/page/oinp-tech-draws#:~:text=Tech%20draws%20are%20a%20new,(%20IRCC%20)%20Express%20Entry%20pool.

[31] Deloitte. (2020). *OVIN Ecosystem Analysis & Roadmap 2020*. Retrieved from https://www.avinhub.ca/wp-content/uploads/2021/04/FY2018-2019-OCE-AVIN-Annual-Report_FINAL-2019-06-28.pdf.

At the same time, Ontario's talent development ecosystem faces several challenges, including: [32]

Rapidly changing talent needs. A recent study by RBC suggests that 50 percent of occupations will undergo a significant skills overhaul over the coming decade.[33] A key driver of this is automation and digitization, requiring workers to upskill and reskill. For example, the increasing convergence and shift in focus from traditional automotive towards advanced automotive technologies globally will underpin the software-defined, connected and more environmentally friendly cars of the future and shape the evolution of talent. A recent study by McKinsey & Company estimates that up to 374 million workers — 14 per cent of the global workforce — will need to switch occupational categories due to the automation and digitization of the world economy. In Canada, estimates suggest that 25 per cent of current work activities will be automated between 2016 and 2030.[34]

Attracting new talent through industry exposure and early education pathways. A key challenge in talent development for the sector is attracting new students and professionals early on in their education and careers. This is in part due to the limited awareness that high-school and post-secondary students have of career options in the automotive and mobility sector, in addition to stigmas amongst students and their parents around the automotive and mobility sector and the skilled trades more generally. Training programs that provide exposure early on in one's career present a key opportunity to addressing this challenge.

Changing demographics in Canada. There is a rapidly aging workforce and shrinking working-age talent pool in Canada. Individuals 65 years of age and older constitute the fastest growing age group in Ontario and it is projected

that by 2041, as much as 25% of the population may fall into this demographic.[35] These workers will need to be replaced by new talent with advanced skills that are in-demand by the sector. There is also a need for the workforce to reflect Canada's diverse communities, as outlined by the underrepresentation of women, Indigenous peoples, and racialized groups within the sector.

Competition for talent. Competition from other sectors and geographies is exacerbating pressure for in-demand talent. For example, primary competition for talent in areas like automotive manufacturing comes from other manufacturing sectors.[36] Ontario must also compete for talent with other countries. For decades, Canada has experienced brain drain, referring to when Canada's talent, particularly with STEM skills, take up work in the United States or other countries with the promise of better pay and opportunities. A recent study by researchers at the University of Toronto and Brock University found that a quarter of recent STEM graduates from three leading Canadian universities are now working outside Canada, mainly in the United States.[37]

Trend acceleration during COVID-19. In 2020, COVID-19 further disrupted the labour market, including the automotive and mobility sector. More than one million Ontarians lost their jobs as the province's unemployment rate jumped to a record high of 13.6% in May 2020.[38] Within the automotive manufacturing sector alone, 115,000 jobs were impacted during March and April of 2020 by the sector shutdown.[39] The pandemic also caused a sharp decline in automotive and mobility sector job listings between January and April 2020, along with a year-over-year decline in job listings — for most occupation categories related to the sector — from January 2020 to January 2021. The automotive and mobility sector segments that saw the biggest drop in the average number of monthly listings in

2020 were mobility planning and infrastructure (-44%), aftermarket, maintenance, and repair (-42%), auto and parts manufacturing (-38%), and tool, die, and mold (-29%).[40] For the C/AV sector segment, the impact has been varied, with some organizations successfully pivoting to new ways of working without any significant loss in productivity, while others have had to furlough workers, make widespread redundancies, and freeze recruitment. Considering social distancing requirements, the pandemic also accelerated automation and digitization, heightening the need for specific skillsets.[41]

Disruptions and challenges faced by Ontario's talent development ecosystem also present exciting opportunities to address future needs across the automotive and mobility sector. The following Talent Strategy & Roadmap is intended to foster collaboration across Ontario's talent development ecosystem on concrete priorities to address the talent needs of the automotive and mobility sector.
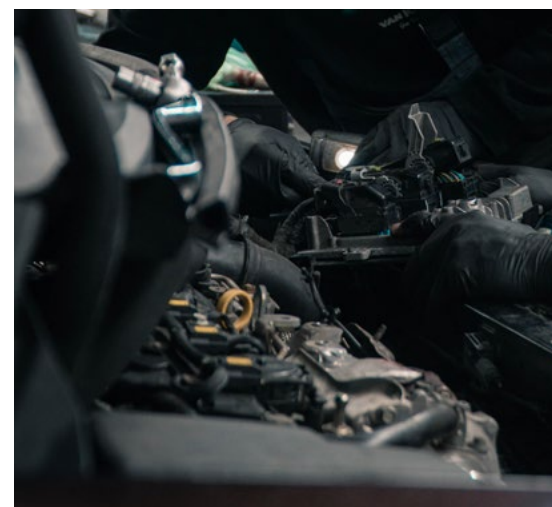
[32] Ibid.

[33] RBC. (2018). *Humans Wanted: How Canadian youth can thrive in the age of disruption*. Retrieved from **https://www.rbc.com/dms/enterprise/futurelaunch/_assets-custom/pdf/RBC-Future-Skills-Report-FINAL-Singles.pdf.**

[34] McKinsey & Company. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation.* Retrieved from **https://www.mckinsey.com/~/media/mckinsey/industries/public%20and%20social%20sector/our%20insights/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi-jobs-lost-jobs-gained-executive-summary-december-6-2017.pdf.**

[35] Government of Ontario. (2017). *Archived - Aging with Confidence: Ontario's Action Plan for Seniors.* Retrieved from **https://files.ontario.ca/ontarios_seniors_strategy_2017.pdf.**

[36] Future of Canadian Automotive Labourforce. (2020). *Automotive Industry Labour Market Analysis – Ontario*. Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Regional-Profiles_Provincial-Ontario.pdf.**

[37] Spicer Z., Olmstead, N. & Goodman, N. (2018). *Reversing the Brain Drain: Where is Canadian STEM Talent Going?* Retrieved from **https://brocku.ca/social-sciences/political-science/wp-content/uploads/sites/153/Reversing-the-Brain-Drain.pdf.**

[38] Government of Ontario. (2020). *Labour market report: May 2020.* Retrieved from **https://www.ontario.ca/page/labour-market-report-may-2020.**

[39] Future of Canadian Automotive Labourforce. (2020). *COVID-19 & Canada's Automotive Manufacturing Sector: A Year in Review.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/12/Canadas-Automotive-Technology-Clusters.pdf.**

[40] LMIC, Canadian Online Job Posting Dashboard. (2021). *Ontario Vehicle Innovation Network (OVIN) - Labour Market Analysis.*

[41] McKinsey & Company. (2020). *Building the vital skills for the future of work in operations.* Retrieved from **https://www.mckinsey.com/business-functions/operations/our-insights/building-the-vital-skills-for-the-future-of-work-inoperations**.

Ontario's Talent Development Ecosystem:
Strengths and Challenges Overview

The following factors set Ontario's talent development ecosystem apart from others:

- Unique talent programs by the Ontario government, OVIN, and post-secondary institutions
- High quality public educational institutions with industry connections
- Investment by industry in Ontario's talent
- Strong immigration and work-visa programs that attract global skilled talent to Ontario
- Highly liveable cities
- Ontario's global smart mobility and CA/V leadership, innovation expertise, and technological capabilities

At the same time, Ontario's talent development ecosystem faces several challenges, including:

- Rapidly changing talent needs
- Attracting new talent through industry exposure and early education pathways
- Changing demographics in Canada
- Competition for talent
- Trend acceleration during COVID-19

Talent Strategy & Roadmap Overview

2030 Vision for Ontario's Automotive and Mobility Workforce: Ontario's automotive and mobility sector has a highly skilled, adaptable, and diverse workforce reinforced by a global leading network that provides tailored and responsive initiatives that meet the evolving needs of the workforce.

The collaboration of different stakeholders and partners (e.g., educational and training institutions, public sector organizations, industry) is critical to ensuring that Ontario's automotive and mobility sector can meet emerging challenges and take advantage of key opportunities. The 2030 Vision outlined above is intended to frame the Talent Strategy & Roadmap and define an aspirational goal for the automotive and mobility ecosystem, by 2030.

To support the 2030 Vision for Ontario's Automotive and Mobility Sector Workforce, **four objectives** have been set for the Talent Strategy & Roadmap. These objectives are reinforced by **nine initiatives**.

Objective 1
Collaboration & Coordination Across the Province

Objective Statement

Strengthen collaboration and coordination between industry, educational and training institutions, and government to support responsive skills planning and development for tomorrow's workforce needs. Leverage the regional strengths of local economies to cultivate a complementary and coordinated approach to talent development and availability across Ontario.

Introduction

There are several factors constraining the availability and development of skills and talent in the automotive and mobility sector's workforce. For example, while Skills Canada estimates that 40 percent of new jobs created between 2015 and 2025 in Canada will be in the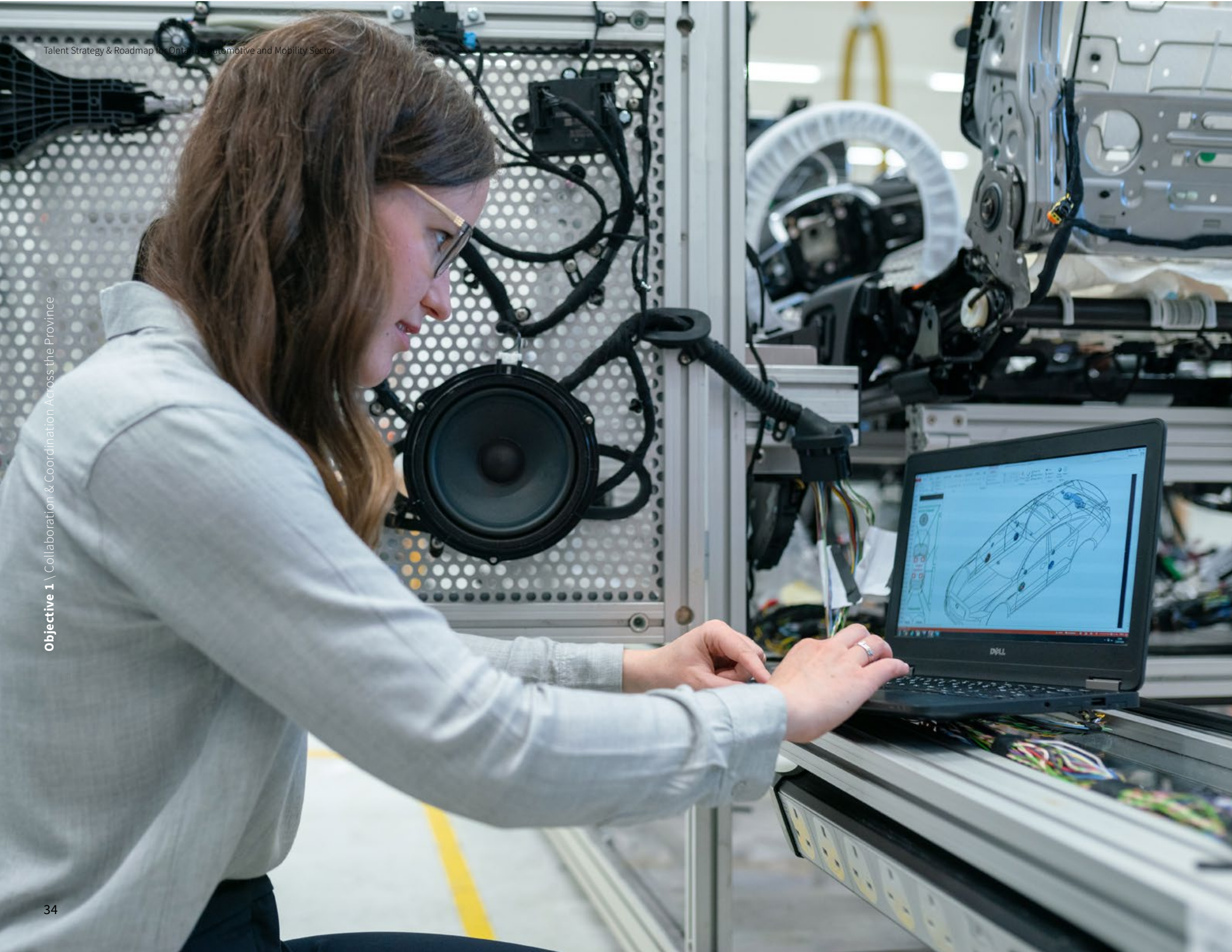 skilled trades, only 26 percent of young people aged 13 to 24 are considering a career in these areas - adding additional constraints to the automotive and mobility sector's talent pool.[42] Limited incoming talent is amplified by the fact that young people who select careers in these areas may still face barriers to entry, particularly finding appropriate training and apprenticeship positions.[43] In addition, less than half the people who begin an apprenticeship program in Ontario end up completing their apprenticeship.[44] Ageing demographics also present significant challenges in the industrial workforce, particularly in the automotive and mobility sector, and there is an increasing need to grow and diversify the skilled trades workforce to establish a sustainable stream of talent.

[42] Dawson Strategic. (2015). *Modernizing Ontario's Skilled Trades Apprenticeship and Training System: Building New Opportunities through Governance and Regulatory Reform*. Retrieved from **https://www.rescon.com/reports/files/DAWSON-REPORT-OHBA-report.pdf.**

[43] Ontario Chamber of Commerce. (2017). *Talent in Transition: Addressing the Skills Mismatch in Ontari*o. Retrieved from **https://occ.ca/wp-content/uploads/Talent-in-Transition.pdf**.

[44] Office of the Ontario Auditor General. (2016). *Annual Report, Chapter 3: Ministry of Advanced Education and Skills Development, Section 3.04: Employment Ontario*. Retrieved from **http://www.auditor.on.ca/en/content/annualreports/arreports/en16/v1_304en16.pdf. P. 2**.

A recent talent mobility and development study conducted by the World Economic Forum found that collaboration among multiple stakeholders is at the core of addressing talent and skills gaps, as the isolated actions of single entities are unlikely to achieve desired objectives within competitive labour markets.[45] Talent development is contingent on cooperation between partners and stakeholders to:

Ensure that talent planning and development incorporates the perspectives of different stakeholders and partners.

Ensure alignment between industry needs and government programs and policies.

Drive continuous improvement by supporting the joint identification of innovative ways to enable skills development throughout the talent lifecycle and the adaptation of talent to industry needs.

Foster and communicate cohesive employee value propositions to potential talent to drive interest and exposure to specific industries.[46]

Develop necessary conditions for ease of talent exchange, inter- and intra-sector redeployment, and an overall complementary approach to talent development and industry resilience based on balancing regional strengths with areas requiring additional growth.

Skills and talent development in the automotive and mobility sector is broadly characterized by inconsistent access to the right skills, at the right time, and in the right place. Given the increasingly complex, and rapidly evolving nature of the technology and critical skills landscape, effectively meeting the talent needs of the automotive and mobility sector and building capacity across different regions in Ontario requires a strong mechanism for, and regular cadence of collaboration between key partners. Building capacity across the province means stronger collaboration within, and outside of the automotive and mobility sector, and working closely with adjacent sectors to encourage better integration, diverse talent consortiums and skills sharing, and overall, more robust economic activity. Despite synergies and generally strong communication within the sector, an opportunity for enhanced and more formalized collaboration to better foster contextually accurate, future-focused talent planning and the creation of a complementary talent development approach has been identified.

45 World Economic Forum. (2012). *Talent Mobility Good Practices Collaboration at the Core of Driving Economic Growth*. Retrieved from **http://www3.weforum.org/docs/WEF_PS_TalentMobility_Report_2012.pdf**.

46 Ibid.

Objective 1

Sector Segment Snapshot

Across Ontario's automotive and mobility sector, some skills are lessening in demand while others grow in demand.

For example:

Ontario's connected and autonomous vehicle (C/AV) sector segment (i.e., the segment that involves the research, design, development, testing, and operation management of C/AV technologies for cars, shuttles, trucks, buses, delivery vehicles and drones) is facing considerable gaps between skills required by employers and skills available in the labour market.

As of 2020, some of the top emerging skills in the C/AV segment were technical and functional skills ranging from system development (up by 50%) and continuous integration and delivery (up by 59%) to controls engineering (up by 39%) and test-driven development (up by 69%). As these skills become more in demand, employers are facing increasing difficulty in filling roles that require these skillsets.[47]

The top C/AV in-demand skills are in transferable skill areas, such as software implementation, development, and integration, as well as technical leadership and algorithms development, indicating an opportunity for a complementary and coordinated approach to talent development.[48]

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[47] Accenture (2020). *Ontario's C/AV Talent Strategy & Roadmap Report.* Prepared for Invest Ottawa.
[48] Ibid.

Key Stakeholders

Government

Industry

Educational and Training Institutions
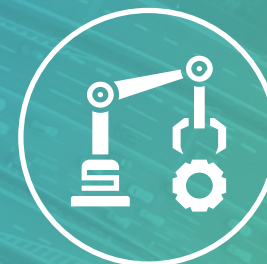
Objective 1

Initiative 1

Launch an Automotive & Mobility Curriculum Collaboration Committee for the automotive and mobility sector to support proactive curriculum development that reflects the rapidly evolving industry, and its corresponding talent and critical skills needs and requirements.

Background

Globally, there is a growing skills mismatch, with an estimated 1.3 billion people having competencies misaligned with their corresponding work requirements.[49] The fast pace of innovation is a key driver of this mismatch, accentuated by an often-limited relationship between industry and academia as frontline leaders for curriculum development and skills training.[50]

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[49] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration*. Retrieved from **https://www.bcg.com/ publications/2020/new-era-higher-ed-employer-collaboration**.
[50] Ibid.

