Executive Summary

Ontario's Automotive and Mobility Supply Chain at a Crossroads: Reinforcing Competitiveness in a Time of Global Change

Annual Comprehensive Sector Report

Ontario Vehicle Innovation Network

August 2026

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Ontario

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Minister's Foreword

Ontario's automotive and mobility sector is one of the province's greatest economic strengths, supporting tens of thousands of good-paying jobs, driving investment, and serving as a pivotal industry to many communities across the province.

With the global economy changing at a rapid pace, strong and reliable supply chains have become more important than ever. As companies across the globe make decisions about where to invest, where to source materials, and where to build the next generation of vehicles and mobility solutions, Ontario is stepping up to meet this moment.

Ontario brings together the key strengths needed to compete, including a world-class manufacturing base, a highly skilled workforce, clean and reliable energy, critical minerals, leading research institutions, and a strong network of suppliers and technology companies. These advantages have helped Ontario attract billions of dollars in investment across the auto supply chain since our government took office.

The Ontario Vehicle Innovation Network (OVIN) continues to play a critical role in building on this momentum by helping Ontario companies develop, test, and bring new automotive and mobility technologies to market. This work is especially important as the sector continues to evolve, with the future of Ontario's automotive industry not only about building cars, but the broader ecosystem of batteries, charging infrastructure, advanced manufacturing, connected technologies, dual-use applications serving both commercial and defence-related needs, and the SMEs innovating across these areas. By strengthening our supply chains and supporting homegrown innovation, Ontario can help more businesses grow, compete, and access new markets.

Our government is taking bold, decisive action to protect workers, attract investment, and strengthen the industrial base that supports Ontario's economy. By continuing to work with industry, entrepreneurs, researchers, and communities, we can build on this strong foundation and ensure Ontario remains a trusted and competitive place to lead the next generation of automotive and mobility growth.

The Honourable Victor Fedeli

Ontario Minister of Economic Development, Job Creation and Trade

1. Executive Summary

Ontario's automotive and mobility supply chains are operating in an increasingly complex global environment shaped by shifting trade patterns, geopolitical uncertainty, evolving industrial policies, and rapid technological change. Global production and investment are increasingly concentrated in Asia, while governments across North America, Europe, and Asia are deploying tariffs, incentives, domestic content requirements, and industrial strategies to strengthen supply chain resilience, secure critical inputs, and attract advanced manufacturing investment. At the same time, the transition toward electrified, connected, and software-defined vehicles is reshaping where value is created across the automotive ecosystem and altering the capabilities required to compete.

These changes are transforming automotive value chains. Batteries, critical minerals, power electronics, software, artificial intelligence, and digital systems are capturing a growing share of industry value, while supply chain resilience, cybersecurity, traceability, and trusted production networks have become strategic priorities. Automotive competitiveness is no longer defined solely by manufacturing scale, but increasingly by a jurisdiction's ability to integrate advanced technologies, secure critical inputs, enable digital supply chains, and support innovation across interconnected industrial ecosystems.

Ontario enters this transition from a position of strength. The province remains the centre of Canada's automotive industry, supported by five major manufacturers, a deeply integrated supplier network, advanced manufacturing capabilities, a growing battery ecosystem, significant critical mineral resources, clean electricity, and globally recognized strengths in engineering, artificial intelligence, software, and cybersecurity. Ontario's integration within North American production networks, combined with its research institutions, innovation infrastructure, and commercialization ecosystem, provides a strong foundation for continued participation in evolving automotive and mobility value chains.

Ontario also faces important challenges. Trade disruptions, tariff uncertainty, intensifying global competition, supply chain vulnerabilities, and changing technology requirements are creating new pressures across the sector. At the same time, slower-than-expected EV adoption and shifting market conditions have contributed to delays, restructurings, and suspensions of several major EV-related investments across North America, highlighting the importance of maintaining flexibility while supporting supplier adaptation and workforce transition.

The analysis in this report suggests that Ontario's long-term competitiveness will depend on its ability to build on existing industrial strengths while expanding into higher-value segments of the automotive and mobility value chain. Key opportunities include:

- Reinforcing Ontario's position as a trusted North American production and supply chain jurisdiction,
- Modernizing and retaining its existing manufacturing base,
- Strengthening battery, critical mineral, and circular supply chain,
- Accelerating supplier transition into electrified, software-defined, and integrated vehicle systems,
- Advancing trusted digital supply chains, cybersecurity, and traceability capabilities,
- Broadening adoption of AI and advanced manufacturing technologies,
- Leveraging cross-sector and dual-use applications, and
- Developing the talent required to support next-generation automotive production.

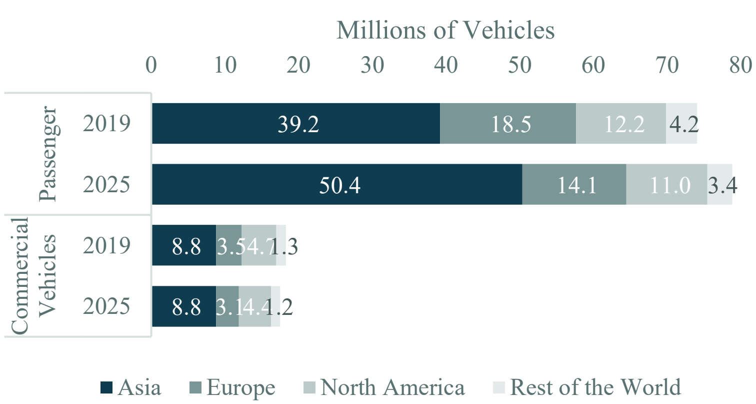
2. Global Trade, Policy, and Supply Chain Environment

Global Trade and Supply Chain

Global automotive production and trade are being reshaped by the rise of Asia, particularly China, evolving industrial policy, and the transition to electrified platforms. As shown in

Figure **1**, global vehicle production reached 96.5 million units in 2025, up 3.8 percent year-over-year, with Asia accounting for 61 percent of output. Since 2019, production in Asia has increased by 23 percent, while Europe and North America have declined by 22 percent and 9 percent respectively. China's scale, vertical integration, and sustained state support have strengthened its position as the world's largest vehicle producer and a dominant EV exporter, intensifying competitive pressure on established automotive jurisdictions.

