Driving Trade Forward: Ontario's Automotive and Mobility Market

Annual Comprehensive Sector Report

2024-25

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Minister's Foreword

Ontario's auto sector is a key driver of economic growth in Canada and a source of pride for workers and families across the province. With five global automakers, 700 parts suppliers, and more than 100,000 auto workers, Ontario has solidified its position as a global leader in automotive manufacturing.

Our province has everything the auto industry needs to thrive, including a wealth of critical minerals, clean steel, reliable and affordable energy, and the best talent in the world. These strengths have helped Ontario attract over $46 billion in new investments from global automakers and parts suppliers. These investments will build on our legacy of innovation and drive future growth across the sector.

As we look ahead, the Ontario Vehicle Innovation Network (OVIN) will continue to play a vital role in building a resilient and competitive auto supply chain. Through OVIN's many programs, OVIN is accelerating the development and commercialization of next-generation automotive technologies. To date, it has supported 770 small and medium-sized companies, leveraged over $850 million in private investment, and created more than 6,100 new jobs.

Our automotive industry is a testament to what happens when industry, innovators, skilled workers, and government move forward in lockstep. As we continue to grow the sector, we remain committed to protecting the good jobs and strong industrial base that support Ontario's economy.

With the foundation we have built together, Ontario is ready to shape the next generation of mobility.

The Honourable Victor Fedeli

Ontario Minister of Economic Development, Job Creation and Trade

Executive Summary

Ontario's automotive and mobility sector is a cornerstone of the province's economy, fueling innovation, attracting investment, and supporting tens of thousands of jobs. With a legacy dating back to the early 20th century, Ontario has long been the heart of Canada's automotive industry. It is home to major original equipment manufacturers (OEMs) such as Ford, General Motors (GM), Honda, Stellantis, and Toyota, and is responsible for producing all of Canada's light motor vehicles.[1]

Despite recent global disruptions – including the COVID-19 pandemic and semiconductor shortages – the sector has shown remarkable resilience. In 2023, Ontario contributed 86% of Canada's total automotive sector Gross Domestic Product (GDP), underscoring its critical role as the engine of the national industry.[2]

Ontario's automotive sector is a fully integrated ecosystem, from mineral extraction to battery recycling, driving innovation in key areas such as artificial intelligence (AI), machine learning, and autonomous technologies through strong collaboration among industry, academia, and government. Backed by supportive policies, the province is advancing electric vehicle (EV) adoption, enhancing manufacturing competitiveness, and investing in workforce upskilling to meet the demands of the growing low-emission vehicle economy.

A Global Trade Powerhouse

Trade is a vital pillar of Ontario's automotive industry. The province is a leading exporter of high-value automotive goods, with exports reaching over $133B in 2024.[3] Over the past five years, Ontario's export performance has remained dynamic, navigating global market shifts, supply chain disruptions, and the accelerating transition to EVs. Ontario's global competitiveness is bolstered by its access to a network of free trade agreements, which streamline cross-border commerce and attract international investment. These agreements enhance Ontario's role in the global automotive supply chain.

As global trade dynamics evolve, Ontario remains agile - adapting through targeted legislation, interprovincial cooperation, and international partnerships. The province's deep integration into global supply networks highlights its dual role as both a major producer and consumer of automotive goods.

Leading the Transition to Clean Mobility

Ontario is at the forefront of the global shift toward zero-emission vehicles (ZEVs), positioning itself as a North American leader in electric, autonomous, and connected vehicle technologies. Since 2020, the province has secured over $46B in automotive and EV-related investments, reflecting a strong commitment to sustainable innovation and advanced manufacturing.[4]

This transformation is supported by several factors, including but not limited to a strong research and development (R&D) ecosystem, its robust manufacturing infrastructure, and skilled workforce. Institutions such as the Automotive Centre of Excellence and the CHARGE Lab are pioneering advancements in EV batteries, autonomous systems, and smart mobility. The province's Driving Prosperity strategy aims to scale production to 400K electric and hybrid vehicles annually by 2030, reinforcing Ontario's leadership in clean transportation.[5]

Policies Catalyzing EV Growth

Ontario is driving the shift to electric mobility through targeted policies that support both production and adoption. On the supply side, initiatives like Driving Prosperity, tax credits, and regional development funds are strengthening EV manufacturing, battery supply chains, and critical minerals exploration. These efforts are attracting investment, modernizing facilities, and building a skilled workforce.

On the demand side, programs such as EV ChargeON, time-of-use electricity pricing, and green licence plates are making EV ownership more accessible and convenient. Regulatory updates and building code enhancements are also accelerating the rollout of charging infrastructure. Together, these policies are positioning Ontario as a competitive, clean mobility leader.

Building a Future-Ready Workforce

Ontario's automotive sector is transforming, creating demand for new skills and displacing some traditional roles. While the industry supports over 110K direct jobs, the shift to EVs and automation is reshaping workforce needs.[6] To respond, Ontario is investing in upskilling and talent development through initiatives led by OVIN, such as the Talent Strategy & Roadmap, OVIN Learn, and the EV Skills Gap. Programs like the Skills Development Fund, FIRST Tech Challenge are also helping attract and prepare new talent, ensuring Ontario's workforce remains competitive and future-ready.

Looking Ahead

Ontario's automotive and mobility sector is poised for continued growth, driven by strategic investments, a world-class R&D ecosystem, and a highly skilled workforce. The province's unwavering commitment to sustainability and technological advancement positions it as a global leader in the future of mobility.

This Annual Comprehensive Sector Report provides an in-depth analysis of Ontario's automotive landscape – covering economic performance, production capacity, recent investments, trade dynamics, R&D, emerging technologies, government policy support, and labour market trends. It also outlines strategic opportunities in EV battery innovation, lightweight materials, smart mobility, and international collaboration that will shape the next chapter of Ontario's automotive and mobility leadership.

1. Current Economic Landscape in Ontario

Ontario has been a leader in Canada's automotive industry since the early 1900s, starting with large-scale production in Windsor in 1904. By the 1920s, Canada became the world's second-largest automotive producer, largely due to Ontario's strength.[7] Despite changes over the decades, Ontario remains Canada's automotive hub, housing five major OEMs – Ford, GM, Honda, Stellantis, and Toyota – making it a significant automotive force in North America.

Ontario’s well-established position in the automotive industry has attracted over $46B in automotive and EV investments from a wide range of companies over the past five years, demonstrating their commitment to expanding in the province.[8] With automobile manufacturing accounting for 16% of Ontario’s total manufacturing GDP, the automotive sector remains a cornerstone of the province’s economy and a key driver of its growth.[9] The following section covers current automotive production and capacity, and recent ZEV and EV investments in Ontario.

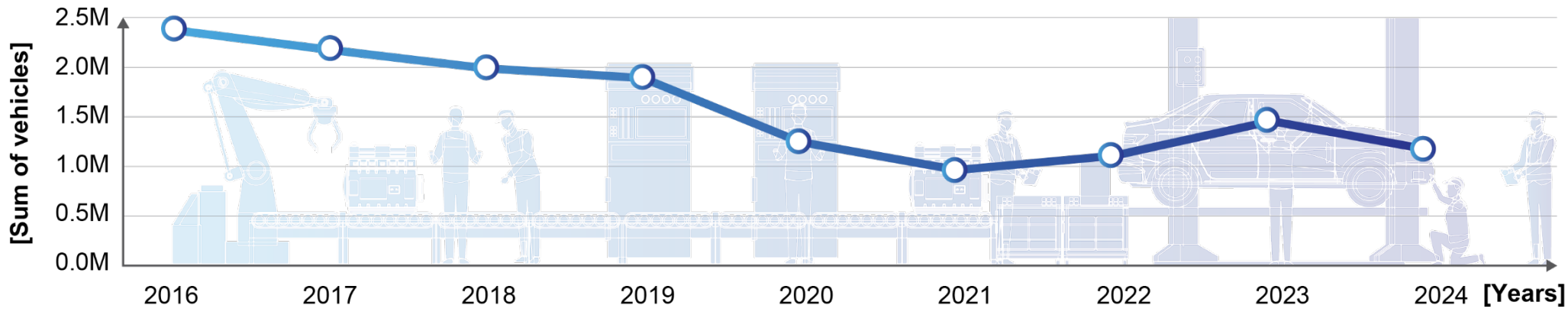
Automotive Production and Capacity

Ontario is the engine behind Canada's automotive sector, contributing 86% of the sector's national GDP in 2023. Within the province, automotive manufacturing made up 16% of Ontario's total manufacturing GDP.[10] Notably, Ontario produces all of Canada's light motor vehicles, which includes passenger vehicles, vans, and light trucks.[11] The province presently hosts 11 OEM automotive vehicle and automotive parts production plants in the Windsor-Ottawa corridor, with two plants currently undergoing retooling for the production of EVs.[12] To facilitate seamless automotive production in the province, an ecosystem of automotive parts suppliers and support industries has developed and evolved over the years, leveraging a robust and mature supply chain to bolster a resilient automotive sector. There are currently close to 1K parts suppliers in Ontario, ranging from Tier 1 parts manufacturers, such as Magna International in Aurora and Linamar Corp. in Guelph, to numerous Tier 2 and Tier 3 suppliers.[13] The province also hosts over 500 tool, die, and mold makers, as well as more than 400 companies specializing in connected and autonomous vehicle (CAV) technologies.[14]

Approximately 88% of Canada's automotive parts manufacturing facilities are located in Ontario.[15] Additionally, OEMs have established their own parts manufacturing plants in the province, producing elements such as engines and transmission components. Ontario, with a strong OEM presence, produces over 1M vehicles annually. The chart below shows Canadian light vehicle production from 2016 to 2024.[16]

Vehicles produced in Canada (2016-2024)

Source: DesRosiers Automotive Consultants Inc. (DAC)



Between 2016 and 2024, Canada's automotive manufacturing sector underwent a significant contraction, marked by declines in both total output and market dynamics. In Ontario, vehicle production fell sharply from 2.35M units in 2016 to just 1.29M in 2024 – a decrease of nearly 45%.[17]

While it is well documented that the COVID-19 pandemic significantly impacted production across 2020 and 2021, the industry has since rebounded steadily with a slight decline from 2023 to 2024.[18] This recent decline highlights deeper structural challenges within the industry, including persistent global supply chain disruptions, semiconductor shortages, and shifting consumer preferences.

The decline in production may be attributed to several interrelated factors: a global pivot away from traditional sedans toward SUVs and EVs, with assembly plants undergoing modernization; uneven progress in electrification strategies among manufacturers; and weak global demand and economic headwinds. Market share data over this period reveals a consolidation of strength among a few players and a marked decline for others. While some automakers managed to maintain or grow their presence, the overall trend points to a shrinking and increasingly competitive landscape. This may be attributed to the recent shift towards electrification, which has favoured companies with early investments in hybrid and EV technologies, while others have struggled to adapt quickly enough to changing market demands.

In summary, the Canadian automotive sector in 2024 was impacted by technological transformation, supply chain volatility, and shifting consumer expectations. However, investments in the Ontario autmotive sector continue to rise, especially as manufacturers look to further supporting the growing EV industry.

"Ontario's auto manufacturing sector is a pillar of our economy, attracting billions of dollars of investment and creating tens of thousands of good-paying jobs for Ontario workers throughout our domestic electric vehicle supply chain."[19]

The Honourable Victor Fedeli, Ontario Minister of Economic Development, Job Creation and Trade

EVs are increasingly comprising a larger portion of manufactured motor vehicles. Both internal combustion engine (ICE) vehicles and EVs involve complex manufacturing processes, sharing similarities such as assembly lines and skilled labor. However, these processes differ significantly, mainly due to the drivetrain: ICE vehicles use pistons, valves, and crankshafts, while EVs rely on electric motors, batteries, and power electronics. To meet increasing demand, OEMs continue to progress towards establishing EV-specific plants and/or retooling existing facilities to support EV assembly and battery manufacturing in Ontario, with others highly likely to follow suit.

The table to the right outlines a selection of OEM manufacturing plants in Ontario and their current retooling efforts to support EVs. Recent investments and infrastructure enhancements are further described in the next section.

Plant name	Plant type	Plant capacity	OEM	Location
Stellantis LG Energy Solution Battery Plant (NextStar Energy Battery Plant)	EV batteries	Up to 450K EVs/yr (Up to 49.5 GWh/yr)	Stellantis/LG Energy Solution	Windsor
St. Thomas Battery Cell Plant	EV batteries	Up to 1M EVs/yr (Up to 90 GWh/yr)	Volkswagen	St. Thomas
EV Plant and EV Battery Plant	EV vehicles, EV batteries	Up to 240K EVs/yr (Up to 36 GWh / yr)	Honda	Anticipated for Alliston
Oakville Assembly Plant	Passenger vehicle/truck	Up to 100K vehicles/yr	Ford	Oakville
Brampton Assembly Plant	Passenger vehicles/trucks	Info. not available	Stellantis	Brampton
CAMI Assembly Plant	Commercial EV	Info. not available	GM	Ingersoll
Windsor Assembly Plant	Passenger vehicles /trucks, EV vehicles	Info. not available	Stellantis	Windsor

Legend

Planned facility or retooling | Undergoing retooling | Existing facility

Source: multiple sources, refer to in text sources under Recent Investments and Infrastructure Enhancements

Recent Investments and Infrastructure Enhancements

Ontario is experiencing a significant surge in investments in its automotive sector. Since 2020, the province has secured more than $46B in auto and EV-related investments from a range of companies that intend to establish, upgrade, and expand operations in Ontario.[20] This influx of capital aims to strengthen the automotive supply chain, create thousands of jobs, and support Ontario's positioning as a leader in automotive innovation. Several examples of recent investment and infrastructure upgrade announcements are presented here.

OEMs

Ford is investing around $3B to expand production of its F-Series Super Duty pickup trucks at its Oakville Assembly Complex, with plans to introduce production of next generation electric trucks in future. This announcement is a pivot away from its plans for an Oakville EV assembly plant but is expected to secure approximately 1,800 jobs – 400 more than would have been needed for EV manufacturing. The retooled facility is expected to have capacity of up to 100K vehicles per year. [21]

GM committed $2B in 2022 to update its Oshawa and Ingersoll manufacturing plants, as well as to make improvements across all its manufacturing and R&D facilities in the province. This investment supported GM's efforts to produce EVs in Ontario, with the Ingersoll plant solely dedicated to the production of commercial electric vans, and the continuation of ICE vehicle production in Oshawa.[22] In April 2025, GM announced it would be pausing production at its CAMI Ingersoll facility until October of the same year, with plans to reduce production capacity from that time, citing a reduction in EV demand.[23]

Honda announced an investment of $15B in 2024 to build four new facilities in Ontario.[24] This investment includes the retooling of an existing facility to build an EV assembly plant with a capacity of producing up to 240K EVs annually (initially planned to start operations in 2028) and the building of a stand-alone 36 gigawatt hours (GWh) battery manufacturing plant in Alliston.[25] In May 2025, Honda announced that it would be postponing the EV assembly and battery manufacturing plants by at least two years, citing changing market conditions and a slowdown in the EV market.[26] However, Honda will also be building a cathode active material and precursor (CAM/pCAM) processing plant in collaboration with South Korean firm POSCO Future M Co. Ltd., and a separator plant jointly with Japanese firm Asahi Kasei Corporation.[27]

Stellantis announced in 2022 it would be upgrading and re-tooling its Windsor and Brampton assembly plants to manufacture low-emission vehicles, EVs and hybrids, with a $3.6B investment.[28] This initiative will enhance Stellantis' capacity to produce more decarbonized vehicles and support the company's sustainability goals.

Battery Manufacturing Facilities

NextStar Energy (Stellantis and LG Energy Solution) is constructing a battery manufacturing facility in Windsor with a $5B investment.[29] Battery module production at the site started in October 2024, with construction poised to finish in 2025.[30] This facility will produce battery cells and modules, with a production capacity of 49.5 GWh, which is capable of powering up to 450K EVs per year.[31]

Siemens is launching a $150M Global AI Manufacturing Technologies R&D Centre in

Oakville to enhance EV battery production.[32] This centre will leverage AI to improve efficiency and production methods, positioning Siemens as a key player in the battery sector.[33]

Umicore began building an industrial-scale CAM and pCAM manufacturing plant in October 2023 with a $2.76B investment, including federal and provincial support of close to $1B.[34] The facility is intended to produce essential materials for EV batteries, supporting the growth of the EV market. However, at the time of publication, construction has been on pause since July 2024 with Umicore citing a slowdown in EV sales.[35]

Volkswagen, via its subsidiary PowerCo SE, is investing $7B to establish its first overseas EV battery manufacturing plant in St. Thomas, Ontario.[36] The 90 GWh per year battery cell gigafactory, expected to open in 2027,[37] will have the capacity to produce enough batteries for about 1M EVs annually.[38]

Automotive Parts Suppliers

Hanon Systems is building North America's first e-compressor plant in Woodbridge with an investment of over $155M, creating 300 jobs. E-compressors are designed for EVs without belt-driven engines and are crucial for performance and safety, being integral to the thermal management system. Hanon Systems' heat pump system uses these e-compressors to enhance thermal management, boosting energy efficiency and driving range.[39]

Linamar Corporation is investing over $1B to expand its operations across Ontario, creating more than 2.3K jobs.[40] This expansion will drive the development of key components for hybrid and EVs, including advancements in semiconductor packaging methods for EV batteries. Linamar's commitment also includes the production of eAxle systems, an essential component used in modern hybrid and EV powertrains, and support for hydrogen fuel cell and battery storage technologies.[41]

Magna International is investing $471M to expand its EV operations, including a new EV battery parts plant in Brampton and upgrades to five existing facilities.[42] This investment will enhance Magna's capacity to produce EV components and support the growing demand for EVs.

Martinrea International Inc. is expanding its Ridgetown facility with a nearly $35M investment, adding a new stamping press for larger and more complex automotive parts, comprising body-in-white components, battery enclosures, and chassis parts.[43] This expansion will enhance production efficiency and quality, addressing the increasing demand for lightweight, high-strength metal solutions in the automotive industry.[44]

Minth Group is investing nearly $300M to establish a new auto parts manufacturing facility in Windsor, creating over 1K jobs. This facility will produce essential components for both ICE and EVs, including metal EV battery housing units and plastic exterior parts.[45]

Specialized Component Manufacturers

Arcelor Mittal Dofasco is investing $1.8B in clean steelmaking technology to support the automotive industry.[46] This investment will enable the production of high-quality steel for automotive applications.

Goodyear Canada Inc. is dedicating over $575M to scale EV and all-terrain tire production. This investment will support the growing demand for specialized tires for EVs (which are typically heavier than ICE vehicles) and enhance Goodyear's production capabilities.[47]

2. Trade Dynamics

Ontario stands as a powerhouse in the automotive industry, significantly contributing to Canada's economy by leveraging its strategic geographic location, robust infrastructure, and diverse industrial base. The province excels in exporting high-value automotive-related goods which are in high demand globally. To meet the growing demand for automotive products, Ontario also relies on imports, particularly from countries like the United States, Mexico, South Korea, Japan, and China. These imports are essential for maintaining the province's production capabilities and ensuring a steady supply of components necessary for vehicle assembly.

Ontario's advantageous position is further bolstered by free trade agreements, which facilitate seamless trade and economic integration across borders. These agreements not only enhance Ontario's export potential but also attract significant investments, reinforcing its role as a critical hub in the automotive supply chain. Through strategic collaborations and continuous innovation, Ontario remains at the forefront of the global automotive industry, driving economic growth and technological advancements.