Post-secondary students are facing increasing uncertainty about employment prospects after graduation, alongside the added pressure of potentially requiring additional training and certification at later points in their career.[51] Post-secondary institutions often lack adequate career services to support students or could improve upon how they promote these services to students and workers, contributing to limited student clarity regarding existing jobs and employer skills requirements and expectations.[52]

The automotive and mobility sector in Ontario is experiencing a similar trend. There is a growing gap between conventional curriculums offered in higher education and the quickly evolving automotive and mobility skills landscape. Post-secondary institutions and training institutions face the dual challenge of adapting their teachings to keep pace with in-demand skillsets while also providing a strong learning foundation and environment for students.[53]

Conventional curriculums increasingly do not reflect the changing skill needs of the automotive and mobility sector, exacerbating talent and skills gaps.

The curriculum lag in Ontario can be attributed to several factors, such as:

Rapid changes in industry needs coupled with lengthy curriculum development requirements and approval processes.

Limited post-secondary-industry collaboration in skills planning and curriculum development, as well as in building career awareness.

A recent survey identifies that

81%

of business leaders believe that better aligning educational curricula with job openings and skills gaps could resolve the skills mismatch that their business faces.[54]

The curriculum gap is not only affecting student employment prospects and learning outcomes but is also impacting the automotive and mobility industry's ability to fill roles with necessary talent and skillsets.

There is an emerging opportunity to address current state curricula challenges and better prepare students to meet industry demand.

[51] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration*. Retrieved from **https://www.bcg.com/publications/2020/ new-era-higher-ed-employer-collaboration**.

[52] Ibid.

[53] EU Commission and Informatics Europe. (2020). *Bridging the Digital Talent Gap: Towards Successful Industry-University Partnerships*. Retrieved from **https://www. informatics-europe.org/news/544-bridging-the-digital-talent-gap-towards-suc- cessful-industry-university-partnerships.html**.

[54] Ibid.

Initiative Description

This initiative is focused on the establishment of an Automotive & Mobility Curriculum Collaboration Committee comprised of industry representatives, representatives from Ontario's training / apprenticeship schools and post-secondary institutions that offer relevant programming to the automotive and mobility sector, non-profits, innovation hubs, and other relevant stakeholders. The Committee will be tasked with convening relevant stakeholders to inform curriculum development but will not effectively be involved in curriculum development itself. The Committee will conduct reviews of key areas of post-secondary curriculums on an annual basis, with an in-depth review of curricula every three to five years. By convening on a regular basis, the Committee will develop suggestions on curriculum changes and propose complementary and supporting learning opportunities for talent such as micro-credentialing, among others. A regular review cycle will support the continued identification of employer skills and talent needs and help foster strong alignment between industry and academic stakeholders regarding skills needs. The Committee's composition will be reviewed periodically to ensure continued and accurate representation of the changing talent development ecosystem and context.

Leading Practice Highlights

Centring People and Skills in Strategy Development:

The Manitoba Industry-Academic Partnership is an organization that brings together Manitoba post-secondary institutions and the Business Council of Manitoba to develop a strategy that centres people and skills in responding to the rapidly changing skills landscape. The collaboration between industry and academia is focused on fostering work-integrated learning (WIL) opportunities through the arrangement of a regular cadence of engagement roundtables with leaders in predominant economic sectors in Manitoba.[55]

Closing Gaps Between Industry and Academia:

The Korean Institute for the Advancement of Technology (KIAT) is a non-profit, non-governmental organization developed under the Ministry of Trade, Industry, and Energy. It seeks to convene leaders in industry and academia to form a comprehensive support organization for industry-academia cooperation. KIAT seeks to close gaps between industry and academia, develop talented engineers, provide direct access to and experience with industrial technology, and nurture Korea's talent pool to become future managers and innovators.[56]

[55] Manitoba Industry-Academia Partnership. (2020). *Priority Areas.* Retrieved from **https://miap.ca/priority-area-2/**.
[56] Korean Institute for Advancement of Technology. (2020). *Industry-Academia Cooperation.* Retrieved from **https://kiat.or.kr/site/engnew/activities/aCooperation.jsp.**

Objective 1 \ Initiative 1

Timeline

Short-term

Identify Automotive & Mobility Curriculum Collaboration Committee representatives, appoint and finalize representatives, and establish key targets, objectives, engagement cadence, frequency, and structure.

Medium-term

Refine existing targets and objectives based on representative engagement, feedback on what is working well, and what is not. Monitor and evaluate engagement impacts and efficacy. Explore the expansion of Committee scope, if required.

Long-term

Continued engagement with industry, academia, community, and other leaders through the Committee. As new learning models emerge, continue to evaluate the inclusion of additional stakeholders to the Committee to support continued accuracy in representation and relevance.

Key Success Factors

- Engaging with stakeholders to co-design the objectives and desired outcomes of the Automotive & Mobility Curriculum Collaboration Committee.

- Creating clear mechanisms for robust trend identification and skills planning to ensure that curriculum development is proactive, while maintaining a strong educational foundation for students.

- Integrating core Committee recommendations and supporting the incorporation of opportunities into talent development strategies and educational / training offerings.

- Supporting representation from appropriate industry leaders and post-secondary institutions, as well as vocational training providers.

- Recruiting Committee members from diverse backgrounds to provide an EDI lens on the work of the Committee.

- Clearly communicating outcomes of curricula review (e.g., recommended requirement changes) to key stakeholders; supporting stakeholder awareness of Committee activities and developments.

Sample Key Performance Indicators

- # of engagement sessions between Committee members

- # of initiatives emerging from Committee collaboration (e.g., new curricula development initiatives, curricula refinement initiatives)

- # of program curricula adhering to Committee recommendations

Key Stakeholders

Government

Educational and Training Institutions

Industry
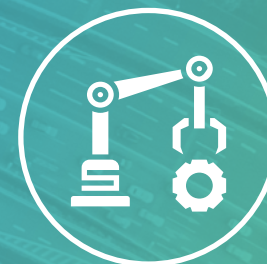
Objective 1

Initiative 2

Leverage existing automotive and mobility clusters to provide targeted skills and talent support and engage with areas outside of these clusters to enhance regional integration.

Background

Economic clusters are geographic collections of interlinked firms, specialized suppliers and manufacturers, association-based organizations, and educational, vocational training, and research institutions that develop around a particular industry. [57] They are also defined by their corresponding and specialized labour pools.

[57] Porter, M. E. (2000). *Location, competition, and economic development: Local clusters in a global economy.* Economic development quarterly, 14(1), 15-34. Retrieved from **https://journals.sagepub.com/doi/10.1177/089124240001400105**.

Objective 1 \ Initiative 2

Canada has six major automotive and mobility hubs.[58] In Ontario, there is a unique ecosystem of leading practice vehicle assemblers, parts manufacturers, research centres, companies, educational and training institutions, incubators, and accelerators with expertise spanning from "proof-of-concept prototyping, to production line automation systems, and global logistics tracking software." [59]

Ontario's automotive and mobility ecosystem is characterized by five Original Equipment Manufacturers (OEMs) and a growing regional innovation network defined by small- and medium-sized enterprises (SMEs) that lead technology innovation specific to the sector. [60 61]

Six automotive and mobility clusters

Its innovation ecosystem is anchored by six Regional Technology Development Sites (RTDS) in Durham Region, Hamilton, Ottawa, Toronto, Waterloo, and Windsor-Essex – each of which specializes in a specific area of technology innovation relating to automotive and mobility (e.g., artificial intelligence, connected and autonomous vehicles, cross-border technologies and cybersecurity). [62]

Ontario's automotive and mobility sector is undergoing significant transformation as the activities of OEMs and other ecosystem stakeholders converge with tech, and advanced processes utilizing robotics, computer systems, complex sequencing and logistics are increasingly used in the production and assembly of automobiles.[63] Within this context, and alongside an overarching push to modernize and innovate in the sector, considerable disruption to workers, talent, and critical skills is expected.

Workforce transformation catalyzed by increased automation and digitization will impact the role of individuals in certain occupations within Ontario, particularly individuals within operationally intensive sectors such as manufacturing, transportation, and maintenance.[64] It is estimated that most roles in the automotive and mobility sector will require skills upgrades, with 50% of workers being influenced by new technologies and just over 18% from more substantial transformations.[65]

Worker susceptibility to labour market disruption is differentiated depending on their specific occupation and the corresponding level of skill required to meet work requirements. For example, skills related to traditional methods of manufacturing, tool, mold, and die making, and sales are anticipated to become less emphasized over the next 3 to 5 years as the automotive and mobility industry transitions from more manually intensive processes to more automated processes. Different sector segments will require different levels of support and planning depending on the nature and magnitude of skills disruption.

Although many workers are increasingly susceptible to labour market disruption, they often lack effective, coordinated, and timely learning and development opportunities and reskilling support across sector segments and provincial regions that accurately reflects the evolving labour market. Workers and industry leaders can face difficulty coordinating talent development across distal regions in the province and sector segments. To effectively address the diverse needs of talent across the automotive and mobility sector, partners must be engaged across the value chain and province to develop a complementary approach to reskilling and the redeployment of workers whose occupations are at-risk, into other occupations and segments within the automotive and mobility sector.

58 59 Invest Ontario. (2021). *Where Automotive Lives.* Retrieved from **https://www.investontario.ca/sites/default/files/2021-05/Ontario_WhereAutomotiveLives.pdf.**

60 Ibid.

61 Ashiem, B & Coenen,L. (2004). *"The Role of Regional Innovation Systems in a Globalising Economy: Comparing Knowledge Bases and Institutional Frameworks of Nordic Clusters."* Retrieved from **https://www.diw.de/documents/dokumentenar-chiv/17/41804/asheim_coenen.pdf.**

62 Autonomous Vehicle Innovation Network. (2020). *Regional Technology Development Sites.* Retrieved from **https://www.avinhub.ca/regional-technology-development-sites/**.

63 Holmes, John, Tod Rutherford., and Jeffrey Carey. 2017. *"Challenges Confronting the Canadian Automotive Parts Industry: What Role for Public Policy?" Canadian Public Policy 43 (S1): 75-89.* Retrieved from **https://utpjournals.press/doi/10.3138/cpp.2016-030**.

64 Autonomous Vehicle Innovation Network. (2021). *Workforce Transformation: Realities and Future Outlook for the Automotive and Mobility Sector.* Retrieved from **https://www.avinhub.ca/wp-content/uploads/2021/04/ST-monthly-insights-series-Work-force-Transformation-Jan-2021.pdf**

65 Ibid.

Initiative Description

This initiative is focused on distributing the benefits of existing regional automotive and mobility clusters to local areas and regions involved in the automotive and mobility value chain, as well as cultivating additional clusters outside of the existing ecosystem to better support local sector segment activity across all regions in the province. The initiative involves expanding existing talent development efforts among regional sites to better include individuals outside existing clusters through regular information sharing, connection to cluster opportunities, and the provision of targeted skills and talent development support based on local needs.

Through this initiative, formalized collaboration will occur across different regions in the province for talent development, leveraging OVIN's RTDS network. Through regular outreach to, and consultation with local sector segment representatives, adjacent sector representatives, and other relevant stakeholders, regional skills strengths and deficits will be assessed and a complementary approach to building capacity in existing and new clusters around the province identified. The strengths of different sectors with activities that are adjacent to the automotive and mobility sector, such as minerals and electrification in Northern Ontario, will be supported in developing new consortiums of talent and economic activity outside of existing hubs, tied to Ontario's automotive and mobility sector.

Leading Practice Highlights

Developing a Shared Vision for Talent and Skills Exchange:

The EU recently (2020) launched the **Pact for Skills** as a skills partnership across key industrial ecosystems: automotive, microelectronics, and aerospace defence industries. The Pact seeks to promote a joint and coordinated effort to maximize the impact of investing in existing skills (upskilling) and training new skills (reskilling).[66] The Pact for Skills is based on a Charter signed by stakeholders, which outlines a shared vision on talent and skills exchange across their defined ecosystem, that includes components such as the provision of quality training from industry, social partners, and vocational education and training providers. It will offer the following tools, while encouraging all signatories of the Pact (or the Charter) to translate their engagement into concrete commitments on upskilling and reskilling:

• A networking hub;

• A knowledge hub;

• A guidance and resources hub; and

• Roundtables with "industrial ecosystem" leaders.[67]

The Pact for Skills engages local industry leaders and representatives across key sectors that are signatories to the Charter to expand the reach of key resources (as noted above) to local industry representatives and leaders. While there are existing ecosystems that are engaged through this program in the EU, the Pact also aims to extend the boundaries of existing ecosystems to other areas in order to increase collaboration and knowledge transfer across the region.

[66] European Commission. (2021). *Employment, Social Affairs & Inclusion: Blueprint for sectoral cooperation on skills.* Retrieved from **https://ec.europa.eu/social/main.jsp?catId=1415&langId=en**.

[67] European Cluster Collaboration Platform. (2020). *European Commission Launches Pact for Skills.* Retrieved from **https://clustercollaboration.eu/news/european-commission-launches-pact-skills**.

Leading Practice Highlights

Advancing Mutual Goals Through Collaboration:

In Canada, the Advanced Manufacturing Supercluster — **Next Generation Manufacturing Canada (NGen)** — is an industry led consortium with a focus on connecting local and national industrial stakeholders to support several initiatives from high potential technology development, ground-breaking process transformation, technology diffusion, SME capacity building, and ecosystem development to support training, collaboration, and the development of tools and test beds.[68] The NGen Supercluster — part of the Government of Canada's **Innovation Superclusters Initiative** — is a model that has effectively supported increased levels of research and development through partnership, networking, and ease of knowledge transfer, as well as increased employment opportunities among, and beyond supercluster 'members'; the model has also driven a steady attraction of skilled labour due to an employee value proposition highlighting a large volume of employment opportunities and the corresponding flexibility of moving between closely related SMEs.[69]

Harnessing the Power of Collaboration in Skills Development:

Invest Ottawa and its flagship **Area X.O** leveraged strong partnerships with industry, post-secondary institutions, and innovation leaders for its **C/AV Talent Catalyst Pilot**. The Pilot involved hands-on, industry-led workshops with a broad mix of participants, including recent graduates seeking career opportunities and connections to employers, members of Ontario's tech workforce aiming to reskill or upskill to advance their career, entrepreneurs, innovators, developers, researchers, professors, and members of underrepresented groups, amongst others. Through the Pilot, participants were supported in improving their skills, and actionable insights developed regarding enabling and equipping the next generation of talent and increasing the global competitiveness of Ontario's future automotive and broader workforce.

[68] Government of Canada. (2020). *Canada's Advanced Manufacturing Supercluster: Innovation, Science and Economic Development Canada.* Retrieved from **https://www.ic.gc.ca/eic/site/093.nsf/eng/00010.html**.

[69] Future of Canadian Automotive Labourforce. (2020). *Canada's Automotive Technology Clusters: Labour Market Characteristics and Regional Specializations.*
Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/12/Canadas-Automotive-Technology-Clusters.pdf.**

Timeline

Short-term

Engage with relevant stakeholders to define key objectives, coordination cadence, and the potential prerequisite conditions for strengthening talent capacity within automotive and mobility clusters around Ontario, including the identification of new regions to engage via the cluster model. Identify existing platforms that can be leveraged to support information sharing to support better coordination across sector segments.

Medium-term

Facilitate the continuous identification of opportunities to expand and develop emerging clusters and to spearhead consistent communication on best practices (e.g., curriculum development, talent, skills development etc.) across sector segments and the province. Monitor and evaluate sector segment skills and talent needs and support talent building initiatives across segments with increasing skills demands.

Long-term

Continue evaluating automotive and mobility industry segment skills and talent needs and identifying additional opportunities to develop clusters and consortiums of talent across the province. Facilitate talent capacity building initiatives and coordination on a needs-basis between members of existing and emerging automotive and mobility clusters in Ontario.

Key Success Factors

Leveraging existing platforms to facilitate a regular cadence for information sharing and cooperation related to skills and talent needs across the value chain.

Identifying skills needs and talent development requirements on a more real-time basis to inform new talent attraction, recruitment, retention, and coordination for current talent within and outside the sector (see initiative 7 on the Reskilling Framework).

Engaging with local sector segment representatives and areas with established sector expertise to identify and define existing skills gaps and talent and skills needs, alongside the appropriate mechanism for coordination and information sharing.

Sample Key Performance Indicators

- # of industry representatives participating in the talent coordination initiative (e.g., OEMs, SMEs, start-ups)

- # of engagement and collaboration sessions between stakeholders
- # of talent attracted to regional clusters

- # of regions engaged
- # of new cluster initiatives (e.g., new programs)

Objective 2
Talent Sourcing & Attraction

Objective Statement

Continue building a strong, agile, and diversified talent pool in Ontario with the right skills for the sector now, and into the future through talent identification and engagement.

Introduction

Because of technological advancement, changing consumer behaviour, and other factors, employers increasingly require talent with digital, data analysis, and critical thinking skills. While increased demand for talent signals a positive shift towards high-quality jobs within the sector, it also creates challenges, as the demand for talent with preferred skills outpaces supply and employers increasingly compete for the same pool of candidates within and across different industries and jurisdictions.

The demand for talent with specific skills is compounded by demographic challenges within Canada. Canada's workforce is aging quickly, shrinking the country's working-age talent pool. In Ontario, mid-career workers (i.e., individuals between the ages of 45 and 64) comprise most of the automotive and mobility sector workforce.[70] Over the next decade, many of these individuals are expected to retire, and will need to be replaced by new employees.

It is estimated that Ontario's broader automotive industry will face a recruitment gap of 30,090 individuals in total between 2021 and 2030, even after accounting for approximately 9,800 new workforce entrants (i.e., individuals between the ages of 15 and 30 who are entering the workforce for the first time).[71] Without significant recruitment initiatives, this gap could be even higher.

