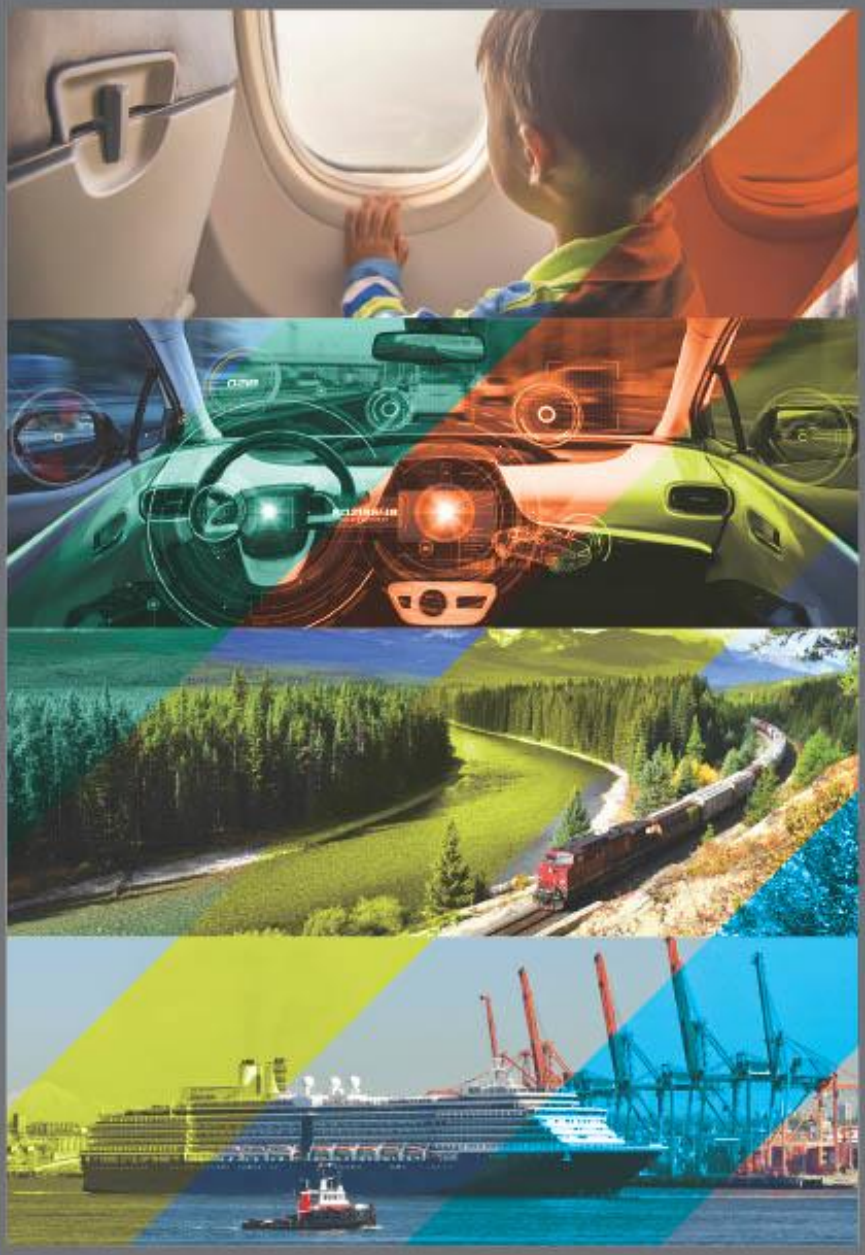
Transportation in Canada 2023

Overview Report



Transport Canada Transports Canada

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MINISTER'S MESSAGE

THE HONOURABLE

PABLO RODRIGUEZ

MINISTER OF TRANSPORT

It has been a busy year for the department, and for me personally since I became Minister in July.

As Canada's aviation sector continued to see an increase in activity since the pandemic, the department took steps to help make sure travellers experienced as little disruption as possible.