ICE and EV Supply Chains

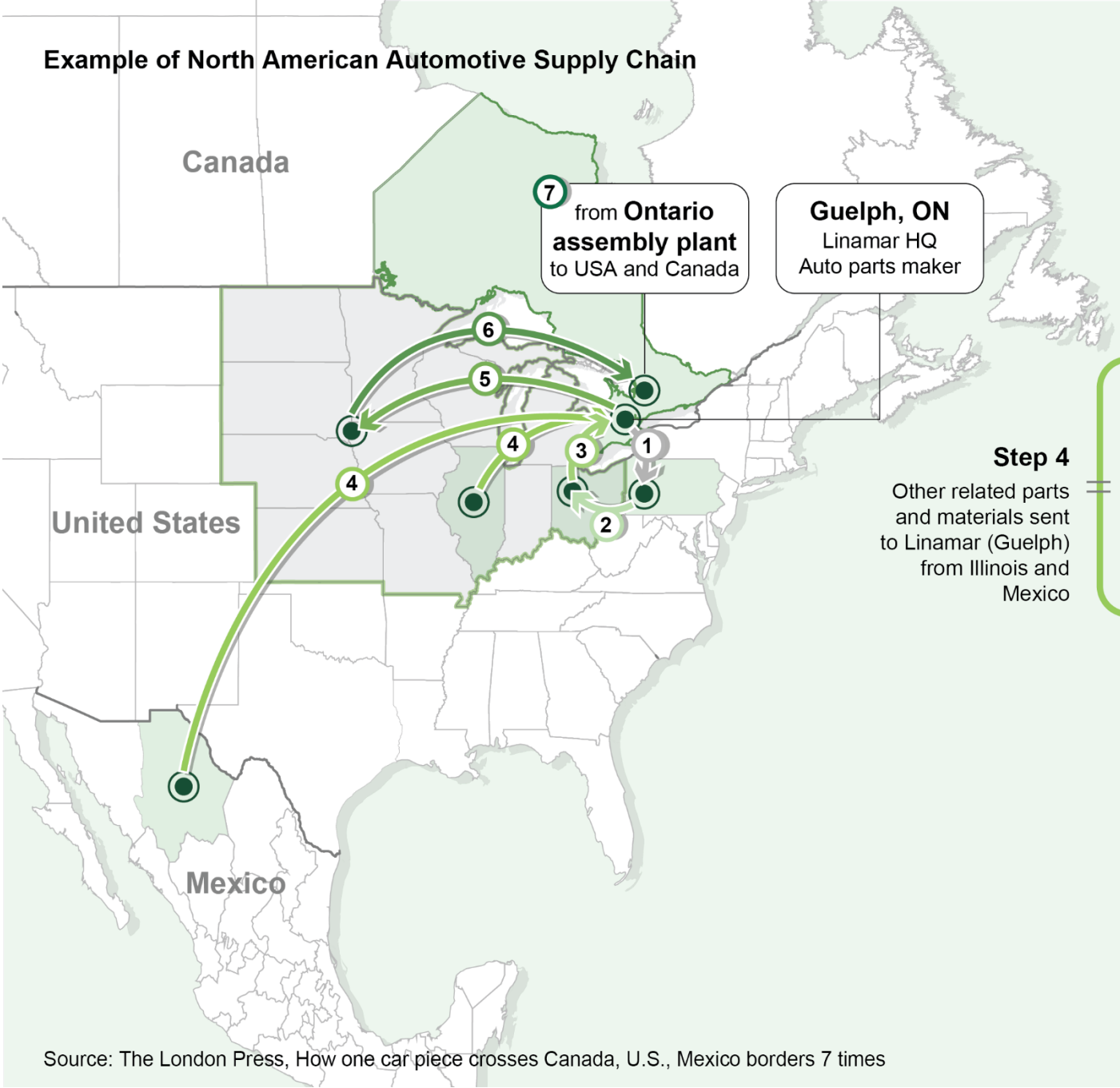
The automotive supply chain – for both ICE vehicles and EVs – is an intricate and comprehensive network of players, such as manufacturers, suppliers, and ancillary service providers, who work together to deliver new vehicles to market. In North America, the automotive supply chain has been strengthening across Canada, the United States, and Mexico for several decades. Particularly, the Auto Pact of 1965 between Canada and the United States supercharged the industry between the two countries. The removal of trade barriers meant that both began importing and exporting vehicles and automotive parts between them to capitalize on each country's specializations and contribute to the growing industry.[48] Implementing the North American Free Trade Agreement (NAFTA) in 1994 officially added Mexico to the integrated supply chain. The new agreement began allowing companies to source from anywhere in Canada, the United States, or Mexico. In the decades since, the agreement has allowed vehicle manufacturers and suppliers to optimize their operations and cost efficiencies across the three countries, which helped keep domestic industry competitive with global capacity.[49] As Canada's automotive hub, Ontario holds a significant and important role across the supply chain. While global trade has been experiencing recent uncertainties, several automotive organizations have expressed how closely integrated the supply chains for all vehicle types are.

In an example publicly shared by Linamar Corp., a piece of scrap metal that eventually becomes automatic transmission first moves from Guelph to be smelted in Pennsylvania, where the smelted steel is then sent to Ohio to manufacture a hub. From Ohio, the hub is sent back to Linamar in Guelph where it is assembled into other components for a transmission assembly. Guelph then receives parts from Illinois and Mexico's Coahuila state for further assembly into a module. The module then moves to a plant in midwestern United States to become a transmission, which is then sent back to one of Ontario's vehicle assembly plants to become part of a fully assembled vehicle. Such vehicles are either sold in Canada or sent to the United States. In just this example, the component crosses Canada, United States, and Mexico borders seven times.[50] This particular example is mapped on the following page.

There are various other examples of similar supply chain scenarios across other automotive parts. One instance is that of vehicles being assembled in Kentucky using gearboxes from St. Catharines, Ontario, and aluminum from Quebec.[51] Supplies can also come from across Ontario; in another instance, for seats assembled in Windsor, the foam can come from Mississauga and springs can be sourced from Hamilton.[52] Each supply chain has been meticulously developed over many years to take advantage of economics and specialization to ensure competitive end pricing for consumers.[53]

While the current industry approach is optimized for cost, there are associated challenges such as: lack of agility and adaptability to market changes; reliance on integrated logistics that move components within and outside of continents; and sensitivities to disruptions, like those seen during the COVID-19 pandemic and the subsequent semiconductor shortage. Europe has similarities to North America's geographically diversified and economically optimized supply chain process and faces many of the same challenges.[54]

Example of North American Automotive Supply Chain



Step 1
Linamar sends scrap metal from Guelph to a smelter in Pennsylvania

Step 2
Pennsylvania smelted steel is sent to hub manufacturer in Ohio

Step 3
Ohio hub is sent back to Linamar (Guelph) to be used in assembly

Step 4
Other related parts and materials sent to Linamar (Guelph) from Illinois and Mexico

Step 5
Linamar (Guelph) sends parts to the midwestern United States for transmission assembly

Step 6
Completed transmission assembly sent from the midwest to an Ontario vehicle assembly plant

Step 7
Completed vehicles delivered to dealership network across Canada and the United States

Source: The London Press, How one car piece crosses Canada, U.S., Mexico borders 7 times

Experts have expressed that there is more than one factor to consider when making an automotive-related supply chain sourcing decision. Three variables often analyzed include: the price of the piece, which includes the cost of labour and materials; required tooling, which refers to the specialized equipment and tools used in the manufacturing process; and the logistics, which can include components like packaging, transportation, and warehousing. These major elements influence decision-making. For example, shipping large, stamped parts like body panels over long distances can be challenging and costly but the parts themselves may be relatively less expensive than the cost to ship. The same can be said for inputs like steel. For this reason, in Ontario, many large, heavy, and/or bulky parts and materials are sourced within the province.[55]

There are also variations between different vehicle type supply chains. EV supply chains, while sharing many of the same features as ICE vehicle supply chains, have their own unique considerations, primarily due to the battery and associated components. For instance, a typical EV requires six times the mineral inputs than a conventional vehicle and is therefore heavily reliant on the mining sector, in addition to the more traditional automotive supply chain.[56] Experts note that the EV supply chain is also currently highly dependent on the leading battery manufacturers, such as China,[57] which has produced over 70% of all EV batteries ever manufactured.[58] In contrast, ICE vehicle components are primarily sourced within the continent through well-matured and solidified supply chains and in alignment with current trade agreements. For the North American supply chain, as EVs continue maturing there is significant benefit to producing primarily foreign components, like batteries, more locally and reducing dependencies on a few highly concentrated jurisdictions. A challenge with this is cost. Investing in EV battery manufacturing requires significant capital and many years of planning and construction. Uncertainties like levels of EV adoption, volatile commodity markets, and tariffs can impact such major investments.[59]

Additionally, EVs have created significant changes to the technological makeup of vehicles, where, more than ever, there is a reliance on software over mechanical components to manage intricate systems and provide the overall driving experience. Compared to hardware, software requires a different supply chain and associated skilled labour, which contributes to growing automotive supply chain complexities. Experts note that Ontario is well positioned for tackling ever-changing technology with its mature automotive industry backed by a skilled and well-educated workforce. Ontario is also home to innovative manufacturing facilities that already leverage technologies to optimize efficiency and for suppliers to remain competitive in a price-focused market.[60] Ontario's automotive sector also benefits heavily from its proximity to the technology corridor[61] between Toronto and Waterloo, which is one of the largest tech hubs in North America.[62] Experts also point to higher access to labour through strong immigration as an Ontario advantage.[63]

A commonality between both EV and ICE supply chains is Ontario's significant contribution. The province leverages its longstanding history in the sector, a skilled and knowledgeable workforce, and its culture of innovation and technology adoption to provide manufactured parts and fully assembled vehicles to both North America and the world through strong import and export activity.

Ontario's Exports and Imports

Ontario's automotive industry underscores the interconnectedness and importance of the global automotive supply chain, where Ontario plays a pivotal role as both a producer and consumer of automotive goods. This section explores the province's contributions to the automotive sector's imports and exports. The following North American Industry Classification System (NAICS) codes are examined in this section:

NACIS 3361 – Motor vehicle manufacturing

Includes two subcategories: 33611, automobile and light duty vehicles, including EVs; and 33612, heavy-duty trucks.

NACIS 3362 – Motor body and trailer manufacturing

Includes three subcategories: 336211, motor vehicle bodies; 336212, truck trailers; 336215, motor homes, travel trailers, and campers.

NAICS 3363 – Motor vehicle parts manufacturing

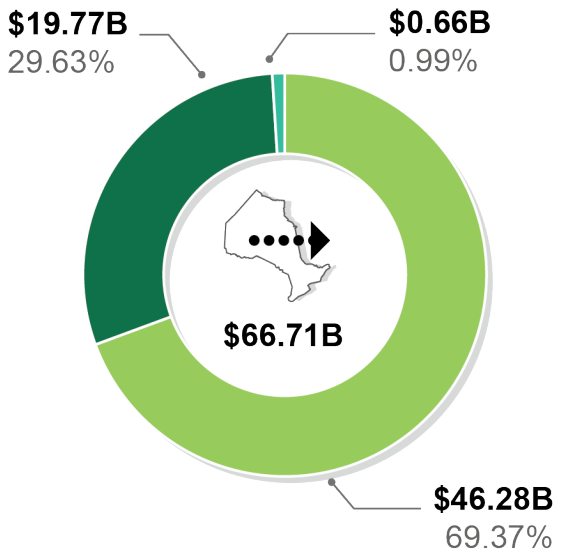
Includes eight subcategories, which span parts such as gasoline engines and parts (33631), electrical and electronic equipment (33632), steering and suspension (33633), brake systems (33634), transmission and power train parts (33635), seating and interior trim (33636), metal stamping (33637), and other parts (33638).

Exports

Over the past five years, Ontario's automotive exports have shown remarkable dynamism, shaped by evolving local and global market forces, disruptions, recovery cycles, and shifting industrial capacities – including the COVID-19 pandemic, semiconductor shortages, and the accelerating shift toward EVs. Amid this volatility, the province's strong manufacturing base and strategic emphasis on innovation have fostered a climate of resilience and stability.

In 2024, total motor vehicle related exports in Ontario reached over $133B.[64] Automobile and light-duty motor vehicle manufacturing (33611) has experienced significant volatility. Exports were approximately $39.7B in 2020, dropping sharply to $32.2B in 2021, then rebounding to $38.1B in 2022 and surging to $53.7B in 2023, before declining again to $45.5B in 2024.[65] This turbulence likely reflects the combined impact of the COVID-19 pandemic, semiconductor shortages, and broader supply chain disruptions,

Ontario Total Exports (2024)



Source: StatsCan. Ontario Total Imports NAICS

followed by a recovery driven by pent-up demand, expanded production capacity, and a strategic shift toward EV manufacturing.

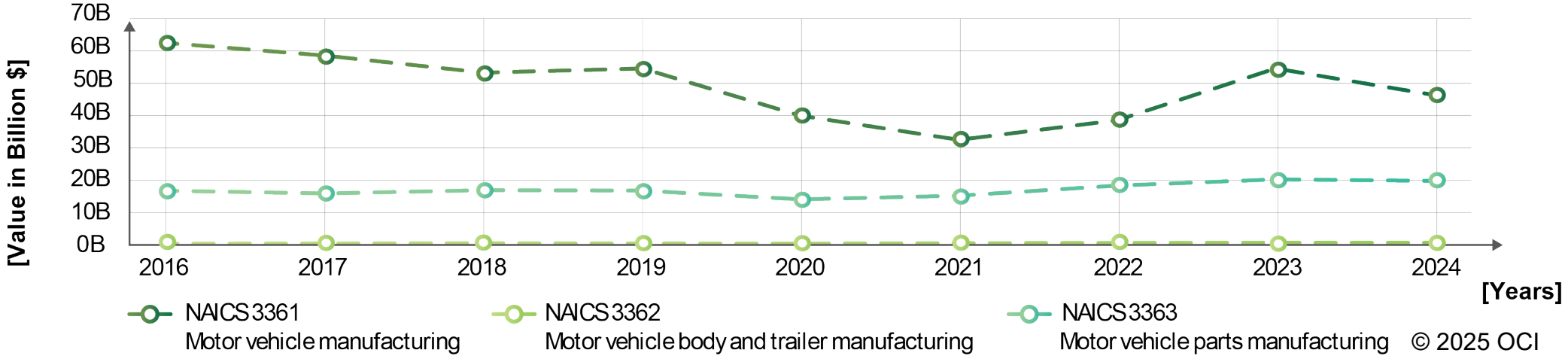
In contrast, exports in heavy-duty truck manufacturing (33612) have shown steady growth, with exports nearly doubling year-over-year: from $128M in 2020 to $208M in 2021, then rising to $420.7M in 2022 and $701M in 2023, before stabilizing at $710M in 2024.[66] This sustained growth may be attributed to rising demand in freight and logistics, especially with the expansion of e-commerce, as well as fleet modernization and electrification efforts aimed at meeting stricter environmental standards and improving fuel efficiency.

In motor vehicle body and trailer manufacturing (3362), all three subcategories across trailers, motor homes, and campers, have generally shown steady year-over-year growth in exports. Exports expanded from $374M in 2020 to $600M in 2022, reaching $663M in 2024. However, motor home, travel trailer, and camper manufacturing (336215) experienced a sharp decline between 2023 and 2024, diverging from the otherwise consistent upward trend.[67] This overall growth likely reflects stable demand for vehicle bodies, potentially driven by increased vehicle assembly activity or export-oriented production contracts.

Exports of motor vehicle parts manufacturing (3363) – which includes eight subcategories ranging from engines to electrical and electronic components – have demonstrated resilient growth over the past five years, with only minor fluctuations. In 2020, exports totaled $14B, rising to $15.2B in 2021 and $18.3B in 2022, likely driven by the global rebound in automotive production and inventory restocking as economies reopened. This upward trend continued in 2023, reaching $20B, before

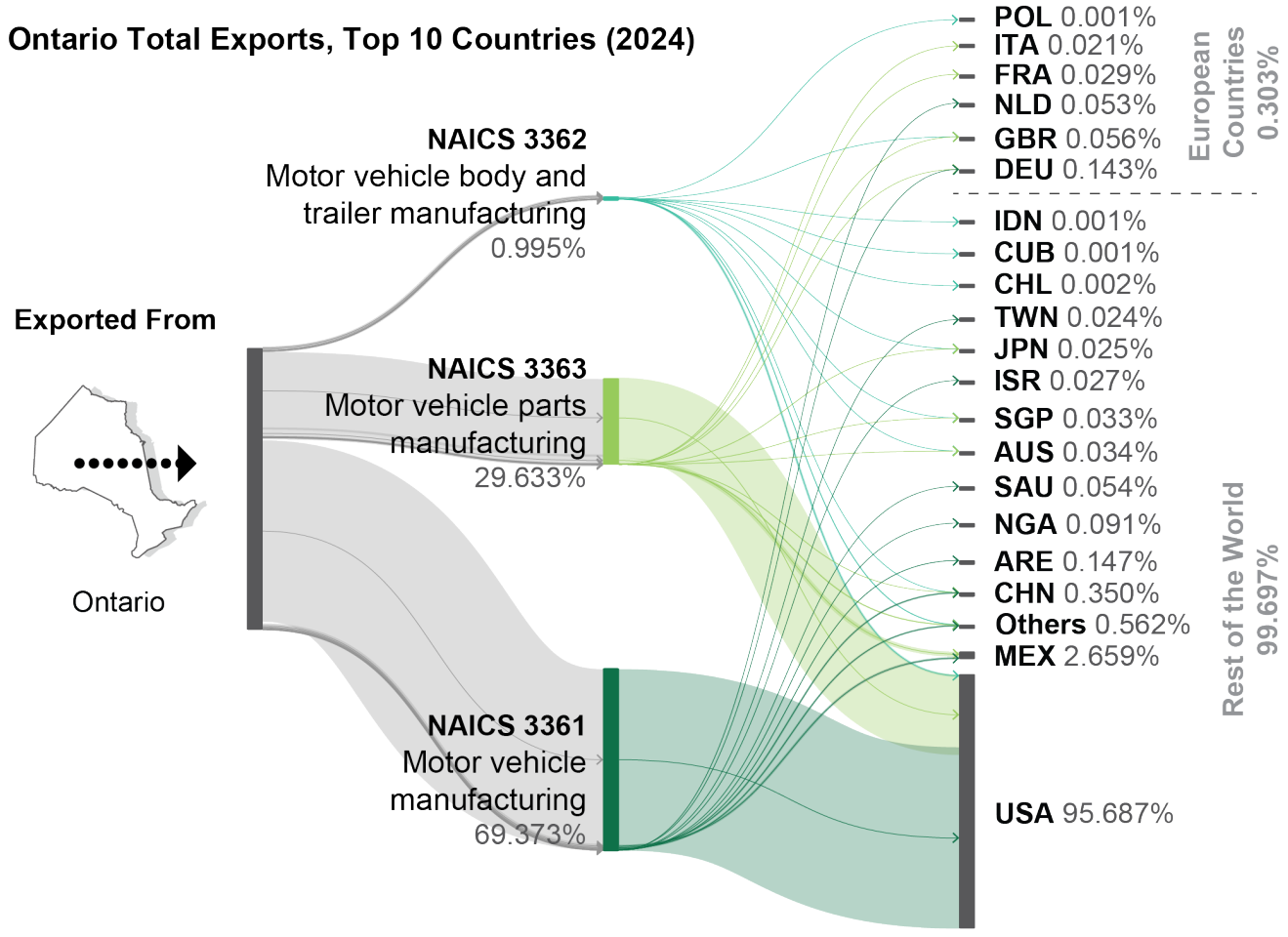
Value of Ontario's Motor Vehicle-Related Manufacturing Exports (2016-2024)

Source: StatsCan (n.d.). Report – Ontario Total Exports



stabilizing at $19.77B in 2024.[68] Overall, the sector's performance underscores its adaptability and critical role within the broader automotive supply chain, as well as its capacity to withstand global disruptions and seize emerging opportunities in a rapidly evolving industry.

In motor vehicle manufacturing, Ontario recorded total exports worth approximately $46.28B, with the United States commanding the overwhelming majority at $45B, followed by Mexico, China, and the United Arab Emirates (UAE), albeit at much smaller scales, ranging between $487M to $98M.[69] In motor vehicle parts manufacturing (3363), the United States absorbed the greatest share at $18.1B, demonstrating Ontario's role as a critical upstream supplier in North American automotive production.[70] Secondary markets included Mexico, Germany, Singapore, and Australia, pointing to Ontario's growing diversification in parts export destinations.[71] This is reflective of Ontario's deep integration with United States automotive supply chains and trade routes, a trend consistent with the historical auto pact legacy and the current North American trade regulations.