Figure 1: Global Vehicle Production (In Millions) by Region, 2019 vs 2025



China's vehicle export value increased from USD 8.6 billion in 2019 to USD 90.2 billion in 2024, and Chinese customs data estimates automotive exports reached USD 142.4 billion in 2025. Chinese-made vehicles represented 7 percent of EU vehicle sales in 2025, with electric vehicles accounting for a growing share. This shift is affecting global sourcing, market positioning, and investment decisions, including in North America, where direct Chinese vehicle penetration remains limited but competitive effects are already influencing Original Equipment Manufacturer (OEM) strategies.

Governments are increasingly treating automotive supply chains as strategic assets tied to economic security. Nearshoring, friendshoring, semiconductor controls, Electric Vehicle (EV) battery restrictions, and connected-vehicle security rules are influencing where production is located and which suppliers are considered trusted. These strategies are influencing the location of manufacturing investment, and the set of jurisdictions considered trusted partners within integrated production networks.

Further, the EV transition is changing where value is created across the automotive value chain. Global EV sales exceeded 20 million units in 2025 and accounted for 25 percent of global new car sales. In a Battery Electric Vehicle (BEV), the battery pack can represent 30 to 40 percent of total vehicle cost, compared to 10 to 15 percent for the powertrain in a conventional Internal Combustion Engine (ICE) vehicle. This shift creates new opportunities for batteries and power electronics, but exposes traditional parts manufacturers to declining demand for core products.

Ontario is highly exposed to this transition. The province employs more than 100,000 workers across auto assembly and parts manufacturing, hosts five major vehicle manufacturers, and accounts for the majority of Canadian automotive production. Investments such as Volkswagen's PowerCo gigafactory in St. Thomas and the LG Energy Solution NextStar battery plant in Windsor position Ontario to capture higher-value EV supply chain activity. However, the pace of commercialization, supplier adaptation, and workforce transition will be critical to maintaining competitiveness.

Trade Policy, Market Access, and Regulation

The automotive trade policy environment is becoming more volatile and complex, with tariffs, incentive regimes, and regulatory fragmentation affecting cost structures, trade flows, and investment decisions. U.S. Section 232 tariffs introduced in 2025 created new exposure for vehicles and parts, although Canada-United States-Mexico Agreement (USMCA)-compliant vehicles from Canada and Mexico face tariffs only on non-U.S. content. Canada responded with reciprocal tariffs and an auto remission framework tied to domestic production commitments.

On March 26, 2025, the U.S. announced a 25 percent tariff on automobiles and auto parts under Section 232 of the Trade Expansion Act which came into effect on May 3, 2025. For vehicles originating from Canada and Mexico that qualify under USMCA rules of origin, the 25 percent tariff applies only to the vehicle's non-U.S. content, reducing tariff exposure for automakers with significant U.S. production and sourcing. Since its introduction, the tariff framework has evolved through bilateral and multilateral arrangements. Agreements with the European Union, Japan, and South Korea established a reduced combined tariff rate of 15 percent on their automotive exports, while the United Kingdom secured a 10 percent rate within defined quota limits. The U.S. Department of Commerce also introduced a temporary import adjustment mechanism, allowing manufacturers with U.S. assembly operations to offset a portion of their parts tariff burden by up to 3.75 percent of vehicle manufacturer's suggested retail price (MSRP) through April 2026, and 2.5 percent of aggregate MSRP for eligible vehicles produced between May 2026 and April 2027.

Trade impacts were initially moderated by inventory management and USMCA provisions, but recent data suggest growing pressure. As shown in Table 1 Canada's total automotive exports to the U.S. declined from $75.3 billion in 2024 to $71.5 billion in 2025, while Ontario exports fell from $64.8 billion to $62.1 billion. Comparing January to April 2024 with the same period in 2026, Canadian exports to the U.S. fell 22.1 percent, while Ontario's total trade with the U.S. declined 20.7 percent. Oxford Economics projects that permanent tariffs could reduce Canada's motor vehicle exports by 10 percent by 2029, lower sector output by CAD 1 billion, and eliminate approximately 6,000 jobs.

Table 1: Canada and Ontario Exports to U.S. (CAD)

Exports to U.S.	2024	2025
Canada (including Ontario)	$75.3 Billion	$71.5 Billion
Ontario only	$64.8 Billion	$62.1 Billion

Competing incentive regimes are also reshaping investment decisions. The U.S. retained Section 45X battery production credits while ending consumer EV credits in 2025. Although, U.S. states continue to offer major capital grants, tax abatements, and workforce subsidies. Canada has introduced or maintained federal clean technology manufacturing supports, project-level production subsidies, and a CAD 2.3 billion Electric Vehicle Affordability Program, while Ontario has extended CAD 85 million through Driving Prosperity, the Ontario Automotive Modernization Program (O-AMP), Ontario's Regional Development Program: Advanced Manufacturing and Innovation Competitiveness Stream, and OVIN. The diversity and stability of these policy frameworks are now central considerations for OEMs and suppliers.

The 2026 USMCA review adds further uncertainty. The review may revisit automotive rules of origin, regional value content, and restrictions related to Chinese-origin content. Failure to extend the agreement would trigger annual reviews and could create long-term uncertainty for the preferential trade framework that has supported North American automotive integration for three decades. At the same time, international cybersecurity, connected-vehicle, software-update, and battery traceability requirements are increasing compliance costs, while creating opportunities for jurisdictions that can demonstrate trusted, digitally secure, and transparent supply chains.