One important step was introducing the *Enhancing Transparency and Accountability in the Transportation System Act*. The act would allow us to create regulations that would require airports and other operators within airports to create service standards for their part of the passenger journey and require them to publish their performance against these standards. The act would also introduce changes to the *Canada Transportation Act* to help achieve a barrier-free Canada for people with disabilities.

Another step we took this year was to propose amendments to the *Canada Transportation Act* to improve air passenger rights and simplify the complaint resolution process. We invested $30 million to build a United States preclearance facility at Billy Bishop Toronto City Airport, worked closely with our partners at CATSA to launch a Verified Traveller Program at Canada's major airports, and increased funding for CATSA to reduce delays.

The Aviation Climate Action plan has progressed with the newly launched Sustainable Aviation Task Force, co-lead by Transport Canada and the National Airlines Council of Canada. This task force is dedicated to overseeing and ensuring the implementation of the action plan and is comprised of representatives across all levels of government, academia, industry associations, and non-governmental organizations.

We also announced Canada's first proposed drone safety regulations for beyond visual line-of-sight operations, along with new measures to support commercial space launches in Canada. Through the Safer Skies Initiative, we continue to work with our partners across the globe to improve the safety and security of commercial airlines travelling in, or near conflict zones. And this year we co-hosted the third annual Safer Skies Forum with the Netherlands.

In the marine sector, Transport Canada continued to improve our already world-leading marine safety system. We announced the Green Shipping Corridor Program, which will help accelerate the move to zero- and near-zero emission fuels and technologies. At COP28, we signed an MOU to pursue a green shipping corridor between Canada's West Coast and ports in the United Arab Emirates, Korea, and Japan.

Through Canada's Oceans Protection Plan, we made several investments to help make marine shipping safer, further protect marine ecosystems, and improve how we prevent and respond to marine accidents. We announced funding for the Ballast Water Innovation Program to further reduce the spread of aquatic invasive species in the Great Lakes and St. Lawrence River region. We also funded projects to remove abandoned and wrecked boats in local communities across the country. We

expanded the Marine Training Program to the Western Arctic Marine Training Centre in Hay River, NWT, which will continue to help attract, train, and employ a diverse range of candidates in the marine industry.

We also began work on a new hangar for the National Aerial Surveillance Program in Iqaluit to better support northern operations. Finally, we've continued to formally integrate Indigenous knowledge and expertise into the marine safety system, while making progress toward a more modern and streamlined regulatory regime that meets or exceeds international standards.

Additionally, Regulations Amending the Vessel Operation Restriction Regulations (VORR) were published in the Canada Gazette. Consultations were held in the fall on approaches to modernizing the VORR.

In the rail sector, we continue working on the Lac-Mégantic bypass, with the goal of preventing a similar tragedy from ever happening again. That's why in December, we proposed changes to the *Transportation of Dangerous Goods Regulations,* which will further reduce the risk of accidents across the country. We also launched a mandatory online database for people and organizations involved with dangerous goods, which will give us more current, accurate, and complete information.

Our work on the high frequency rail file also moved forward, as we seek to give Canadians a world-class passenger rail transportation system between Québec City and Toronto. In February, we launched the Request for Qualifications process and, following that, several groups were invited to continue to the next stage of the procurement process, which is the Request for Proposal phase. These will be evaluated later this year, with the winner should be announced in late autumn.

Meanwhile, the multi-billion-dollar National Trade Corridors Fund continued to fund a wide range of projects aimed at improving the strength, efficiency, and resiliency of our supply chains. By making it easier to get raw materials and consumer goods where they need to be, and when, the fund continues to invest in the critical transportation assets that support improvements to Canada's roads, rail, air, and marine shipping routes has advanced critical infrastructure along roads, as well as at ports, railyards, and other transportation hubs from coast to coast to coast. We also launched the National Supply Chain Office in December, meeting a key recommendation of the 2022 report by the Supply Chain Task Force.

