

Executive Summary

Driving Dual-Use Technology: Advancing Ontario's Mobility and Defence Advantage

Leveraging Ontario's Mobility Ecosystem, Industrial
Capacity, and Strategic Supply Chains

Quarterly Specialized Report

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Executive Summary

The convergence of technological innovation, industrial competitiveness, resilience, and national security is creating new opportunities for jurisdictions with strong innovation ecosystems. Technologies originally developed for commercial markets are increasingly being applied across transportation, public safety, emergency response, critical infrastructure, remote operations, defence and strategic sectors. Artificial intelligence, advanced sensing, autonomous systems, digital twins, secure communications, advanced computing, and connected infrastructure are becoming foundational technologies supporting both economic growth and organizational resilience.

Ontario is well positioned to benefit from these developments. The province combines one of North America's largest automotive and mobility ecosystems with strengths in advanced manufacturing, software development, connected and autonomous vehicles, critical minerals, battery production, research, testing infrastructure, and commercialization support. These assets position Ontario to participate in emerging dual-use markets while strengthening industrial competitiveness, attracting investment, supporting innovation, and creating new economic opportunities.

Ontario's greatest opportunity lies in strengthening connections between its mobility ecosystem, research institutions, commercialization networks, manufacturers, and emerging markets that increasingly require advanced digital, industrial, and mobility capabilities. Ontario's advantage is not based on a single technology or sector, but on the breadth of assets that can be connected to support innovation, scale-up, and commercialization.

Ontario's Dual-Use Opportunity at a Glance

Ontario's position as one of North America's leading mobility and advanced manufacturing jurisdictions creates a strong foundation for growth in dual-use technologies. The following statistics illustrate Ontario's breadth of ecosystem assets, talent, infrastructure, and industry capabilities that support innovation across civilian, public-sector, resilience-focused, and strategic applications.

Mobility & Advanced Manufacturing Ecosystem	Nearly 700 Automotive Suppliers	400+ Connected and Autonomous Vehicle Companies	100,000+ Vehicle Assembly and Parts Workers
	9 OVIN RTDS Sites	~\$70 Million RTDS Investment	\$12.4+ Billion Invest Ontario-Supported Investments
Defence & Strategic Ecosystem	300+ Defence Organizations	13,000+ Defence Industry Workers	\$5 Billion Annual Defence Industry Revenue

Ontario's advantage lies in its ability to connect strengths across both defence and commercial innovation ecosystems

This creates two complementary opportunities: expanding established defence and manufacturing capabilities, while enabling commercially developed technologies from Ontario's mobility and advanced manufacturing sectors to scale into dual-use and strategic markets.

1. Dual-Use and the New Industrial Context

Technological innovation and the increasing use of connected systems are changing how competitiveness and national security are viewed.

Defence readiness is evolving.

National defence has traditionally been understood through the lens of military platforms, weapons systems, bases and physical infrastructure. These capabilities remain essential, but the nature of defence readiness has evolved to include the digital, cyber, industrial, and infrastructure systems that enable governments, businesses and communities to operate securely and respond effectively to disruption.

Commercial innovation is advancing strategic capabilities.

Commercial markets can scale innovation more quickly than can be done through defence procurement due to access to capital, competitive pressures and larger customer bases. As a result, advanced technologies are increasingly being developed and commercialized in civilian markets before being adapted for broader resilience, security, and strategic purposes.

Global investment trends reflect growing interest in technologies that combine commercial scalability with broader strategic applications.

Global investment is growing

Global venture capital investment in defence-related technologies reached approximately USD \$29 billion in 2025, nearly three times 2020 levels.

Commercial scale does not equal defence readiness

Technologies that have achieved commercial success may still require adaptation, operational testing, security assurance, systems integration, qualification, accreditation, and fit-for-purpose procurement pathways before they can be adopted for defence applications.

Supply chains are being reconfigured around trusted partnerships and strategic alignment.