Source: StatsCan. Report – Ontario Total Exports, Top 10 Countries (NAICS 3361, NAICS 3362, NAICS 3363), ISO 3166-1 Alpha 3 codes

Imports

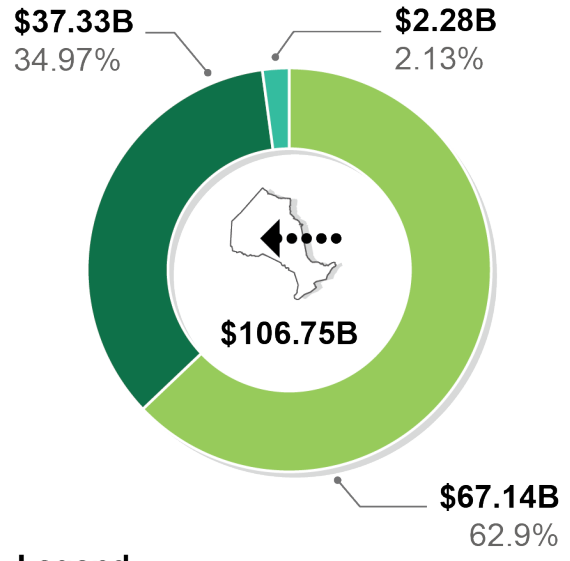
While Ontario's automotive exports have flourished, the province's imports have also grown significantly, driven by the need to meet domestic demand for both finished vehicles and parts. From 2020 to 2024, total imports under the three core NAICS codes – motor vehicle manufacturing (3361), motor vehicle body and trailer manufacturing (3362), and motor vehicle parts manufacturing (3363) – rose significantly, underscoring Ontario's status as a vital node in the international automotive landscape. By 2024, these combined imports reached approximately $106.7B, up from $70.9B in 2020, with a notable post-pandemic spike in 2023, likely due to supply chain normalization and resurgent production demand.[72]

Imports of automobiles and light-duty motor vehicles (33611) have shown steady growth, from $35.6B in 2020 to $52B in 2022, and reaching nearly $60B in 2024 – almost double the 2020 value. Imports of heavy-duty trucks also more than doubled over the same period, rising from $4B in 2020 to $7B in 2024. This surge may be driven by increased demand in logistics, freight, and delivery services across North America.[73]

Motor vehicle body and trailer manufacturing (3362) imports rose steadily from $1.6B in 2020 to $2.2B in 2024, peaking at $3.2B in 2022. Truck trailers remained the dominant import category, reflecting growing demand in freight and industrial transport. Meanwhile, imports of motor homes and campers peaked at over $1.6B in 2022 before declining to $906M in 2024, possibly indicating a saturated recreational vehicle market or a shift toward domestic production.[74]

It is also important to note the sustained rise in motor vehicle parts (3363) imports. Totaling $37.3B in 2024, this category reveals Ontario's ongoing reliance on international partners for complex vehicle systems and components.[75] Imports of gasoline engines and parts neared $9B in 2024, up from $7B in 2020, while electrical and electronic systems – crucial to EV production – grew steadily to $3.5B, signaling the increasing electrification of mobility solutions.[76] Brake, steering, suspension, and transmission components also contributed significantly, highlighting areas where Ontario could strategically localize production to improve supply chain resilience.

Ontario Total Imports (2024)



Legend

- NAICS 3361
  Motor vehicle manufacturing
- NAICS 3362
  Motor vehicle body & trailer manufacturing
- NAICS 3363
  Motor vehicle parts manufacturing

Source: StatsCan. Ontario Total Imports NAICS

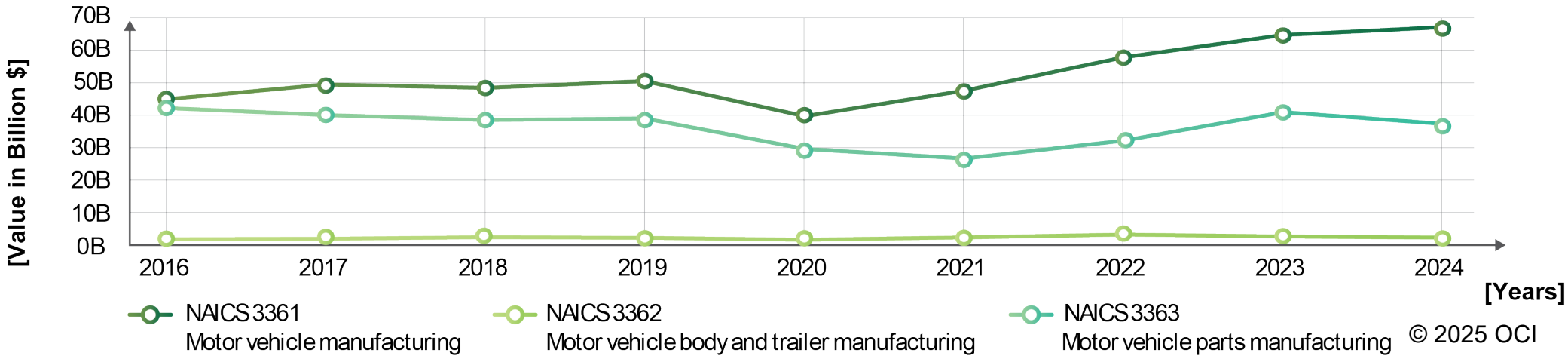
As Ontario's automotive sector continues to demonstrate its deep integration with global supply chains, the province's growing import needs reflect not only rising production but also opportunities to foster domestic innovation, reduce dependency on foreign components, and further expand its role as a continental hub for advanced vehicle technologies.

Automotive imports to Ontario follow a similar trend as exports, with the United States being the country of origin for close to 62% of all imports – motor vehicle manufacturing (3361) and motor vehicle parts manufacturing (3363) contributing the greatest shares at $38.5B and $26B for 2024 respectively.[77] Mimicking exports, Mexico emerged as the second biggest importer to Ontario – being responsible for close to 17.2% of total imports. Mexico is followed by South Korea, Japan, and China.[78]

The largest share of imports in 2024 came from motor vehicle manufacturing, totaling $67.14B.[79] The United States alone contributed more than $38.5B, reinforcing the enduring strength of cross-border trade under the Canada-United States-Mexico Agreement (CUSMA) framework and longstanding automotive integration between Ontario and the United States. Mexico, South Korea, and Japan were also major contributors, indicating Ontario's reliance on North American and East Asian manufacturers for complete vehicles.[80] It is also interesting to note that a wide cast of countries including Germany, China, Slovakia, and Hungary exported motor vehicles and parts to Ontario, suggesting that Ontario sources from both mass-production leaders and specialized vehicle manufacturers globally.[81]

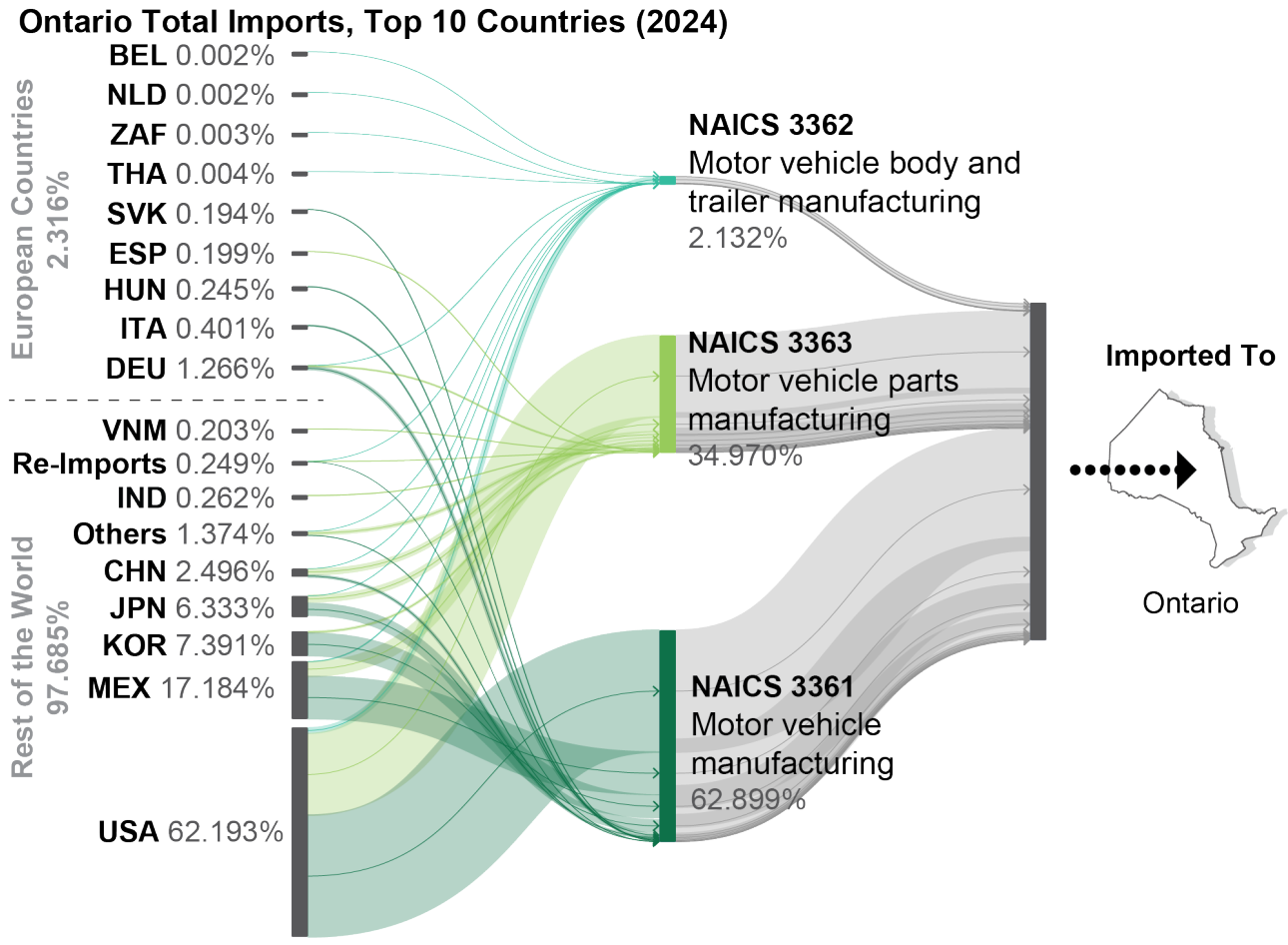
Value of Ontario's Motor Vehicle-Related Manufacturing Imports (2016-2024)

Source: StatsCan (n.d.). Report – Ontario Total Imports



In contrast, motor vehicle body and trailer manufacturing accounted for a relatively modest $2.28B, with the United States once again supplying the bulk – over 84% of total imports in this category.[82] This suggests that, while Ontario may assemble and produce trailers domestically, its high-value or specialized body components often originate in the United States and occasionally from partners like Mexico, Germany, and China.[83]

Motor vehicle parts manufacturing (3363) imports amounted to $37.33B with the dominance of the United States (nearly $26B) reaffirming the continent-wide integration of parts supply chains.[84] However, this category features a greater geographic diversification with countries such as Mexico, China, Japan, India, Vietnam, and Spain reflecting a strategic spread of sourcing channels.[85] This diversification may contribute towards helping Ontario mitigate risk amid shifting geopolitical and trade dynamics.



Source: StatsCan. Report – Ontario Total Imports, Top 10 Countries (NAICS 3361, NAICS 3362, NAICS 3363), ISO 3166-1 Alpha 3 codes

A Focus on EVs and Trade

Ontario's commitment to expanding its EV sector is reflected in newly available Canadian trade data. The Harmonized System (HS) codes provide clear data on EVs and are examined in this section include:

HS 870240 – Motor vehicles with only electric motor, 10+ passengers

HS 870380 – Motor vehicles with only electric motor

HS 870460 – Motor vehicles with only electric motor for transport of goods

In 2024, exports of electric motor vehicles reached $922M, signaling rising global demand for Ontario-made EVs and aligning with the province's focus on automotive sustainability and innovation.[86] Imports also surged to $8.7B in 2024.[87] This sharp increase highlights Ontario's efforts to meet growing domestic demand for cleaner transportation options and to accelerate EV adoption. While imports currently outpace exports, the gap underscores a significant opportunity for Ontario to strengthen its role as a North American EV manufacturing hub.

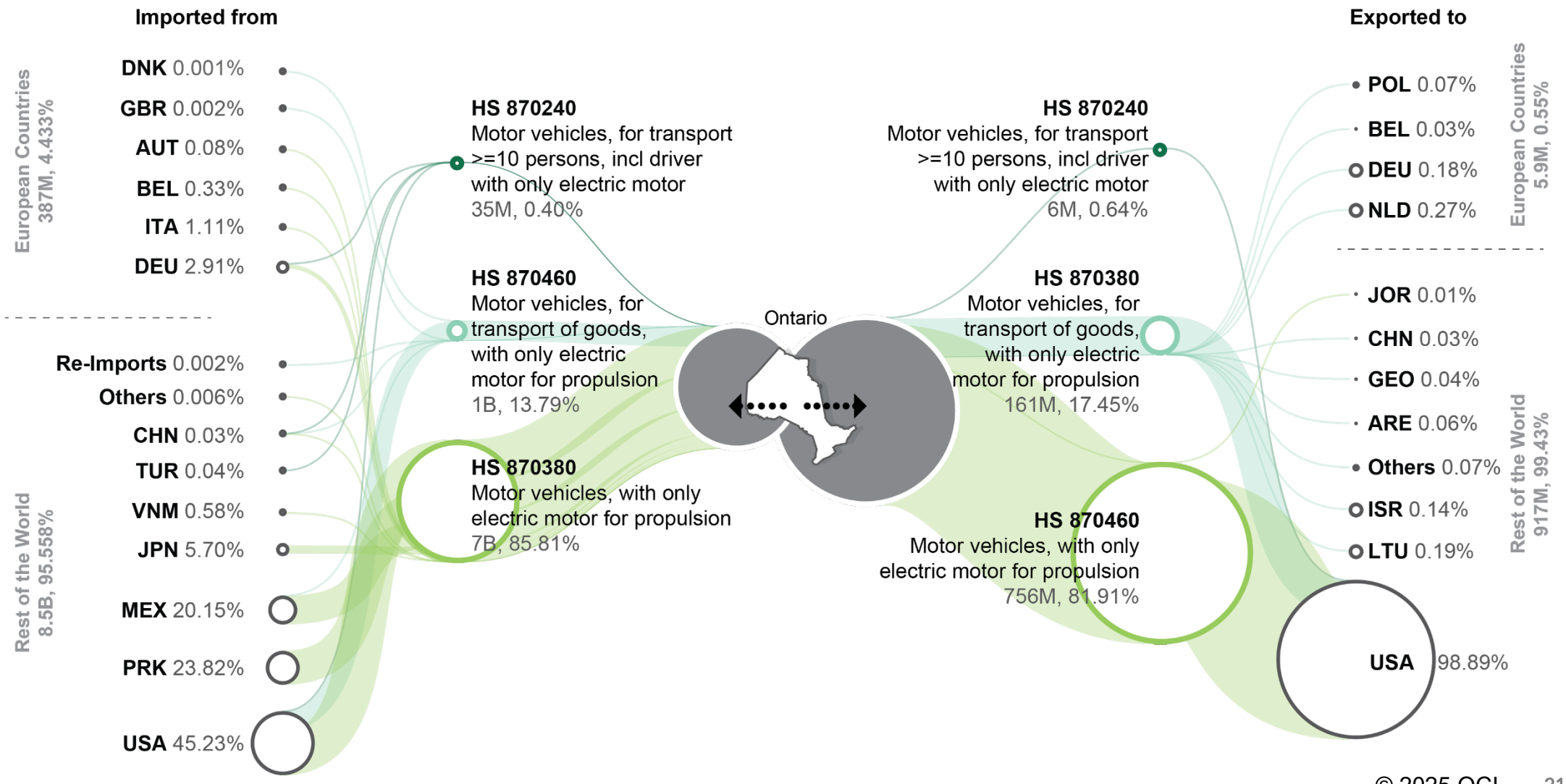
EV Exports

Ontario's 2024 EV export activity reveals a growing global footprint, especially in passenger and goods transport.[88] Ontario exported $161M worth of passenger EVs, 93% of which went to the United States.[89] Other destination countries included Germany, the Netherlands, Lithuania, the UAE, Belgium, and China, showing that Ontario-made EVs are reaching both mature and emerging markets.[90] These strategic exports could grow rapidly as production capacity scales and major OEMs expand their Ontario-based EV lines. Ontario exported $755.8M of goods transport EVs, with the vast majority destined for the United States and a small volume totalling $116K shipped to Jordan.[91] This strong alignment with American demand underlines Ontario's role as a key manufacturing partner in North America's electrified logistics ecosystem. In contrast, electric buses and large passenger EV exports remained modest at $5.9M, all of which went to the United States. This suggests that while Ontario has established capabilities in electric bus assembly (e.g., BYD's facility in Newmarket), export volumes are still in the early stages and largely limited to bilateral trade.[92]

EV Imports

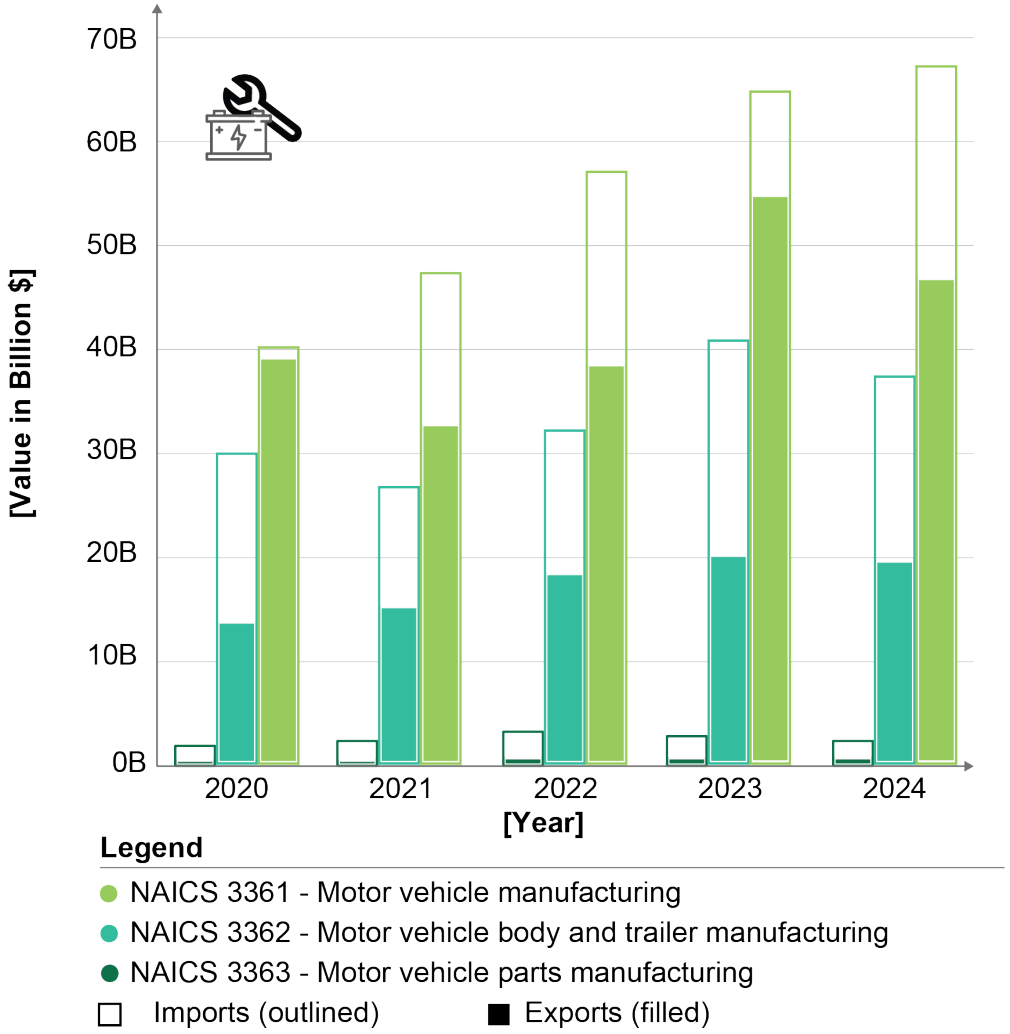
Ontario's import figures reflect strong domestic demand for EVs, especially passenger vehicles, which showed the largest share, totaling approximately $7.5B.[93] The United States led the charge with over $2.72B, followed closely by South Korea ($2.08B), Mexico ($1.76B), and Japan ($497M), showcasing a heavily North American and East Asian sourcing base.[94] The spread also includes Germany, Italy, Vietnam, Belgium, Austria, and China, indicating Ontario's diversified EV passenger vehicle import base.[95] With EVs for goods transport, Ontario imported $1.2B, once again largely from the United States, with smaller contributions from Mexico, China, the UK, Denmark, and others.[96] The significant United States imports underscore the close alignment between Ontario and American commercial vehicle manufacturers and likely increasing demand in last-mile delivery and logistics electrification. Large passenger EV imports were relatively modest at $34.9M, driven again by the United States.[97] This reflects Ontario's nascent adoption of electric public transit vehicles, which may grow with policy incentives and fleet decarbonization mandates.