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[70]   Future of Canadian Labourforce. (2020). *Automotive Industry Market Analysis. Provincial Automotive Industry Forecast Profile: Ontario*. Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Ontario_May2020_FINAL.pdf.**

[71]   Ibid.

Objective 2

Sector Segment Snapshot

Sector segments across the automotive and mobility value chain are facing significant talent shortages across North America. This can be attributed to several factors, such as:

- The high average age of the workforce within specific industries.
- The need to hire highly qualified individuals (e.g., due to safety and professional requirements).
- Global competition for top talent, further intensified by the rise of an increasingly virtual, flexible, and productive workforce.
- Challenges attracting diverse talent (e.g., women, young people).[72]

Truck driver vacancies more than doubled in Canada between 2016 and 2018.[73] In 2018, there was a total of 22,000 vacant positions for truck drivers, with 61% of industry employers surveyed citing difficulty filling truck driver positions within the last 12 months.[74][75]

In Canada, the two manufacturing occupations with the highest labour shortages in 2016/2017 were skilled production workers and general labour, with 63% and 45% of employers citing they have current shortages in each of these occupations, respectively.[76] By 2022, 75% of the businesses expect to face shortages in the skilled production worker occupations, while 38% of businesses expect to face shortages in the general labour occupation.[77]

Manufacturing and assembly line workers are likely to be the most disrupted, with an estimated 20 million jobs threatened to be replaced by robots by the year 2030, as the automotive and mobility sector evolves towards smart mobility and C/AVs. These are likely to be replaced by up to 133 million new jobs that include a mixture of human and robot roles. This presents a significant opportunity for Ontario's automotive and mobility sector to grow, if it can pivot to advanced manufacturing.

If current trends continue and new workers cannot be recruited or retained, labour shortages could become even more problematic for the automotive and mobility sector.

[72] American Trucking Associations. (2019). *Truck Driver Shortage Analysis 2019.* Retrieved from **https://www.trucking.org/sites/default/files/2020-01/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf.**
[73] TruckingHR Canada. (2019). *Labour Market Information – Interim Report.* Retrieved from **https://truckinghr.com/wp-content/uploads/2019/10/THRC_Report_LMIInterim-WEB-FINAL.pdf.**
[74] Ibid.

[75] TruckingHR Canada. (2020). *The Road Ahead: Addressing Canada's Trucking and Logistics Labour Shortages.* Retrieved from **https://truckinghr.com/wp-content/uploads/2020/03/THRC-Labour-Market-Information-Report_English-version.pdf.**
[76] Canadian Manufacturers and Exporters (2018). *Building a Strong and Safe Workforce.* Retrieved from **https://cme-mec.ca/wp-content/uploads/2018/11/Doc_Industrie-2030_Building-a-Strong-and-Safe-Workforce.pdf.**
[77] Ibid.

It is estimated that Ontario's broader automotive industry will face a recruitment gap of

30,090

individuals in total between 2021 and 2030

Key Stakeholders

- Government
- Industry
- Educational and Training Institutions
- Community Organizations Engaged in Training Initiatives

Objective 2

Initiative 3

Enhance industry's engagement with elementary, secondary, and post-secondary students to support greater awareness of automotive and mobility sector career opportunities and reduce stigmas associated with working in the sector.

Background
Exposing kindergarten – grade 12 (K-12) and post-secondary students to occupations within the automotive and mobility sector is critical for laying a strong foundation to grow the sector talent pool which will help to fuel sector competitiveness over the long-term.

Objective 2 \ Initiative 3

Elementary, secondary, and post-secondary students generally have low awareness of skilled trades opportunities, particularly as they relate to opportunities within the automotive and mobility sector. Students in disciplines relevant to the automotive and mobility sector can also have trouble understanding the applicability of their skillset to occupations within the sector. For example, STEM graduates within Ontario often have low awareness of opportunities related to sector automation generally and specifically with respect to connected and autonomous vehicles.

Elementary, secondary, and post-secondary students generally have low awareness of skilled trades opportunities.

There is a stigma that exists around the skilled trades amongst young people and their parents in Ontario.

Despite the many benefits to skilled trades careers, such as high-labour market demand, strong earning potential, opportunity for advancement, use of leading-edge technologies, and transferable skills – there is a stigma that exists around the skilled trades amongst young people and their parents in Ontario.[80] For example, skilled trades occupations are often perceived as physically demanding and with limited potential for advancement.[81] These and other inaccurate perceptions can be reinforced by curricula in which students are not sufficiently exposed to skilled trades and opportunities within the automotive and mobility sector.

In addition, fewer young people are considering careers in manufacturing than in the past.[78] With respect to the skilled trades, it is estimated that while "as many as 40 percent of new jobs created in Canada over the next decade will be in the skilled trades, only barely one quarter of Canadians aged 13 to 24 are considering a career in this area."[79]

[78] Ontario 360. (2020). *Made in Ontario: A Provincial Manufacturing Strategy*. Retrieved from **https://on360.ca/policy-papers/made-in-ontario-a-provincial-manufacturing-strategy/**.

[79] Ontario 360. (2020). *Advancing Structural Reforms to the Skilled Trades and Apprenticeships in Ontario*. Retrieved from **https://on360.ca/policy-papers/advancing-structural-reforms-to-the-skilled-trades-and-apprenticeships-in-ontario/**.

[80] Government of Ontario. (2020). *Ontario's Action Plan: Protect, Support, Recover – 2020 Ontario Budget*. Retrieved from **https://budget.ontario.ca/2020/pdf/2020-ontario-budget-en.pdf**.

[81] Canadian Manufacturing. (2020). *Skills Ontario debunks five myths about skilled trades*. Retrieved from **https://www.canadianmanufacturing.com/manufacturing/skills-ontario-debunks-five-myths-about-skilled-trades-246316/**.

Initiative Description

This initiative is focused on continuing to increase K-12 and post-secondary students' understanding and awareness of the diverse academic and career pathways that lead into the automotive and mobility sector and eliminating sector misconceptions through heightened industry engagement with students. Specifically, the sponsorship of and participation in field trips and other educational events such as open houses, competitions, and hackathons targeted to specific audiences (e.g., diverse students not typically represented within the sector's labour force, young people involved with the youth justice system who are scheduled to exit the system etc.).

In addition to field trips and other educational events, dedicated sector segment engagement activities, such as "Career Months" will be held to increase students' awareness of modern, highly skilled, and well-paying occupations within Ontario's automotive and mobility sector. During these types of events, companies and educational and training institutions will open their in-person or virtual "doors" to students, parents, caregivers, and teachers, and provide facility tours, interactive presentations and workshops, and networking and experiential learning opportunities. As part of this initiative, government, industry, educational and training institutions, and other relevant stakeholders and communities will also collaborate in awareness campaigns and mentorship programs to incentivize students to remain within Ontario.

Leading Practice Highlights

Building Student Awareness of Career Opportunities:

In Michigan, the **Discover Auto Program** connects high school students with leaders within the automotive and mobility sector to better understand career opportunities within the sector and learn about company culture.[82] Virtual sessions include a presentation by professionals that highlights different careers within their company and the technology they use and develop, as well as a live Q & A with students. [83] In-person sessions provide students with an opportunity to tour automotive and mobility company facilities and receive a "behind the scenes" look at different careers.[84]

Engaging Young People Through Interactive Activities:

In collaboration with industry partners, Workforce WindsorEssex and WindsorEssex Economic Development Corporation organize an annual **Manufacturing Day** in the region. The event builds on a North American initiative designed to increase awareness of modern manufacturing careers.[85] Each year, employers open their doors to K-12 students, their parents, teachers, and community leaders, allowing them to tour their facilities, ask questions, and engage in hands-on activities like 3D scanning and welding.[86]

[82] MICHauto News (2021). *Discover Auto: How MICHauto Is Continuing Student-To-Business Connections Amid Uncertain Times.* Retrieved from **https://michauto.org/discover-auto-how-michauto-is-continuing-student-to-business-connections-amid-uncertain-times/**.

[83 84 85] Workforce Planning Board of Waterloo Wellington Dufferin. (2018). *Manufacturing Day.* Retrieved from **https://www.workforceplanningboard.com/projects/mfgday.**
[86] Workforce WindsorEssex. (2019). *Region Opens Doors and Minds About Modern Manufacturing.* Retrieved from: **https://www.workforcewindsoressex.com/manufacturing-day-2019/**

Leading Practice Highlights

Supporting Student Impact Creation:

In Toronto, students between the ages of 13 and 17 can apply to participate in a 10-month innovation program run by **The Knowledge Society.** The program is aimed at helping students make an impact in the world through over 100+ hours of live instruction, events, and workshops focused on knowledge, skill, and mindset development.[87] One focus of the program is educating students about emerging technologies (e.g., artificial intelligence, cloud computing, nanotechnology, advanced transportation, blockchain etc.); students are provided access to an online platform where they can use new technologies to solve problems.[88]

Engaging Students Through Real-World Problem-Solving:

OVIN and the **Windsor-Detroit Bridge Authority (WDBA)** partnered to deliver a Smart Infrastructure Face-Off targeted to post-secondary students in engineering, information technology, and business administration. During the event, participants were provided with a challenge statement and encouraged to use data analytics and knowledge of new payment and security technologies to create solutions. Participants were provided the opportunity to pitch their ideas to an esteemed panel and participate in moderated sessions regarding career opportunities related to smart / infrastructure technologies.
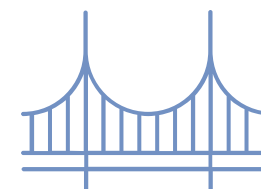
Enhancing Students Automotive and Mobility Awareness:

In collaboration with key partners, **OVIN** hosted an event for students in grades 6 - 12 called "Driving Your Career: 24-Hour Smart Mobility Competition." During the event, students were exposed to programming and resources to help inform them of opportunities in Ontario's automotive and mobility sector. The competition was conducted via an online quiz through which students were guided directly to a range of partner websites where they learned about educational, skills development, and job opportunities in the sector while locating the answer to quiz questions. Students were awarded points for every correctly answered question and for conducting research on each question. The event was successful in informing students on automotive and mobility career opportunities, as 81% of students noted that their perspective on the sector had changed from having participated in this event.
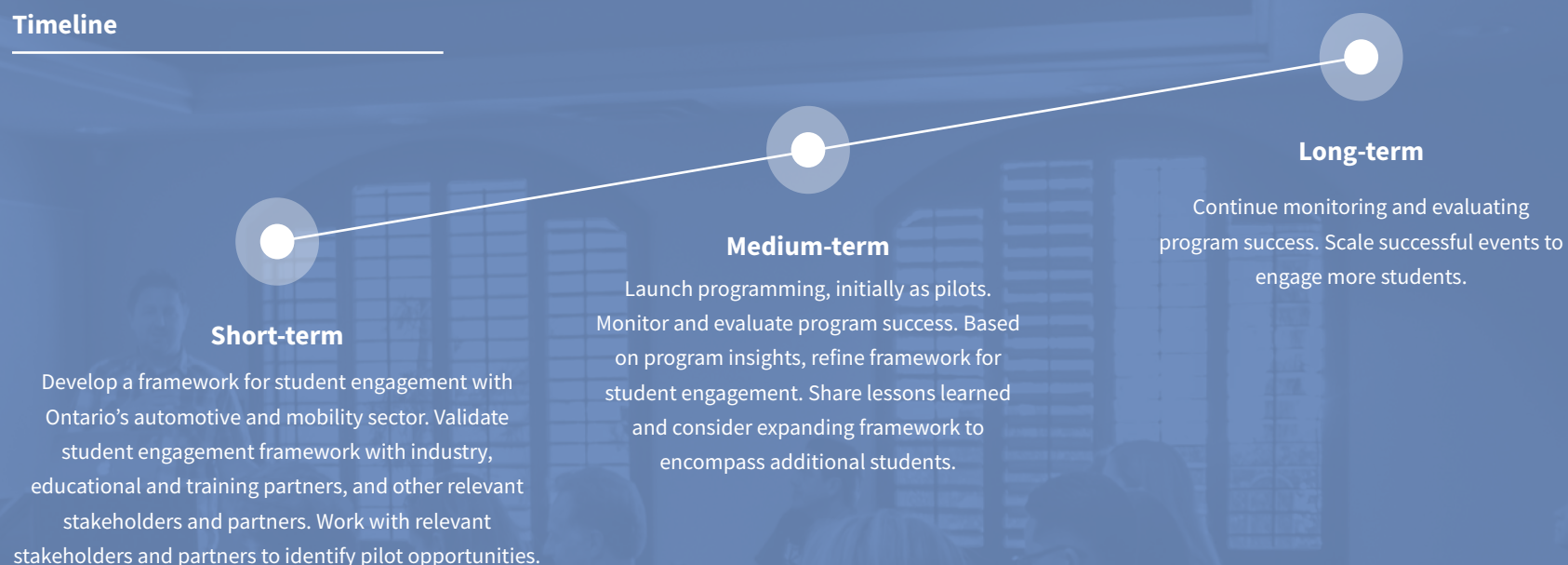
[87] The Knowledge Society. (2021). *Toronto.* Retrieved from **https://tks.world/toronto/#learn-about-emerging-technologies**.
[88] Ibid.

Timeline

Long-term

Continue monitoring and evaluating program success. Scale successful events to engage more students.

Medium-term

Launch programming, initially as pilots. Monitor and evaluate program success. Based on program insights, refine framework for student engagement. Share lessons learned and consider expanding framework to encompass additional students.

Short-term

Develop a framework for student engagement with Ontario's automotive and mobility sector. Validate student engagement framework with industry, educational and training partners, and other relevant stakeholders and partners. Work with relevant stakeholders and partners to identify pilot opportunities.

Key Success Factors

Creating accessible, inclusive programming, recognizing that some students will experience barriers to participation (e.g., live in remote regions, have a disability, are English as a second language learners, have been involved with the youth justice system etc.).

Ensuring compliance with applicable policies, regulations, and standards required by educational institutions and other relevant entities for student engagement (e.g., regarding conflicts of interest, event funding and sponsorship, commercial displays, accessibility etc.).

Demonstrating that students have been heard if they take the time to provide feedback (e.g., through follow-up communication summarizing feedback received and next steps regarding feedback incorporation).

Sample Key Performance Indicators

- # of events for students
- # of registrants vs. number of attendees
- Attendee satisfaction (e.g., Net Promoter Score)
- # of attendees from rural, remote, and northern communities
- # of attendees from underrepresented groups
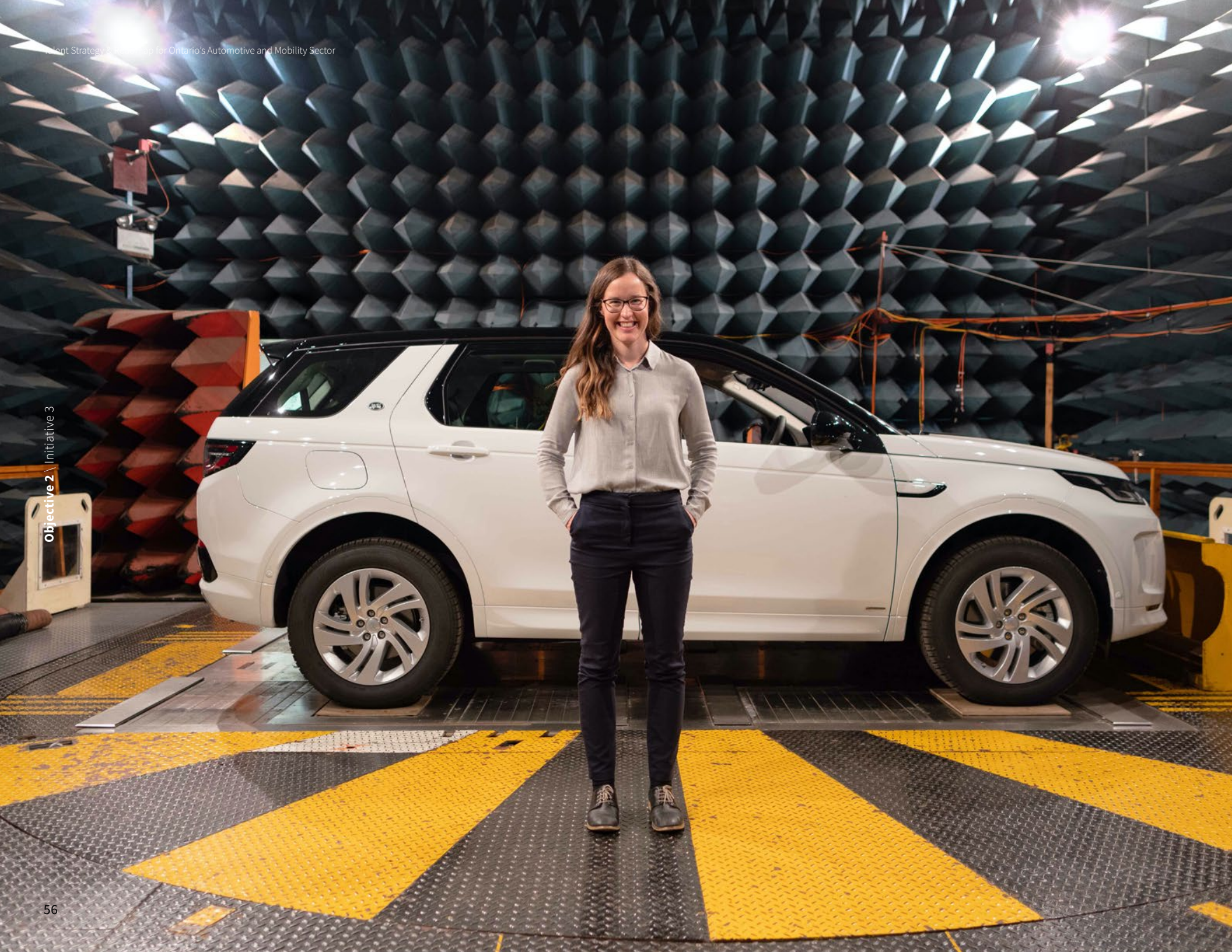
Key Stakeholders

🏛 Government

⚙ Industry

🎓 Educational and Training Institutions

👥 Community Representatives

Objective 2

Initiative 4

Support the identification, attraction, and redeployment of talent from other sectors and jurisdictions that possess the transferrable skills needed in Ontario's automotive and mobility sector.