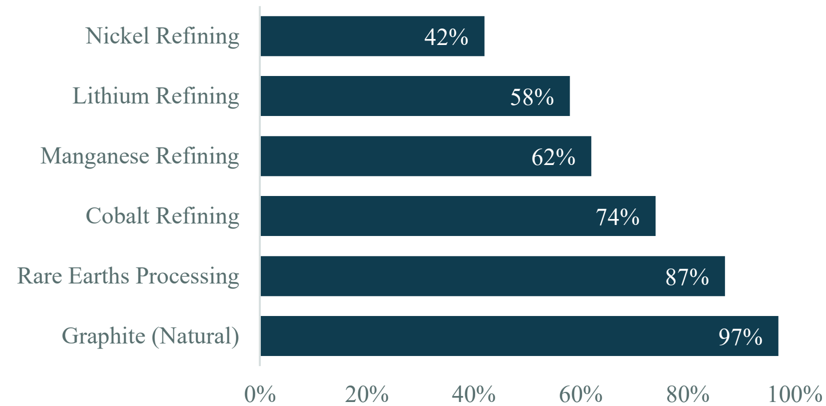
Supply Chain Resilience, Risk and Security

Supply chain resilience has become a strategic priority following pandemic disruptions, semiconductor shortages, port congestion, geopolitical tensions, tariffs, and critical mineral concentration. A 2025 McKinsey survey found that 90 percent of global supply chain leaders encountered resilience challenges in 2024, while visibility beyond Tier 1 suppliers declined. These conditions have increased the importance of multi-tier transparency, diversified sourcing, and digitally enabled risk monitoring.

As shown in Figure 2, critical mineral concentration is a key vulnerability. More than 80 percent of global rare earth processing and over 50 percent of lithium refining capacity are concentrated in China. Research indicates that minerals refined in China are present at some processing stage in 80 percent of nickel manganese cobalt (NMC) cathodes and 92 percent of lithium iron phosphate (LFP) cathodes. China's 2025 export controls on rare earths and lithium-ion battery supply chain materials underscored the strategic risks associated with reliance on a single dominant processor.

In response, governments and industry are pursuing strategies to reduce this concentration risk, including investment in domestic and allied-nation mineral processing capacity, diversification of sourcing across Africa, Latin America, and Australia, development of battery chemistries that reduce dependence on the most concentrated minerals, and the creation of strategic stockpiles. However, building alternative processing capacity is capital-intensive and takes years to reach commercial scale. As a result, the dependency on concentrated sources will likely persist through at least the medium term.

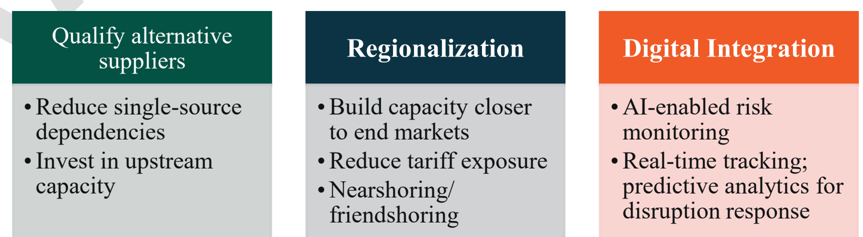
Figure 2: China's Share of Critical Mineral Processing by Commodity



OEM and Supplier Resilience Strategies

As a response to this evolving risk landscape, automakers and major suppliers have restructured their supply chain strategies around three interconnected priorities: diversification of sourcing, regionalization of production, and digital integration described in Figure 3.

Figure 3: Three Pillars of Automotive Supply Chain Resilience



These strategies reduce dependence on single-source suppliers, locate more production closer to end markets, and improve visibility through AI-enabled risk monitoring, real-time inventory tracking, and predictive analytics.

3. Automotive and Mobility Value Chains and System Transformation

Value Chain Structure and Supplier Ecosystem

The automotive value chain spans raw material extraction, component manufacturing, vehicle assembly, distribution, and end-of-life management. It is undergoing a structural reconfiguration as electrification, evolving sourcing strategies, and shifting global production dynamics reshape where value is created and how it is captured across the system. Three forces are driving this change:

- BEV value is increasingly concentrated in batteries and electronics,
- Battery cell manufacturers, semiconductor firms, software platform providers, and vertically integrated EV entrants are reshaping the supplier ecosystem, and
- Chinese OEMs and battery producers are setting new benchmarks for cost, scale, vertical integration, and product development speed.

Conventional ICE vehicles contain approximately 25,000 to 30,000 parts, while EVs reduce mechanical complexity and introduce high-value components, such as battery cells and modules, battery management systems, power electronics, thermal management systems, high-voltage wiring, semiconductors, and embedded software.

The battery is the most consequential part of this shift, accounting for approximately 30 to 40 percent of total vehicle cost compared with 10 to 15 percent for the powertrain in an ICE vehicle. Global EV battery deployment reached approximately 1.2 terawatt-hours in 2025, while average battery pack prices fell to USD 108/kWh globally and USD 84/kWh in China. Battery chemistry diversification is also reshaping mineral demand: lithium iron phosphate (LFP) batteries are gaining share in price-sensitive and fleet applications because they are lower cost and avoid nickel and cobalt, while nickel-rich chemistries remain important for long-range and performance applications.

Additionally, the transition from hardware-centric vehicles to software-defined platforms, where critical functions such as battery optimization and automated driving are increasingly governed by software rather than mechanical systems, is also redistributing value across major vehicle component categories. Industry analysis projects that the global SDV market will grow from approximately USD 475 billion in 2025 to USD 1.6 trillion by 2030.