Ontario's Electric Motor Vehicle Imports and Exports (2024)



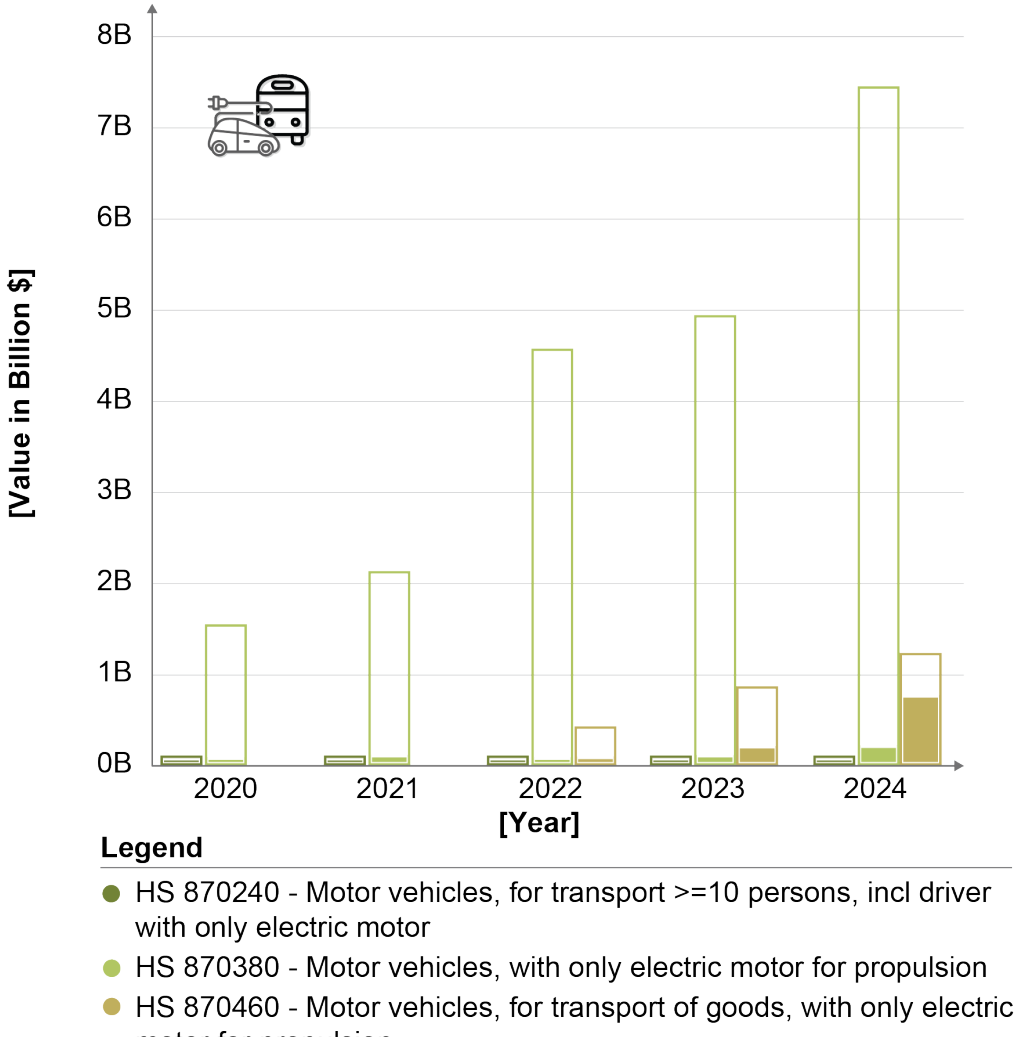
Source: StatsCan (n.d.) Report – Ontario Total Exports and Imports, EVs, Top 10 Countries (HS 870240, HS 870380, HS 870460), ISO 3166-1 Alpha 3 codes

Ontario's Motor Vehicle Manufacturing Imports and Exports (2020-2024)



Source: StatsCan (n.d.). Report – Ontario Total Exp/Imp (NAICS 3361, NAICS 3362, and NAICS 3363)

Ontario's Electric Motor Vehicle Imports and Exports (2020-2024)



Source: StatsCan (n.d.). Report – Ontario Trade Balance, EVs (HS 870240, HS 870380, HS 870460)

Key Trade Partners and Free Trade Agreements

Canada's automotive trade landscape is evolving rapidly in response to shifting global dynamics, regional agreements, and strategic investments. At the heart of this transformation is Ontario, which plays a central role in shaping Canada's trade relationships – particularly with the United States and Mexico. As trade policies fluctuate and new barriers emerge, both federal and provincial governments are adapting through targeted legislation, interprovincial cooperation, and international partnerships. At the same time, Canada is leveraging its extensive network of global trade agreements to diversify markets and reduce reliance on the United States, while attracting major industry investments to strengthen its position as a competitive, sustainable, and innovation-driven automotive hub.

Trade with the United States and Mexico

Free trade agreements have played a crucial role in shaping Canada's economic relationships with various countries, in particular the United States and Mexico. CUSMA serves to reinforce Canada's strong economic ties with both countries.[98] The agreement, renegotiated in 2018, includes strict automotive rules of origin which determine if a product has undergone sufficient production within the CUSMA region to qualify for preferential treatment.[99] These updated rules ensure ongoing growth and stability for Canadian companies and their employees. Additionally, the updated agreement enhances Canada's competitive edge, helps to retain facilities within the country and promotes well-paying jobs for Canadians.[100] Experts note that CUSMA incentivizes a more regional and less global supply chain, and has different impacts on EVs and ICE vehicles due to their varying components. For EVs, this is primarily due to availability of batteries and materials like processed critical minerals, which currently must be largely sourced from outside of North America.[101]

Another critical element of the renegotiated agreement, ensuring the smooth flow of automotive parts and vehicles between the United States, Canada, and Mexico, is the guaranteed exemption from Section 232 measures (for CUSMA-compliant goods), which enable the United States to impose trade restrictions for the purpose of national security, on a certain number of vehicles and auto parts annually.[102] Despite protective measures under CUSMA, the recent escalation of Canada-United States tariffs – including the announcement of 25% tariffs on United States imports of automotives and certain automotive parts under Section 232 of the Trade Expansion Act – are leading to a dynamic shift in global trade outlooks.[103] Fluctuating United States trade policies are exacerbating uncertainty and prompting a significant rethinking of supply chains and business relationships as Canadian companies and multinationals with Canadian operations adjust to legal and operational uncertainty.[104] With current North American integration, experts also point to trade tensions between the United States and China as a significant impact to Canada-based supply chains, particularly access to critical minerals.[105]

Provincial Agreements

In response to mounting instability, Canadian provinces themselves have been actively working to reduce barriers to inter-provincial trade since the imposition of United States tariffs on Canadian products. In April 2025, Ontario announced the introduction of the Protect Ontario through Free Trade within Canada Act, aimed at reducing internal trade barriers.[106] Now enacted,

the Act is designed to enhance domestic trade and mitigate some of the effects of United States tariffs including through a focus on labour mobility.[107]Additionally, on April 16 2025, Ontario signed an Economic Cooperation Memorandum of Understanding (MOU) with both Nova Scotia,[108] and New Brunswick to support the reciprocal removal of trade barriers between the provinces.[109] Ontario, through OVIN, also has partnerships with states outside of Canada, including Baden Wurttemberg in Germany and Michigan in the United States. They are described in greater detail in the case studies below.

National Trade Agreements

As Canadian businesses seek to diversify their markets due to shifting trade dynamics, significant opportunities exist to leverage Canada's extensive network of free trade agreements, which provide preferential access to numerous countries globally, including key markets in Europe, Asia, and the Americas. Canada is strategically positioned to reduce its reliance on United States markets by leveraging its trade agreements, which amount to a coverage of 60% of the global economy. An analysis by Clean Energy Canada highlighted that aside from the United States, Canada's ten largest trading partners all have net zero commitments, and half of them have implemented carbon border adjustments on imports and are subject to domestic EV requirements.[110] This alignment with key trading partners offers Canadian automotive businesses an opportunity to diversify and expand their international footprint, particularly in markets that uphold similar environmental standards.

Canada is well-positioned to secure stable market access for automotive production by leveraging its tariff-free entry to Europe through the Canada-European Union Comprehensive Economic and Trade Agreement (CETA),[111] its access to Indo-Pacific markets via the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP),[112] and its bilateral trade agreements with South Korea and several South American countries.[113] The Indo Pacific region, for instance, is a global leader in economic growth, presenting substantial opportunities for trade and expansion.[114] Rising instability related to the United States market may also prompt other regions to consider the Canadian market as a more stable and cost-effective alternative.

Industry Partnerships

The government of Canada has also been exploring industry partnerships, working with provinces such as Ontario to attract large scale projects that can bolster the auto manufacturing sector and secure jobs within Canada. Since 2020, Ontario has attracted over $46B in automotive and EV battery-related investments, underscoring its emergence as a key hub for next-generation vehicle manufacturing. This includes two landmark investments from Honda and Volkswagen. In 2024, Honda announced a $15B project for four new Ontario manufacturing facilities to support a worldclass and innovative, including an EV assembly plant – the first of its kind for Honda – and a stand-alone battery plant.[115] In May 2025, Honda announced a two-year pause on the investment as the company re-evaluates the project's timing.[116] 2024 also saw Volkswagen announce a $7B investment to establish its first overseas EV battery manufacturing facility in St. Thomas.[117] Both the governments of Canada and Ontario jointly committed substantial performance-based incentives – up to $13B for Volkswagen's St. Thomas facility,[118] and up to $15B for Stellantis-LG Energy's battery cell plant in Windsor.[119]

Going Global Spotlight: Ontario and Baden-Württemberg

Ontario and the State of Baden-Württemberg in Germany have a longstanding strategic partnership aimed at advancing the automotive and mobility sectors.[120] As two of the largest automotive jurisdictions globally, they are home to nearly 2K suppliers combined. This collaboration, via a renewed MOU, leverages the strengths of both regions to drive innovation, enhance research, and boost economic growth. Driven by OVIN and e-mobil BW GmbH – the innovation agency and competence center of the State of Baden-Württemberg for new mobility solutions and automotive – the partnership was renewed in April 2025 for a three-year term.[121] It aims to:

- Enhance collaboration across jurisdictions – by integrating Ontario and Germany's automotive sectors, the partnership seeks to strengthen a robust innovation partnership.
- Drive technological advancements – focus on electric, connected, and autonomous vehicle technologies to accelerate the development and commercialization of next generation technologies.
- Strengthen global opportunities – facilitate connections between innovators and industry leaders, paving the way for new market opportunities.

The partnership outlines a commitment to fostering connections between Ontario and Baden-Württemberg companies and industry leaders to drive global collaboration. These connections have facilitated the development of new customers and global market entry for Ontario companies, allowing them to grow their global footprint and drive the sector forward through knowledge sharing and cooperation.[122]

The strategic partnership between OVIN and the State of Baden-Württemberg exemplifies how worldwide collaboration can propel innovation and economic growth. As both regions continue to work together and build on their first year of collaboration, they are well-positioned to continue to lead the global automotive and mobility sectors into a sustainable and technologically advanced future.

Going Global Spotlight: Ontario and South Korea

Ontario and South Korea are building on their longstanding economic and innovation ties through a new strategic partnership between OVIN and the Korea Agency for Infrastructure Technology Advancement (KAIA).[123] This collaboration marks a significant milestone in strengthening bilateral efforts to drive forward the future of automotive and mobility innovation.

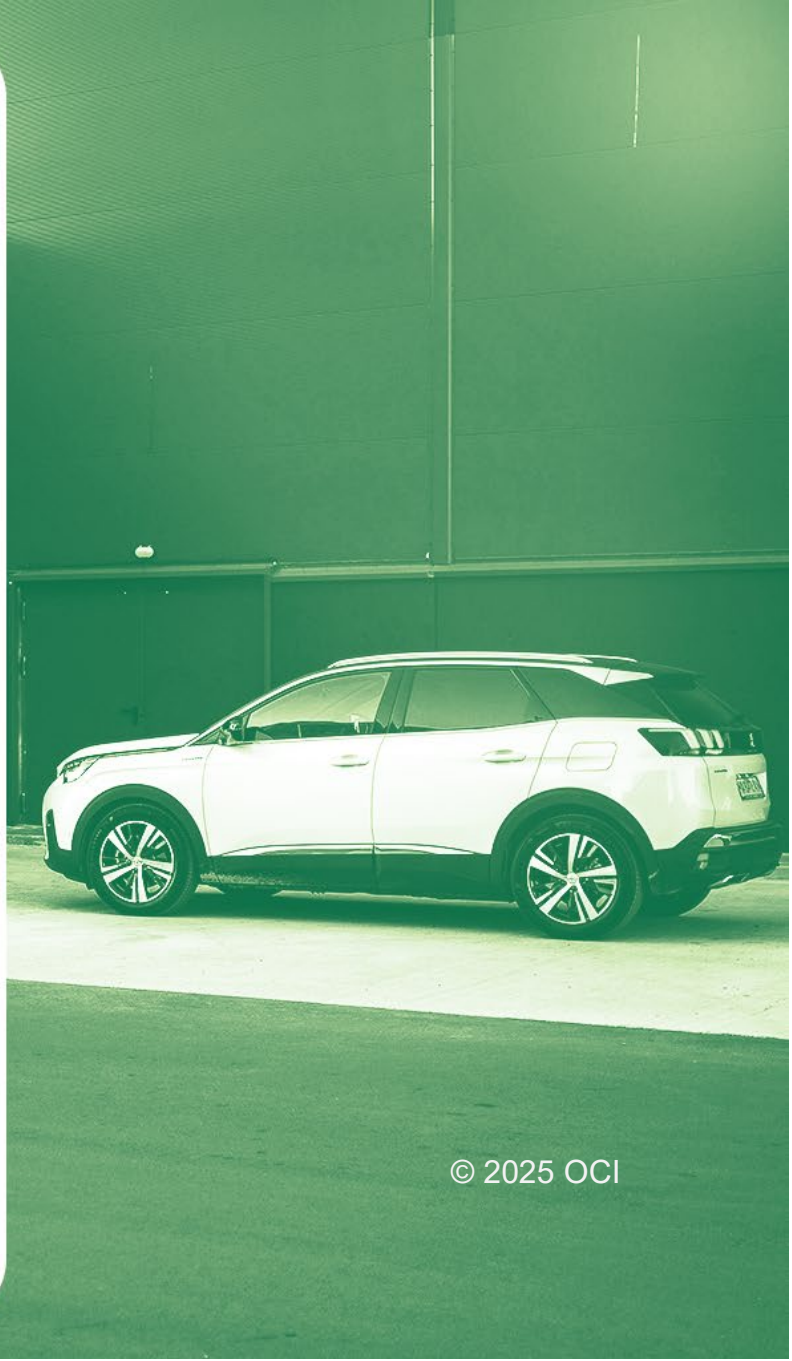
With two-way goods trade between Ontario and South Korea valued at over $13.2B in 2024, the relationship between the two jurisdictions continues to grow.[124] South Korea is Canada's eighth largest trading partner, offering valuable opportunities for expanding commercial ties.

The new partnership between OVIN and KAIA is focused on enabling greater cross-border collaboration in the development and commercialization of advanced transportation technologies. Through joint efforts, Ontario and South Korea will explore ways to support small- and medium-sized enterprises, facilitate their entry into new markets, and catalyze economic growth through innovation.

KAIA is the sole government institution in Korea that specializes in the overall research, development and innovation activities for the sectors of built environment, infrastructure, transport, cities, aviation, etc. Its scope of services covers conducting R&D planning, management and implementation and issuing the certification on new technologies.

OVIN's partnership with KAIA will focus on shared areas of interest such as smart mobility, intelligent transportation systems, charging infrastructure, sustainable cities, the net-zero transition, and digital twin technologies. The partnership will explore opportunities for mutual exchange of resources to support technology pilots and bilateral research and development

By leveraging the shared strengths of Ontario and Korea in innovation and advanced R&D in the automotive and mobility sector, this strategic alliance reinforces both jurisdictions' positions as global leaders in the future of clean, connected, and competitive mobility.



3. Current Operational Landscape in Ontario

Ontario is a leading force in the automotive and mobility sector, supported not only by a strong R&D ecosystem but also by its robust manufacturing infrastructure and skilled workforce. The province drives innovation across the supply chain, from mining and EV battery technologies to automotive parts manufacturing and EV battery recycling, fostering collaboration between industry, academia, and government. Technological advancements are rapidly transforming Ontario's automotive landscape, with breakthroughs in autonomous driving technologies, AI, and machine learning, while innovations in EV systems, battery technologies, connected vehicle infrastructure, and advanced manufacturing processes are driving greater efficiency and performance across the sector. Ontario's automotive and mobility sector is also a major employer, directly supporting nearly 110K workers and numerous indirect jobs.[125] As the industry transitions to ZEVs, the province invests in upskilling initiatives to mitigate impacts on workers and prepare them for future opportunities.

Technological Advancement Research and Development in Ontario

Ontario is home to a diverse array of R&D centres, facilities, and labs that play a pivotal role in the automotive and mobility sector. These institutions are integral to the entire supply chain, encompassing everything from mining and EV battery technologies to automotive parts and vehicle manufacturing, and EV battery recycling.

The province's commitment to innovation and technological advancement is evident in the numerous specialized centres dedicated to various aspects of the automotive and mobility industry. These centres not only drive progress in their respective fields but also foster collaboration between industry leaders, academic institutions, and government bodies.

The research conducted in these centres covers a wide range of topics, including the development of advanced EV battery technologies, the creation of sustainable automotive materials, and the implementation of cutting-edge manufacturing processes. The majority of automotive research is located within the automotive corridor in southern Ontario. The contribution of a selection of these facilities is presented here.