Background

Due to Canada's aging workforce and strong demand for specific skills within the automotive and mobility sector (e.g., skills related to autonomous, connected, electric, and shared mobility solutions), attracting talent to the sector is becoming increasingly important.[89] It is estimated that Ontario's broader automotive industry will need to hire 24,940 workers between 2021 and 2025 and 14,960 workers between 2026 and 2030.[90]

[89] McKinsey & Company. (2020). *Winning the race for talent: A road map for the automotive industry.* Retrieved from **https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/winning-the-race-for-talent-a-road-map-for-the-automotive-industry.**

[90] Future of Canadian Automotive Labour Force. (2020). *Automotive Industry Labour Market Analysis — Provincial Automotive Industry Forecast Profile: Ontario.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Ontario_ May2020_FINAL.pdf.**

This hiring requirement represents 25% of Ontario's broader automotive industry employment as of 2019. [91] It is also estimated that while 80% of new jobs in Ontario will require skilled workers in 2031, only 66% of Ontario's labour force will be able to provide those required skills.[92]

Despite the significant need to attract talent, talent attraction is challenging for many employers within the automotive and mobility industry. For example, employers have highlighted difficulty in identifying candidates, creating company awareness (specifically for smaller and less well-known companies), and competing against technology companies and start-ups. For example, graduates from the University of Waterloo are the second most frequently hired graduates by Silicon Valley companies.[93] These challenges can be especially prominent outside of the Greater Toronto and Hamilton Area (GTHA).

Strategies to support the global sourcing of top talent, the integration of immigrants into companies within the automotive and mobility sector as well as the shifting of mid-career workers from sectors decreasing in size (e.g., due to new technologies) to growing sectors have been identified as potential mechanisms to support industry recruitment efforts to address labour needs within the sector. [94] [95]

[91] Ibid.

[92] StrategyCorp Institute of Public Policy and Economy. (2020). *The Future of Ontario's Workers.* Retrieved from **https://strategycorp.com/wp-content/uploads/2020/06/ Colleges-Ontario-The-Future-of-Ontarios-Workers-White-Paper-June-2020.pdf**.

[93] Invest Ontario. (2021). *Why Ontario.* Retrieved from **https://www.investontario.ca/ why-ontario**.

[94] Future of Canadian Automotive Labour force. (2021). *Automotive Industry Labour Market Analysis: Recruiting Immigrant Labour in the Automotive Production Sector.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2021/05/TREND-REPORT-Immigrants-in-Auto-May-14-2021.pdf.**

[95] Ontario 360. (2018). *Talent Development for the Tech Sector – Transition Briefing: Supporting growth in Ontario's knowledge economy.* Retrieved from **https://on360.ca/ wp-content/uploads/2018/04/ON360-Talent-Development-for-the-Tech-Sector.pdf.**
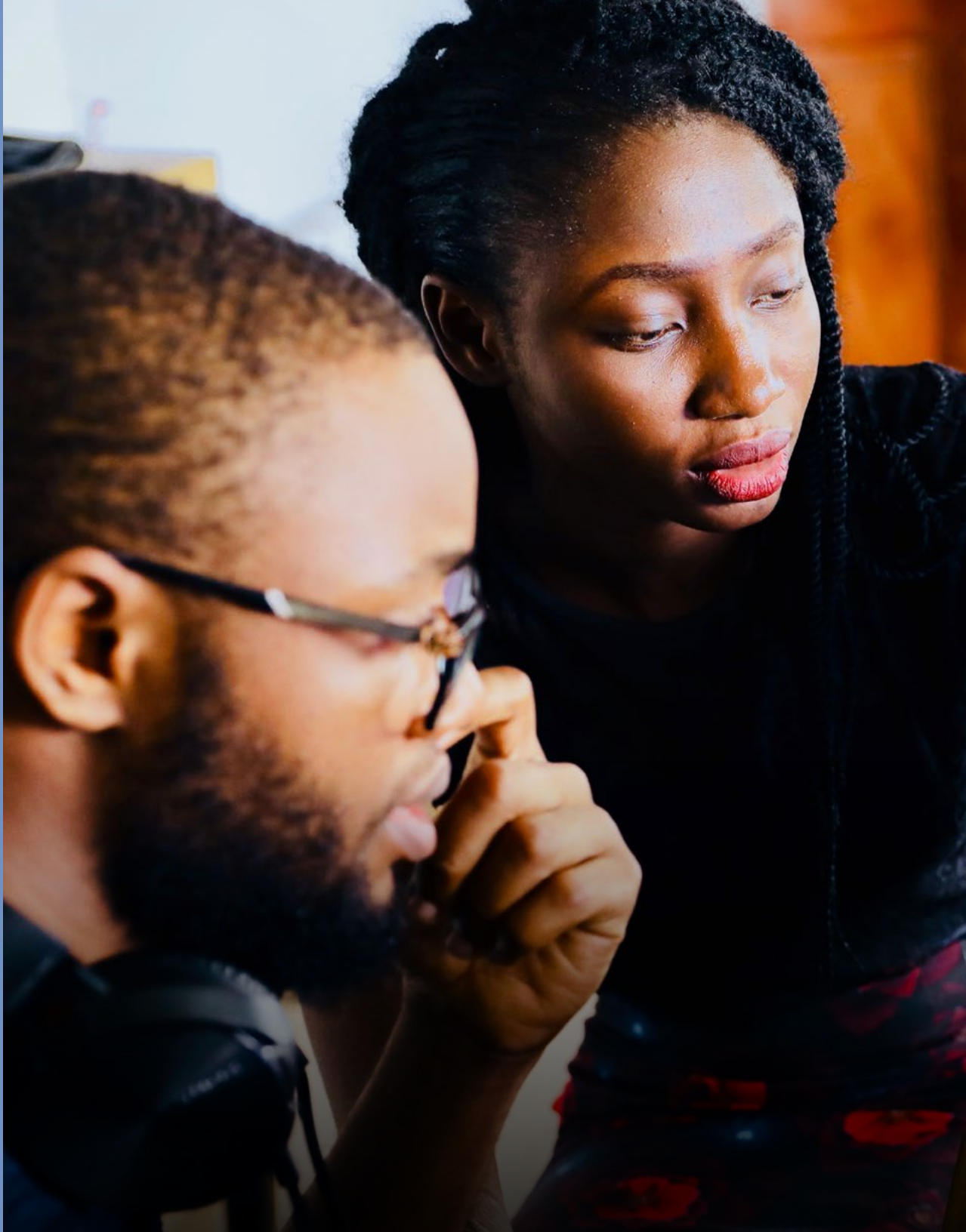
Initiative Description

Building on the success of existing talent sourcing and attraction initiatives, this initiative is focused on the design and execution of coordinated provincial, national, and international marketing campaigns for the automotive and mobility sector. Campaigns will highlight Ontario as a leader in the automotive and mobility industry and include tailored value propositions targeted to different populations, including but not limited to youth and young professionals, professionals with desired skills working in other sectors, professionals working in the automotive and mobility sector in other jurisdictions, underrepresented groups, and students in environmental fields. Campaigns will be developed in collaboration with government, industry, educational and training institutions, and community partners, and will incorporate feedback from consultation with representatives of target groups.

Under this initiative, talent sourcing and attraction guidance will also be provided to SMEs through the **Skills & Career Navigator.** Talent sourcing and attraction challenges within Ontario's automotive and mobility sector will also be continuously identified, initiatives to improve the attractiveness of the sector designed, and industry representatives connected with prospective employees.

Leading Practice Highlights

Co-Designing High Impact Promotional Campaigns:

MICHauto, an automotive and mobility cluster association in Michigan, recently launched an industrywide talent attraction campaign under the tagline "Discover Auto: You Drive the Future." The grassroots-style social media campaign aims to increase awareness about and improve the perception of careers within the automotive and mobility industry amongst emerging talent, in addition to highlighting the industry as inclusive, high-tech, growing, and global. [96] In the campaign, young industry professionals share their perspective on their career, the industry, and how they are making a difference.[97] Focus groups with high school students informed the development of the campaign, which was developed through a task force of MICHauto Talent Attraction and Industry Awareness Committee members.[98] Promotional toolkits were designed to market the campaign, including campaign infographics and taglines, day-in-the-life videos, bios, and career maps.[99]

Conducting Talent Attraction Pilots:

ART-ER Attractiveness Research Territory in Emilia-Romagna, northern Italy, is a consortium focused on fostering the sustainable growth of the region through a focus on innovation, knowledge development, and talent attraction and retention.[100] ART-ER recently announced their intention to co-create and pilot a talent attraction campaign. The campaign will focus on profiles in-demand by employers within the region, and on enhancing the awareness of specific individuals who may not have considered a career in the region of the region's value proposition (e.g., what makes the region attractive to potential talent).[101]

[96] MICHAuto News. (2021). *MICHauto Launches Industrywide Talent Attraction Campaign to Improve Career Perceptions.* Retrieved from **https://michauto.org/michauto-launches-industrywide-talent-perception-campaign/**.

[97] Ibid.

[98] Ibid.

[99] Ibid.

[100] ART-ER. (2021). *About Us.* Retrieved from **https://internationaltalents.art-er.it/about-us**.

[101] Future Place Leadership. (2021). *Talent Attraction Campaign for Emilia-Romagna region, Italy.* Retrieved from **https://futureplaceleadership.com/talent-attraction-campaign-for-emilia-romagna-region/**.

Objective 2 \ Initiative 4

Timeline

Long-term

As the automotive and mobility sector continues to evolve, scale successful initiatives, and develop new initiatives based on additional target audiences.

Medium-term

Launch promotional campaigns. Monitor and evaluate campaign success. Continue collaborating with partners to identify talent sourcing and attraction challenges and develop and implement initiatives to improve the attractiveness of Ontario's automotive and mobility sector to top talent.

Short-term

Develop a multi-year, multi-channel promotional approach targeting key audiences. Design marketing collateral in collaboration with partners and target audiences.

Key Success Factors

✓ Leveraging existing talent attraction and related initiatives in Ontario to maximize impact (e.g., initiatives led by Invest Ontario, Communitech, Invest Ottawa, regional employment and community planning organizations, etc.).

✓ Understanding the unique talent sourcing and attraction needs of partners (e.g., SMEs) and supporting their participation in promotional campaigns (e.g., by providing them with tailored collateral and marketing / communications support).

✓ Balancing the development of a consistent message regarding Ontario's automotive and mobility value proposition with customized messaging based on the needs, motivations, and preferences of target groups.

✓ Ensuring supporting policies and processes are in place, such as employer-talent matching, and transparency regarding how individuals can learn more about Ontario's automotive and mobility sector after campaign viewing.

Sample Key Performance Indicators

- # of events / activities promoting the sector to different audiences (e.g., students, prospective students, prospective employees)

- % increase in newcomers to Ontario with desired skills employed in the automotive and mobility sector

- % increase in users utilizing the **Skills & Career Navigator**

Objective 3
Workforce Development & Retention

Objective Statement

Support Ontario's workforce to adapt and advance their skills and knowledge to the pace and scale of the automotive and mobility sector's transformation.

Introduction

It is estimated that nearly 50% of Canada's workforce does not have the skills required to fully participate in the labour market, with skills becoming obsolete increasingly quickly.[102] For example, in a recent study of the impact of advanced manufacturing technologies and systems on tasks, roles, and skills in key automotive manufacturing occupations, some production occupations were identified as having most of their tasks potentially impacted and a significant number of them eliminated entirely due to their mostly routine, manual nature.[103] At the same time, managerial and engineering occupations were identified as likely requiring skills upgrades due to the predominance of non-routine, cognitive tasks within these occupations and their relationship to evolving technologies (e.g., data analytics, machine learning, and artificial intelligence).[104]

Challenges exist for individuals, educational institutions, and employers within this shifting skills landscape. Access to education varies for individuals across Ontario and is a significant contributor to uneven employment outcomes. It is estimated that approximately 35% of Ontarians aged 25 – 64 – roughly 2.5 million people – do not have a post-secondary qualification and as a result have a lower employment and labour market participation rate.[105] Canadian workers often lack opportunities for upskilling and reskilling or are unable to take advantage of opportunities due to specific challenges.

[102] Canada West Foundation. (2018). *Literacy Lost: Canada's basic skills shortfall.* Retrieved from **https://cwf.ca/research/publications/report-literacy-lost-canadas-basic-skills-shortfall/**.

[103] Future of Canadian Automotive Labourforce. (2020). *Automotive Industry Labour Market Analysis: Impact of Industry 4.0 Technologies on Key Occupations in Automotive Manufacturing.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Final-Impact-of-Industry-4.0-on-Automotive-Manufacturing-Occupations.pdf**.

[104] Ibid.

[105] Ontario 360. (2019). *Policy Papers: Skills-Training Reform in Ontario: Creating a Demand-Driven Training Ecosystem.* Retrieved from **https://on360.ca/policy-papers/skills-training-reform-in-ontario-creating-a-demand-driven-training-ecosystem/**.

Objective 3 | Workforce Development & Retention

For example, while workplace training is critical to individuals' ongoing learning and development, Canada is behind other jurisdictions in the provision of workplace training, where less than one-third of Canadians receive job-related, non-formal education.[106] Research also indicates that the individuals most in need of training may be the least likely to receive it (e.g., workers in rural and remote locations, individuals without a post-secondary qualification, individuals with lower literacy levels).[107]

Challenges Canadian workers experience taking advantage of reskilling and upskilling opportunities are compounded by challenges experienced by educational institutions, which often struggle to prepare students with relevant and in-demand skills in the absence of ongoing communication with key stakeholders (e.g., industry) and competing priorities (e.g., measuring performance and learning outcomes, fiscal sustainability). As a result, employers may need to hire individuals who do not meet their skills needs; these individuals are likely less productive due to a lack of skills and require training or retraining, often at the expense of their employer.[108]

Some employers also struggle with the delivery of training, due to factors like the absence of a learning strategy, learning culture, and / or supporting processes and infrastructure, in addition to a lack of time, cost associated with learning and development,

and uncertainty regarding learning and development deployment. For example, while 95% of respondents in a BCG employer survey indicated that learning was crucial to a company's future success and should be treated as a high priority, only 15% indicated that their company had delivered on this priority.[109] Significantly, investment in employee learning is also critical for retaining employees, as top talent increasingly expects their employers to invest in their learning. For example, in a recent LinkedIn survey, 94% of employees indicated they would work at a company longer if the company invested in their career.[110] The importance of investment in employee learning has also been emphasized by stakeholders within Ontario's automotive and mobility ecosystem, who have highlighted the criticality of helping employees grow their skills to retain them within a highly competitive labour market.

> While **95% of respondents in a BCG employer survey indicated that learning was crucial to a company's future** success and should be treated as a high priority, **only 15% indicated that their company had delivered on this priority**.

[106] Ontario 360. (2019). *Policy Papers: Skills-Training Reform in Ontario: Creating a Demand-Driven Training Ecosystem*. Retrieved from **https://on360.ca/policy-papers/skills-training-reform-in-ontario-creating-a-demand-driven-training-ecosystem/**.

[107] Conference Board of Canada. (2021). *Rising Skills: Digital Skills Needs for Smart and Connected Vehicles*. Retrieved from **https://fsc-ccf.ca/wp-content/uploads/2020/12/Automotive-Issue-Briefing-English.pdf**

[108] Boston Consulting Group. (2020). *Fixing the Global Skills Mismatch*. Retrieved from **https://www.bcg.com/en-ca/publications/2020/fixing-global-skills-mismatch**.

[109] Boston Consulting Group. (2020). *Three Steps to Turn Your Company into a Learning Powerhouse*. Retrieved from **https://www.bcg.com/en-ca/publications/2020/turn-your-company-into-a-learning-powerhouse**.

[110] LinkedIn Learning. (2018). *Workplace Learning Report*. Retrieved from **https://learning.linkedin.com/resources/workplace-learning-report-2018**.

Objective 3

Sector Segment Snapshot

Across the automotive and mobility sector, opportunities for learning and development vary according to factors like an individual's occupation and their employer and location, contributing to disparate learning barriers and outcomes. For example:

Financial barriers to upskilling have been identified for automotive tradespeople, who have one of the lowest median employment incomes amongst male-dominated Red Seal trades (i.e., trades involving a nationally recognized level of competency).[111][112]

Other barriers tradespeople may experience regarding upskilling include the cost of tools, range of diagnostic tools and software, limited opportunities for upskilling at independent garages relative to dealerships, lack of access to advanced vehicles at technical training institutes, and barriers to accessing training in northern and remote regions.[113]

Learning and development barriers and uneven learning opportunities within the automotive and mobility sector may be exacerbated by the changing nature of the sector (e.g., how occupations such as assembly and factory workers are anticipated to be less in-demand in the future).[114]

[111] Conference Board of Canada. (2021). *Rising Skills: Digital Skills Needs for Smart and Connected Vehicles.* Retrieved from **https://fsc-ccf.ca/wp-content/uploads/2020/12/Automotive-Issue-Briefing-English.pdf.**

[112] Ontario Youth Apprenticeship Program. (2021). *Red Seal Trades.* Retrieved from: **https://oyap.ca/en/about_apprenticeship/red_seal_trades/**

[113] Ibid.

[114] International Labour Organization. (2021). *The future of work in the automotive industry: the need to invest in people's capabilities and decent and sustainable work.* Retrieved from **https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/meetingdocument/wcms_741659.pdf.**

Key Stakeholders

Government

Industry

Educational and Training Institutions

Community Representatives

Objective 3

Initiative 5

Elevate awareness of and enhance work-integrated learning (WIL) opportunities within the automotive and mobility sector based on the needs of students, faculty, and employers.