Table 2 compares the approximate value distribution across key component categories in a conventional ICE vehicle vs. a BEV vehicle, illustrating the structural shift in where automotive value is concentrated.

Table 2: Approximate Value Distribution by Component Category, ICE vs. BEV

Component Category	ICE Vehicle	BEV	Direction of Change
Powertrain / Battery	10–15%	30–40%	▲ increase
Electronics & Software	15–20%	25–35%	▲ increase
Chassis, Body, Interior	35–40%	25–30%	▼ decline
Transmission & Exhaust	8–12%	< 2%	▼ decline
Thermal Management	2–3%	5–8%	▲ increase

Ontario's existing automotive base, battery investments, critical mineral assets, and software capabilities provide a strong foundation, though long-term competitiveness will depend on how quickly suppliers transition from legacy mechanical components toward batteries, power electronics, semiconductors, software, systems integration, recycling, and traceable circular supply chains.

Integrated Industrial Systems

Automotive manufacturing is shifting toward platform-based production architectures that standardize vehicle underbodies and structures across multiple models, brands, and powertrains. This approach spreads engineering costs, supports economies of scale, and provides flexibility as demand shifts. For suppliers, platform consolidation can create larger-volume opportunities when parts are specified across platforms, but it can also reduce unique part numbers and concentrate procurement among fewer, larger firms. Ontario's five major assemblers operate across different platform architectures, making multi-platform production capability a key provincial strength.

Production also depends on just-in-time and just-in-sequence systems, where components arrive in the sequence and timing required for assembly. This model increases efficiency but heightens exposure to disruptions, as demonstrated by the 2020 to 2022 semiconductor shortage. OEMs and suppliers are now balancing efficiency with resilience through hybrid inventory strategies, strategic buffers for critical components, and stronger digital coordination. This is especially important in the Ontario–Michigan corridor, where components often cross the border multiple times before final assembly.

OEM–supplier relationships are also becoming more integrated. Tier 1 suppliers are increasingly expected to provide physical components together with embedded software, calibration data, integration support, and system-level functionality. EV and software-defined vehicle programs require batteries, power electronics, vehicle operating systems, and data systems to operate as coordinated architectures. Suppliers that can combine manufacturing, software engineering, data management, and systems integration will be better positioned to participate in future platform programs.

As automotive production becomes more integrated, the capabilities required of manufacturers and suppliers are extending beyond the factory floor. Vehicle electrification requires grid readiness, charging networks, and energy management. Connected and autonomous vehicles require telecommunications, cybersecurity, digital identity, and interoperable data frameworks.

The ability of these systems to function at scale depends on the infrastructure and digital capabilities that support production. Energy networks must be able to serve both manufacturing operations and a growing fleet of electrified vehicles. Digital connectivity must be fast, reliable, and secure enough to support real-time coordination across suppliers, logistics providers, and OEMs. Software platforms must be interoperable across organizational boundaries, while cybersecurity requirements must be embedded across the system.

Enabling Infrastructure, Digital Systems and Operational Performance

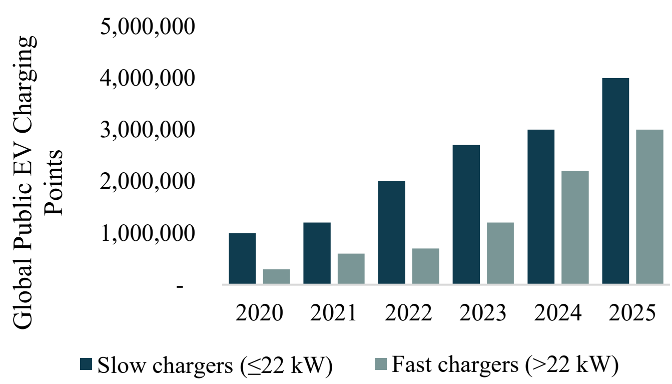
The integrated production systems and reconfigured value chains depend on a foundational layer of physical and digital infrastructure. Energy systems, charging networks, digital connectivity, software platforms, cybersecurity frameworks, and AI-enabled operations together determine whether advanced manufacturing and connected mobility can be deployed reliably and at scale.

The electrification of the vehicle fleet is placing two distinct demands on energy systems. The first is large, continuous industrial loads from battery and vehicle manufacturing. The second is a distributed network of charging infrastructure for end users. Battery manufacturing is highly energy-intensive, with gigafactories typically requiring 200 to 400 megawatts of continuous power and electricity representing 20 to 30 percent of production costs. As a result, power availability and carbon intensity are now core competitiveness factors for automotive investment.

Furthermore, charging infrastructure is expanding quickly. In Ontario, the province's ChargeON program, led by OVIN, has supported 270 public EV charging stations. Figure 4, shows the growth in global public

EV charging infrastructure from 2020 to 2025. Nearly 1.8 million public charging points were added globally in 2025, a 33 percent increase over 2024, bringing the worldwide total to more than 7 million.

Figure 4: Global Public EV Charging Points, 2020 to 2025



While the expansion of public charging has largely supported passenger vehicles, the fastest growth in battery demand is now occurring in the heavy-duty segment. Global sales of medium- and heavy-duty electric trucks reached approximately 65,000 units in 2024, up 80 percent year-over-year, while megawatt charging systems are moving from pilots to early commercial deployments. Freight electrification is reshaping the infrastructure stack. It is increasing demand for larger battery packs, placing new requirements on grid capacity and depot infrastructure, and concentrating value in fleet software, route optimization, and energy management.

For Ontario, freight electrification carries direct implications. The Highway 401 corridor is one of North America's busiest freight routes, with the Windsor–Detroit crossing alone handling roughly one quarter of Canada–U.S. merchandise trade. The addition of the Gordie Howe International Bridge, which opened in July 2026, further expands cross-border capacity.