Automotive Research Centres

Automotive Centre for Excellence (ACE): a state-of-the-art R&D facility at Ontario Tech University. ACE fosters strong industrial connections by collaborating with OEMs, Tier 1 suppliers, tech startups, and researchers worldwide. Part of OVIN's Durham Regional Technology Development Site (RTDS), it offers industry partners advanced climatic research capabilities, allowing for the testing of vehicles and automotive equipment under extreme environmental conditions.[126] ACE is continuously expanding its technology and capabilities. It has conducted testing on a wide range of vehicles, including ICE cars and light-duty trucks, EVs, autonomous vehicles (AVs), Class 6-8 trucks (hydrogen, diesel, and electric), full coach buses, motorcycles, all-terrain vehicles (ATVs), and many other prototype mobility solutions.[127] ACE features various testing chambers dedicated to aerodynamic, climatic, and structural R&D. Its Climatic Aerodynamic Wind Tunnel can simulate diverse conditions, including solar exposure, rain, freezing rain, light snow, and blizzards, with wind speeds up to 300 km/h and temperatures ranging from -40°C to +60°C.[128]

Centre for Automotive Research and Education (CARE): located at the University of Windsor, CARE is dedicated to enhancing the competitiveness of the Canadian automotive industry through world-class research and education. Located in the heart of North America's automotive sector, CARE emphasizes collaborative industrial R&D to improve vehicle safety, energy efficiency, and innovation in connected, autonomous, cybersecurity, and electrified technologies.[129]

CARE has strong ties with major companies like Ford and GM Canada, providing students with hands-on experience in accredited engineering programs.[130] This enables students to address real-world challenges and collaborate with global automotive leaders. Through its efforts, CARE plays a crucial role in advancing automotive technology and fostering the next generation of industry innovators.

Centre for Automated and Transformative Transportation Systems (CATTS): a pioneering research centre, located at the University of Toronto, dedicated to analyzing the large-scale impacts of disruptive transportation technologies and services, such as automation, on urban systems. CATTS brings together academia,

industry, and government to develop analytical tools for assessing transportation performance, promoting technologies like Mobility as a Service (MaaS), and supporting smart infrastructure management.[131] Building on the strengths of the University of Toronto Transportation Research Institute (UTTRI), one of Canada's largest transportation research institutes, CATTS plays a critical role in shaping the future of transportation and automotive industries. The centre drives the adoption of advanced technologies and fosters the transition toward sustainable, smart cities.[132]

McMaster Automotive Resource Centre (MARC): located at McMaster Innovation Park, MARC is a state-of-the-art facility designed to foster collaboration between researchers and industry in the development of next-generation automotive technologies.[133] MARC is home to several leading research groups, including the Canada Excellence Research Chair (CERC) Laureate Program. The Centre's research focuses on EVs and smart mobility, with expertise in advanced electric motors, power electronics, energy management systems, electrified powertrains, and autonomous systems – positioning MARC at the forefront of sustainable transportation innovation.[134]

Mobility Innovation Centre (MOVE): based at York University's Lassonde School of Engineering, MOVE is a hub for interdisciplinary research tackling the most pressing mobility challenges in Canada and globally. Drawing on the expertise of approximately two dozen leading researchers across science and engineering disciplines, MOVE develops innovative solutions to create safer, more sustainable, and accessible transportation systems. The centre's research spans six key themes: Autonomous Mobility, Sustainable Mobility, Mobility Analytics, Internet of Things (IoT), Shared and Connected Mobility, and Augmented Reality (AR) / Virtual Reality (VR) Mobility. Through these focus areas, MOVE advances the development and integration of connected, autonomous, and intelligent transportation technologies, ensuring they are implemented safely and effectively within society.[135]

NRC Automotive and Surface Transportation Research Centre: located at the NRC Uplands Campus in Ottawa, this Research Centre offers product development and de-risking for new technologies through leading-edge research, and technical and engineering services. The Centre's key research areas include low-emission ground transportation, climate resilience and safety in transportation, and digital and sustainable manufacturing.[136] Facilities based at the Uplands Campus cover automotive and rail, with research facilities for climatic testing, compression and tension testing, a heavy structural dynamics lab, heavy vehicle tilt research, rail vehicle impact ramp research, and wheel bearing and brake research.[137]

NRC Manufacturing and Automotive Innovation Hub: a 75K-square-foot, open-concept research and collaboration facility located in London, Ontario. As part of the NRC's Automotive and Surface Transportation Research Centre, the Hub brings together all levels of the automotive and manufacturing supply chain to co-develop innovative technologies alongside NRC experts and Canada's broader research ecosystem. The facility features dedicated labs for advanced manufacturing, CAVs, vehicle lightweighting, and alternative propulsion systems. Designed to accelerate innovation and commercialization, the Hub provides manufacturers, integrators, and equipment makers with direct access to technical solutions that can be applied to real-world products and processes –

supporting the growth and competitiveness of Canada's automotive sector.[138]

Smart Connected Vehicles Innovation Centre (SCVIC): located at the University of Ottawa's Kanata North campus, SCVIC is a state-of-the-art research facility accelerating innovation in CAV technologies. SCVIC takes a multidisciplinary approach to solving challenges related to connectivity, cybersecurity, decision-making, and sustainability in smart mobility systems. The centre features an indoor AV test bed, advanced computing infrastructure, and a suite of drones, ground robots, and self-driving car prototypes. SCVIC supports rapid, low-cost experimentation and real-time data analysis using AI, machine learning, IoT, and 5G-enabled edge computing. It also serves as a collaborative hub for researchers, industry partners, and policymakers, fostering the development and commercialization of next-generation mobility solutions.[139]

Waterloo Centre for Automotive Research (WatCAR): Canada's largest automotive-focused academic research enterprise, serving as the central hub for the University of Waterloo's automotive innovation and industry engagement. WatCAR fosters collaboration between researchers and automotive manufacturers, parts suppliers, and related organizations at the provincial, national, and global levels. With participation from hundreds of faculty members and researchers across diverse disciplines, WatCAR drives advancements in automotive technology, innovation, and education. Its interdisciplinary approach and strong industry partnerships make it a cornerstone of Canada's automotive research landscape, supporting the development of next-generation mobility solutions and strengthening the country's position in the global automotive sector.[140]

EV Technologies Research Centres

Centre for Hybrid Automotive Research and Green Energy Lab (CHARGE): located at the University of Windsor in Ontario, CHARGE lab is a pioneering research facility dedicated to transformative EV technologies. The lab fosters interdisciplinary collaboration among materials, mechanical, electrical, and software engineers to drive innovation in the EV sector.[141] CHARGE Lab focuses on four major research programs: traction e-machines, traction motor drives and controls, e-motor and drive testing, and battery management systems and chargers.[142] As a leading R&D testing facility in North America, CHARGE Lab specializes in EV powertrain component testing. It boasts advanced infrastructure, including high-speed and high-torque dynamometer test benches, battery simulators, power electronics testing equipment, and cooling systems, all supported by a skilled mechanical workshop.[143]

Through ongoing industry collaborations with partners such as Magna, Ford, and McMaster University, CHARGE Lab advances traction e-motor technology by innovating in materials, structural optimization, and thermal management. These efforts contribute to the development of high-performance, reliable, and cost-effective electric machines, supporting the growth of the EV industry.[144]

ElectroChemical and Energy Storage Lab (EESL): located at Lambton College in Sarnia, EESL is a cutting-edge research facility dedicated to advancing energy storage technologies. The lab is equipped with state-of-the-art tools for designing, testing, and analyzing a wide range of battery chemistries, including lithium-ion, solid-state, and flow batteries. It features advanced instrumentation for in-depth electrochemical analysis. EESL also supports the development of fuel cell technologies, prototyping of integrated energy storage systems, and the integration of

storage with renewable energy sources. In addition, the lab focuses on the synthesis and characterization of supercapacitor materials and conducts research into thermal management, safety, and lifecycle performance of energy storage systems.[145]

FLEX-ION Battery Innovation Centre: a state-of-the-art facility launched in 2022 through an $18.5M investment by auto parts manufacturer Ventra Group.[146] The facility is dedicated to advancing next-generation EV battery technologies. Located in Windsor, the Centre focuses on the development of innovative battery chemistries and the design and manufacturing of cells, modules, and packs. With a full-scale pilot line offering production-level capabilities, FLEX-ION enables proof-of-concept testing through to full-scale production validation.[147]

NRC Battery Performance and Safety Evaluation Research Facility: a national hub for advanced battery testing and analysis, located in Ottawa. Operated by the National Research Council of Canada (NRC), the facility provides comprehensive safety assessments, performance evaluations, and environmental testing of battery cells and packs.[148] Serving both industry and government clients, the facility has supported some of the world's leading automakers, offering not only rigorous testing services but also expert guidance to help organizations establish their own in-house testing capabilities.[149]

Ontario Battery and Electrochemistry Research Centre (OBEC): a pioneering facility launched in March 2024 at the University of Waterloo, OBEC is dedicated to advancing next-generation EV battery technologies. OBEC focuses on battery materials development, recycling, and advanced manufacturing, while also serving as a hub for talent development and industry collaboration. The Centre supports both start-ups and established companies across the EV battery supply chain, playing a vital role in strengthening Ontario's position in the global battery innovation ecosystem.[150]

University of Toronto Electric Vehicle Research Centre (UTEV): a dynamic university-industry partnership dedicated to advancing EV technologies. Anchored by a state-of-the-art battery and power electronics laboratory, UTEV serves as a hub for leading-edge research in energy management, next-generation powertrains, ubiquitous charging, and energy storage systems. The Centre also explores advanced power modules and innovative ways to expand the utility of EVs and their batteries.[151] UTEV fosters interdisciplinary collaboration across electrical, computer, mechanical, industrial, and aerospace engineering, driving innovation in areas such as bidirectional charging – enabling EVs to supply power to homes, the grid, and other vehicles.[152]

Innovation & Commercialization Programs

OVIN Demonstration Zone: Ontario's flagship platform for showcasing and advancing next-generation automotive and smart mobility technologies. Located across the Regional Municipality of York – with dedicated sites in Vaughan Metropolitan Centre and Markham Centre – the Zone provides Ontario-based small and medium-sized enterprises (SMEs) with access to real-world urban environments to demonstrate innovations in connected, autonomous, shared, and electric mobility. From autonomous shuttles and delivery robots to smart intersections and EV charging infrastructure, the Demonstration Zone enables companies to test and refine their solutions using both physical and digital infrastructure, including 5G networks, smart traffic systems, and municipal facilities. Beyond technology integration, the Demonstration Zone fosters collaboration

between SMEs, municipalities, academic institutions, and industry partners. It offers access to mentorship, business advisory services, co-working spaces, and connections to potential customers and partners across Ontario's automotive value chain.[153]

OVIN Regional Technology Development Sites: a province-wide network of specialized innovation hubs designed to accelerate research, development, and commercialization in Ontario's EV and CAV sectors. These sites foster collaboration among industry, academia, and government, providing companies, particularly SMEs, with access to cutting-edge facilities, technical expertise, and real-world testing environments. Each RTDS focuses on distinct areas of EV and CAV innovation, such as vehicle safety systems, smart mobility solutions, cybersecurity, advanced manufacturing, and the integration of emerging technologies like AI, IoT, and AR/VR. Together, they support the development of a robust and competitive EV supply chain, from raw materials to advanced vehicle systems, while helping Ontario companies scale and compete globally.[154]

OVIN R&D Partnership Fund: a cornerstone initiative supporting Ontario-based SMEs in the development, testing, and validation of advanced automotive and smart mobility technologies. Designed to accelerate innovation and commercialization, the fund is structured into several targeted focus areas that address key areas of the evolving mobility landscape. The fund offers co-investments of up to $100K (Stream 1) and $1M (Stream 2) to support of technologies – from early-stage concepts to near-commercial solutions.[155] The fund is underpinned by SME collaboration with industry and research partners to bring forward safer, more efficient mobility solutions.[156] Its focus areas include:

- CAV & Smart Mobility Stream – advancing innovations in autonomous systems, connectivity, intelligent transportation, and mobility analytics.
- EV Stream – supporting breakthroughs in EV technologies, including powertrains, battery systems, and vehicle integration.
- Advanced Charging and Vehicle-to-Grid (V2G) Stream – targeting innovations in EV charging infrastructure, bidirectional charging, and grid integration technologies.

Together, these streams help position Ontario as a global leader in next-generation transportation and mobility solutions.[157]

OVIN Piloting Programs: supported by the Government of Canada through FedDev Ontario, OVIN's Technology Pilot Zones provide Ontario-based SMEs with real-world environments to pilot and validate leading-edge automotive and mobility technologies. These zones are designed to accelerate commercialization, foster strategic partnerships, and support Canada's transition to a zero-emissions future. By offering access to live testing environments, the initiative enables SMEs to integrate and refine innovations in connected, autonomous, and EV technologies, as well as smart infrastructure and mobility solutions.

Two key pilot zones are currently active. The Urban Mobility Zone in Toronto addresses challenges such as congestion, accessibility, and aging infrastructure by enabling the testing of technologies like CAVs, dynamic traffic systems, and EV charging solutions. The Cross-Border Mobility Zone, located in the Windsor-Sarnia corridor, focuses on enhancing the safe and efficient movement of goods and people across international borders. This zone supports innovations such as automated credentialing,

commercial drones, and real-time travel data systems, while also serving as a regulatory sandbox for emerging technologies.[158]

OVIN QEW Innovation Corridor: a flagship initiative designed to accelerate the development and deployment of advanced mobility technologies in real-world conditions. Spanning a 40-kilometre stretch of the Queen Elizabeth Way (QEW) between Burlington and Toronto, the corridor serves as a living lab and freeway-based testbed for smart mobility and connected vehicle innovations. The program supports SMEs with funding of up to $150K to pilot technologies that enhance transportation safety, sustainability, and efficiency. Key focus areas include work zone safety, queue warning systems, and broader applications in connected vehicles and smart mobility. By fostering collaboration between public and private sectors, academia, and innovators, the QEW Innovation Corridor strengthens Ontario's position as a global leader in next-generation transportation.[159]

Advanced Materials Research Centres

CanmetMATERIALS: located in Hamilton, this facility is the largest research centre in Canada dedicated to the fabrication, processing, and evaluation of metals and materials. This state-of-the-art facility plays a pivotal role in advancing the automotive and mobility sector in Ontario. By focusing on the development of innovative materials solutions, CanmetMATERIALS supports the transportation, energy, and metal manufacturing industries.[160] In the transportation sector, CanmetMATERIALS collaborates extensively with vehicle, engine, and component manufacturers. These partnerships are crucial for developing advanced materials that enhance fuel efficiency while maintaining high performance and safety standards.[161] The research conducted at CanmetMATERIALS is instrumental in driving technological advancements and sustainability in the automotive industry, positioning Ontario as a leader in automotive innovation.

Centre for Automotive Materials and Corrosion (CAMC): part of McMaster University, CAMC is a leading research facility dedicated to advancing materials engineering in the automotive sector. CAMC focuses on developing lightweight material systems, addressing material degradation and protection, and solving joining issues critical to automotive innovations. By collaborating with top scientists and industry partners, CAMC conducts leading-edge research to test the mechanical and environmental limits of materials.[162] This work is vital for enhancing the durability, safety, and performance of automotive components, positioning Ontario as a hub for automotive materials R&D.

Fraunhofer Project Centre for Composites Research: a collaborative initiative between Western University and the Fraunhofer Institute for Chemical Technology in Pfinztal, Germany. Operating through the Fraunhofer Innovation Platform for Composites (FIP-Composites) at Western University, the Centre focuses on the development and industrial-scale testing of advanced lightweight materials and manufacturing processes. With a strong emphasis on composite production for the automotive sector, FIP-Composites bridges academic research and industry needs to accelerate innovation in high-performance, sustainable materials.[163]

Policy, Economic, and Industry Research Centres

Automotive Policy Research Centre (APRC): based in Ontario, APRC conducts research to support Canada's automotive industry through public policy. It focuses on industry profiling, economic modelling, labour market research, and industry mapping. By analyzing sectors, forecasting economic impacts, studying workforce trends, and mapping industry facilities, the APRC provides valuable insights for policymakers, businesses, and researchers. This work helps shape policies that promote the growth and sustainability of the automotive sector in Canada.[164]

"By bringing together the best of industry, research, and entrepreneurial talent, we're fostering innovation that will strengthen our economy, create good jobs and position Ontario as a leader in the auto and electric vehicle technologies of the future."[165]

The Honourable Doug Ford, Premier of Ontario

Technological Advancements

The automotive and mobility sector is undergoing a profound transformation, driven by rapid technological innovation and shifting societal expectations. What was once a domain dominated by mechanical engineering is now a dynamic intersection of software, data, connectivity, and sustainability. From AVs and electric drivetrains to smart infrastructure and shared mobility, the industry is redefining how people and goods move through the world.

This chapter explores the emerging technologies reshaping the landscape of mobility, highlighting the advancements being made in Ontario. As home to the largest technology hub in Canada, the Toronto-Waterloo Corridor, Ontario is at the forefront of automotive and mobility advancements.[166]

Advancements in autonomous vehicles

Autonomous driving technologies are advancing rapidly, driven by breakthroughs in sensor systems, AI, and machine learning. These innovations are enabling vehicles to operate across a range of automation levels – from advanced driver-assistance to full autonomy, AI is central to AVs' ability to make real-time decisions. By processing data from sensors like cameras, radar, and LiDAR, AI enables vehicles to detect obstacles, plan routes, and respond to dynamic conditions. Machine learning, especially deep learning, enhances these capabilities by predicting the behavior of other road users, improving safety in complex environments.[167]

Sensors form the foundation of AV perception. LiDAR, radar, and cameras have all evolved significantly: LiDAR now offers compact, affordable, high-resolution 3D mapping; Cameras provide sharper, more responsive imaging for recognizing road signs, lane markings, and pedestrians; and Radar excels in detecting speed and distance, even in poor visibility. Together, these sensor technologies, interpreted through AI, enable AVs to navigate safely and confidently.[168]

AI also enhances road safety by addressing human error, a factor in over 90% of traffic accidents. Advanced Driver Assistance Systems (ADAS) use AI to detect lane departures, monitor driver alertness, and apply emergency braking. AI-powered dashcams and in-cabin monitoring are becoming standard in commercial fleets, helping reduce risky behavior and ensure compliance.[169] In maintenance, AI enables predictive diagnostics by analyzing real-time sensor data to detect issues before they cause failures. This reduces downtime and operational costs, especially in fleet management, while improving reliability and efficiency.[170]

Ontario is a vibrant hub for AI innovation in the automotive sector, with a mix of startups, research institutions, and government-backed initiatives driving progress. One notable example is **Waabi**, a Toronto-based AI company at the forefront of AV innovation. Waabi is pioneering a new approach to self-driving technology

through its AI-native platform, the Waabi Driver, and its advanced simulation environment, Waabi World.[171] With a mission to safely and efficiently deploy autonomous trucks, Waabi leverages cutting-edge generative AI to accelerate development and reduce reliance on real-world testing. In June 2024 it raised $200M to support the launch of its fully driverless trucks.[172]

Another example is Kitchener-based **Acerta Analytics** – an AI company specializing in predictive analytics for the automotive and manufacturing sectors. Acerta empowers OEMs and Tier 1 suppliers to improve product quality and operational efficiency through its flagship platform, LinePulse, which was developed in parternship with Nissan and was part-funded by OVIN.[173] By leveraging machine learning, Acerta helps manufacturers detect early signs of defects, reduce scrap and rework, and accelerate root cause analysis. With a strong presence in Ontario's innovation ecosystem, Acerta is transforming how precision manufacturers use data to ensure reliability, safety, and performance in automotive production.[174]

Additionally is **Gatik**, which was founded in Silicon Valley but has a strong presence in Toronto. Gatik is a leading autonomous technology company specializing in light and medium-duty trucks for business-to-business (B2B) short-haul logistics, also known as the "middle mile." Gatik is transforming supply chain efficiency by deploying autonomous delivery vehicles that operate on fixed, repeatable routes for major retailers.[175] In 2021, Gatik received nearly $1M in funding from OVIN's R&D Partnership Fund. This investment supported the company's efforts to winterize its autonomous driving technology, enabling safe and reliable operation in harsh Canadian weather conditions.[176]

Another Toronto-based organization working within this sector is **NuPort Robotics**. Founded in 2019, NuPort Robotics is a Canadian technology company pioneering autonomous driving solutions for the logistics and supply chain sector. Specializing in middle-mile automation, NuPort is developing Canada's first autonomous trucking solution aimed at enhancing sustainability, reducing operational costs, and positioning Canada as a global leader in autonomous vehicle innovation. In 2021, the firm received $1M in funding from OVIN for an automated heavy duty trucking initiative alongside Canadian Tire.[177]

Advancements in connected vehicles

As vehicles become increasingly connected, they are no longer isolated machines but active participants in a broader digital ecosystem. Connected vehicles leverage wireless technologies to communicate with each other, infrastructure, and even pedestrians, enhancing situational awareness, safety, and traffic efficiency. At the heart of this transformation is Vehicle-to-Everything (V2X) communication.[178] V2X enables AVs to exchange real-time data with their surroundings, including other vehicles (V2V), traffic signals and road infrastructure (V2I), and even mobile devices carried by pedestrians (V2P). This communication can occur over various channels, such as Wi-Fi, cellular networks, and Bluetooth, allowing AVs to share critical information like speed, location, and road conditions.