In the face of geopolitical uncertainty, trade disruptions and concentration risks, governments and industry are placing greater emphasis on trusted supply chains, domestic industrial capability, infrastructure resilience, and access to strategically important technologies. This is leading to growing interest in reshoring, nearshoring, friendshoring, and trusted industrial networks. These developments place growing value on jurisdictions that possess industrial capacity, access to strategic inputs, advanced infrastructure, and strong innovation ecosystems.

Investments are being made in sovereign capabilities.

Canada, like other governments, is investing in strengthening domestic capacity and reducing supply chain vulnerabilities in strategic areas to defend its sovereignty and meet allied commitments. Priority areas include aerospace, ammunition, digital systems, in-service support, personnel protection, sensors, space, specialized manufacturing, training and simulation, and autonomous systems, supported by resilient energy, transportation, communications, digital, and compute infrastructure.

2. Dual-Use Technologies and Ontario's Potential

Dual-use technologies are developed for commercial, public-sector, or industrial applications that can also support resilience, security, and other strategic objectives.

Artificial intelligence and high-performance computing.

Artificial intelligence (AI) and advanced analytics are foundational technologies that enable the processing of real-time data, predictive analytics, sensing, autonomy and decision-support. High-performance computing provides the computational foundation to support AI use.

Key dual-use technologies.

Infrastructure monitoring and management, transportation and communications in both civilian and military applications are increasingly using digital technologies. Examples are:

Advanced sensing and computer vision are used in navigation, infrastructure inspection, asset monitoring, threat detection, and operational awareness.

Autonomous and connected mobility is used for autonomous driving, fleet coordination, logistics and remote operations.

Digital twins are used in monitoring and planning applications such as vehicle and factory simulation, system optimization, emergency planning, scenario planning and operational modelling.

Secure and space-enabled communications connect disparate regions in real time, support transportation and logistics networks, enable emergency response and remote monitoring and surveillance functions.

A strong foundation for developing dual-use technologies.

As the technologies underpinning connected and autonomous vehicles increasingly support applications beyond transportation, there is potential for Ontario to leverage ecosystem strengths such as:

- Strong artificial intelligence and software ecosystem.
- 400+ companies active in connected and autonomous vehicle technologies.
- Advanced manufacturing and systems integration capabilities.
- Growing battery and electrification ecosystem.
- Expanding compute and digital infrastructure.
- Established satellite communications and sensing capabilities.
- Specialized testing and validation environments.

Ontario's opportunity is not limited to specialized strategic technologies. Equally important is creating pathways that enable commercially developed technologies in mobility, software, infrastructure, communications, sensing, and manufacturing to access adjacent markets while maintaining commercial scale and innovation.

Dual-use technologies are provided by Ontario companies.

Ontario companies are at various stages in the provision and adaptation of commercial technologies to military and security applications. Two examples are:

Low Earth Orbit and Geostationary Satellites provide communication services across vast distances that support connectivity, data transmission, and operational coordination for both civilian and military customers.

Company: Telesat

Monitoring of civilian infrastructure using vehicle-mounted cameras that capture and assess infrastructure and street-level conditions in real time. This has the potential to be used to identify improvised explosive devices.

Company: City Rover

3. Strategic Inputs and Trusted Supply Chains

The competitiveness of advanced technology industries increasingly depends not only on innovation and manufacturing capacity, but also on secure access to critical inputs and trusted supply chains.

Increasing emphasis on resilience, traceability and supply-chain security.

Geopolitical tensions, supply disruptions, and dependence on complex global networks for materials, components, software, and production capabilities have exposed vulnerabilities within existing networks. In response, governments and industry are placing greater emphasis on resilience, traceability, and supply-chain security to ensure access to critical inputs and reduce strategic risk.

Traceability in Supply Chains

End-to-end provenance: Suppliers are expected to provide verified information on the origin and movement of critical materials, components, software, and manufacturing inputs across the product lifecycle.