Finally, given the ongoing transition away from internal combustion engines and toward zero-emission vehicles, or ZEVs, Transport Canada continued our work reducing barriers to entry, building a comprehensive network of charging stations, and supporting the manufacturing of ZEVs and advanced batteries. We're also offering purchase incentives to help lower the price of ZEVs, and an accelerated tax write-off for businesses. In an additional green move, we announced a binational alternative fuels corridor in May of 2023 between Canada and the United States.

That's a lot of projects completed and underway. For myself, and the excellent people of this department, these steps are only the beginning. Over the coming months we plan to do even more – because there's always room for improvement, and our ambition is to make Canada's transportation network as strong, efficient, and resilient as it can possibly be. Canadians deserve no less.

Sincerely,

The Honourable Pablo Rodriguez

Minister of Transport

HIGHLIGHTS

In 2023, Canada's transportation sector showcased its vital economic role. Despite domestic and international challenges, the sector moved around $1.54 trillion worth of international merchandise trade —an increase of 1.3% from 2022.

Geopolitical tensions, armed conflicts, labour disputes, and climate-related disruptions placed the resiliency of Canada's supply chain on full display in 2023. These external pressures, coupled with relatively high inflation and interest rates, led to marked fluctuations in freight volumes at Canada's ports. Containerized freight volumes (largely imported manufactured goods) declined 14.5%, whereas non-containerized freight volumes (largely exported bulk commodities) increased 8.1%. These forces were particularly impactful at the ports of Vancouver and Prince Rupert, which faced a longshoremen strike and an especially severe wildfire season.

Rail and road networks performed very well amid a challenging operating environment. Rail companies reported a 5.3% increase in transported volumes of bulk commodities like grain and coal. Road transportation also showed resilience, with truck border crossings noting a 1.3% increase compared to the previous year, indicating fluid movement across our land borders – critical for trade with our largest trade partner, the United States.

The passenger air sector continued its post-pandemic recovery trajectory, nearly reaching pre-pandemic demand. Major Canadian airlines carried over 7 million passengers in July, up 13% year-over-year. Air departures in the last quarter approached 98.6% of 2019 levels, reflecting the continued return of international travel.

Canada continues to have one of the safest and most secure transportation systems in the world. Road casualty collisions decreased steadily over the last 10 years, while the number of vehicles on the road increased. In the air sector, 136 accidents involving registered aircraft were recorded – 13% lower than the 5-year average of 157. The rail sector continued its downward trend in the number of accidents, recording 913 accidents in 2023, also 13% below its 5-year average of 1,045.

Canada's transportation sector has also shown notable progress in reducing its environmental impact. In 2021 (the most recent year of complete data), emissions decreased by 11.8% from 2019 levels due to reduced activity resulting from pandemic-related travel restrictions. Within this broader context, the road transportation sector specifically accounted for 118 megatonnes of carbon dioxide equivalent (CO_2e), making up 79% of the sector's emissions and 18% of all national emissions.

In summary, the 2023 performance of Canada's transportation sector showed:

- incremental improvements in some modes, like air,
- adaptability in others, like rail and road, and
- overall resilience in the face of labour and climate-related disruptions

The sector maintained its role as a vital part of supporting economic resilience and keeping Canadians safe, all while reducing overall environmental impacts.

Looking forward, as the fastest-growing commodities are largely oriented towards overseas trade, growth in transportation demand is expected to concentrate on rail and road corridors connecting to major ports in the coming years.

PURPOSE OF THIS REPORT

Transportation is a major contributor to the Canadian economy and plays an important role in the wellness of Canadians. It also supports many industries, including the manufacturing and tourism sectors.

Transportation not only moves finished Canadian goods to domestic and international markets. It also moves materials and goods that Canadian businesses need to operate. Transportation connects people within and between different communities, major urban centres, provinces, territories, and countries.

Canada's vast and sparsely populated territory, and extreme weather conditions, can make it challenging to ensure the safe, secure, and efficient movement of goods and passengers in Canada. In this context, Transport Canada plays a central role in monitoring and reporting on the state of the Canadian transportation system by sharing data and information with the public through this annual report.