Digital Connectivity and Vehicle-to-Everything (V2X) Systems

Digital connectivity is becoming equally important. Vehicles are increasingly connected nodes that exchange data with other vehicles, infrastructure, cloud systems, and road users. The global automotive Vehicle-to-Everything (V2X) market is estimated at USD 2.9 billion in 2025 and is projected to reach USD 18.7 billion by 2030.

In Ontario, through the Queen Elizabeth Way (QEW) Innovation Corridor, OVIN supports the deployment and testing of connected vehicle technologies on a 40-kilometre highway testbed between Toronto and Burlington. The corridor incorporates enabling infrastructure, including V2X management systems, communications networks, roadside units (RSUs), and security credential management systems, providing a real-world environment for innovators to validate and deploy advanced connected mobility solutions.

Additionally, Software-Defined Vehicles (SDVs) are reshaping revenue models and supplier dynamics. OEMs are increasingly using over-the-air updates, subscription features, connected services, and data monetization to generate revenue across the vehicle lifecycle. Value is shifting toward firms that control computing platforms, operating systems, software stacks, and vehicle electronics. Ontario has a relevant capability base, including BlackBerry QNX in Ottawa, whose real-time operating system is embedded in more than 275 million vehicles, alongside AI, cybersecurity, and software strengths in the Toronto-Waterloo corridor.

As vehicles become more software-intensive and more deeply connected, they also become more exposed to digital threats. Therefore, cybersecurity, traceability, and trusted systems are becoming baseline market-access requirements. The United Nations Economic Commission for Europe (UNECE) Regulations 155 and 156 require cybersecurity and software update management systems across the vehicle lifecycle as a condition of type approval in markets representing approximately 60 percent of global production. The International Organization for

Standardization / Society of Automotive Engineers (ISO/SAE) 21434 provides the corresponding engineering framework for road-vehicle development lifecycle. Together, these frameworks embed cybersecurity, software governance, and data control into the regulatory architecture of the automotive sector.

AI and advanced automation are also becoming critical to automotive supply chain competitiveness, helping firms improve visibility, detect risks earlier, optimize production, and strengthen logistics performance across complex, cross-border networks. These capabilities support more resilient and responsive supply chains by improving supplier monitoring, quality control, predictive maintenance, route planning, and real-time decision-making.

For Ontario, the opportunity is to extend these tools beyond OEMs and major Tier 1 suppliers to the broader supplier base. Supporting adoption among smaller firms will be important to improving productivity, reducing disruption risk, and ensuring the province's automotive ecosystem remains competitive as supply chains become more digital, integrated, and data-driven.

Transition to Higher-Value, Cross-Sector, and Dual-Use Capabilities

The transformation of automotive value chains is creating capabilities that extend beyond vehicle production. Precision manufacturing, software engineering, sensing, secure communications, autonomous navigation, edge computing, cybersecurity, and systems integration are increasingly applicable to defence, public safety, logistics, infrastructure management, and smart mobility. Jurisdictions that can connect automotive capabilities to these adjacent sectors are better positioned to capture higher-value activity and reduce exposure to cyclical vehicle demand.

The automotive industry is shifting toward a model in which system integration captures a growing share of value. The global automotive software market is projected to grow from approximately USD 19.3 billion in 2025 to USD 30.3 billion by 2030 as OEMs and suppliers pursue lifecycle revenue. Suppliers that can combine sensors, computing, connectivity, and software are positioned to capture higher margins and influence platform strategies. The same capabilities underpin expansion into adjacent markets. Integrated systems in sensing, computing, and connectivity developed for ADAS, autonomous driving, and vehicle management are directly applicable to sectors such as defence, logistics, and critical infrastructure.

The convergence of electrification, connectivity, and AI is enabling mobility service models that operate at the intersection of automotive manufacturing, digital platforms, and urban transportation. Mobility-as-a-Service (MaaS) integrates multiple transport modes, including public transit, ride-hailing, car-sharing, micromobility, and on-demand shuttle services, into unified digital interfaces that support route planning, booking, and payment within a single application. While MaaS remains at an early stage in most markets, its development is driving demand for integrated mobility platforms, backend data systems, fleet management solutions, and interoperable digital infrastructure. These capabilities extend directly into adjacent sectors, including logistics optimization, smart-city infrastructure, and public transportation systems, where similar data integration, routing, and coordination functions are required.

The growing strategic importance of dual-use technology is reflected in investment trends. Venture funding for European defence, security, and resilience startups reached USD 8.7 billion in 2025, up 55 percent year-over-year and nearly four times the level of five years earlier. NATO Defence Innovation Accelerator for the North Atlantic (DIANA) has selected more than 250 dual-use firms across its 2024 to 2026 cohorts, and the EUR 1 billion NATO Innovation Fund is supporting allied dual-use technology scale-up.

Ontario's industrial base already includes firms with established dual-use capabilities spanning civilian and defence applications. L3Harris

WESCAM in Burlington produces electro-optical and infrared imaging systems used in defence, border security, and search-and-rescue operations. MDA Space in Brampton supplies space-based imaging and surveillance systems, including the RADARSAT Constellation Mission, which supports both civilian and defence use cases. General Dynamics Land Systems Canada in London manufactures light armoured vehicles that integrate commercial automotive engineering with military requirements. The Toronto-Waterloo corridor also hosts a growing cluster of AI and cybersecurity firms serving both commercial and defence markets. This capability base is reinforced by national policy. Canada's defence strategy, Our North, Strong and Free (April 2024), commits CAD 8.1 billion over five years and CAD 73 billion over twenty years, including significant investment in NORAD modernization and defence innovation.

4. Ontario’s Position, Capabilities and Industrial Readiness

Role in Regional and Global Supply Chains

Ontario is the centre of Canada’s automotive industry and a major node in the North American production system. Its industrial base gives Ontario scale, supplier depth, engineering capability, and cross-border integration that few jurisdictions of comparable size can match.