One practical application of V2X is traffic signal coordination. By receiving data on upcoming traffic light cycles, AVs can adjust their speed to avoid unnecessary stops – reducing fuel consumption, improving traffic flow, and enhancing passenger comfort. As more vehicles and infrastructure become connected, the collective intelligence of the transport network grows, paving the way for safer, more efficient, and more responsive mobility systems.[179]

A critical enabler of this ecosystem is 5G connectivity. Unlike previous generations of wireless networks, 5G offers ultra-low latency, high bandwidth, and near-instantaneous response times. These capabilities are vital for AVs, which rely on real-time data exchange to make split-second decisions. With 5G, vehicles can instantly share information such as road conditions, traffic congestion, and safety alerts – not only with each other but also with traffic lights, road signs, and cloud-based systems.[180]

Ontario is home to a growing number of companies innovating in connected vehicle technologies. One such example is **Geotab**, a global leader in connected transportation solutions, headquartered in Oakville. The company provides advanced telematics and data analytics platforms that empower businesses and governments to optimize fleet performance, enhance safety, and drive sustainability. With over 4M connected vehicles worldwide, Geotab leverages AI and big data to deliver real-time insights into vehicle health, driver behavior, and operational efficiency. Recognized as the world's top telematics provider, Geotab continues to shape the future of smart mobility through innovation, open platforms, and a robust ecosystem of partners.[181] Another organization working within the connected vehicles space is **Raven Connected**. An Ottawa-based technology company leading the way in AI-powered video telematics for commercial fleets and smart city applications, Raven Connected proudly designs and manufactures its products in Canada. Raven offers an all-in-one connected vehicle platform that combines high definition video capture, real-time GPS tracking, and AI-enabled analytics. Its flagship solution enhances fleet safety, operational efficiency, and insurance outcomes through advanced machine vision and V2X capabilities.[182] Additionally is Mississauga-based **RideFlag Technologies**, which specializes in smartphone-based Vehicle Occupancy Detection (VOD) to support sustainable commuting by accurately verifying carpooling in High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes. Their solution integrates with transportation systems to provide real-time occupancy data and performance metrics.[183] In May 2025, RideFlag was one of 30 Ontario-based SMEs to benefit from a combined investment of over $56M – comprising nearly $39M from the private sector and over $17M from OVIN – to help develop, test, and commercialize innovative transportation technologies.[184] Another startup which benefitted from this funding is Toronto-based **YScope**. YScope is a technology company focused on developing advanced data analytics and AI-driven solutions, and is collaborating with Uber Technologies Inc. to develop high efficiency data collection and compression tools for data platforms.[185] Another example is Kitchener-based **GeoMate**, which is a startup specializing in AI-powered mapping solutions for smart mobility and autonomous driving. The company is developing dynamic high-definition (HD) maps to support future autonomous shuttle services and other intelligent transportation systems.[186] At the beginning of this year, in partnership with the City of Kitchener, GeoMate secured $580K in funding from OVIN to advance its mapping technology.[187]

Advancements in electric vehicles

As EVs move closer to mainstream adoption, the race to develop high-performance, long-lasting, and cost-effective batteries has become more critical than ever. Recent breakthroughs in battery technology are reshaping the future of electric mobility, with innovations such as ultra-fast charging lithium-ion cells, solid-state batteries offering higher energy density and improved safety, and emerging alternatives like cobalt-free and graphene-based chemistries that promise lower costs and greater sustainability. Manufacturers are also exploring structural battery designs and second-life applications to extend battery utility and reduce environmental impact. These advancements are not only addressing key limitations in range, charging time, and lifecycle but are also laying the groundwork for a more resilient and scalable EV ecosystem.

A wave of next-generation battery technologies is pushing the boundaries of what EVs can achieve. Solid-state batteries, which replace liquid electrolytes with solid materials, promise higher energy density, faster charging, and improved safety – potentially enabling ranges of up to 600 miles and full charges in under 15 minutes.[188] Major automakers like Honda[189] and Toyota[190] are already investing in production lines and vehicle integration. Meanwhile, cobalt-free batteries are gaining traction as a more ethical and sustainable alternative to traditional lithium-ion chemistries, with research from institutions like the University of Toronto[191] and Massachusetts Institute of Technology (MIT) showing promising performance using nickel-based or organic materials.[192] Graphene-based batteries and silicon anode technologies are also advancing rapidly, offering significant gains in energy density, charging speed, and lifespan. Companies like Chinese automotive company GAC[193] and GM[194] are exploring these innovations to enhance vehicle range and efficiency.

Other promising developments include zinc-air batteries, which are safer and more abundant.[195] Toronto-based zinc-air battery company **e-Zinc** and Toyota Tsusho (a member of the Toyota Group) signed a pilot project agreement in 2022 to test eZinc's zinc-air battery storage systems.[196] Additional advancements include nanowire batteries, which offer extreme durability,[197] and structural battery packs, which integrate energy storage into the vehicle's frame to reduce weight and increase range.[198] Finally, carbon nanotube electrodes are emerging as a powerful enhancement to battery performance, with the potential to dramatically boost power, storage, and lifecycle.[199] Together, these technologies represent a transformative shift in EV energy storage, paving the way for cleaner, longer-lasting, and more accessible electric mobility.

As the EV landscape evolves, so too does the technology that powers and supports it – particularly in how EVs are charged. A new generation of charging solutions is emerging, designed to make charging faster, more convenient, and more integrated into everyday life. Wireless charging allows EVs to recharge simply by parking over an inductive pad, with North American companies like FLO and WiTricity pioneering this hands-free approach.[200] Dynamic charging takes this further by enabling vehicles to charge while in motion, either through

embedded road coils or overhead systems – these technologies are now being tested on public roads in Detroit.[201] Portable charging offers flexible, infrastructure-free solutions, already in use by providers like Portable Electric[202] and CAFU in Canada.[203] Meanwhile, battery swapping is gaining momentum as a rapid alternative, with companies like Ample enabling full battery exchanges in under 10 minutes.[204] Additionally, bidirectional charging is transforming EVs into mobile energy hubs, capable of supplying power back to homes or the grid, as demonstrated in Ontario's Peak Drive Pilot.[205] Plug and Charge simplifies the user experience by enabling secure, automatic authentication and billing without apps or cards – already deployed by Electrify Canada.[206] Smart charging systems allow users and utilities to manage energy use more efficiently, reduce peak demand, and support grid stability.[207] A number of smart charging pilots have been implemented across Canada, including the Toronto Hydro Smart Charging Pilot Program.[208] Finally, high-speed charging is pushing performance boundaries, with ultra-fast chargers delivering over 350 kW, and up to 600 kW for heavy-duty vehicles,[209] capable of fully charging an EV in just minutes.[210]

An innovative organization working in this space in Ontario is **Kiwi Charge**. Headquartered in Toronto, Kiwi Charge offers a unique subscription model that delivers portable EV chargers directly to users' doorsteps. This approach, which was showcased via OVIN's Demonstration Zone,[211] eliminates the need for costly infrastructure and makes EV charging more accessible and affordable for everyone. By focusing on sustainability and convenience, Kiwi Charge is playing a pivotal role in accelerating the adoption of EVs across Ontario and beyond.[212]

Ottawa-based **Gbatteries** is revolutionizing electric mobility with its AI-driven battery technology, offering ultra-fast, safe, and long-lasting charging solutions. Gbatteries has developed a patented adaptive battery management system that enables lithium-metal batteries to charge up to four times faster than conventional lithium-ion alternatives, while significantly extending their lifespan and safety.[213]

Another organization is Toronto-based **eLeapPower**. This company specializes in developing efficient powertrain systems and wireless chargers that enable EVs to charge directly from renewable sources.[214] In 2021, supported by OVIN, the company held a successful wireless AV/EV charging demonstration project.[215]

Additionally, **Betterfrost Technologies**, based in Toronto, is a pioneering company focused on developing ultra energy-efficient defrost and de-icing solutions for electric and autonomous vehicles. Their proprietary technology clears ice and snow from windshields, windows, and sensors in seconds, using less than 5% of the energy required by conventional systems – enhancing vehicle safety, range, and operability in extreme climates.[216] Betterfrost has received significant support from OVIN, including $100K in funding to commercialize cold-weather solutions for autonomous EVs in partnership with Toyota Tsusho,[217] and an additional $500K from OVIN's R&D Partnership Fund to co-develop a low-energy defrost and defog system with DENSO, aimed at improving EV range and performance in extreme temperatures.[218]

Another innovative organization operating in Ontario is **ITD Industries**. This company, headquartered in Toronto, is a leading manufacturer of advanced commercial transportation equipment, including dry vans,

container chassis, dollies, and specialty trailers. Known for its innovation in ZEV technology, ITD Industries integrates battery electric and hydrogen fuel cell systems into its Class 8 trucks, supporting the shift toward sustainable freight solutions. Their proprietary electric trailer systems and lightweight composite van panels are designed to enhance efficiency and reduce environmental impact.[219] Through support from OVIN, ITD Industries is currently commercially testing their electrified refrigerated trailer, which combines electric axles and solar technology to harness and generate renewable energy to power a trailer for multiple days without diesel.[220]

Enedym, based in Hamilton, is a clean technology company pioneering the development of next-generation electric propulsion systems, including switched reluctance motors (SRMs), electric powertrains, and control systems. Its innovations aim to reduce reliance on rare earth materials while delivering high-efficiency, robust electric motor solutions for a range of applications, including EVs and industrial equipment.[221] Enedym has received $800K in funding from OVIN to support a collaborative project with Toyota Tsusho Canada. This initiative focuses on developing rare-earth-free electric powertrains for airport ground support equipment.[222]

Another organization operating within the EV space is **SWTCH**. This Toronto-based firm provides tailored EV charging solutions for multi-tenant buildings, supported by a robust charging management platform.[223] In partnership with Kite Mobility, SWTCH completed a high-impact demonstration project at a luxury resort community in Ontario, showcasing how smart load-managed Level 2 chargers can improve grid resiliency and support EV adoption. This project was supported by $500K in funding from OVIN.[224]

QuantumEV, headquartered in Langton, is a Canadian company specializing in custom EV charging solutions for businesses across North America. Its services include the design and construction of EV infrastructure, seamless integration with existing technologies, and ongoing maintenance and support.[225] With nearly $400K in funding support from OVIN, QuantumEV launched the QuantumEV-Energizer, a mobile EV charging platform developed in partnership with Polara Energy Inc.[226]

There are also innovations in the software to support EV charging. **ChargeLab** is a Toronto-based technology company developing the software infrastructure behind North America's EV charging networks. ChargeLab offers a hardware-agnostic, cloud-based platform that enables businesses, fleets, and network operators to deploy and manage EV chargers at scale. ChargeLab's open and interoperable system supports over 30 Open Charge Point Protocol (OCPP) compliant charger models, making it one of the most flexible solutions on the market.[227]

Advancements in mobility technologies

Mobility is undergoing rapid transformation, driven by a convergence of digital technologies, sustainability goals, and evolving urban mobility needs. As cities become more connected and environmentally conscious, traditional models of transportation are giving way to more integrated, efficient, and user-centric systems.

At the forefront of this evolution is MaaS, which unifies various modes of transport – such as buses, trains, ride-hailing, bike-sharing, and carpooling – into a single, seamless digital platform. This allows users to plan, book, and pay for multi-modal journeys through one interface, enhancing convenience and reducing reliance on private vehicles.

Simultaneously, shared mobility solutions – including car-sharing, ridesharing, and on-demand shuttles – are becoming more intelligent and accessible, thanks to advancements in AI, real-time data analytics, and mobile connectivity. These services are helping to reduce congestion, lower emissions, and make better use of existing infrastructure. A critical component of this transformation is the focus on first and last mile connectivity – the often-overlooked segments of a journey that connect users to major transit hubs. Innovations in micromobility, such as e-scooters, e-bikes, and compact EVs, are addressing this gap, offering flexible and sustainable options for short-distance travel.

A standout example of an Ontario-based organization supporting technological advancements in the mobility space is **Joyride**. Founded in 2014 and headquartered in Toronto, Joyride is a leading micromobility software platform that empowers entrepreneurs and transit operators to launch and manage shared fleets of e-scooters, bikes, and e-bikes. The company offers a white-label solution that includes a branded rider app, backend analytics, multimodal vehicle integrations, and payment processing.[228] In 2023, Joyride received $900K in funding from OVIN to support a $1.9M project in partnership with Waev Inc., a California-based electric mobility manufacturer. The initiative focuses on deploying low-speed electric vehicles (LSVs) for shared use, aiming to expand sustainable urban transport options and integrate LSVs into the broader MaaS ecosystem.[229]

Another example is Brampton-based **SCOOTY** – a Canadian startup focused on transforming urban mobility through its micromobility platform, which offers shared EVs tailored for Transit-Oriented Communities (TOCs). The company provides a fleet of electric scooters designed to bridge the first- and last-mile gap, making it easier for residents to connect with public transit systems.[230] In 2023, SCOOTY received $1M in funding from OVIN to support a major initiative in Brampton. This project aimed to integrate micromobility solutions directly with public transit infrastructure, enhancing accessibility, reducing traffic congestion, and promoting sustainable transportation alternatives. The funding supported the deployment of smart docking stations, real-time vehicle tracking, and app-based trip planning tools that align with Brampton's broader smart city and climate goals.[231]

A further example is Vaughan-based **Kite Mobility**, which is a shared e-mobility company that provides EV and micromobility solutions

tailored for residential and commercial communities. By integrating EVs, e-bikes, and e-scooters into a unified platform, Kite enables convenient, low-emission transportation options that reduce reliance on personal vehicles.[232] As previously mentioned, in partnership with SWTCH, Kite received support from OVIN through its R&D Partnership Fund to showcase how smart EV charging and vehicle-sharing systems can reduce grid strain and enhance access to sustainable transportation in high-density, multi-tenant environments.[233]

Advancements in sustainable development

Technological advancements in the automotive and mobility sectors are increasingly centered around sustainable development, with a growing emphasis on alternative fuels beyond electricity. Hydrogen fuel, biofuels, and ammonia are gaining momentum as viable low-emission or carbon-neutral energy sources. Hydrogen fuel cells, for example, are particularly promising for heavy-duty vehicles and long-distance transport due to their high energy density and fast refueling capabilities.[234] Biofuels derived from organic waste or algae offer a renewable substitute for traditional diesel and gasoline, especially in aviation where electrification remains challenging.[235] Ammonia is gaining renewed attention due to its potential as a carbon-free fuel, especially in maritime transport. Historically used in vehicles and even rocket propulsion, ammonia is now being reconsidered for its ability to replace heavy fuel oils in shipping.[236]

AI complements these fuel innovations by optimizing how vehicles consume energy and interact with infrastructure. AI-powered systems can recommend the most fuel-efficient routes, reducing unnecessary fuel burn and emissions. In urban environments, AI helps manage traffic flow to minimize congestion and idle time, further cutting down on pollutants. For fleets using alternative fuels, AI can monitor usage patterns and suggest eco-friendly driving practices, maximizing the benefits of cleaner energy sources. Additionally, in sectors like rail and aviation, AI is used to fine-tune engine performance and flight paths for optimal fuel efficiency, significantly reducing the carbon footprint of long-distance travel. Together, these technologies are reshaping mobility into a smarter, cleaner, and more sustainable system.[237]

Ontario hosts a dynamic and expanding network of organizations focused on alternative fuel innovation. **Hydrogen Optimized** is an Ontario-based clean energy company pioneering large-scale green hydrogen solutions to power the future of fleet mobility. Through its proprietary RuggedCell™ water electrolysis technology, the company enables the production of clean hydrogen at industrial scale – fueling zero-emission transportation for heavy-duty fleets, commercial vehicles, and off-road applications. Headquartered in Owen Sound, Hydrogen Optimized plays a vital role in Canada's hydrogen economy, supporting the decarbonization of logistics and mobility sectors with scalable, renewable hydrogen infrastructure.[238]

CHAR Technologies is a Toronto-based cleantech company transforming organic waste into renewable energy solutions for a low-carbon future. Through its proprietary High-Temperature Pyrolysis process, CHAR Technologies produces

renewable natural gas (RNG), green hydrogen, and biocarbon products that support the decarbonization of industrial operations and fleet mobility. With a strong presence in Ontario and a growing portfolio of clean energy projects, CHAR Technologies is helping to build the infrastructure needed for sustainable transportation and circular economy systems.[239]

Pond Technologies is a Markham-based cleantech company transforming industrial carbon emissions into algae-based biofuels and bioproducts. Using its proprietary algae cultivation platform, Pond captures CO_2 from heavy emitters and converts it into renewable fuels that can power low-carbon transportation, including heavy-duty fleets, marine vessels, and aviation. By turning industrial waste into sustainable energy, Pond Technologies is helping to build a cleaner, circular economy for the future of mobility.[240]

Another company operating within this space is **Elemental Trucks**, which is supported by OVIN. Based in Toronto, Elemental Trucks is a clean transportation company focused on developing and deploying zero-emission commercial vehicles. Their work includes the design, manufacturing, and certification of electric trucks tailored for the Canadian market, with an emphasis on performance, sustainability, and real-world usability.[241]

In addition, **Next Hydrogen** is a clean technology company specializing in the design and manufacture of advanced electrolysers that produce green hydrogen from water and electricity. Headquartered in Mississauga, the company's patented cell design enables high-efficiency hydrogen production with strong dynamic response, making it ideal for pairing with intermittent renewable energy sources.[242] Next Hydrogen is another SME which has recently received support via OVIN's R&D Partnership Fund.[243]

"Our government remains laser focused on positioning Ontario as a world-class jurisdiction for domestic and international companies to grow their businesses, promote innovation and build more resilient supply chains."[244]

The Honourable Victor Fedeli, Ontario Minister of Economic Development, Job Creation and Trade

Government Policies

In recent years, the Government of Ontario has taken significant steps to accelerate the transition to EVs as part of its broader climate and economic development strategies. Recognizing the dual imperatives of reducing emissions and fostering a competitive economy, Ontario has implemented a range of policies targeting both the supply and demand sides of the EV market. A selection of these is outlined here.

Supply-Side: Strengthening Vehicle and Parts Production in Ontario

Driving Prosperity is Ontario's comprehensive, long-term strategy to position the province as a global leader in the development and production of EVs and CAVs. The plan outlines a clear vision to strengthen Ontario's automotive sector by enhancing competitiveness, fostering innovation, and building a highly skilled workforce. It supports the growth of a robust EV battery supply chain, encourages the adoption of advanced manufacturing technologies, and promotes the production of cleaner, smarter vehicles. By aligning industry, government, and research efforts, Driving Prosperity is helping to create a dynamic business environment that attracts investment, supports workers, and drives sustainable economic growth across the province's mobility ecosystem.[245]

A crucial component of Driving Prosperity is the **Ontario Automotive Modernization Program (O-AMP)**. Launched by the Ontario government in 2019, this $22M initiative aims to support small and medium automotive parts suppliers in the province. It helps these suppliers adopt new tools, technologies, and manufacturing practices.[246] In 2021, the Ontario government introduced the **Site Readiness Program**, a funding initiative designed to prepare industrial sites for investment.[247] This program has facilitated the investment in and construction of large-scale manufacturing facilities throughout the province, including the ongoing development of battery manufacturing plants.