The *Canada Transportation Act* of 2007, Subsection 52, requires the Minister of Transport to table this report every year, in both the House of Commons and the Senate. This report provides an overview of transportation in Canada based on the latest information for all modes of transportation (at the time of writing).

This report highlights the role that transportation plays in the economy and summarizes our transportation networks' infrastructure. It describes major developments in the transportation sector during 2023, from efficiency, safety and security, and environmental perspectives.

The report also assesses the Canadian transportation system's performance in 2023 by looking at the system's use and capacity. It ends by looking at upcoming trends in the transportation sector.

In addition to this report, transportation statistics have been produced and are available digitally or to download by contacting the Canadian Centre on Transportation Data (CCTD) or visiting the Transportation Data and Information Hub (TDIH). This data includes information on freight and passenger traffic for each mode, infrastructure and labour statistics, price and productivity indicators, freight trade data by mode and country, reported accidents, and greenhouse gas emissions.

Beyond the report's addendum tables, the hub is an authoritative source for a wide range of Canadian transportation-related data and resources. It offers users access to an extensive collection of transportation statistics and products from Transport Canada, Statistics Canada, and other key partners.

Check back regularly for timely content updates, and new features, like interactive maps and dynamic dashboards.

Supporting the economy

In 2023, the transportation and warehousing sector continued to demonstrate resilience and adaptability in the face of economic challenges. Following a decline in 2021, which mirrored broader economic contractions due to external factors, the sector rebounded impressively in 2022, and further expanded in 2023 by 4.1%.

Specifically, it directly contributed 4.0% to GDP, amounting to $88.5 billion in monetary terms. This underscores the sector's substantial economic footprint and its importance in driving overall economic activity.

LABOUR

In 2023, the sector's unemployment rate remained at 2.8%, the same as in 2022. Although lower than national average of 5.3%, it did not result in comparative wage growth. Average weekly earnings in transportation and warehousing grew by 2.2% in 2023, while they increased by 4.7% on average for all industries.

In general, women are significantly underrepresented in the transportation industry, making up less than 25% of the workforce. Initiatives such as the Marine Training Program prepare underrepresented groups including women, northerners, and Indigenous Peoples to enter rewarding careers in the transportation industry. In 2023, the program provided nearly $30 million to 4 training programs.

According to Employment and Social Development Canada, major gaps between labour demand and supply for some transportation occupations will develop in the next 10 years. Notably, the trucking sector is already experiencing a shortage of over 20,000 drivers with an aging workforce that is older than the national average.

COMPETITIVENESS

The Logistics Performance Index (LPI), developed by The World Bank, serves as a vital tool for benchmarking trade logistics performance globally. In the most recent assessment for 2023, Canada attained the 7th position with a score of 4.0. This marks a significant jump of 10 positions compared to the 2018 report, reflecting Canada's ongoing efforts to enhance its trade logistics efficiency.

Notably, Canada excelled in the "Infrastructure" category, securing the 3rd position globally. This achievement underscores the nation's commitment to maintaining robust infrastructure vital for facilitating smooth trade operations.

Canada's progress in the Logistics Performance Index shows our dedication to improving trade logistics abilities. Moving forward, it's imperative the department continue fostering an environment conducive to improving trade logistics efficiency. This may involve targeted investments and strategic initiatives aimed at addressing identified challenges and further strengthening Canada's position in the global trade landscape.

PRODUCTIVITY

Recently, multifactor productivity (a way of measuring the economy's performance by comparing the amount of goods and services produced (output) to the amount of material used to produce those goods and services) in the transportation and warehousing sector has plateaued. Between 2013 and 2022, multifactor productivity decreased around 3.4% per year, compared to the 0.2% increase for the business sector as a whole.