Background

WIL is an increasingly popular approach in higher education in which students learn "from the integration of experiences in educational and workplace settings."[115] Through WIL, students participate in hands-on learning in real or simulated workplaces alongside their academic studies.[116] Apprenticeships, co-operative education, internships, field placements, and entrepreneurship are all examples of different types of WIL. [117]

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[115] Higher Education Quality Council of Ontario. (2016). *A Practical Guide for Work-integrated Learning: Effective Practices to Enhance the Educational Quality of Structured Work Experiences Offered though Colleges and Universities.* Retrieved from: **https://heqco.ca/wp-content/uploads/2020/03/HEQCO_WIL_Guide_ENG_ACC.pdf.**

[116] Government of Ontario (2021). *Career Ready Fund.* Retrieved from: **http://www.tcu.gov.on.ca/pepg/programs/careerreadyfund.html**.
[117] Autonomous Vehicle Innovation Network. (2021). *Work Integrated Learning: A snapshot on programs, benefits and opportunities for the automotive and mobility sector.* Retrieved from **https://www.avinhub.ca/wp-content/uploads/2021/06/AVIN-Insights-Work-Integrated-Learning.pdf**.

When designed effectively, WIL benefits students, academic institutions, and employers.[118] Through WIL, students gain the opportunity to apply their knowledge, expand their skillset, grow their network, and deepen their understanding of different careers.[119] WIL can also prepare students for labour market entry by allowing them to gain experience in a business setting and understand workplace culture.[120] Through WIL, academic institutions can strengthen their relationships (e.g., with government and their community) and enhance the recruitment and satisfaction of students. [121] Similarly, employers can deepen their relationships with students and their community, and access talent with innovative ideas who they can potentially hire in the future.[122]

In Ontario, close to 50% of post-secondary students participate in a co-op, internship, field placement, or other form of experiential learning before they graduate.[123] Similarly, approximately 50% of post-secondary students in Canada participate in WIL during university, as well as between 65% and 70% of college and polytechnic students.[124]

Despite known positive impacts, challenges exist for students, academic institutions, and employers regarding WIL in Ontario. Students are often required to identify their own WIL opportunities and can face challenges in finding and pursuing impactful opportunities when awareness of opportunities amongst faculty members of academic institutions is limited.[125] Some students struggle to complete WIL due to financial, logistical, or other factors. For example, at least 25% of apprentices recently reported having difficulty progressing throughout their apprenticeship. Progression challenges were cited as especially prevalent for welders and millwrights. [126] The participation of certain students in WIL programs could also be increased, such as first-generation students, Indigenous students, students from racialized groups, international students, and students experiencing physical health, mental health, or other challenges (e.g., precarious housing, food insecurity).[127] Students located in rural, remote, and northern communities can also have difficulty accessing WIL opportunities, as can students in more urban areas if their employer's location is not connected to local transit networks.[128]

Student demand for WIL can outpace supply, and creating opportunities based on the needs of specific academic programs and students is a continuing challenge for many educational institutions and their partners.[129] Because the implementation of WIL can also be costly, academic institutions and employers may be reluctant to provide WIL opportunities.[130] For example, effectively training, supervising, and mentoring students involves significant employer / supervisor effort and coordination, as does the financial compensation of students.[131] Academic institutions, too, must devote time, effort, and resources to the development and maintenance of relationships with industry and community partners and to the creation of WIL programs.[132] Both employers and academic institutions can struggle to identify appropriate WIL opportunities for students.

118 Higher Education Quality Council of Ontario. (2020). *A Practical Guide for Work-integrated Learning.* Retrieved from **https://heqco.ca/wp-content/uploads/2020/03/HEQCO_WIL_Guide_ENG_ACC.pdf**.
119 Ibid.
120 Ibid.
121 Ibid.
122 Autonomous Vehicle Innovation Network. (2021). *Work Integrated Learning: A snapshot on programs, benefits and opportunities for the automotive and mobility sector.* Retrieved from **https://www.avinhub.ca/wp-content/uploads/2021/06/AVIN-Insights-Work-Integrated-Learning.pdf.**
123 Business/Higher Education Roundtable. (2020). *Taking the Pulse of Work-Integrated Learning in Canada.* Retrieved from **https://www.bher.ca/sites/default/files/documents/2020-08/BHER-Academica-report-supplement.pdf.**
124 Ibid.

125 Higher Education Quality Council of Ontario. (2018). *Barriers to Work-integrated Learning Opportunities.* Retrieved from **https://heqco.ca/pub/barriers-to-work-integrated-learning-opportunities/**.
126 Higher Education Quality Council of Ontario. (2018). *Diving into the Trades: An In-depth Look at 10 Apprenticeship Programs in Ontario.* Retrieved from **https://heqco.ca/wp-content/uploads/2020/11/Diving-Into-The-Trades-FINAL.pdf**.
127 Higher Education Quality Council of Ontario. (2018). *Barriers to Work-integrated Learning Opportunities.* Retrieved from **https://heqco.ca/pub/barriers-to-work-integrated-learning-opportunities/**.
128 Business/Higher Education Roundtable. (2020). *Taking the Pulse of Work-Integrated Learning in Canada.* Retrieved from **https://www.bher.ca/sites/default/files/documents/2020-08/BHER-Academica-report-full.pdf**.
129 Ibid.
130 Ibid.
131 Ibid.
132 Ibid.
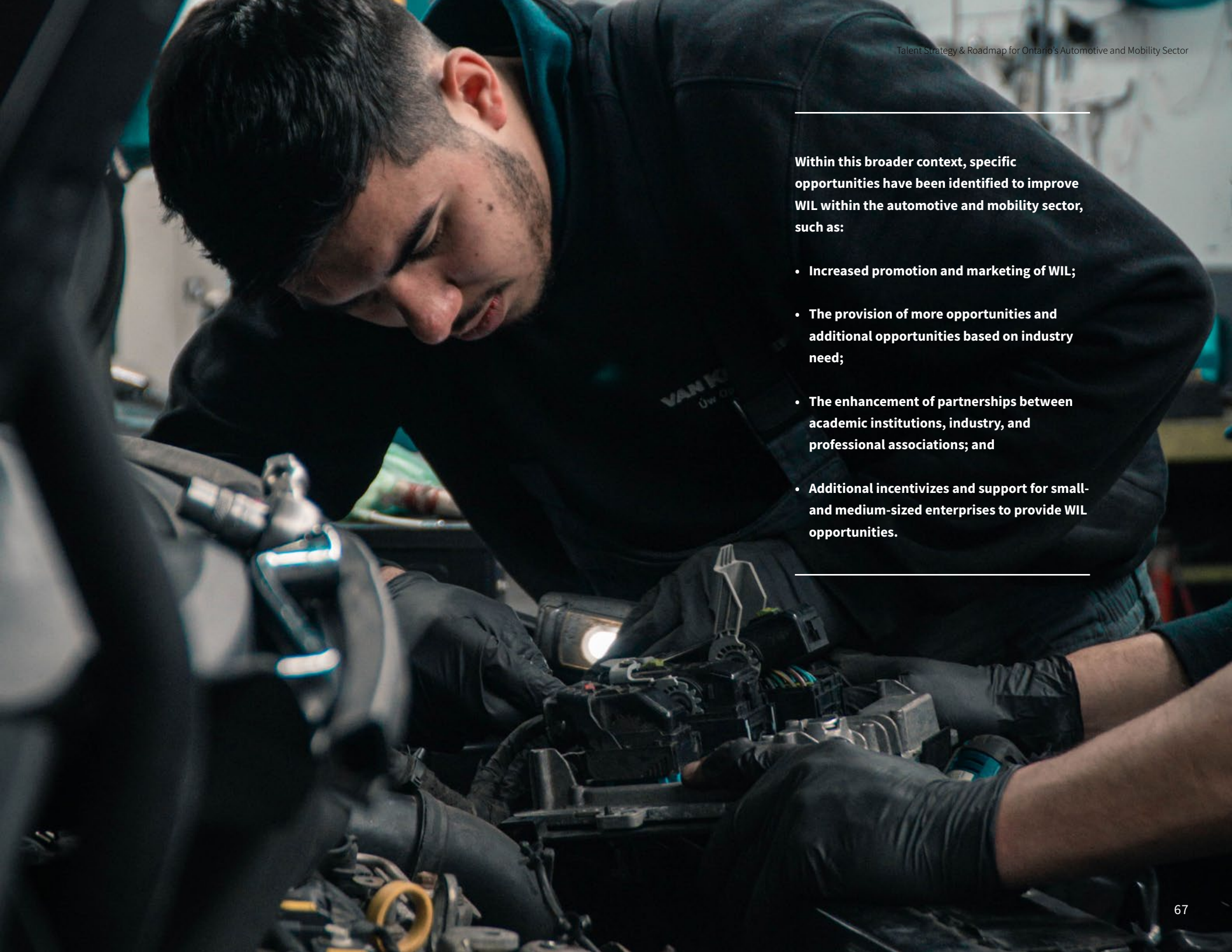
Within this broader context, specific opportunities have been identified to improve WIL within the automotive and mobility sector, such as:

- **Increased promotion and marketing of WIL;**

- **The provision of more opportunities and additional opportunities based on industry need;**

- **The enhancement of partnerships between academic institutions, industry, and professional associations; and**

- **Additional incentivizes and support for small- and medium-sized enterprises to provide WIL opportunities.**

Initiative Description

Building on the success of OVIN's Talent Development internship and fellowship program, this initiative is focused on the provision of additional WIL opportunities and supports across Ontario's automotive and mobility sector in partnership with government, industry, academic institutions, private sector organizations, non-profit and/or not-for-profit organizations, and professional associations. This initiative includes the collaborative design of more WIL opportunities, the centring of existing and anticipated future skills gaps in the development and refinement of WIL opportunities, and increasing the accessibility of WIL for underrepresented groups, learners living in rural, northern, and remote communities, individuals whose occupations are at-risk, mid-late career workers, individuals scheduled to exit the youth justice system and adult corrections system, and other individuals who experience barriers in participating in WIL.

Leading Practice Highlights
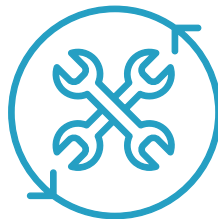
Integrating Academic and Work-Based Learning:
 In 2015, the United Kingdom introduced **degree apprenticeships**, which provide students the opportunity to combine academic and work-based learning. During their apprenticeship, students' study at university part-time while working. Upon graduation, students attain either a full bachelor's or master's degree as well as several years of work experience.[133] Degree apprenticeships were designed in partnership between employers, universities, and professional bodies, and are co-funded by the government and employers.[134] The government pays two-thirds of a student's tuition, while their employer funds the remaining third.[135] Students also receive a salary during their apprenticeship, meaning that many students graduate without student debt.[136]

[133] GOV.UK. (2019). *The Complete Guide to Higher and Degree Apprenticeships.* Retrieved from **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/781848/Uni_Appr_guide2019_web2.pdf**
[134] UCAS. (2021). *Degree Apprenticeships.* Retrieved from **https://www.ucas.com/apprenticeships/apprenticeships-england/what-apprenticeships-are-available/degree-apprenticeships**.
[135] Top Universities. (2021). *What Are Degree Apprenticeships?* Retrieved from **https://www.topuniversities.com/student-info/careers-advice/what-are-degree-apprenticeships**.
[136] Ibid.

Leading Practice Highlights

Addressing Skills Gaps Through Collaboration:

The **Michigan Advanced Technician Training Program (MAT2)** is aimed at supporting high-tech manufacturers and companies with complex technologies or logistics address their skills gaps through access to a sustainable talent pipeline. Under the program, apprentices are provided a salary, a debt-free associate degree, national and international credentials, and hands-on work experience.[137] The approach is industry-driven, having been developed in partnership between global industry technology leaders to address growing skills gaps and an aging workforce.[138] The design, implementation, and leadership of the program is driven by a Strategic Steering Committee, which includes representatives from industry, education, and workforce and economic development.[139]

Supporting Students in Gaining Real-World Experience:

OVIN's **Talent Development program** provides students and recent graduates from Ontario colleges and universities with hands-on industry experience working at Ontario-based companies or post-secondary institutions. Through the program, students receive on-the-job training (e.g., software and hardware development, data analytics) and are provided with an opportunity to apply their knowledge and skills to topical automotive and smart mobility technology challenges (e.g., related to C/AVs).

[137] MAT Squared – Michigan Advanced Technician Training. (2021). *Program Overview.* Retrieved from **https://mat2apprenticeships.com/program-overview/**.
[138] MAT Squared – Michigan Advanced Technician Training. (2021). *About Us.* Retrieved from **https://mat2apprenticeships.com/about-us/**.
[139] Ibid.

Objective 3 \ Initiative 5

Timeline

Short-term

Document existing WIL opportunities within Ontario's automotive and mobility sector and map opportunities against in-demand skills within the sector. Consult with industry representatives, faculty, students, and other relevant automotive and mobility stakeholders regarding their specific WIL challenges, objectives, and desired outcomes.

Medium-term

In collaboration with relevant stakeholders, develop action plan regarding WIL for Ontario's automotive and mobility sector. Action plan to include desired new opportunities, the refinement of existing opportunities, and pilot opportunities. Initiate implementation of action plan.

Long-term

Continue implementation of WIL action plan. Monitor and evaluate existing WIL opportunities and support continuous improvement.

Key Success Factors

Ensuring the consideration of existing and anticipated barriers to effective WIL, particularly as they relate to specific groups (e.g., based on gender, race, sexuality, ability, income, location etc.) and the provision of new, innovative programming that supports the participation of diverse groups in WIL (e.g., provision of WIL alongside life stabilization and wraparound supports).[140]

Developing and refining WIL based upon clearly defined objectives and desired outcomes for the automotive and mobility sector for different stakeholders and partners, such as students, employers, and faculty (e.g., development of specific competencies, equity in WIL programs etc.) and anchoring programming in a clear understanding of stakeholder needs and priorities.

Creating broad stakeholder buy-in in WIL.

Complementing new and existing WIL opportunities with marketing and promotional activities to support increased awareness and participation.

Sample Key Performance Indicators

- # of new WIL opportunities created

- % increase of students placed in WIL roles in Ontario

- Student, employer, and faculty satisfaction (e.g., measured through a satisfaction survey or questionnaire)

- # of students that secure full-time roles post-WIL placement

[140] Lethbridge College – Centre for Technology, Learning and Innovation. (2021). *Work-Integrated Learning: Maximizing Benefits and Minimizing Challenges*. Retrieved from **https://learninginnovation.ca/work-integrated-learning-maximizing-benefits-and-minimizing-challenges/**.

Key Stakeholders

Government

Industry

Educational and Training Institutions

Objective 3

Initiative 6

Provide a digital Upskilling Platform through which Ontario's talent can access short-term courses, micro-credentials, and learning resources developed by educational institutions and industry and understand how to upgrade their skillset to match those required for available jobs.

Background

To support worker adaptation to transformation within the automotive and mobility sector, ongoing learning opportunities must be provided based on specific skills gaps and emerging fields. However, employers can be hesitant to invest in or experience challenges investing in opportunities for employee reskilling, especially for workers with greater learning and development needs (e.g., older individuals, individuals with less skills).[141]

141 Conference Board of Canada. (2021). *Bridging Generational Divides: Advancing Digital Skills in Canada's Apprenticeships and Skilled Trades Ecosystem.* Retrieved from **https://www.conferenceboard.ca/e-library/abstract.aspx?did=10707**

Objective 3 \ Initiative 6

Employees can also find it challenging to make time for learning, given competing commitments and priorities.[142] For example, 30% of working-age Canadians indicated a desire to participate in additional training in a recent survey but cited that barriers prevent them from doing so (e.g., cost, time, learning accessibility).[143]

Flexible learning opportunities such as short-term courses and micro-credentials have been identified as important mechanisms for supporting individuals in reskilling and upskilling, including those who may be underserved in terms of learning and development resources.[144] Short-term courses and micro-credentials can respond quickly to situations that may exacerbate labour force challenges (e.g., recessions, pandemics), and support individuals in learning about different fields of study, developing transferrable skills, and addressing skills gaps.[145] However, despite their potential to support workforce development, limited awareness of the purpose and benefit of micro-credentials often exists amongst the public and employers.[146] In addition, there can be variation in terms of the quality of micro-credentials. For example, micro-credentials are not always competency-based or industry-aligned.[147]

30%

of working-age Canadians indicated a desire to participate in additional training

[142] LinkedIn Learning. (2018). *Workplace Learning Report.* Retrieved from **https://learning.linkedin.com/resources/workplace-learning-report-2018**.

[143] Ontario 360. (2020). *Higher Education for Lifelong Learners: A Roadmap for Ontario Post-Secondary Leaders and Policymakers.* Retrieved from **https://on360.ca/policy-papers/higher-education-for-lifelong-learners-a-roadmap-for-ontario-post-secondary-leaders-and-policymakers/**.

[144] Higher Education Quality Council of Ontario. (2021). *Microcredentials: Short, focused learning that responds to emerging demands.* Retrieved from **https://heqco.ca/janice-deakin-julia-colyar-jackie-pichette-microcredentials-short-focused-learning-that-responds-to-emerging-demands/**.

[145] Higher Education Quality Council of Ontario. (2021). *Making Sense of Micro credentials.* Retrieved from **https://heqco.ca/pub/making-sense-of-microcredentials/**.

[146] Colleges and Institutes Canada. (2021). *CICan launches new report and environmental scan on micro credentials.* Retrieved from **https://www.collegesinstitutes.ca/news-centre/news-release/cican-launches-new-report-and-environmental-scan-on-microcredentials/**.