An initiative introduced by the province in 2023 is the **Ontario Made Manufacturing Investment Tax Credit**, which is a 10% refundable Corporate Income Tax credit for eligible corporations on qualifying investments in buildings, machinery, and equipment used for manufacturing or processing in Ontario. This initiative aims to lower costs, foster innovation, and enhance the competitiveness of Ontario manufacturers, with eligible corporations able to receive up to $2M in tax credits annually.[248] In May 2025, the government announced that it would be enhancing the program with an additional $1.3B over three years, allowing Canadian-controlled private corporations to receive a 15% tax credit rate, and expanding eligibility to non-Canadian-controlled private corporations as a non-refundable tax credit, to support their investments in Ontario. Qualifying organizations could receive up to $3M per year in tax credits.[249]

Other Ontario government initiatives to support companies across manufacturing sectors include a suite of targeted funding programs and strategic investment tools. The **Southwestern Ontario Development Fund**[250] and the **Eastern Ontario Development Fund**[251] provide financial

assistance to businesses, municipalities, and not-for-profit organizations undertaking projects that drive regional economic development, improve productivity, and create sustainable jobs in their regions. The **Advanced Manufacturing and Innovation Competitiveness (AMIC)** Stream of the Regional Development Program supports small and medium-sized manufacturers across Ontario by funding investments in capital equipment, technology adoption, and workforce development to enhance competitiveness and stimulate innovation.[252] The **Critical Minerals Innovation Fund (CMIF)** is designed to accelerate the development of Ontario's critical minerals sector – essential for EV batteries and clean technologies – by supporting research, commercialization, and pilot projects.[253] Additionally, the **Ontario Junior Exploration Program (OJEP)** is a government program that boosts growth and the creation of jobs, particularly in northern and Indigenous communities. In 2023, the Government of Ontario announced that it would be investing nearly $9M via OJEP to support junior mining companies in financing early exploration projects to locate critical minerals used in EVs and other advanced technologies.[254] Meanwhile, the **Invest Ontario Fund** serves as a strategic investment agency, attracting high-value business investments to the province by offering tailored support to companies in key sectors such as advanced manufacturing, life sciences, and technology.[255]

Demand-Side: Accelerating EV Adoption in Ontario

To make EV ownership more affordable, in 2023 the Ontario government introduced the **Ultra-Low Overnight (ULO) Electricity Price Plan.** This is an innovative time-of-use pricing option to support energy affordability and sustainability. Designed with EV owners and energy-conscious consumers in mind, the plan offers significantly reduced electricity rates during overnight hours – specifically from 11 p.m. to 7 a.m. – when demand on the grid is lowest. This plan enables households to save up to $90 annually by shifting high-energy activities, such as EV charging, laundry, and dishwashing, to off-peak hours. It also helps balance the electricity grid and reduce greenhouse gas emissions by encouraging smarter energy use.[256] Ontario's **Green Licence Plate Program** offers a unique benefit to drivers of eligible EVs and plug-in hybrid EVs (PHEVs) weighing under 4,500 kg. Individuals, businesses, and commercial fleets that register qualifying vehicles receive distinctive green licence plates, which grant access to HOV lanes and HOT lanes across the province – regardless of the number of occupants in the vehicle and at no additional cost. This initiative is designed to reward environmentally conscious transportation choices and encourage broader adoption of low-emission vehicles by offering time-saving and cost-saving travel advantages.[257]

The Government of Ontario's **EV ChargeON Program** is investing a total of over $180M to increase public EV charging stations across the province, improve EV charging infrastructure, reduce range anxiety, fill gaps in underserved areas, and build a more affordable and connected charging network for everyone in Ontario. The initial $91M program was launched in 2023, and consists of two streams:[258]

- The Community Sites Stream, which is a competitive, application-based grant program for eligible private, public and non-profit sector entities and Indigenous communities. A total of 270 projects have been approved to date for funding, which will deliver over 1.3K new EV charging ports across the province; and
- The Government Sites Stream, which supports the installation of public EV charging ports on government sites along key provincial corridors and destinations, including highway rest areas, Ontario Parks sites and carpool lots. Chargers are planned to be installed at an initial 15 provincial sites through this stream.

Through the 2025-26 Budget, the government is investing a further $92M in the program.[259] More details on this further funding will be released soon. The additional investment will ensure continued deployment of EV chargers in key areas across the province.

Another example is the **Affordable Energy Act, 2024**, which includes exemptions for EV charging station owners and operators from the regulatory requirements of electricity distributers and retailers, to help ensure effective and timely EV charging infrastructure deployment across the province.[260] In addition, the Ontario government – through the OEB – is developing a discounted electricity rate for public EV chargers in areas with low utilization. The **Electric Vehicle Charger Discount Electricity Rate** would cut operating costs for charging stations, encouraging private investment in charging infrastructure where demand is just beginning.[261] The new rate is expected to come into effect on January 1, 2026.[262]

Ontario also encourages EV adoption through measures like streamlined permitting and standards. As of May 2024, under the **EV Charging Connection Procedures (EVCCP)**, all local electric utilities adopt a standardized process for installing and connecting new non-residential EV chargers, simplifying and speeding up charger installations.[263] The province has also introduced parking regulations, such as the **Reserved Parking for EVs Charging Act, 2019**, which prohibits ICE cars from blocking EV charging spots.[264]

In Toronto, the local government has also updated building codes via the **Toronto Green Standard (TGS) Version 4.0**. This is a comprehensive framework which mandates that residential parking spaces, whether in low-rise dwellings or multi-unit apartments, must be equipped with energized outlets or full EV Supply Equipment (EVSE) for Level 2 charging. For mid to high-rise buildings and non-residential uses, the standard requires that all residential parking spaces and 25% of non-residential parking spaces include energized outlets for Level 2 charging. City-owned facilities are also required to have parking spaces equipped with EV charging outlets. To facilitate implementation, the TGS Version 4.0 encourages the use of dedicated electrical outlets, receptacles, or EVSE supplied by separate branch circuits, and Electric Vehicle Energy Management Systems (EVEMS) for load sharing.

These measures aim to make EV charging infrastructure more accessible and affordable, thereby promoting the widespread adoption of EVs in Ontario.[265]

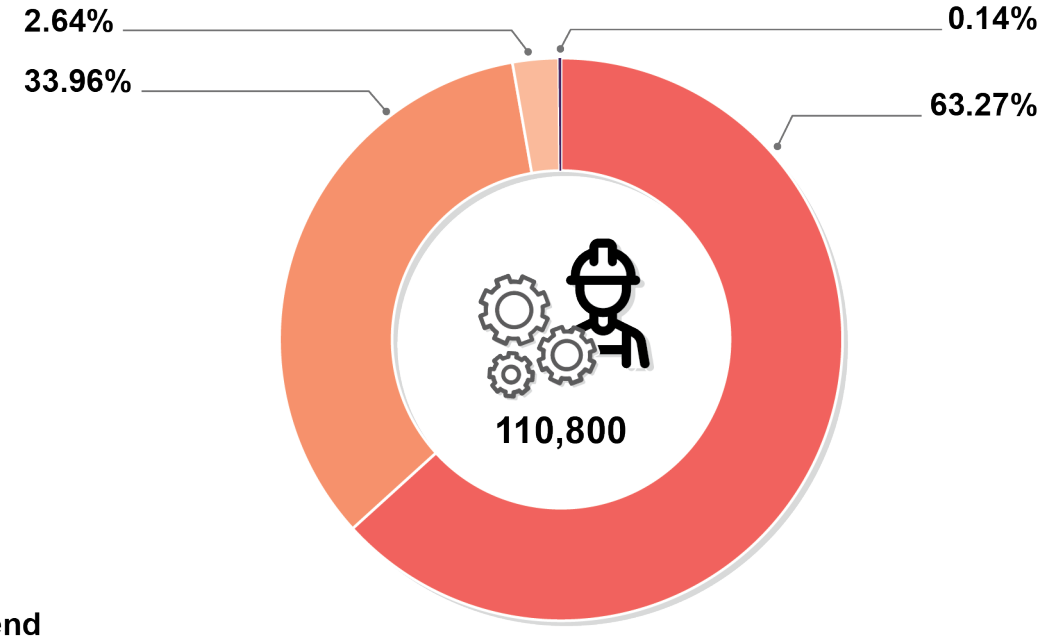
Labour Market Trends

Ontario's automotive labour market is dynamic and evolving, driven by technological advancements and a shift towards sustainable practices. The industry is a significant employer in the province, however, an increasing demand for new vehicle types necessitates a technically skilled workforce. Two key challenges face the sector: a shortage of automotive tradespeople and an urgent need to equip the existing workforce with the skills necessary to service advanced technologies, including EVs.[266] This has prompted a focus throughout the province on attracting new talent, and the provision of training programs and upskilling to meet the industry's evolving needs and ensure its continued prosperity.

A transforming sector

It is estimated that each automotive assembly job creates approximately ten additional jobs in upstream and downstream activities.[267] With at least 80% of Canadian automotive manufacturing jobs concentrated in Ontario in 2023, Ontario's automotive and mobility sector is a major source of employment, directly supporting over 110K workers – the majority of whom (63%) are

Automotive Labour Market in Ontario (2023)



Legend

- NAICS 3363 Motor vehicle parts manufacturing
- NAICS 3362 Motor vehicle body and trailer manufacturing
- NAICS 33611 Automobile and light-duty motor vehicle manufacturing
- NAICS 33612 Heavy-duty truck manufacturing

Source: StatsCan. Table 36-10-0489-01.
Labour statistics consistent with the System of National Accounts (SNA), by job category and industry

employed within motor vehicle parts manufacturing – and generating hundreds of thousands of indirect jobs throughout the broader supply chain.[268] The automotive industry is, however, undergoing a significant transformation as technological advancements, changing consumer preferences, and increasing regulatory pressures drive automakers to invest in the transition to ZEVs. As part of this transformation, automakers are retooling their plants to accommodate new production requirements.[269] This transition has led to layoffs, as the retooling process often involves automation and changes in the skill sets required, reducing the need for certain roles. Production workers in automotive and parts manufacturing are expected to be most at risk as evidenced by recent layoffs at several major production factories including Ford, GM, and Stellantis, as well as at numerous feeder plants.[270] Addressing the shortage of skills required to deal with new vehicle production requirements is therefore of crucial importance.[271] Ontario is actively responding to this evolving landscape by taking steps to mitigate impacts on current workers and equip future workers with the skills needed to secure reemployment across the transforming supply chain, particularly in the fields of battery and steel production, auto assembly and research and innovation, where there is high demand for skilled workers.[272]

Upskilling the workforce

OVIN is at the forefront of building a resilient, future-ready workforce for Ontario's automotive and mobility sector. As the province's lead on talent development in this space, OVIN is driving a comprehensive Talent Strategy & Roadmap that aligns with the goals of the Driving Prosperity Plan for Ontario, which outlines ambitious targets for the sector through 2030. OVIN's forward-looking roadmap is designed to create a competitive and inclusive talent ecosystem by:

- Delivering targeted skills support to address critical gaps.
- Aligning education and training with industry needs.
- Launching a digital upskilling platform to expand access to training.
- Promoting equity, diversity, and inclusion by working with underrepresented communities.
- Strengthening collaboration among government, industry, and academia.[273]

To support this strategy, OVIN Learn serves as a centralized online learning platform that connects industry professionals, post-secondary institutions, and the broader workforce. The platform is designed to help users build both foundational and advanced skills that align with the evolving needs of the automotive industry. Users can engage with an AI chatbot to help find career paths and related resources, access a detailed job board, and explore learning pathways across a breadth of topics in English and French. A key feature of OVIN Learn is its focus on micro-credentials, which offer flexible, targeted learning opportunities to upskill workers, prepare for future demands, and elevate Ontario's automotive expertise on the global stage. To fuel the development of these micro-credentials, OVIN's Content Partnerships Program invites input from industry to create learning pathways.[274]

OVIN has also, with support from the Ontario Ministry of Labour, Immigration, Training and Skills Development, released a first-of-its-kind, employer-informed EV Skills Gap Analysis and Reskilling Training Framework. This framework is a strategic roadmap to help employers and talent leaders identify workforce gaps, reskill ICE

vehicle manufacturing talent, and fill high-demand roles across EV production. The framework was developed in close collaboration with one of Ontario's largest OEMs, ensuring that the recommendations are grounded in real-world hiring needs and ready for immediate use by HR teams, training providers, and workforce development partners.[275] This initiative helps Ontario stay ahead by delivering:

- A comprehensive EV Skills Gap Analysis, identifying urgent knowledge gaps in areas like battery systems, electric drivetrains, power electronics, and high-voltage components.
- A Reskilling Training Framework aligned with real employer needs, featuring modular learning, micro-credentials, and immersive training models designed to reduce hiring timelines.
- A sector-wide blueprint for collaboration among OEMs, suppliers, unions, training institutions, and government

The framework goes beyond training – it lays the groundwork for a more integrated, agile workforce system that can keep pace with ongoing innovation in EV technology and advanced manufacturing.

Furthermore, OVIN's Skills and Career Navigator is an interactive digital tool designed to guide individuals through career pathways in Ontario's evolving automotive and mobility sector. It helps users, whether students, jobseekers, or professionals, identify in-demand roles, understand required skills and qualifications, and explore relevant training and education opportunities. By aligning talent with industry needs, the Navigator supports workforce development and helps build a resilient, future-ready talent pipeline for Ontario's automotive ecosystem.[276] Additionally, OVIN's Automotive Innovation Challenge (AIC) is a dynamic initiative spotlighted on the following page, showcasing how emerging talent is driving creative solutions in Ontario's mobility sector.

In alignment with OVIN's leadership, the Ontario government is also investing in a range of complementary initiatives:

- Expanding the FIRST Tech Challenge, a program that provides students with hands-on, team-based learning opportunities to develop STEM skills and prepare for advanced manufacturing jobs.[277]
- Training partnerships supporting secondary, post-secondary, and provincial job skills programs such as the Specialist High Skills Majors and the Ontario Youth Apprenticeship Program. Beginning in the 2021-2022 academic year, the province allocated an additional $39.6M over three years to expand the Specialist High Skills Major program.[278] These programs remained key funding areas in Budget 2024.

The Ontario government is also actively leveraging the Skills Development Fund (SDF). In 2023, $4.7M was allocated to two innovative programs:

- One managed by the Automotive Parts Manufacturers' Association (APMA), offering three-month paid job placements leading to full-time employment.[279]
- Another managed by the Automotive Industries Association of Canada (AIA), delivered at college campuses to help 90 technicians and 70 jobseekers transition into the EV industry.[280]

In May 2025, it was announced that an additional $1B is to be invested by the provincial government into the SDF. The aim of this additional funding is to help train and reskill workers in Ontario, including those impacted by layoffs due to tariffs.[281] In March 2025, $3M was provided to AIA to support three key training programs:

- EV, Hybrid, and ADAS Technologies Training Program – equipping technicians with skills to maintain and repair a wide range of vehicles.
- Exploration of the Automotive Trades Training Program – supporting jobseekers in finding employer sponsors and pursuing apprenticeships.
- Plug'n Drive Training Session – offering non-technical training and consumer education to better understand EV owner expectations.[282]

Attracting talent

In addition to upskilling, the Driving Prosperity Plan emphasizes attracting new workers to the automotive sector through targeted programs and partnerships. Key initiatives include:

- Expanding the FIRST Tech Challenge, which not only builds skills but also inspires students to consider careers in advanced manufacturing.[283]
- Supporting the Canadian Manufacturers & Exporters (CME) in celebrating Ontario's manufacturing sector during Manufacturing Month in October, helping to raise awareness and interest in the industry.[284]
- Exploration of the Automotive Trades Training Program (under AIA) – specifically designed to attract jobseekers to automotive careers by supporting them in finding employer sponsors and pursuing apprenticeships.[285]

Talent Strategy and Workforce Planning: OVIN's Automotive Innovation Challenge

OVIN is leading the way in helping Ontario's emerging talent learn about and prepare for careers in the automotive and mobility sector. One signature talent initiative is the AIC, which aims to foster collaboration between emerging talent, post-secondary institutions, and employers in the province's automotive and mobility sector.[286]

As the industry undergoes a significant transformation – driven by electrification, battery technology, and the critical minerals supply chain – the AIC will engage industry partners across sectors and provide participants with direct exposure to real-world problems in automotive and mobility.

Through AIC, post-secondary institutions will collaborate with one or more industry partners in Ontario's automotive and mobility ecosystem to design a student competition to either solve a real-world industry problem or design an experiential learning training program. Featuring 19 industry partners – including Honda of Canada Manufacturing, GM of Canada, Magna International, Toyota Canada, Deaf AI, SCOOTY, ABC Technologies, and Cogito Capital – AIC will be integrating innovation with execution and sparking future careers for emerging talent.

The upcoming programming will feature 700+ student participants from across Centennial College, Georgian College, Ontario Tech University, Western University, and York University. With 10 events and six funded projects spanning AI and software solutions, digital prototypes, autonomous vehicles, safety, business optimization, technology development, manufacturing, EV charging, and inclusive design, OVIN is powering up the next generation of Ontario's automotive and mobility talent through AIC.

4. Future Outlook and Opportunities

Ontario is uniquely positioned to lead Canada's transition to cleaner transportation, thanks to its fully integrated and organically developed automotive and mobility ecosystem. Spanning the entire value chain – from critical mineral extraction and advanced R&D to parts manufacturing and final vehicle assembly – Ontario offers a comprehensive foundation for innovation and growth. As global supply chains realign and the province continues to attract major investments in the automotive sector, Ontario is poised to strengthen its leadership in the evolving mobility landscape by capitalizing on emerging opportunities in clean and connected transportation.

Ontario – a Global Automotive and Mobility Hub

Ontario is strategically leveraging its diverse strengths to establish itself as a central figure in the global automotive and mobility sector. With a long-standing legacy in automotive manufacturing, a highly skilled workforce, and a robust innovation ecosystem, Ontario is uniquely positioned to lead the transition toward next-generation mobility. Recognizing the global shift toward electrification, automation, and sustainability, the province is doubling down on its competitive advantages – such as its integrated supply chain, critical mineral resources, and strong R&D capabilities – to invest heavily in transformative technologies like EVs, smart mobility solutions, and lightweight materials. This forward-looking approach not only builds on Ontario's historical strengths but also ensures its continued leadership in a rapidly evolving global industry.

One of the province's primary advantages is its robust supply chain, which spans from raw material mining and refining to advanced manufacturing and assembly. Ontario's wealth of critical minerals, essential for EV batteries, positions it uniquely in the North American market. This resource advantage is complemented by significant investments in EV battery cell and module manufacturing, as well as cathode production.

The province's commitment to innovation via its robust R&D ecosystem is another critical factor. By fostering collaboration between industry, academia, and government, Ontario is driving innovation across the entire supply chain. This includes advancements in mining and EV battery technologies, automotive parts manufacturing, and EV battery recycling. These efforts ensure that Ontario remains at the forefront of technological progress and sustainability in the automotive industry.

Moreover, Ontario's government has been proactive in creating a favorable business climate for the automotive industry. The Driving Prosperity Phase 2 plan outlines ambitious goals, including the production of at least 400K EVs and hybrids by 2030.[287] This plan also emphasizes the development of a comprehensive battery supply chain ecosystem and continuous innovation at every stage of vehicle production. These efforts are supported by substantial policy measures and investments, which have attracted over $46B in transformative investments in the auto and EV battery-related sectors over recent years.[288]

Ontario's automotive sector is a cornerstone of the province's economy, directly supporting nearly 130K workers and generating numerous indirect jobs. Recognizing the vital role these workers play, Ontario is deeply committed to workforce development, especially as the industry transitions to ZEVs. As part of this, the province is fostering partnerships between industry leaders, educational institutions, and government bodies to create a supportive ecosystem for workers. This collaborative approach not only enhances the quality of training but also ensures that programs are aligned with industry needs and future trends. This commitment to workforce development ensures that Ontario's automotive sector remains resilient and adaptable, ready to meet the demands of a rapidly evolving global market.