In contrast, labour productivity in transportation and warehousing decreased over the same period, at an annual rate of 1.3%. That's lower compared to the overall business sector, which increased by 1%. Labour productivity for rail transportation outperformed the business sector with average annual growth rate of 2.4% while air transportation declined by 0.6% over the same period.

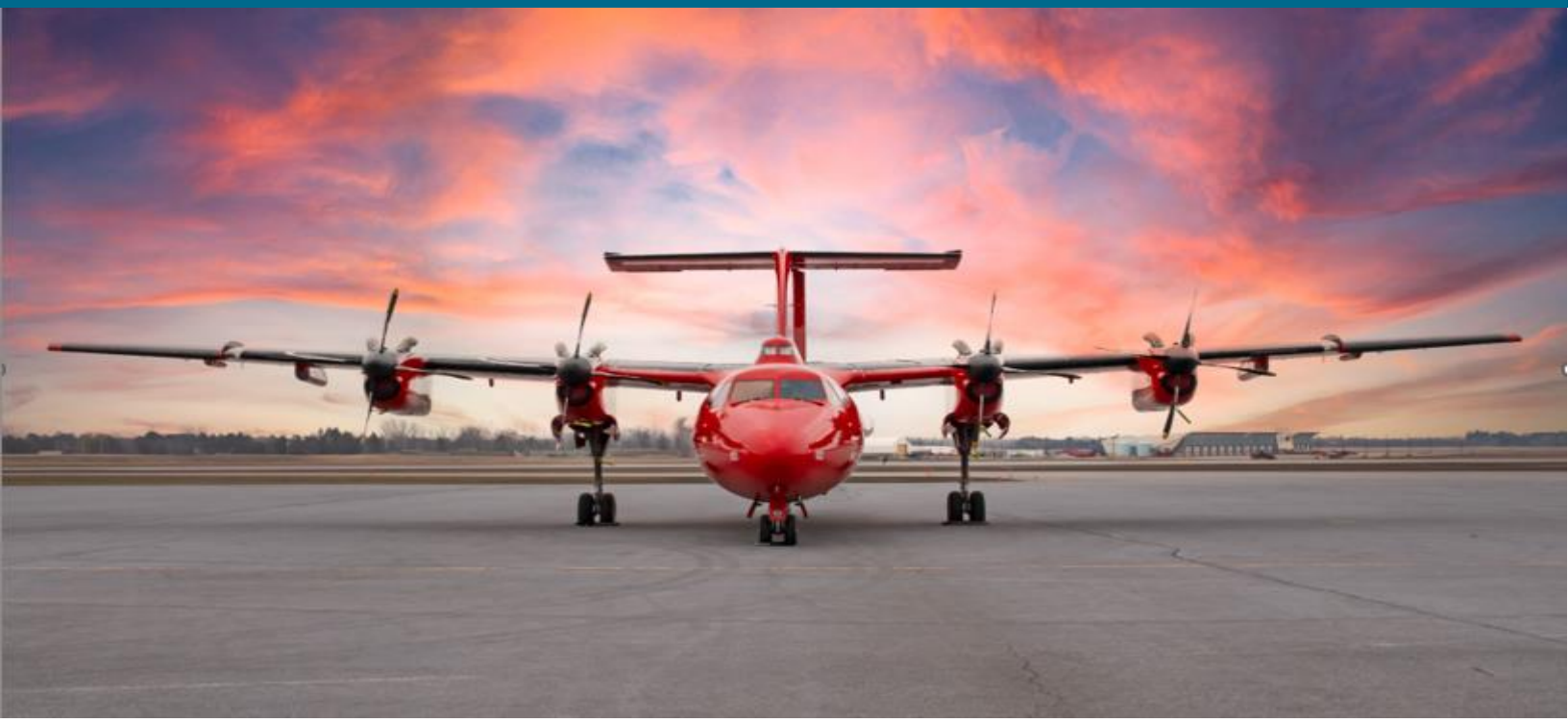
Supporting trade

Canada has 15 free trade agreements in force with 51 countries, representing two-thirds of the global economy. Canada is also the only G7 country to have free trade agreements with every other member of the G7. These agreements connect Canadian businesses to over 1.5 billion consumers around the world.