[147] Higher Education Quality Council of Ontario. (2021). *Making Sense of Micro credentials.* Retrieved from **https://heqco.ca/pub/making-sense-of-microcredentials/**.

Initiative Description

This initiative is focused on the provision of an Upskilling Platform to help individuals navigate change within the automotive and mobility sector and broader labour market and access relevant training programs. The flexible education platform will provide a centralized source through which individuals can learn about the ongoing transformation of the automotive and mobility sector, understand how to enhance their skillset to meet evolving sector demands (e.g., through an accreditation guideline), and access supporting educational resources and micro-credentials. The Upskilling Platform will be informed by regular engagement with educational and training institutions, industry (e.g., employers), and other stakeholders to ensure the continuous identification of skill and labour needs.

In addition, as part of this initiative, employers will be encouraged to and assisted with helping their workforce participate in learning and development via the Upskilling Platform. For example, educational material will be shared that highlights the role of employers in ensuring their staff receive the training and learning and development support that they need. Resources on leading learning and development practices and enablers will also be disseminated to SMEs (e.g., the importance of dedicated training time, briefing employees on training tools, providing training alongside a formal training structure that consists of goal-setting and regular check-ins with leadership and management, the provision of learning and development incentives etc.).

Leading Practice Highlights

Helping People Discover the Trades Digitally:
France's **Automotive Platform** is a partnership of more than 4,000 different companies within the automotive sector in France. The Automotive Platform works to implement strategic priorities related to innovation, competitiveness, employment, and skills.[148] One such initiative – the **"My Professional Project"** – allows individuals to "build their future" in the sector. The digital platform supports individuals in discovering trades that correspond to their unique profile, which includes information such as their existing skills and goals. The platform links individuals to employers and active job postings, automotive and mobility sector news, and tailored training based on their profile (e.g., project management, problem-solving, mechanical design).[149]

[148] PFA – Automotive Platform. (2021). *Preparing Today for Tomorrow's Mobility.* Retrieved from **https://pfa-auto.fr/**.
[149] PFA – Automotive Platform. (2021). *My Professional Project.* Retrieved from **https://monfuturjobauto.fr/**.

Leading Practice Highlights

Supporting Vulnerable Workers in Adapting to Sectoral Change:
The Automotive Parts Manufacturers' Association (APMA)
is launching a **Digital Learning Program** for Advanced
Manufacturing to equip workers with an opportunity to develop
skills in areas such as health and safety, lean manufacturing,
quality assurance, and leadership within a context of significant
technology-driven change within the sector.[150] The program is
intended to address skills and labour shortages within the sector
and support the building of a sectoral talent pipeline.[151] Hourly
workers who work on the production floor of SMEs are the main
targets of this program, as they are considered more vulnerable
to sectoral change and generally lack in-house employer training
due to limited employer resources.[152] The program will include a
phased roll-out of training and certifications to help workers keep
their skills relevant as well as support individuals interested in a
career in the sector. For example, the program will both provide
self-paced beginner and advanced training for existing workers
within the sector, as well as career pathways for less experienced
individuals (e.g., recent graduates) to support their long-term
integration into the sector.[153] Training and certifications are being
collaboratively developed by industry leaders, post-secondary
institutions, and the Government of Ontario. Upon course or
program completion, individuals will be provided a digital badge
to recognize their certification and skill development.[154]

[150] Automotive Parts Manufacturer's Association. (2021). *Parts association's new online program addresses shortage in skilled trades.* Retrieved from **https://apma.ca/2021/01/13/parts-associations-new-online-program-addresses-short-age-in-skilled-trades/**.

[151] Automotive Parts Manufacturer's Association. (2021). *About.* Retrieved from **https://apma.ca/digital-learning/**.

[152] Automotive Parts Manufacturer's Association. (2021). *Parts association's new online program addresses shortage in skilled trades.* Retrieved from **https://apma.ca/2021/01/13/parts-associations-new-online-program-addresses-short-age-in-skilled-trades/**.

[153] Automotive Parts Manufacturer's Association. (2021). *Program.* Retrieved from **https://apma.ca/program/**.

[154] Automotive Parts Manufacturer's Association. (2021). *How It Works.* Retrieved from **https://apma.ca/how-it-works/**.

Timeline

Short-term

Consult with automotive and mobility ecosystem stakeholders regarding existing curricula, gaps the Upskilling Platform could address, and industry and educational and training institution involvement with the development of the Upskilling Platform. Support educational and training institutions in the development of short-term courses and micro-credentials to address current gaps. Leverage existing initiatives to develop and promote the Upskilling Platform (e.g., the Government of Ontario's micro-credentials awareness campaign, OVIN's **Skills & Career Navigator**, talent attraction and promotion activities etc.). Launch and promote the Platform.

Medium-term

Continue supporting the development of learning content to address gaps. Gather feedback and update Platform based on this feedback.

Long-term

Continuously update and enhance the Upskilling Platform based on trends within the automotive and mobility sector, in-demand skills and occupations, and ongoing feedback.

Key Success Factors

✓ Developing broad awareness of and excitement about the Upskilling Platform and its purpose and value.

✓ Recognizing that different regions of Ontario are affected by automotive and mobility sector transformation and labour market disruption in different ways, such as urban, rural, and remote communities, that digital platforms are more appropriate for some people and programs than others, and that some skills in the automotive and mobility sector are best developed through hands-on experience.

✓ Establishing channels through which learner, educational and training institution, industry, and other stakeholder satisfaction with the Upskilling Platform can be measured (e.g., extent to which the relevant training is provided, quality of training etc.).

✓ Continually updating the Platform based on feedback and engagement with stakeholders (e.g., consultation with employers around emerging skills needs).

✓ Considering how to best create an accessible and inclusive service for different groups.

✓ Leveraging existing initiatives to support individuals in accessing the Platform (e.g., Ontario's Micro-Credentials Strategy and Broadband and Cellular Action Plan).

Sample Key Performance Indicators

- Partnership satisfaction (e.g., satisfaction survey or questionnaire for educational and training institution partners)

- # of micro-credentials and short-term courses developed and hosted on the Platform

- # of completed courses by learners

- Learner satisfaction post-course completion

- Platform traffic (i.e., quantity of people who visit the Platform)

Key Stakeholders

- Government
- Industry
- Educational and Training Institutions

Objective 3

Initiative 7

Use knowledge about the transformation of the automotive and mobility sector to inform the development and continued evolution of a Reskilling Framework for the sector and the design of responsive programs and initiatives to support worker reskilling.

Background

The occupations and skillset of many individuals within the automotive and mobility sector will need to evolve alongside broader sector and labour market shifts. For example, it is estimated that the role of 1 in 5 Canadian employees is at risk due to automation and that reskilling will be necessary to support these individuals in shifting to different occupations.[155]

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155 Conference Board of Canada (2020). *Bracing for Automation: What Are Canada's Most Vulnerable Jobs?* Retrieved from **https://www.conferenceboard.ca/focus-areas/innovation-technology/future-skills/bracing-for-automation?utm_source=PRESSRE-LEASE&utm_medium=social&utm_campaign=COMMS**.

Objective 3 \ Initiative 7

Within the automotive and mobility sector, drivers, mechanics, and transportation inspectors may experience some occupational transformation because of automation.[156] At the same time, new occupations are emerging, such as 3D printing technicians and technical specialists, mechanical design simulation engineers, and robotic welding operators, creating potential opportunities for workers to transition from one occupation to another.[157]

Helping individuals and businesses within the automotive and mobility sector better understand how the sector is changing and how sector change will affect future skills needs is critical to supporting worker resilience within the sector. An opportunity has been identified by sector stakeholders to improve organizational capacity to identify relevant workforce development solutions (e.g., new learning methods to support timely skills development, reskilling strategies, rapid development of education and training tools based on current and future skills needs etc.) to address potential skills gaps.[158]

> **It is estimated that the role of 1 in 5 Canadian employees is at risk due to automation and that reskilling will be necessary to support these individuals in shifting to different occupations.**

[156] Deloitte. (2017). *Making the future of mobility work: How the new transportation ecosystem could reshape jobs and employment.* Retrieved from **https://www2.deloitte.com/cn/en/pages/consumer-industrial-products/articles/making-the-future-of-mobility-work.html**.

[157] Information and Communications Technology Council. (2021). *The Digital-Led New Normal: Revised Labour Market Output for 2022.* Retrieved from **https://www.ictc-ctic.ca/wp-content/uploads/2020/08/Outlook-ENG-FINAL-8.24.20.pdf**.

[158] Autonomous Vehicle Innovation Network. (2021). *Workforce Transformation: Realities and Future Outlook for the Automotive and Mobility Sector.* Retrieved from: **https://www.avinhub.ca/wp-content/uploads/2021/04/ST-monthly-insights-series-Workforce-Transformation-Jan-2021.pdf**.

Initiative Description

This initiative is focused on the design and ongoing development of a Reskilling Framework for the automotive and mobility sector in partnership with sector stakeholders (e.g., employers). The Reskilling Framework will include a map of occupations within the automotive and mobility sector anticipated to be disproportionately affected by sector transformation and broader labour market shifts. The Reskilling Framework will highlight how the role and activities of individuals within these occupations are expected to change and identify how existing skillsets can be leveraged elsewhere in the automotive and mobility sector (e.g., to emerging occupations). The Framework will guide individuals in their reskilling journey through the provision of different pathways and assist individuals in developing both a basic skill set that is applicable regardless of an individual's specific role (e.g., digital skills, higher cognitive skills, social and emotional skills, and adaptability and resilience skills) and specific expertise based upon their interests, goals, and sector demand.[159]

Employers and other stakeholders will be able to use the Reskilling Framework to support the development of strategies to address skills gaps within the automotive and mobility sector (e.g., pilot programs targeted to the needs of individuals whose occupations are at-risk). The Reskilling Framework will also help facilitate the redeployment of workers within the automotive and mobility sector from occupations and segments experiencing declining labour market demand to occupations and segments where there is increased demand. The Upskilling Platform and **Skills & Career Navigator** will house and support the implementation of this Reskilling Framework.

Leading Practice Highlights

Implementing an Industry-Driven Learning Platform:
In India, a digital platform has recently been implemented, called the **FutureSkills Prime Platform**. The industry-driven learning ecosystem is a marketplace and content library, whereby international content and learning providers collaborate to offer learners the latest information on in-demand occupations, related skills, free and paid learning content, assessments, and certifications.[160] Through the platform, learners can participate in diagnostics which guide them in their learning journey based on their career goals, aptitude, and skillset. Individuals can access foundational courses that include key concepts regarding emerging technologies as well as bridge courses that are introductory in nature and allow individuals to learn about new technology tools, programming platforms, and hardware.[161] Learners can also access "collaborative deep skilling" courses that align to industry recommended and government approved competency standards.[162] The FutureSkills program aims to reskill 2 million individuals over a period of 5 years and support India in becoming a global hub for talent in emerging technologies.[163]

[159] McKinsey & Company. (2020). *To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now.* Retrieved from **https://www.mckinsey.com/business-functions/organization/our-insights/to-emerge-stronger-from-the-covid-19-crisis-companies-should-start-reskilling-their-workforces-now**.

[160] Future Skills – A NASSCOM Initiative. (2020). *Future Skills.* Retrieved from **https://futureskills.nasscom.in/assets/img/FutureSkills-brochure-B2B-2020.pdf**.

[161] FutureSkills Prime. (2021). *About FutureSkills Prime.* Retrieved from **https://futureskillsprime.in/about-us**.

[162] Ibid.

[163] Future Skills – A NASSCOM Initiative. (2020). *Future Skills.* Retrieved from **https://futureskills.nasscom.in/assets/img/FutureSkills-brochure-B2B-2020.pdf**.

Leading Practice Highlights

Supporting Skills Transferability Through Short Courses:
The **Continuous Learning Office** at Ontario Tech University is supporting manufacturing workers in adapting their skills while working through short courses. The courses emphasize the transferability of specific skills gained in project work in a particular industry to project management skills that could be transferred to another sector or a different job within the same sector.[164] Ontario Tech University is also developing short Master's certificates to support managers in moving from one sector to another, as well as a program that allows individuals working in the automotive and broader manufacturing sectors to use their experience and knowledge to transition to a new industry.[165]

[164] Ontario's Universities Policy Discussion Series. (2019). *Partnering for a Better Future for Advanced Manufacturing.* Retrieved from **https://ontariosuniversities.ca/wp-content/uploads/2019/05/MPP-PDS2-booklet-4.pdf.**
[165] Ibid.

Timeline

Long-term

Scale pilots as appropriate and disseminate lessons learned. Continuously update the Reskilling Framework in collaboration with partners.

Medium-term

Implement piloting of tailored programs and services identified through partner collaboration to support at-risk workers. Monitor and evaluate pilot results.

Short-term

Engage stakeholders to determine how the Reskilling Framework can best support them. Develop the Reskilling Framework. In collaboration with partners, identify how the Reskilling Framework can be used to inform the piloting of tailored programs and services to support worker resilience and the ongoing evolution of the Reskilling Framework. Publish and promote the Reskilling Framework.

Key Success Factors

Considering the design and ongoing evolution of the Reskilling Framework so that the guide is accessible (e.g., easy-to-navigate) and inclusive for different groups of individuals.

Providing support and outreach to assist individuals in accessing and utilizing the Framework and developing supporting informational campaigns so that individuals understand the Framework's intent and how it can help them.

Establishing channels through which individuals' satisfaction with the Framework can be measured (e.g., how easy the Framework is to navigate). Continually updating the Framework based on user and stakeholder feedback (e.g., employer insights), sectoral evolution, and broader labour market trends.

Sample Key Performance Indicators

- Framework traffic (i.e., quantity of people who access the Reskilling Framework)

- # of pilots completed

- # of workers successfully reskilled and redeployed

Objective 3 \ Initiative 7

Objective 4
Equity, Diversity, & Inclusion

Objective Statement

Support groups who experience barriers to entry to enter the automotive and mobility sector and enable industry access to diverse talent.

Introduction

A diversified and inclusive workforce is one that addresses systemic barriers as it relates to labour market entry and participation and includes people from different ethnic and racial backgrounds, genders, and sexual orientations, as well as physical health and mental health conditions and disabilities. The automotive and mobility industry is facing significant challenges as it relates to a diversified and inclusive workforce across these identifiers. For example, in a recent survey, 50% of women in the automotive and mobility sector indicated that they would move to a different industry if they were given the opportunity to restart their career today – with a lack of equity, diversity and inclusion cited as the top reason to leave.[166] Women's underrepresentation in the automotive and mobility sector in Ontario can be attributed to several factors, such as a lower share of female graduates in technical and engineering fields of study and apprenticeship training and cultural and historical factors related to gender stereotypes.[167] For example, career counselors, teachers, and educators are more likely to steer women towards university rather than apprenticeships, citing that women may not be best suited for "non-traditional" occupations.[168] These and other stereotypes around the suitability of skilled trades occupations for women are frequently transmitted through the "very information pathways intended to recruit youth to apprenticeship.[169]

[166] Career wise by CERIC. (2019). *Canada's Global Leadership in Co-op and Work-Integrated Learning.* Retrieved from **https://career-wise.ceric.ca/2019/11/29/canadas-global-leadership-in-co-op-and-work-integrated-learning/#.YPsM3uhKhPa**.

[167] American Association of University Women. (2020). *Why So Few? Women in Science, Technology, Engineering, and Mathematics.* Retrieved from **https://www.aauw.org/app/uploads/2020/03/why-so-few-research.pdf**.

[168] Construction Sector Council. (2010). *The State of Women in Construction in Canada.* Retrieved from **https://www.winsett.ca/GetSiteFile/StateOfWomenConstruction.pdf**

[169] Construction Sector Council. (2010). *The State of Women in Construction in Canada.* Retrieved from **https://www.winsett.ca/GetSiteFile/StateOfWomenConstruction.pdf**

Similarly, Black, Indigenous and people of colour (BIPOC) experience challenges to participating in the automotive and mobility sector across North America. For example, in the United States, educational attainment in STEM fields among racialized groups is low, with Black and Indigenous students making up an even lower proportion of graduates than other racialized groups, accounting for 7% of STEM graduates in 2018.[170] In Ontario, Black students in high school are more likely to be streamed into courses below their ability, specifically into applied rather than academic high school courses, potentially affecting their ability to meet university application pre-requisites.[171] For example, a recent report found that only 53% of Black high school students were enrolled in academic programs (e.g., programs leading to a degree, versus certificates or diplomas), compared to 81% of white, and 80% of other racialized students.[172]

As the automotive and mobility sector faces a deepening skills and talent shortage, experts have called for increased efforts related to diversity and inclusion to support the mitigation of challenges experienced by underrepresented groups. This includes a greater focus on equity to support equality of opportunity and ensuring that people from diverse backgrounds are valued and integrated into their workplaces and within the automotive and mobility sector more broadly.

These calls to action recognize that supporting equity, diversity, and inclusion benefits both individuals and employers, such as allowing employers to:

- Enhance cultural / historical knowledge, problem-solving, and increase access to international markets, where applicable;

- Increase the number of entrepreneurs from underrepresented groups;[173]

- Respond to change, address conflict, and improve alignment more effectively;[174]

- Access, develop, and retain top talent, as organizations EDI commitment and demonstration are key decision criteria when candidates choose and decide to remain with an employer;

- Enhance sustainable cultures of inclusion and equity;

- Create better business outcomes (e.g., outperform their competitors, make better business decisions etc.);[175]

- Spot and reduce risk occurrence;[176] and

- Significantly improve financial performance.[177]

Conversely, a single incident of 'micro-exclusion' — or micro-behaviours such as tone, and implicit bias / assumptions based on identity — can lead to an immediate 25% decline in an individual's performance on a team project.[178]

[170] Hechinger Report. (2021). *Even as colleges pledge to improve, share of engineering and math graduates who are Black declines.* Retrieved from **https://hechingerreport.org/even-as-colleges-pledge-to-improve-share-of-engineering-graduates-who-are-black-declines/**.