Supplier and component assurance: Defence buyers may require documentation linking products to approved manufacturers, supported by inspection, testing, and authentication to prevent counterfeit or non-compliant inputs.

Ongoing visibility: Digital bills of materials, software bills of materials, trusted data sharing, and monitoring of high-risk suppliers and components are increasingly expected to identify dependencies and manage security or continuity risks.

Concentration of critical mineral processing is a strategic risk.

Critical minerals underpin batteries, semiconductors, sensors, secure communications, aerospace systems, autonomous platforms, and other dual-use mobility and defence technologies. Refining, processing, and advanced materials production are concentrated in a small number of countries, exposing technology and defence supply chains to export controls, geopolitical conflict, and other disruptions. This makes secure access to trusted sources of both raw materials and downstream processing capacity an increasingly important determinant of competitiveness, sovereign capability, and resilience.

Ontario's potential.

Ontario occupies a unique position within this evolving landscape, combining critical mineral resources, advanced manufacturing capabilities, processing potential, strong integration within North American production networks, and an established defence industrial base. Ontario is home to more than 300 defence organizations, employing over 13,000 workers and generating more than \$5 billion in annual revenue, providing a foundation for growth in dual-use and strategic industries.

Gallium, niobium, rare earth elements, cobalt, and tungsten are examples of minerals that are present in Ontario that could help reduce vulnerabilities in the U.S. defence industrial base and allied supply chains. However, projects related to these minerals are at various stages of development and may require advancement to contribute to long-term supply chain resilience objectives.

Strategic implication

Connecting resource development to refining, advanced-material production, alloy manufacturing, battery inputs, traceability systems, and component production would allow Ontario to retain more value while contributing to secure North American supply chains for military mobility, aerospace systems, autonomous platforms, communications equipment, and other dual-use technologies.

4. Ontario's Strategic Position and Ecosystem Readiness

Ontario has significant ecosystem advantages.

Established capabilities in automotive and mobility.

The province's automotive and mobility sector includes nearly 700 automotive suppliers, major global vehicle manufacturers, advanced software expertise, research institutions, testing infrastructure, and commercialization supports. These assets provide capabilities directly relevant to emerging technology markets.

Coordinated supports for innovation.

Ontario's innovation ecosystem is supported by:

- Nine OVIN Regional Technology Development Sites (RTDS).
- Approximately \$70 million invested in testing and commercialization infrastructure.
- More than 100,000 workers in vehicle assembly and parts production.
- Expanding investments in battery manufacturing and advanced manufacturing.
- Established strengths in software-defined systems, artificial intelligence, autonomy, connectivity, and advanced sensing.

The province also supports a large innovation pipeline through research institutions, commercialization networks, technology pilots, and demonstration environments that help firms move technologies from development toward deployment. For example, OVIN's RTDS network includes Area X.O. and the Ontario Tech AVIN Test Centre, both of which have been designated as NATO DIANA test centres, providing firms with access to advanced testing and validation environments for technologies with commercial and strategic applications.

Breadth and depth across the mobility value chain.

Ontario's primary strength is the breadth and diversity of capabilities across the mobility value chain. The province combines advanced manufacturing, software and artificial intelligence, connected and autonomous mobility, battery and electrification technologies, critical mineral resources, world-class research institutions, and specialized testing and validation infrastructure. Together, these assets provide a strong foundation for participation in emerging dual-use technology markets. However, defence-relevant capabilities may not directly equate to defence readiness. Additional validation, testing, security assurance and accreditation may be required.

Opportunities to strengthen the ecosystem.

Stakeholder consultations identified the following opportunities to strengthen Ontario's dual-use ecosystem and accelerate the pathway from technology development to broader market adoption.