Ontario’s role in North American vehicle production is underpinned by a deeply integrated and evolving supplier base. This ecosystem combines a mature network of incumbent firms with newer clusters emerging in response to electrification and SDV technologies. Initiatives such as Automotive Parts Manufacturers’ Association (APMA) Project Arrow demonstrate the capacity of Ontario’s supplier base to collectively design, engineer, and integrate a complete zero-emission vehicle. At the same time, they highlight that Ontario’s ecosystem remains stronger in component engineering, manufacturing, and system integration than in some of the highest-value segments of the EV stack, including software integration, battery cell production, and full-stack vehicle architecture. Strengthening linkages between established manufacturers and emerging technology firms, will be critical to ensure that Ontario captures a larger share of value as automotive production shifts toward electrified and software-defined platforms.

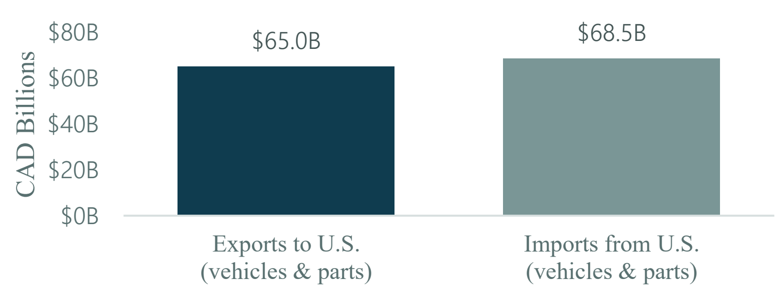
Ontario’s automotive production is deeply integrated with the U.S. Great Lakes industrial cluster. Tier 1 suppliers serve assembly plants on both sides of the border, with an estimated 30 to 40 percent of parts used in Michigan auto plants originating in Canada. This integration creates major advantages in scale and market access, but also exposes Ontario to border reliability, tariff, and policy risks.

In 2024, Ontario’s vehicle and parts exports to the U.S. were valued at CAD 64.8 billion, while imports from the U.S. were CAD 68.5 billion as shown in Figure 5. Approximately 92 percent of vehicles assembled in Canada are exported to the U.S. In 2024, Ontario accounted for 86 percent of Canadian motor vehicle and parts exports to the U.S. These figures underscore the province’s reliance on two-way North American trade. They also highlight why tariff disruptions can transmit quickly across Ontario’s production system, as seen in 2025 shift reductions, layoffs, and export declines following heightened trade tensions.

Project Arrow

Project Arrow is a multi-supplier electric vehicle initiative led by APMA, demonstrating the integration capacity of Canada’s automotive ecosystem. Phase 1, unveiled in 2023, brought together more than 55 predominantly Ontario-based companies to design and build Canada’s first domestically developed zero-emission concept vehicle, supported by CAD 5 million in FedDev Ontario funding. Phase 2.0, launched in February 2026 with two prototype vehicles, expanded participation to more than 80 suppliers and secured an additional CAD 7 million in funding.

Figure 5: Ontario–U.S. Automotive Trade, Vehicles and Parts, 2024 (CAD Billions)



Beyond North America, Ontario's role in global automotive and mobility supply chains is concentrated primarily in midstream activity, where the province has established strengths in vehicle assembly, parts production, tooling, and advanced manufacturing. This position gives Ontario scale and production depth, but it also places the province in a segment of the value chain where competitive pressures are intensifying as value is shifting to upstream (i.e., critical-mineral refining, battery materials, and cell production), and downstream (i.e., vehicle software platforms, connected services, integrated mobility systems, and post-sale software revenue) activities.

Ontario's midstream strength is therefore both an advantage and a constraint. The advantage lies in the province's ability to support full-vehicle assembly and a multi-tier supplier ecosystem at a scale that few jurisdictions of comparable size can match. The constraint is that many of the fastest-growing value pools are developing outside Ontario's traditional areas of specialization. Suppliers remain exposed to globally sourced inputs, including critical minerals and processed battery materials, which can affect production costs, investment decisions, and supply continuity even when those inputs do not physically move through the province.

Ecosystem Assets, Capabilities and System Integration Potential

Ontario's manufacturing base remains a core strength, but its competitiveness is increasingly shaped by how effectively suppliers adapt to electrified and software-defined production. Major Tier 1 suppliers have repositioned toward electrification through investments in battery enclosures, electrified driveline products, lightweight structures, thermal systems, and power electronics. The tool, die, and mould cluster, particularly in Windsor-Essex, is also adapting toward battery pack, battery management, and electrified body-structure applications. Small and medium-sized enterprises (SMEs) are contributing specialized capabilities in connected infrastructure, electrification systems, power electronics, and vehicle software.

Ontario's electricity system adds another strategic advantage for energy-intensive automotive activities, including battery manufacturing, battery materials, and advanced manufacturing. More than 90 percent of Ontario's electricity is emissions-free. As OEMs, regulators, and public buyers place greater emphasis on embedded carbon, Ontario's clean grid can strengthen market access and supplier positioning. Maintaining this advantage will require sufficient grid capacity, reliability, and scalability as industrial, charging, and data-centre demand grows.

Ontario's strong supplier base is underpinned by a complementary research and innovation infrastructure. In Ontario, automotive research capacity is concentrated within a small number of universities that have developed specialized capabilities in electrification, battery technologies, and software over several decades. Ontario's university-based research centres operate as part of a coordinated innovation network that links academic research with commercialization pathways. The Regional Technology Development Sites (RTDS) play a central role in this system by connecting post-secondary institutions, incubators, and SMEs through a province-wide platform backed by approximately CAD 70 million in investment from OVIN, industry matched contributions, and broader public sector contributions. Rather than functioning as standalone research hubs, the RTDS network provides the infrastructure through which applied research is translated into industry deployment.