[171] CBC News. *Black Students in Toronto Streamed into Courses Below Their Ability, Report Finds. (2017).* Retrieved from **https://www.cbc.ca/news/canada/toronto/study-black-students-toronto-york-university-1.4082463**

[172] Ibid.

[173] Hamburg Institute of International Economics. (2008). *Cultural diversity and economic performance: Evidence from European regions.* Retrieved from **https://www.hwwi.org/fileadmin/hwwi/Publikationen/Research/Paper/Migration/HWWI_Research_Paper_3-14.pdf.**

[174] Emerald Insight - Journal of Managerial Psychology. (1997). *Managing Diversity in Transnational Project Teams: A Tentative Model and Case Study.* Retrieved from **https://www.emerald.com/insight/content/doi/10.1108/02683949710164190/full/html**.

[175] McKinsey & Company. (2018). *Delivering Through Diversity.* Retrieved from **https://www.mckinsey.com/business-functions/organization/our-insights/delivering-through-diversity**.

[176] Deloitte Review (2018). *The Diversity and Inclusion Revolution: Eight Powerful Truths.* Retrieved from **https://www2.deloitte.com/content/dam/insights/us/articles/4209_Diversity-and-inclusion-revolution/DI_Diversity-and-inclusion-revolution.pdf**.

[177] Harvard Business Review. (2018). *The Other Diversity Dividend.* Retrieved from **https://hbr.org/2018/07/the-other-diversity-dividend.**

[178] BetterUp. (2020). *The Value of Belonging at Work: New frontiers for inclusion in 2021 and beyond.* Retrieved from **https://grow.betterup.com/resources/the-value-of-belonging-at-work-the-business-case-for-investing-in-workplace-inclusion**.

Objective 4

Sector Segment Snapshot

Challenges regarding equity, diversity and inclusion exist across different segments within the automotive and mobility sector. For example:

- Women are underrepresented across the sector. In a study of 49 automotive-sector related occupations in the Canadian labour force, women were found to be underrepresented in most occupations. **Women held only 6.5% of skilled trades jobs, 25% of supervisors/ technical management jobs, and 23% of production/ supervisor jobs.**[179]

- It is estimated that **97% of Canadian transport truck drivers are male**, with females experiencing barriers to working such as "access to safety and rest areas that are highly visible and lit," as well as sexism, sexual harassment, and caregiving obligations, among others.[180 181 182]

- In 2016, **women comprised 19.9% of the motor vehicle manufacturing workforce**, as well as 13.7% of the automotive repair and maintenance workforce.[183]

- Women in the automotive and mobility sector also earn less money than men, with an **hourly gender wage gap of $1.48 in assembly, $3.82 in parts production, and $4.43 in manufacturing.**[184]

Opportunities to increase the representation of racialized groups within the automotive and mobility sector have also been identified.

For example:

- Individuals from racialized groups have lower representation than the overall share of racialized groups in all industries in Ontario in the auto and parts manufacturing segment, aftermarket, maintenance, and repair segment, and the tool, die, and mold segment.[185]

- Recognizing an opportunity for increased representation within the automotive and mobility sector, the non-profit organization Accelerate Auto was created to increase Black representation within the sector across Canada.[186]

[179] Future of Canadian Automotive Labourforce. (2020). *Automotive Industry Labour Market Analysis – Women's Participation in Canada's Automotive Industry.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Trend-report-Diversity-Women-in-Auto-May27-2020-final.pdf**.

[180] TruckingHR Canada. (2019). *Labour Market Information – Interim Report.* Retrieved from **https://truckinghr.com/wp-content/uploads/2019/10/THRC_Report_LMIInterim-WEB-FINAL.pdf**.

[181] USA Today. (2019). *Women are increasingly joining the deadly world of truck driving, confronting sexism and long days.* Retrieved from **https://www.usatoday.com/story/news/nation/2019/03/09/women-truck-drivers-shortage-opportunities-pay-big-rigs/2845083002/**

[182] TruckingHR Canada. (2020). *The Road Ahead: Addressing Canada's Trucking and Logistics Labour Shortages.* Retrieved from **https://truckinghr.com/wp-content/uploads/2020/03/THRC-Labour-Market-Information-Report_English-version.pdf**.

[183] Catalyst. (2020). *Women in the Automotive Industry (Quick Take).* Retrieved from **https://www.catalyst.org/research/women-in-the-automotive-industry/.**

[184] Future of Canadian Automotive Labourforce. (2020). *Automotive Industry Labour Market Analysis – Women's Participation in Canada's Automotive Industry.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Trend-report-Diversity-Women-in-Auto-May27-2020-final.pdf**.

[185] EY Analysis. (2021). *Autonomous Vehicle Innovation Network - Labour Market Research Insights Report.*

[186] Driving. (2021). *How Accelerate Auto plans to increase Black representation in Canada's auto industry.* Retrieved from **https://driving.ca/features/feature-story/how-accelerate-auto-plans-to-increase-black-representation-in-canadas-auto-industry**

Objective 4 \ Equity, Diversity, & Inclusion

Key Stakeholders

- Government
- Industry
- Community Representatives
- Educational and Training Institutions

Objective 4

Initiative 8

Develop an Equity, Diversity, and Inclusion (EDI) Advisory Committee for the sector to support the coordination and development of EDI-related initiatives, programs, and opportunities to ensure representative guidance and support for the automotive and mobility industry as it strives to achieve increased equity, diversity, and inclusion.

Background
The automotive and mobility sector is widely perceived as male-dominated, ethnically homogenous, and with low levels of maturity in equity, diversity, and inclusion efforts and initiatives across the talent lifecycle.

Objective 4 \ Initiative 8

A recent survey conducted by the Information and Communications Technology Council (ICTC) cites some of the key benefits of investing in diversity and inclusion as: increased organizational capacity and capabilities, increased innovation, and a stronger capacity to grow and attract new talent. [187] Another ICTC survey underscores that although companies and industry leaders may understand the significance of diversity and inclusion, and how it may support the overall improvement of business outcomes, there is a lack of adequate investment in company policies and strategies to formalize EDI engagement. [188]

The automotive and mobility sector in Ontario requires an EDI advisory group to spearhead and support the development and implementation of EDI initiatives in the sector to effectively convene diverse perspectives across stakeholder groups and establish strong representation in initiative development from start to finish. The absence of strong engagement in EDI can hinder greater participation across the existing and potential workforce, and further challenge efforts towards greater diversity and inclusion in the industry. Similarly, it can also mean that decisions regarding diversity and inclusion are "top-down" – and not informed by the lived experiences of diverse community members – leaving initiatives to fall short and not deliver on their intended objectives.

While crucial to acknowledge the work still to come, it is important to also recognize progress already made. For example, a recent survey indicates that although a lack of diversity and inclusion may be a primary reason driving women to leave the automotive and mobility industry, 71% of women feel that there has also been significant progress in increasing women's representation in the automotive and mobility sector over the last five years (i.e., between 2015 and 2020). [189]

An opportunity has been identified to develop an EDI Advisory Committee to build on this progress in Ontario and maintain momentum to support the adaptation of the industry to changing workforce expectations and emerging EDI-related prerequisites to talent attraction and retention.

[187] Information and Communications Technology Council. (2016). *A National Strategy to Develop Canada's Talent in a Global Digital Economy*. Retrieved from **https://www.ictc-ctic.ca/wp-content/uploads/2016/03/ICTC_DigitalTalent2020_ENGLISH_FINAL_March2016.pdf.**

[188] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration*. Retrieved from **https://www.bcg.com/publications/2020/new-era-higher-ed-employer-collaboration**.

[189] Deloitte. (2020). *Women at the Wheel: 2020 Women in Automotive Industry Study*. Retrieved from **https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/manufacturing/deloitte-uk-women-at-the-wheel-autosurvey-2020.pdf.**

Initiative Description
This initiative is focused on the development of an EDI Advisory Committee comprised of automotive and mobility industry leaders and employers, government and public-sector leaders, EDI experts and academic representatives, as well as professional associations, diverse community representatives and leaders, and non-government organizations specializing in EDI. A coalition model - or committee-based convener model - refers to a coordinated and synchronous effort to achieve a specific goal and target. This includes involving stakeholders and partners in an advisory capacity, where applicable, and establishing a lead convener to facilitate the coordination and definition of efforts related to EDI.[190]

The EDI Advisory Committee will:

- **Represent key players in the automotive and mobility ecosystem and stakeholders and partners impacted by EDI initiatives, programs, policies, and strategies.**

- **Provide oversight, guidance, coordination, and collaboration support to stakeholders and partners as they collectively work to identify and address key barriers facing diverse community members, alongside barriers to inclusion in the workforce and workplace.**

- **Develop an ongoing awareness of and share best practices related to EDI.**

- **Establish cohesive and overarching targets and action plans to attract and retain underrepresented communities in Ontario's automotive and mobility workforce.**

Fostering a mechanism of regular open dialogue and engagement with community leaders is a key driver to establishing effective EDI programs and initiatives within the workforce and the workplace. By creating a channel for collaboration with outside organizations such as non-government organizations, community groups, and industry and professional associations, automotive and mobility ecosystem members can engage a wider audience, encourage greater participation in EDI initiatives across their workforce, and drive not only greater EDI in the industry but also set the conditions for better, more competitive, innovative, and efficient business outcomes for industry leaders and employers.[191]

[190] Deloitte. (2020). *Inclusive Work: Marginalized Populations in the Workforce of the Future.* Retrieved from **https://www2.deloitte.com/us/en/insights/focus/technology-and-the-future-of-work/future-of-the-workforce-vulnerable-populations.html.**
[191] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration.* Retrieved from **https://www.bcg.com/publications/2020/new-era-higher-ed-employer-collaboration.**

Leading Practice Highlights

Creating Connection Around Equity, Diversity, and Inclusion:

The **Center for Automotive Diversity, Inclusion, and Advancement (CADIA)** in Michigan is a non-profit organization geared to supporting the local automotive and mobility industry in achieving diversity, equity, and inclusion, and more specifically, doubling the number of diverse leaders in the automotive industry by 2030.[192] CADIA offers workshops, spearheads a diversity, equity, and inclusion roundtable series, provides an EDI certification and accelerator program to provide a structured opportunity to learn EDI best practices and solve organizational EDI challenges, and provides a platform for connecting a virtual community for automotive and mobility industry professionals navigating the complex environment of equity, diversity, and inclusion. Although not defined as an advisory committee, CADIA provides advisory services to the automotive and mobility industry through its several program offerings, guided by its advisory board of representatives from industry, community, and non-profit organizations.

Addressing Barriers Through Community Collaboration:

In 2017, the **Post-Secondary Education Standards Development Committee** was established to help advise on and inform recommendations for a proposed education accessibility standard emerging from the *Accessibility for Ontarians with Disabilities Act* (AODA). The Committee is made up of a group of representatives comprised of people with disabilities, disability organizations and sector experts to develop recommendations for a proposed accessibility standard to address barriers in publicly funded post-secondary education.[193]

[192] Centre for Automotive Diversity, Inclusion and Advancement. (2021). *Advancing Talent in a Diverse, Equitable and Inclusive Way for Automotive and Mobility.* Retrieved from **https://www.automotivediversity.org/**.
[193] Government of Ontario. (2021). *Post-secondary Education Standards Development Committee.* Retrieved from **https://www.ontario.ca/page/post-secondary-education-standards-development-committee**.

Timeline

Short-term

Identify, engage with, and appoint key stakeholder representatives for the EDI Committee. Develop objectives and target outcomes. Conduct research and stakeholder engagement to assess and understand existing barriers to program and initiative effectiveness. Identify pilot opportunities for programs and initiatives of interest.

Medium-term

Oversee the implementation of pilots and initiatives. Monitor and evaluate preliminary engagement and pilot and initiative impacts and efficacy.

Long-term

Refine objectives and desired outcomes to ensure the changing needs of underrepresented communities are continuously reflected as they enter and succeed in the automotive and mobility sector's labour force. Oversee the scaling of pilots based on lessons learned and a comprehensive understanding of the needs of underrepresented communities.

Key Success Factors

✓ Ensuring clear communication of the EDI Advisory Committee and its objectives to ensure that stakeholders and partners are aware of the Committee's role as a convener and coordinator of EDI initiatives, best practices, and thought leadership, and of overall industry collaboration on EDI efforts.

✓ Establishing ongoing, effective, and sufficient engagement with community representatives and other key stakeholders and stakeholders and partners to ensure continued relevance of EDI Advisory Committee outputs.

Sample Key Performance Indicators

- # of opportunities emerging from EDI Advisory Committee
- # of individuals within the automotive and mobility sector who perceive themselves as having benefitted from EDI Committee-led initiatives

- % change in representation of BIPOC community members in the sector
- % change in representation of people with disabilities in the sector
- % change in representation of women in the sector

- % change in representation of 2SLGBTQI+ community members in the sector
- % change in representation of recent immigrants in the sector

Key Stakeholders

Government

Industry

Community Representatives

Educational and Training Institutions

Objective 4

Initiative 9

Collaborate with underrepresented communities to evaluate existing programs (e.g., related to talent attraction, learning and development) and develop approaches to program and initiative co-design to address community-specific barriers. Ensure that intersectional identities are appropriately represented and acknowledged in the design of EDI-related initiatives.

Background
Designing EDI-related programs requires consideration of different groups, with different experiences, and therefore different challenges and needs. For example, immigrants face different challenges in workforce and labour market entry than BIPOC and 2SLGBTQI+ community members who also face systemic barriers to entry.

Immigrants, for example, can face difficulty accessing foreign credentials, may lack Canadian work experience, and can face discrimination in hiring practices; BIPOC and 2SLGBTQI+ community members, as well as women, also face systemic challenges that both result in and extend from lower graduation rates in STEM and skilled trades (e.g., apprenticeship programs) in addition to discriminatory hiring practices.[194] Similarly, the participation of underrepresented students of colour decreases at several points in the higher education pipeline – including at application, admission, enrollment, persistence, and completion stages of educational attainment.[195]

Low-skilled, Indigenous, and older-workers are less likely to receive workplace training, with these effects being further exacerbated for those living in rural or remote communities.[196]

Indigenous peoples across Canada are overrepresented in manual intensive labour and underrepresented in fields like technology; they may have to overcome challenges such as living in a more rural or remote area and may lack work history in addition to facing systemic and discriminatory barriers and challenges.[197]

Addressing the challenges and barriers facing distinct communities requires consideration of historical experiences, as well as existing, present-day barriers to entry. Products and services that are externally designed without involving target communities in design activities fail to address a variety of constraints and requirements facing specific communities.[198] Engagement with target communities is critical to ensuring the efficacy and impact of programs to support talent development for the automotive and mobility sector that advances EDI goals and objectives, while simultaneously closing talent and skills gaps.[199]

For example:

- Well-designed course placement strategies mitigate the time students spend in remedial education without making progress toward a credential.

- Individualized mentoring and coaching can increase the odds that students remain enrolled in school.

- First-year experience programs, such as summer bridge programs that support incoming students, can improve academic achievement and credit-earning.[200]

Given the considerable differences in experience, challenges, and barriers, and resulting degrees of EDI-related interventions required, programs and initiatives cannot be designed as a one-size-fits-all approach. Programs and initiatives must be circumstantially tailored to ensure workforce and community outcomes are effectively achieved.

[194] Future of Canadian Automotive Labour Force. (2020). *Automotive Industry Labour Market Analysis: Women, Youth and Indigenous Persons in Canada's Automotive Industry.* Retrieved from **https://www.futureautolabourforce.ca/wp-content/uploads/2020/06/Trend_Women-Youth-and-Indigenous-Persons-in-Canadas-Automotive-Industry.pdf**

[195] Office of Planning, Evaluation, and Policy Development. US Department of Education. (2016). *Advancing Diversity & Inclusion in Higher Education. Key Data Highlights Focusing on Race and Ethnicity and Promising Practices.* Retrieved from **https://www2.ed.gov/rschstat/research/pubs/advancing-diversity-inclusion.pdf**

[196] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration.* Retrieved from **https://www.bcg.com/publications/2020/new-era-higher-ed-employer-collaboration.**

[197] CBC News. (2018). *Trust and patience required in training, hiring Indigenous workers, says CEO.* Retrieved from **https://www.cbc.ca/news/canada/new-brunswick/indigenous-workers-training-trustpatience-1.4768279**

[198] Jagtap, S. (2021). *Co-design with Marginalized People: Designers' perception of barriers and Enablers.* Retrieved from **https://www.tandfonline.com/doi/full/10.1080/15710882.2021.1883065.**

[199] Boston Consulting Group. (2020). *Call for a New Era of Higher Ed–Employer Collaboration.* Retrieved from **https://www.bcg.com/publications/2020/new-era-higher-ed-employer-collaboration.**

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Initiative Description

Once the EDI Advisory Committee is established, direct collaboration with community members can support the implementation of key programs and initiatives. This initiative is focused on working closely with BIPOC, 2SLGBTQI+, women, recent immigrants, people with disabilities, and other underrepresented groups to evaluate existing initiatives and co-design pilot programs to ensure inclusive, needs-based program design as well as approaches to the implementation of programs and initiatives in the automotive and mobility sector that effectively consider the specific barriers and challenges faced by each group based on identity-specific lived experiences and systemic barriers. Collaboration with priority communities will acknowledge the different lived experiences each community faces based on identity, and will seek to address systemic challenges such as anti-black racism and the impact of colonialism on Indigenous communities. Working directly with underrepresented groups, including leaders and community representatives, to co-design and inform initiative, pilot, and program development will not only create opportunities to better reach communities and cultivate increased skilled trades and automotive and mobility sector awareness, but will also support broad engagement with systemically disadvantaged groups to ensure that the future of the automotive and mobility sector is diverse, inclusive, and representative.