Ecosystem Strengths	Ecosystem Areas for Development
✓ Advanced manufacturing	✓ Market access and customer visibility
✓ Software and AI	✓ Qualification and accreditation requirements
✓ Connected and autonomous mobility	✓ Commercial-to-dual-use conversion pathways
✓ Critical minerals and batteries	✓ Supply-chain traceability requirements
✓ Research and commercialization	✓ Scale-up and procurement challenges
✓ Testing and validation infrastructure	✓ Ecosystem connectivity

OVIN's role in supporting dual-use.

OVIN has established a strong foundation to support the growth of Ontario's dual-use ecosystem through its existing network of commercialization programs, testing infrastructure, industry partnerships, and innovation supports. Through its RTDS network, demonstration zones, pilot environments, and technology development programs, OVIN helps SMEs validate, test, and commercialize emerging technologies while building connections with industry partners, researchers, investors, and potential end users.

The recent introduction of OVIN's Defence & Dual-Use R&D stream further expands these supports by encouraging the development and adaptation of technologies with both commercial and strategic applications. Together, these programs provide Ontario companies with opportunities to explore new markets, strengthen product capabilities, demonstrate technologies in operational environments, and identify pathways for applying existing innovations to defence, security, resilience, and other dual-use use cases.

Building on Ontario's strengths in mobility, autonomy, advanced manufacturing, software, sensing, and communications technologies, OVIN's ecosystem can help firms broaden the application of existing products and accelerate their entry into emerging dual-use markets.

5. Opportunities for Ontario

Ontario possesses many of the assets required to support a globally competitive dual-use mobility ecosystem. Its long-term advantage lies not in any single technology, but in its ability to connect existing strengths into a more integrated, scalable, and resilient innovation ecosystem. The following eight strategic opportunities were identified to strengthen these connections and translate Ontario's existing capabilities into competitive advantage:

1. Strengthening Commercial-to-Defence Technology Pathways

Strengthen mechanisms that connect commercially developed technologies with adjacent resilience, security, and strategic applications through testing, validation, customer engagement, and commercialization support. Building on OVIN's existing RTDS network, Ontario can help firms move technologies from research and development through demonstration, validation, and commercialization while identifying opportunities to adapt existing solutions for dual-use applications.

2. Building a Globally Competitive Autonomous Systems Cluster

Leverage Ontario's strengths in artificial intelligence, software development, connected and autonomous vehicles, advanced sensing, and research to strengthen leadership in autonomous systems and intelligent mobility technologies.

Turning Ecosystem Strengths into Competitiveness

Realizing the opportunity will require stronger connections between technology development, commercialization, manufacturing, testing, and market adoption. By strengthening these pathways, Ontario can support innovation, attract investment, expand industrial competitiveness, strengthen trusted supply chains, and increase participation in emerging global markets.

Build on existing strengths in software-defined vehicles, cybersecurity, intelligent infrastructure, connectivity, and embedded software to support next-generation transportation and mobility systems.

4. Leveraging Ontario's Testing and Validation Infrastructure as a Strategic Asset

Position OVIN's RTDS network, demonstration zones, pilot zones, and specialized testing assets as a competitive advantage supporting commercialization, validation, investment attraction, and ecosystem growth.

5. Building Trusted Supply Chains for Strategic Technologies

Use Ontario's manufacturing base, supplier ecosystem, advanced materials capabilities, and integration within North American production networks to support resilient and transparent supply chains.

6. Strengthening Ontario's Critical Minerals and Advanced Materials Advantage

Advance greater value capture through processing, refining, advanced materials production, battery manufacturing, technology development, and commercialization activities linked to critical minerals.

7. Supporting Northern, Remote, and Resilience-Focused Innovation

Leverage Ontario's geography, climate, infrastructure, remote communities, and industrial environments to support innovation in connectivity, emergency response, resilience, mobility, and infrastructure management.

8. Developing an Integrated Dual-Use Mobility Ecosystem

Strengthen connections among research institutions, innovators, manufacturers, investors, commercialization partners, end users, and policymakers to improve technology adoption and long-term ecosystem competitiveness.

6. Disclaimers

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

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