Beyond strong manufacturing and research base, Ontario's critical mineral endowment provides another foundational asset, critical for extending its automotive supply chain into upstream segments. The province is a significant producer of nickel and cobalt, with additional lithium, graphite, copper, palladium, platinum group elements, and rare earth resources at varying stages of development. Proximity between northern mining regions and southern battery, assembly, and supplier clusters creates the potential for a "mine-to-mobility" value chain in which minerals are extracted, processed, and manufactured into batteries and vehicles within Ontario.

Near-term critical mineral development is anchored in existing nickel and cobalt production in Sudbury and Timmins, advancing lithium and nickel projects, and investments in refining and processing capacity. However, some larger opportunities, including the Ring of Fire, remain longer-term and depend on infrastructure development, environmental approvals, and sustained engagement with First Nations communities.

Ontario's supplier base, research infrastructure, and critical mineral endowment form a competitive system when effectively integrated. Ontario's commercialization architecture is a further strength. Coordinated programs and commercialization platforms link SMEs, OEMs, and academic research, enable faster translation of innovation into production. Organizations such as OVIN, OCI, NGen, MaRS, ENCQOR, APMA, and university-based research networks support discovery, demonstration, validation, scale-up, and market entry. These institutions also contribute to market access by helping firms validate products against emerging requirements for cybersecurity, software governance, battery traceability, and trusted supply chains. Assets such as SHIELD at the University of Windsor, BlackBerry QNX in Ottawa, and Waterloo's battery research capabilities position Ontario within compliance ecosystems linked to North American and allied markets.

Investment and Industrial Capacity Development

Ontario's recent investment pattern shows a structural shift from primarily final assembly toward battery cells, battery materials, EV components, and enabling supply chain infrastructure. Volkswagen PowerCo's St. Thomas gigafactory represents approximately CAD 7 billion in capital investment, planned capacity of up to 90 GWh, production targeted for 2027, and approximately 3,000 direct jobs. NextStar Energy in Windsor, backed by approximately CAD 5 billion in investment, is Canada's first commercial-scale advanced battery manufacturing plant and is expected to create up to 2,500 direct jobs at full capacity. Together, these investments demonstrate Ontario's move toward a more vertically integrated electrified manufacturing platform.

Ontario's ability to continue to attract and sustain investment in electrified automotive production is increasingly determined by its infrastructure readiness, scalability, and resilience.

Infrastructure readiness refers to the extent to which physical, energy, digital, and logistics systems are in place to support automotive production and ecosystem development.

Scalability refers to the ability of Ontario's automotive ecosystem to expand production, capacity, supply chains, and supporting infrastructure in response to growing demand.

Resilience refers to the ability for the Ontario automotive ecosystem to withstand abrupt changes in the marketplace and maintain long-term competitiveness.

Workforce and Capability Development

Ontario's automotive workforce is substantial but faces significant transition pressures. The motor vehicle, body, trailer, and parts manufacturing sector directly employs approximately 148,300 workers. Electrification is reducing demand for some ICE-related roles while increasing demand for hybrid skills that combine machining, automation, robotics, quality assurance, high-voltage systems, battery technologies, power electronics, embedded software, cybersecurity, and data-enabled manufacturing. Clean Energy Canada projects that the EV sector could support up to 184,000 jobs by 2030, growing at an annual rate of 39 percent.

Workforce outcomes will depend on coordinated reskilling, upskilling, and talent attraction strategies that align workforce capabilities with emerging industry requirements, particularly in battery pack assembly, electrical safety, EV diagnostics, software-enabled manufacturing, and system-level validation. Without coordinated investment, workforce adjustment is likely to be uneven, increasing short-term displacement risks for workers and firms concentrated in legacy production.

5. Opportunities for Ontario

5.1 Reinforcing Ontario as a Trusted North American Production and Supply Chain Location

Ontario can strengthen its position as a trusted, resilient North American production location as OEMs and suppliers reassess sourcing in response to trade volatility, geopolitical risk, tariffs, rules-of-origin requirements, and connected vehicle security restrictions. Its integration within the Great Lakes automotive corridor, proximity to U.S. assembly and engineering centres, mature industrial capacity, and low-carbon production base provide a strong foundation.

Ontario can strengthen this proposition by supporting supplier localization, improving multi-tier supply chain visibility, and helping firms demonstrate rules-of-origin, labour, cybersecurity, embedded carbon, and provenance compliance. This would position the province as a place where OEMs and suppliers can reduce operational, geopolitical, and compliance risk.

5.2 Retaining and Modernizing the Existing Automotive Industrial Base

Ontario's near-term competitiveness depends on retaining and upgrading its existing assembly plants, supplier networks, tooling capabilities, and skilled workforce. These assets remain foundational but are under pressure from tariffs, cost competition, policy uncertainty, shifting EV demand, OEM platform changes, and declining demand for some ICE-specific components.

Modernization should focus on productivity, automation, digital production systems, advanced tooling, AI-enabled quality control, predictive maintenance, and flexible manufacturing. Programs such as O-AMP, OVIN-supported SME initiatives, and federal and provincial supports can help suppliers adapt to EV, hybrid, software-defined, and platform-based vehicle programs.

5.3 Targeting Strategic Gaps in the Battery, Critical Minerals, and Circular Supply Chain

Ontario can extend beyond assembly and parts production into higher-value EV battery and critical mineral value chains. Its mineral assets, low-carbon electricity, major battery investments, and proximity to North American assembly demand provide the foundation for a more integrated "mine-to-mobility" supply chain.

The priority should be to target strategic value-chain gaps that strengthen resilience and commercial relevance, rather than pursue every battery segment equally. Ontario's nickel and cobalt strengths align with some battery chemistries, but growth in LFP and other lower-cost chemistries means the province should build capabilities that support a wider range of battery technologies.