Leading Practice Highlights

Enhancing Engagement with Indigenous Communities:
The **Mining Industry Human Resources Council (MiHR)** identifies key practices related to indigenizing hiring to improve engagement with Indigenous communities and encourage community-based talent development. Employers who have had success recruiting and retaining Indigenous persons foster relationships with Indigenous communities and 'Indigenize' certain elements of their hiring and training processes.[201] This may involve engaging Indigenous employees as ambassadors for the firm, recruiting directly within Indigenous communities both on and off-reserve, and engaging Indigenous leaders in the recruitment process.[202]

Improving Digital Access through Platform Co-Design:
Fable works to develop accessibility across digital platforms by conducting co-design sessions during the prototyping and mock-up phases of platform development. The organization engages a diverse community of people with disabilities who use various assistive technologies to provide insight on how to best design platforms.

[201] Canadian HR Reporter. (2018). *Indigenizing Workplaces Part of Reconciliation Journey: Panel*. Retrieved from **https://www.hrreporter.com/cultureand-engagement/36719-indigenizing-workplaces-part-of-reconciliation-jou/**.
[202] Mining Industry Human Resources Council (MiHR) (2020). *Mining Industry Human Resources. Guide for Aboriginal Communities.* **https://mihr.ca/wp-content/uploads/2020/03/MIHRGuidetoAboriginalCommunities.pdf**

Objective 4 \ Initiative 9

Leading Practice Highlights

Incorporating Culture Into Program Design:

As part of the broader process of Indigenization, several employers' efforts to identify cultural differences in training, development, and mentoring and design programs with these difference in mind have proven successful. [203] For example, the development of training courses specific to the needs of industry targeted to Indigenous workers, partnering with local organizations such as the **Joint Economic Development Initiative (JEDI)** to recruit applicants, and changing education-requirements for jobs to implement an equity-based lens to hiring that accounts for different levels of education resulting from historical and systemic barriers.

[203] CBC News. (2018). *Trust and Patience Required in Training, Hiring Indigenous Workers, say CEO*. Retrieved from **https://www.cbc.ca/news/canada/new-brunswick/indigenous-workers-training-trustpatience-1.4768279**.

Timeline

Short-term

Develop approaches to evaluating existing programs and initiatives and co-designing pilot programs and initiatives based on the needs of specific communities with key community members and stakeholders. Ensure that the approaches emphasize lived experience and reflect the differentiated needs of underrepresented groups. Pilot co-design mechanism before scaling to ensure efficacy. Engage with community groups and stakeholders to evaluate existing programs and design target pilot programs and initiatives.

Medium-term

Implement pilot programs and initiatives. Establish a mechanism to ensure that impacts are continuously relevant and sustainable (i.e., reflect improved outcomes and changing needs as required).

Long-term

Re-evaluate approaches to program evaluation and pilot co-design based on review and consultation with key stakeholder groups and community members. Scale successful programs and initiatives.

Key Success Factors

Establishing effective communication of the desire to co-design programs and desired impacts.

Considering the investment (e.g., time) required by underrepresented groups to support the development of pilot programs and initiatives.

Using different engagement and co-design methods to support inclusion in approach, methodology, and outcomes.

Sample Key Performance Indicators

- # of programs and initiatives designed or redesigned in collaboration with underrepresented groups
- % increase in underrepresented groups in the sector

- Collaboration participant satisfaction with co-design approaches
- Program/initiative participation levels and rates

- Program/initiative participant satisfaction
- Program/initiative participant employment in sector (levels/rates)

Talent Roadmap Overview

	SHORT-TERM		MEDIUM-TERM			LONG-TERM			
OBJECTIVES & INITIATIVES	KICK START		IMPLEMENT & EVALUATE			OUTCOME REALIZATION & RE-EVALUATION (2030+)			
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+

PERIODIC REVIEW OF THE TALENT STRATEGY & ROADMAP

OBJECTIVE 1: COLLABORATION & COORDINATION ACROSS THE PROVINCE

Initiative 1
Launch an Automotive & Mobility Curriculum Collaboration Committee.

- Appoint Committee Representatives & Define Goals
- Conduct Curricula Reviews & Monitor and Evaluate Committee Impact
- Continue Curricula Reviews & Evolve Committee As Required

Initiative 2
Leverage existing automotive and mobility clusters to provide targeted skills and talent support and engage with areas outside of these clusters to enhance regional integration.

- Engage with Stakeholders to Identify Objectives & Supporting Platforms
- Assess Regional Skills and Talent Needs
- Continue Evaluation of Skills and Talent Needs & Coordination Across the Province

OBJECTIVE 2: TALENT SOURCING & ATTRACTION

Initiative 3
Enhance industry's engagement with elementary, secondary, and post-secondary students to support greater awareness of automotive and mobility sector career opportunities and reduce stigmas associated with working in the sector.

- Develop Student Engagement Framework
- Pilot Programs & Monitor Success
- Refine Programming & Share Lessons Learned
- Continue Program Execution and Evaluation & Scaling of Successful Programs

Initiative 4
Support the identification, attraction, and redeployment of talent from other sectors and jurisdictions that possess the transferrable skills needed in Ontario's automotive and mobility sector.

- Develop Promotional Approach and Materials
- Launch Promotional Campaigns & Continue Collaborating with Partners to Identify Talent Attraction Initiatives
- Scale Successful Initiatives and Evolve Initiatives Based on New Target Groups

Talent Roadmap Overview

OBJECTIVES & INITIATIVES

	KICK START	IMPLEMENT & EVALUATE	OUTCOME REALIZATION & RE-EVALUATION (2030+)						
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+

PERIODIC REVIEW OF THE TALENT STRATEGY & ROADMAP

OBJECTIVE 3: WORKFORCE DEVELOPMENT & RETENTION

Initiative 5
Elevate awareness of and enhance work-integrated learning (WIL) opportunities within the automotive and mobility sector based on the needs of students, faculty, and employers.

- Map Existing WIL Opportunities Against In-Demand Skills & Consult Stakeholders Regarding WIL Challenges and Desired Outcomes
- Develop WIL Action Plan
- Initiate WIL Action Plan
- Continue Action Plan Implementation & Impact Evaluation

Initiative 6
Provide a digital Upskilling Platform through which Ontario's talent can access short-term courses, micro-credentials, and learning resources developed by educational institutions and industry and understand how to upgrade their skillset to match those required for available jobs.

- Consult Stakeholders Regarding Curriculum Gaps & Desired Upskilling Involvement
- Develop the Upskilling Platform
- Launch & Promote Upskilling Platform
- Continue Developing Learning Content, Gather Feedback, and Evolve Platform
- Continue to Enhance the Upskilling Platform

Initiative 7
Use knowledge about the transformation of the automotive and mobility sector to inform the development and continued evolution of a Reskilling Framework for the sector and the design of responsive programs and initiatives to support worker reskilling.

- Engage Stakeholders & Develop Reskilling Framework
- Identify Pilot Opportunities
- Publish Reskilling Framework
- Conduct Pilots & Monitor Results
- Continue Updating the Reskilling Framework & Scale Successful Pilots

OBJECTIVE 4: EQUITY, DIVERSITY, AND INCLUSION (EDI)

Initiative 8
Develop an EDI Advisory Committee for the sector to support the coordination and development of EDI-related initiatives, programs, and opportunities to ensure representative guidance and support for the automotive and mobility industry as it strives to achieve increased equity, diversity, and inclusion.

- Identify & Appoint Committee Representatives
- Conduct Research and Stakeholder Engagement
- Identify Pilot Initiatives
- Oversee the Implementation of Key Pilots and Initiatives
- Monitor & Evaluate Preliminary Engagement and Pilot Impacts
- Re-evaluate Impact of EDI Committee & Refine Target Outcomes and Goals
- Oversee Scaling of Pilots

Initiative 9
Collaborate with underrepresented communities to evaluate existing programs and develop approaches to program and initiative co-design to address community-specific barriers. Ensure that intersectional identities are appropriately represented and acknowledged in the design of EDI-related initiatives.

- Engage with Stakeholders & Pilot Co-Design and Evaluation Approaches
- Identify Pilot Initiatives
- Initiate the Implementation of Pilot Programs and Initiatives
- Monitor & Evaluate Impacts
- Consult with Stakeholders & Continuously Improve Co-Design & Evaluation Approaches
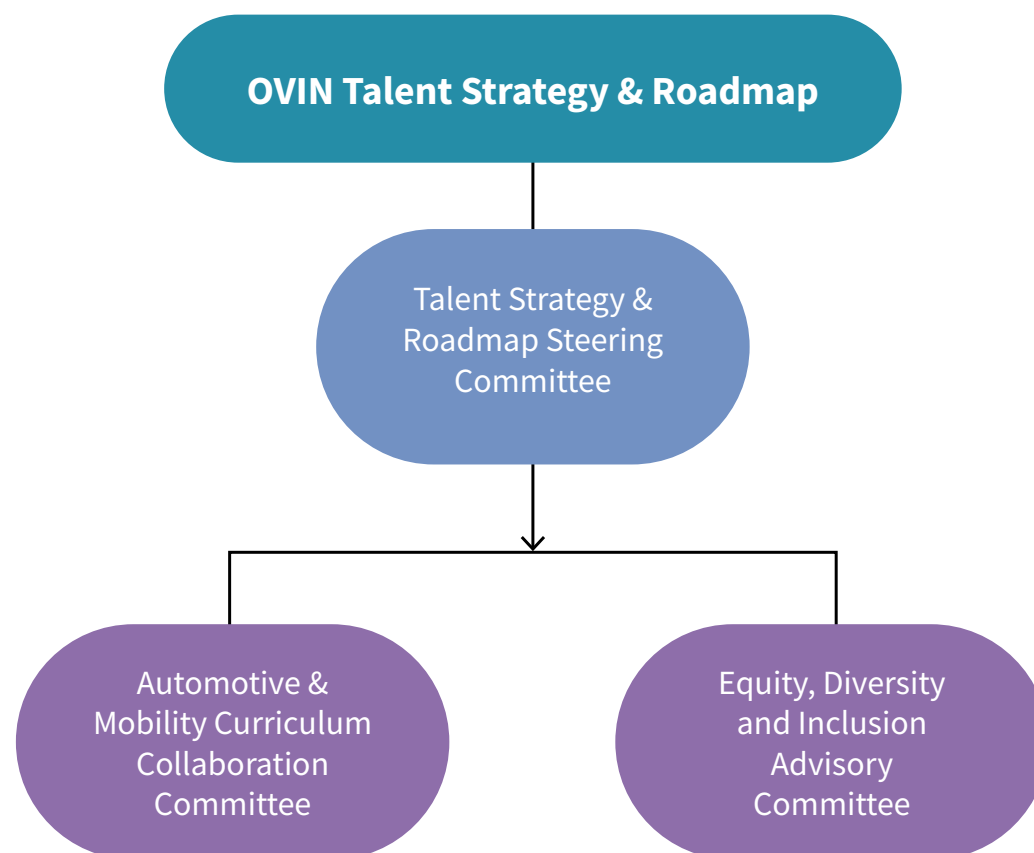- Scale Pilots

Talent Strategy & Roadmap
Implementation

Governance

To support the effective implementation of the Talent Strategy & Roadmap, a collaborative and inclusive governance structure will be developed to support coordination, collaboration, and accountability for results.

The governance structure will include a pan-provincial Steering Committee, with supporting Sub-Committees and Working Groups around specific topics as required. Each of the Sub-Committees will be consistent with the objectives and initiatives identified in the Talent Strategy & Roadmap.

Over the horizon, as we continue to collaborate with industry partners and stakeholders, additional sub-committees and specialized working groups may emerge.

OVIN Talent Strategy & Roadmap

Talent Strategy & Roadmap Steering Committee

Automotive & Mobility Curriculum Collaboration Committee

Equity, Diversity and Inclusion Advisory Committee

OVIN's Skills & Career Navigator

OVIN's Skills & Career Navigator is a key resource for individuals interested in or currently working within Ontario's automotive and mobility sector. The Skills & Career Navigator features the Talent Strategy & Roadmap, provides a centralized source of information, and includes a range of resources targeted to employers and other stakeholders and partners. The tool includes information related to how the automotive and mobility sector is changing, provides a snapshot of existing and emerging technologies, and walks prospective talent through skills and career pathways based on each individual's experience and skillset.

Next Steps

This Talent Strategy & Roadmap is intended to inform a broader understanding and consideration of challenges and opportunities within the automotive and mobility sector, specifically related to talent. While there is broad consensus that the automotive and mobility sector will continue to evolve due to factors such as changing workforce supply and demand, the adoption of new business models, economic uncertainty, and unforeseen events (e.g., the COVID-19 pandemic), uncertainty remains regarding the magnitude and effect of transformation on future skills and occupations. For example, diverging opinions exist regarding the extent to which sector change will enhance workforce productivity or exacerbate skills gaps.[204]

However, we know that individuals across Ontario will be impacted by sectoral and broader labour market changes differently depending on where they live, what sector they work in, and what their occupation and skills are. As such, this Talent Strategy & Roadmap is intended to support the future proofing of Ontario's automotive and mobility sector workforce and the targeted efforts of partners and other sector stakeholders to respond to shifting workforce demands, including talent sourcing, attraction, development, and retention. To assist in the design of collaborative strategies to support workforce adaptability and resilience, the Talent Strategy & Roadmap has been designed as a living document. OVIN will conduct periodic reviews of the Talent Strategy & Roadmap and will consider whether updates are required to objectives, initiatives, or other elements based on new areas of focus (e.g., electric vehicles and lightweighting), existing workforce realities, and future trends.

OVIN will regularly monitor progress regarding the achievement of Talent Strategy & Roadmap initiatives. Progress snapshots will be provided in OVIN's thought leadership published on the Skills & Career Navigator and during OVIN's events.

OVIN is committed to working with and gathering input from partners, innovators, experts, and like-minded people regarding the challenges they experience, their needs, and opportunities within the automotive and mobility ecosystem. As OVIN and its partners work to implement the Talent Strategy & Roadmap, we encourage readers to <u>connect with us</u>. We would like to hear from you!

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Appendix A
Glossary

Appendix

Aftermarket, Maintenance, and Repair: Auto inspection, repair, replacement and service of mechanical, electrical, and electronic systems and components by motor vehicle dealers, garages, fleet maintenance companies, service stations, and automotive specialty shops.

Auto and Parts Manufacturing: The manufacturing and assembly of auto parts, including transmission and power train components, engines and engine parts, body parts and trim, electronics, braking systems, and steering and suspension components.

Connected and Autonomous Vehicles (C/AV): The research, design, development, testing, and operation management of connected and autonomous vehicle technologies for cars, shuttles, trucks, buses, delivery vehicles and drones.

Diversity: The range of visible and invisible qualities, experiences and identities that shape who we are, how we think and how we engage with, and are perceived by the world. These can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical or mental abilities, religious/spiritual beliefs, or political ideologies. They can also include differences such as personality, style, capabilities, and thoughts/perspectives.[205]

Diverse Workforce: Workforces comprised of individuals who have an array of identities, abilities, backgrounds, cultures, skills, perspectives, and experiences that are representative of Canada's current and evolving population.[206] Involves the empowerment of people by respecting and appreciating what makes them different.[207]

Equity: making sure everyone has what they need to succeed and removing barriers that disadvantage some groups over others.[208]

Freight and Goods Movement: The transporting and warehousing of goods and the provision of logistics services. Includes four transportation modes *(trucking, rail, air, and marine)* as well as postal services, couriers and messengers, and warehousing and storage.

Inclusion: The act of including someone as part of a group.[209] The practice of ensuring that all individuals are valued and respected for their contributions and are supported based on their unique needs.[210]

Inclusive Workplace: A fair, equitable, supportive, welcoming, and respectful workplace that recognizes, values and leverages differences in identities, abilities, backgrounds, cultures, skills, experiences, and perspectives.[211] Involves an organizational effort and practice where different groups and individuals with diverse backgrounds are "culturally and socially accepted and welcomed, and equally treated" in an organization.[212]

Mobility Planning and Infrastructure: The planning, design, development, management, and operation of mobility services and associated infrastructure. Includes roads, public transit, Intelligent Transport Systems (ITS), shared mobility services and the built environment.

Regional Technology Development Sites (RTDS): Physical sites across Ontario that bring together post-secondary institutions, regional innovation centres, incubators/accelerators, municipal and regional resources, industry, and other regional collaborators to support SMEs in the development, testing, prototyping, validation and commercialization of automotive technology and smart mobility solutions. Located in Waterloo Region, Ottawa Region, Hamilton Region, Durham Region, Windsor-Essex Region and Toronto Region.

Reskilling: The process of learning new skills to do a different job or of training people to do a different job.[213]

Tool, Die, and Mold: Making, repairing, and modifying custom-made, prototype or special tools, dies, jigs, fixtures, and gauges using various metals, alloys and plastics which require precise dimensions.

Underrepresented Group: Group that receive unequal access to or are excluded from participation in employment, services, or programs due to systemic barriers (e.g., institutional-level policies, practices, traditions and/or values).[214]

Upskilling: Providing an individual with more advanced skills through additional education and training. [215]

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Appendix B

Labour Market Research Insights – Data Limitations

- The job listings database does not include an industry component, meaning job listings can only be linked to occupations associated with the segment. Additionally, it covers the period between January 2018 and January 2021 and due to the impact of the COVID-19 pandemic on the labour market, the data during that period should be treated with caution.

- The job seeker profiles database also does not include an industry component and covers only the period between September 2018 and February 2020. The relatively small sample size also means data trends should be treated with caution.

- Both the job listings and job seeker profiles databases include data from across Ontario, however, at the regional level the data is limited and may not provide reliable insights.

- Skill analysis was limited by data availability and completeness, meaning skill demand/supply outlooks could not be provided for some occupation groups in some segments where there were gaps in terms of job listings, job seeker profiles, or O*NET data.