Opportunities for Ontario

By aligning its industrial strengths with emerging global trends, Ontario can continue to not only drive sustainable economic growth but also shape the future of mobility on a global scale. Here we explore the strategic opportunities Ontario can leverage, from EV battery innovation and lightweight materials to smart mobility technologies and international partnerships.

Continue to Leverage R&D Ecosystem and Integrated Supply Chain for EV Battery Innovation

EV battery innovation stands out as one of the most transformative areas in the automotive sector, and Ontario is exceptionally well-positioned to lead in this space. With a robust ecosystem that spans critical mineral resources, advanced manufacturing capabilities, and a strong foundation in R&D, the province has the essential ingredients to become a global hub for next-generation battery technologies. Emerging battery chemistries – such as solid-state, cobalt-free, and silicon-anode designs – are reshaping the future of electric mobility. These innovations promise significant advantages, including higher energy density, faster charging times, longer lifespan, and a reduced environmental footprint.

For Ontario, the opportunity for the province to become a leader in EV battery innovation and promote its position globally presents a dual advantage: to drive sustainable transportation solutions while also capturing high-value segments of the global EV supply chain. By continuing to foster innovation in battery materials and manufacturing processes, Ontario can reduce dependence on ethically and environmentally challenging supply sources, enhance domestic energy security, and create high-skilled jobs across the province. Moreover, as global automakers and battery producers seek stable, innovation-driven environments for investment, Ontario's integrated automotive ecosystem and policy support make it an attractive destination for battery R&D, pilot production, and commercialization.

In short, EV battery innovation is not just a technological frontier – it is a strategic lever for Ontario to assert global leadership in clean mobility, strengthen its economic resilience, and contribute meaningfully to climate goals.

Harness Strategic Resources to Advance Lightweight Automotive Innovation

Ontario's manufacturing ecosystem, combined with its rich endowment of critical minerals, positions the province to become a leader in lightweighting innovation for the automotive and mobility sector. Lightweighting – using advanced materials to reduce vehicle mass – is essential for improving fuel efficiency, extending EV range, and lowering emissions. Ontario's strength lies in its integrated value chain: from mining and processing critical minerals like aluminum, magnesium, and nickel, to advanced manufacturing and materials engineering. This vertical integration allows for the development and scaling of lightweight materials within a single jurisdiction, reducing reliance on foreign supply chains and enhancing economic resilience.

The province's mining sector provides a secure and sustainable source of the raw materials needed for next-generation lightweight components. Coupled with its advanced manufacturing capabilities and a strong network of research institutions, Ontario can drive innovation in both material science and production techniques, such as forming, joining, and recycling processes that are critical for cost-

effective and sustainable production. As global automakers increasingly prioritize lightweight design to meet stringent fuel economy and emissions standards and growing customer preferences for efficient vehicles, Ontario has a strategic opportunity to become a leader in this space, driving economic growth, attracting investment, and reinforcing its role at the forefront of clean and connected mobility. With Ontario's unique position as a destination of choice for global OEMs, providing lightweight materials can enhance Ontario's value to major manufacturers.

Continue to Accelerate Smart Mobility Innovation via Continued Support of Startup Ecosystem

Ontario is home to a significant and world-class technology industry, with the Toronto-Waterloo Corridor being the third largest tech cluster in North America.[289] The region boasts over 15K tech companies, with multinationals such as SAP and Google, is home to over 5K startups, and offers academic excellence with over 16 post-secondary institutions, including Canada's largest engineering school and the largest co-operative program in North America.[290] Such robust access to exceptional resources is a significant benefit. In addition, Ontario's strengths in AI and its dynamic startup ecosystem create a powerful foundation for leadership in smart mobility innovation. As transportation systems become increasingly connected, automated, and data-driven, Ontario's technology hub and AI expertise – particularly in machine learning, computer vision, and real-time analytics – can be harnessed to develop intelligent mobility solutions. These include autonomous vehicle technologies, predictive traffic management, and personalized mobility services that adapt to user behavior and environmental conditions. Additionally, as cities grow and environmental awareness increases, MaaS is set to transform urban transportation by offering more convenient, inclusive, and sustainable travel options. This shift reflects a broader trend toward integrated, eco-conscious mobility solutions that enhance accessibility while reducing environmental impact. With globally recognized AI research hubs and a growing pool of tech talent, Ontario is well-equipped to drive breakthroughs that make transportation safer, more efficient, and more sustainable.

To support the uptake and development of smart mobility solutions, such as MaaS, Ontario could implement a provincial strategy that promotes integration, innovation, and accessibility across the transportation network. This includes encouraging the use of open data standards and interoperable digital platforms to allow users to plan, book, and pay for multimodal journeys through a single interface. Public-private partnerships should be fostered to pilot MaaS solutions in both urban and rural areas, ensuring services are tailored to diverse community needs. Additionally, the province can offer targeted funding and incentives to support the development of MaaS platforms that prioritize sustainability and equity, such as those integrating low-emission transport modes or offering discounted services to underserved populations. Establishing a clear regulatory framework will also be essential to support innovation while ensuring consumer protection, data privacy, and fair access across all mobility services.

The province's robust startup ecosystem further amplifies this opportunity. Ontario is home to a vibrant community of mobility-focused startups and scale-ups that are pioneering innovations in

areas such as V2X communication, electric fleet optimization, and urban mobility platforms. Supported by accelerators, venture capital, and strong public-private partnerships, these startups are agile, experimental, and well-positioned to bring pioneering smart mobility solutions to market. OVIN has already laid the foundations and continues to act as a catalyst in turning this potential into real-world impact. Via initiatives such as its Demonstration Zones, OVIN connects startups, researchers, and industry partners, enabling them to collaborate on trailblazing mobility innovations and bring them to market faster, and allows innovators to validate technologies under diverse conditions, accelerating commercialization and de-risking investment.

Additionally, development and commercialization can be enhanced by streamlining industry-academia collaboration and strengthening the startup ecosystem through initiatives such as the OVIN Incubators. For more information about initiatives supporting the startup ecosystem, refer to OVIN's Driving Innovation: Ontario's Automotive and Mobility Startup Ecosystem report. This ecosystem approach not only strengthens Ontario's position as a global hub for smart mobility but also supports broader goals around sustainability, economic growth, and inclusive transportation. By aligning AI excellence with real-world testing and entrepreneurial energy, Ontario is uniquely positioned to lead the next wave of intelligent, connected mobility.

Continue Building Localized End-to-End EV Battery Supply Chain

Ontario holds a strategic advantage to localize the EV battery supply chain by capitalizing on its abundant critical mineral resources, advanced manufacturing capabilities, and innovation-driven ecosystem. The province is home to significant deposits of key battery minerals such as nickel, cobalt, lithium, and graphite – essential inputs for battery cell production. By investing in sustainable mining practices and building out domestic refining and processing capacity, Ontario can reduce reliance on foreign sources and create a secure, transparent, and ethically sourced supply chain from the ground up. This upstream advantage is complemented by Ontario's robust base of OEMs and Tier 1 suppliers, many of whom are already investing in EV production and battery assembly. These established players provide a ready-made industrial foundation for scaling battery manufacturing and integrating it directly into vehicle production lines. This is especially true as the majority of battery manufacturing is currently concentrated in China.[291] Strategic initiatives like targeted government incentives are already helping to attract global investment and foster collaboration between industry, academia, and startups. Experts note government support as one of Ontario's competitive advantages, with strong industry-government relationships and opportunities to access government-supported capital.[292] By aligning these strengths, Ontario can not only meet domestic EV demand but also become a key player in the global battery market.

An example of Ontario successfully bringing together stakeholders from across the EV supply chain is Project Arrow – Canada's first fully homegrown zero-emission concept vehicle. Spearheaded by the Automotive Parts Manufacturers' Association (APMA) and led in partnership with OVIN, the first phase of Project Arrow demonstrated the strength of Canada's, and particularly Ontario's, automotive innovation ecosystem. The prototype, unveiled globally at CES 2023, showcased a sleek, high-performance EV built entirely with Canadian technology,

materials, and talent, proving that a fully domestic supply chain for advanced mobility is not only possible but competitive on the world stage. Now in its second phase, Project Arrow 2.0 is pushing the boundaries of innovation even further. With $11M in new federal and provincial funding, the project is advancing at Ontario Tech's ACE Core Research and Testing Facility, where cutting-edge features like a 3D-printed carbon chassis, AI-powered systems, and climate-resilient design are being developed and tested. The initiative continues to unite startups, Tier 1 suppliers, and academic talent, while also serving as a global showcase for Ontario's leadership in clean, connected, and sustainable mobility.[293]

Beyond production, Ontario is also advancing its role in battery recycling and circular economy practices. As EV adoption grows, so does the need for sustainable end-of-life solutions. Ontario's innovation ecosystem – including startups, research institutions, and clean tech firms – is exploring advanced recycling technologies that recover valuable materials like lithium, nickel, and cobalt from used batteries. These efforts not only reduce environmental impact but also help close the loop on battery materials, creating a more resilient and self-sustaining supply chain. By aligning its natural resources, industrial capabilities, and innovation assets, Ontario can become a global leader in a localized, circular EV battery economy, supporting clean transportation while driving long-term economic growth.

Strengthen EV Charging Infrastructure

Ontario has a significant opportunity to lead in the development of a robust, accessible, and user-friendly EV infrastructure. A key priority should be simplifying the charging and payment experience for EV drivers. Ontario could promote the adoption of technologies such as Plug and Charge,[294] and EV roaming technologies, which allow EV drivers to access a wide range of public charging stations using their preferred payment method, to streamline the charging experience. This can be done via supporting interoperability agreements among charging networks, encouraging collaboration between OEMs, utilities, and charging station operators, and building on national initiatives like the Agora campaign to enable access to multiple networks through a single, secure account.[295]

Equity and sustainability must also be central to Ontario's EV strategy. Expanding charging infrastructure to rural and underserved communities through programs like ChargeON will help ensure that all residents have access to public chargers.[296] Ontario should also implement province-wide building codes requiring EV-ready infrastructure in multi-unit residential buildings, following Toronto's example.[297] To further accelerate adoption, the province can offer targeted incentives for smart and fast chargers and provide clear guidance for implementation. Finally, managing demand on the electricity grid through smart and bidirectional charging technologies, supported by Ontario's existing smart meter network and initiatives like the Advanced Charging & Vehicle to Grid stream of OVIN's R&D Partnership Fund, will be essential to maintaining grid stability and meeting clean energy goals.[298]

Increase EV Adoption Through Consumer Education, Raising Ecosystem Profile, and Policy

Expanding the presence of EVs in Ontario will require more than just scaling production, it will also demand a concerted effort to raise awareness, build consumer confidence, and showcase the province's growing EV ecosystem.

A recent J.D. Power study revealed that over half of Canadian vehicle shoppers have never been in an EV, highlighting a significant gap in consumer experience and familiarity.[299] However, the same study found that exposure matters: among those who have borrowed or test-driven an EV, a notable 26% expressed a strong likelihood of purchasing one. This underscores the importance of education and hands-on engagement in driving adoption.

Ontario has a unique opportunity to lead not only in EV manufacturing but also in public education and market development. By continuing to promote its home-grown EV supply chain – from critical minerals and battery production to vehicle assembly and recycling – Ontario can build consumer trust in the quality, sustainability, and economic value of locally made EVs. Public test drive events, EV showcases, and partnerships with dealerships, schools, and municipalities can help demystify EV technology and highlight the province's leadership in clean mobility. Additionally, integrating EV education into broader climate and innovation campaigns can reinforce the message that choosing an EV supports both environmental goals and Ontario's economy. With the right outreach and storytelling, Ontario can turn its industrial strength into a powerful driver of consumer demand.

Ontario already offers some non-financial incentives for EV adoption, such as the green license plate program, which allows qualifying EVs to access HOV and HOT lanes with any number of occupants.[300] As of 2018, the province no longer offers financial incentives to EV buyers, which has had a noticeable impact on EV adoption rates, especially among middle- and lower-income households.[301] However, fiscal incentives across the globe are noted as one of the most signficant policy drivers of EV adoption to date, alongside convenient and afforable publicly accessible chargers.[302]

Continue to Nurture Cross-Border and International Partnerships

Ontario can significantly strengthen its automotive and mobility supply chain by deepening cross-border and international partnerships with leading automotive and technology hubs such as Michigan, Germany, South Korea, and Japan. These collaborations offer strategic opportunities to co-develop and harmonize standards for EVs, batteries, and autonomous systems – ensuring Ontario-made technologies are interoperable and competitive in global markets. Joint standard-setting also helps reduce regulatory fragmentation, making it easier for Ontario companies to scale internationally.

Given Ontario's central role in shaping Canada's trade relationships, the province is well positioned to leverage its broad network of trade agreements with 50 countries.[303] With tariff-free access to over 60% of the global economy through national level agreements like CETA, CPTPP, and bilateral deals with South Korea and South American nations, Ontario can tap into high-growth regions such as the Indo-Pacific. Ontario can also continue to forge mutually beneficial relationships, such as with Baden-Württemberg, across diverse global economies.

To incourge further foreign investment, Ontario can continue to highlight its strengths and opportunities through agencies like Invest Ontario, which directly interfaces with current and future investors and provides tailored resources and services. Invest Ontario's investment attraction priorities currently include automotive, with a particular focus on high-value EV components and niche electric bus and motocycle manufacturers.[304]

Beyond standards, Ontario can engage in bilateral R&D initiatives and pilot programs that bring together academic institutions, startups, and established industry players from both sides. These partnerships can accelerate innovation in areas like battery chemistry, V2X communication, and AI-driven mobility platforms – fields where global leaders are already making significant strides. For instance, Germany is at the forefront of V2X technologies, with a clear charging infrastructure strategy and support for R&D in V2X.[305] Similarly, California and Michigan in the United States are hubs for AI-driven mobility and autonomous vehicle testing, offering opportunities for joint pilots and data-sharing frameworks. In battery innovation, China leads in market dominance and innovation, with growing influence from Korea and Japan, patricularly in new technologies such as solid-state battery development.[306] Ontario could benefit from bilateral R&D agreements that tap into these countries' advanced manufacturing ecosystems and materials science expertise. OVIN has already taken steps to facilitate these international partnerships through its Going Global approach, exemplified by its renewed strategic partnership with the State of Baden-Württemberg, Germany – uniting two leading automotive regions to accelerate innovation, expand market opportunities, and strengthen Ontario's global footprint in the mobility sector.

To operationalize these collaborations, shared testbeds and demonstration zones could be established, allowing Ontario and its partners to trial new technologies in diverse environments, from dense urban centres like Toronto to rural corridors in Northern Ontario. These zones would serve as real-world laboratories for validating interoperability, safety, and performance across different geographies and regulatory contexts. By aligning with global leaders in these domains, Ontario can not only accelerate its own innovation pipeline but also position itself as a trusted partner in the global mobility ecosystem.

Additionally, Ontario can continue working with international partners to streamline trade and regulatory alignment, particularly around safety certifications, emissions standards, and data governance for connected vehicles. This would continue reducing friction in the movement of EV components, software systems, and finished vehicles across borders. There is also value in working to increase interprovincial collaboration and alleviate current challenges with interprovincial trade and the automotive sector, like regulatory differences and skilled labour mobility. Sharing technological expertise and co-developing innovative industry solutions across the provinces could also be explored.

By aligning with global and Canadian leaders and fostering a collaborative innovation environment, Ontario can amplify its influence in shaping the future of mobility while opening new pathways for its companies to grow and compete globally.

Continue to Facilitate Mobility Workforce Transition and Upskilling Strategy

To ensure Ontario's long-term competitiveness in the global mobility sector, it is essential to continue supporting and scaling the strategy to upskill the workforce. This strategy builds on the strong foundation laid by the Driving Prosperity plan and is being actively advanced through OVIN's Talent Strategy & Roadmap – a province-wide initiative aligning workforce development with the evolving needs of the automotive and mobility sectors.

As the industry undergoes rapid transformation driven by electrification, automation, and digitalization, sustained investment in high-demand training areas – such as EV battery

manufacturing, AI and software for smart mobility, and EV maintenance – is critical. Supporting and expanding existing programs will help future-proof jobs, attract investment, and maintain Ontario's leadership in advanced manufacturing and mobility innovation. In support of this, OVIN is currently developing a Rapid Regional Training Program.

By continuing to partner with colleges, universities, unions, and industry leaders, Ontario can ensure that curricula continues to align with emerging industry needs and ensure that students and workers are equipped with the right skills. Equally important is the sustained support of reskilling pathways via OVIN Learn, for workers transitioning from legacy automotive roles, ensuring they are not left behind in the shift to clean and connected transportation. By reinforcing and scaling the work already underway through OVIN's Talent Strategy & Roadmap and EV Skills Gap Analysis and Reskilling Training Framework, Ontario can build a resilient, inclusive, and future-ready mobility workforce.

5. Glossary

ACE	Automotive Centre for Excellence
ADAS	Advanced Driver Assistance Systems
AI	Artificial Intelligence
AIA	Automotive Industries Association
AIC	Automotive Innovation Challenge
AMIC	Advanced Manufacturing and Innovation Competitiveness
APMA	Automotive Parts Manufacturers' Association
APRC	Automotive Policy Research Centre
AR	Augmented Reality
AV	Autonomous Vehicle
B2B	Business-to-Business
CAM	Cathode Active Material and precursor /pCAM
CAMC	Centre for Automotive Materials and Corrosion
CARE	Centre for Automotive Research and Education

CATTS	Centre for Automated and Transformative Transportation Systems
CAV	Connected and Autonomous Vehicle
CERC	Canada Excellence Research Chair
CETA	Comprehensive Economic and Trade Agreement
CHARGE	Centre for Hybrid Automotive Research and Green Energy
CME	Canadian Manufacturers & Exporters
CMIF	Critical Minerals Innovation Fund
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CUSMA	Canada-United States-Mexico Agreement
EDI	Equity, Diversity, and Inclusion
EESL	ElectroChemical and Energy Storage Lab
EV	Electric Vehicle
EVCCP	Electric Vehicle Charging Connection Procedures
EVEMS	Electric Vehicle Energy Management Systems
EVSE	Electric Vehicle Supply Equipment
GDP	Gross Domestic Product
GWh	Gigawatt Hours

HD	High-Definition
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
HS	Harmonized System
ICE	Internal Combustion Engine
IoT	Internet of Things
LSV	Low-Speed Electric Vehicle
KAIA	Korea Agency for Infrastructure Technology Advancement
MaaS	Mobility as a Service
MARC	McMaster Automotive Resource Centre
MIT	Massachusetts Institute of Technology
MOU	Memorandum of Understanding
MOVE	Mobility Innovation Centre
NAFTA	North American Free Trade Agreement
NRC	National Research Council
O-AMP	Ontario Automotive Modernization Program
OBEC	Ontario Battery and Electrochemistry Research Centre

OCPP	Open Charge Point Protocol
OEM	Original Equipment Manufacturer
OJEP	Ontario Junior Exploration Program
OVIN	Ontario Vehicle Innovation Network
pCAM	Precursor Cathode Active Material
PHEV	Plug-in Hybrid Electric Vehicle
R&D	Research & Development
RNG	Renewable Natural Gas
RTDS	Regional Technology Development Site
SCVIC	Smart Connected Vehicles Innovation Centre
SmartTO	Smart Mobility Applied Research and Testing-Toronto
SME	Small and Medium-sized Enterprises
SRM	Switched Reluctance Motors
STEM	Science, Technology, Engineering and Mathematics
TOC	Transit-Oriented Community
ULO	Ultra-Low Overnight
UTEV	University of Toronto Electric Vehicle Research Centre

UTTRI	University of Toronto Transportation Research Institute
V2G	Vehicle-to-Grid
V2I	Vehicle-to-Infrastructure
V2P	Vehicle-to-Pedestrian
V2V	Vehicle-to-Vehicle
V2X	Vehicle-to-Everything
VOD	Vehicle Occupancy Detection
VR	Virtual Reality
WatCAR	Waterloo Centre for Automotive Research
ZEV	Zero Emission Vehicles

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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 October 3, 2024, and has been prepared by Arup Canada Inc. 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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