Priority areas include mineral processing, battery-grade materials, cathode and precursor materials, separators, battery modules, battery enclosures, thermal management, battery management systems, recycling, and end-of-life recovery. These segments can help Ontario capture more value from its resource and manufacturing base while reducing exposure to offshore processing and concentrated supply chains. Circular battery supply chains are especially important. Recycling, scrap recovery, second-life uses, and traceable recovered materials can improve supply security, reduce environmental impacts, and support battery passport and recycled-content requirements.

5.4 Accelerating Supplier Transition into Electrified, Software-Defined, and Integrated Vehicle Systems

Ontario's supplier ecosystem must adapt as vehicle value shifts from mechanical complexity toward batteries, power electronics, software, sensors, data systems, and integrated vehicle architectures. Traditional ICE components remain important in the near term, but long-term competitiveness depends on suppliers moving into higher-value systems.

High-potential areas include battery enclosures, thermal management, lightweight structures, high-voltage systems, power electronics, electric driveline components, embedded software, cybersecurity, and system-level validation. Ontario's advanced manufacturing base, Tier 1 anchors, tooling capacity, research institutions, and SMEs provide a strong platform for this transition.

5.5 Building Leadership in Trusted Digital Supply Chains, Cybersecurity, and Traceability

As vehicles and supply chains become more digitally connected, competitiveness is increasingly shaped by trust. Regulatory requirements and customer expectations are placing greater emphasis on secure, traceable, and standards-aligned production. Cybersecurity, software-update governance, supply chain traceability, battery passports, embedded carbon data, labour compliance, and material provenance are becoming core market-access requirements.

Ontario has several assets that support this opportunity, including BlackBerry QNX, the Toronto-Waterloo technology corridor, the University of Windsor's automotive cybersecurity capabilities, OVIN-supported demonstration infrastructure, and a growing base of firms active in AI, software, and connected mobility. As digital tools become increasingly essential for mapping supply chains, tracking material origins, and demonstrating compliance across multiple supplier tiers, Ontario can support firms by helping them adopt traceability platforms, cybersecurity practices, data governance systems, and digital documentation tools that align with emerging OEM and regulatory expectations.

5.6 Broadening AI and Advanced Manufacturing Adoption Across the Supplier Base

Ontario cannot rely on cost alone to compete with lower-cost jurisdictions or large-scale incentive regimes. Its competitiveness will depend on productivity, precision, flexibility, and broad adoption of AI, automation, robotics, digital production systems, and advanced analytics across the supplier base. AI and automation are already being applied across automotive production and logistics, including quality inspection, predictive maintenance, supply chain risk monitoring, production planning, energy management, and route optimization. However, adoption remains uneven across the supplier ecosystem, particularly among SMEs that often face greater capital, technical, and workforce constraints.

Ontario has a strong base from which to scale these capabilities. Its manufacturing ecosystem includes large Tier 1 suppliers, a deep SME base, post-secondary applied research institutions, automation firms, and programs supporting Industry 4.0 adoption. Ontario can strengthen this opportunity by expanding practical supports for technology adoption, including advisory services, demonstration projects, shared testing facilities, and capital support for SMEs. Existing platforms such as O-AMP, OVIN's RTDS, the QEW Innovation Corridor, and industry-led demonstration programs can help SMEs adopt robotics, machine vision, AI-enabled inspection, predictive maintenance, digital twins, production monitoring, ERP integration, and real-time supply chain analytics.

5.7 Leveraging Cross-Sector and Dual-Use Mobility Applications

Ontario's automotive and mobility capabilities have growing relevance beyond passenger vehicles. Technologies developed for connected, autonomous, electrified, and software-defined vehicles can support defence, public safety, emergency response, mining, logistics, infrastructure monitoring, and critical systems.

Ontario's strengths in advanced manufacturing, systems integration, engineering, and technology development create pathways into adjacent markets where reliability, security, and operational performance are critical. OVIN and ecosystem partners can help firms identify adjacent markets, navigate procurement, validate technologies, and connect with end users in areas such as autonomous inspection, emergency response routing, secure fleet management, mine-site mobility, resilient logistics, infrastructure monitoring, and connected public-safety systems.

5.8 Building the Talent Required for the Next Supply Chain

Ontario's ability to capture value from the opportunities identified above will depend on whether its workforce, firms, and commercialization system can adapt quickly enough. The automotive and mobility supply chain increasingly requires hybrid capabilities that combine manufacturing, electrical systems, battery knowledge, software, cybersecurity, automation, data analytics, and systems integration.

Ontario has a strong foundation through universities, colleges, applied research centres, OVIN Learn, the OVIN Talent Development Fellowship Program, industry-academia supported challenge-based initiatives, the Skills Development Fund, and work-integrated learning initiatives. The opportunity is to align these programs more directly with the strategic needs of the next supply chain.

Building these capabilities will require continued investment in supplier-focused upskilling, applied training, post-secondary industry placements, and technical programs aligned with batteries, software-defined vehicles, automation, cybersecurity, and digital manufacturing. Workforce development should also be closely linked to commercialization, ensuring that research talent, SME capabilities, and industry needs are connected through practical deployment and market adoption pathways.

6. OVIN Team

Information on OVIN team members and relevant contacts for outreach is available on OVIN's website at: https://www.ovinhub.ca/connect/team/

7. Disclaimers

This report was commissioned by the Ontario Centre of Innovation (OCI) through a Request for Proposals titled "Ontario Vehicle Innovation Network (OVIN) – Annual Comprehensive Sector Report & Quarterly Specialized Reports," dated September 26, 2025, and has been prepared by MNP LLP. It is one of five reports covering an analysis of Ontario's automotive technology, electric vehicle and smart mobility landscape while incorporating implications for the sector's skills and talent landscape.

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