In 2023, international merchandise trade equaled around $1.54 trillion, a slight 1.3% increase from 2022 and 43.9% higher than 2020 when trade was severely affected by the pandemic. The United States remains Canada's top trading partner, with $1.08 trillion in total trade ($593 billion exported, $484 billion imported), up 4.8% from 2022. The U.S. made up 70.1% of all Canadian trade in 2023.

Excluding the U.S., Canada's top 4 trading partners included China, Japan, Mexico, and the UK. These 4 countries represented 16.0% of Canada's total international trade in 2022.

In 2022, the domestic trade value of interprovincial merchandise totaled $241 billion, up 19.3% from 2020 after a significant drop due to COVID-19.



Air

KEY TRAFFIC AND VOLUME STATISTICS

Canada's air transportation system connects Canada to the world and moves passengers across the country, which spans 6 time zones and covers about 18 million square kilometres.

Canadian airspace is managed by NAV CANADA, a privately run, not-for-profit corporation that owns and operates Canada's civil air navigation system. It operates air traffic control towers at 42 airports and flight service stations (facilities that provide information and services to pilots before, during, and after flights) at 55 airports.

The Canada Flight Supplement and Canada Water Aerodrome Supplement listed 2,012 certified and registered sites in 2022, and 12 other military landing sites. The sites fall into three categories:

- 343 water aerodromes for float and ski planes
- 427 heliports for helicopters, and
- 1,254 land aerodromes for fixed-wing aircraft

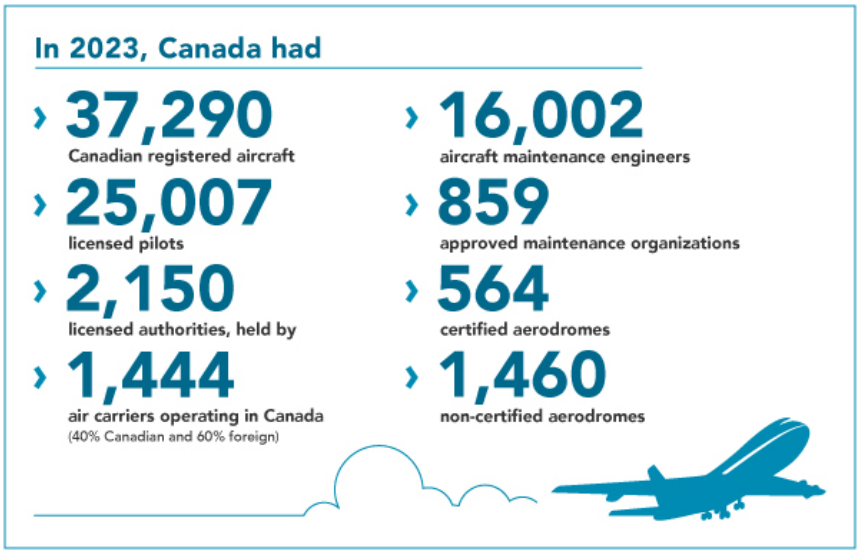


Table 1: Volume highlights from some domestic Canadian airlines

Airline	Highlights
Air Canada	• Accounted for 47% of available seat-kilometres in the domestic air market • Operated an average of 775 scheduled flights per day • Air Canada's fleet of aircraft totaled 206 aircraft for the main line, 115 for Air Canada Jazz, and 40 for Air Canada Rouge
WestJet	• Accounted for 27% of available seat-kilometres in the domestic air market. • WestJet's fleet totalled 129 aircraft, with 47 from WestJet Encore • The airline provides scheduled passenger services to 39 Canadian destinations, 30 U.S., and 42 other foreign destinations
Porter Airlines	• Porter Airlines' fleet of 58 aircraft including 52 Q400 turboprop aircraft, connects passengers to 26 destinations in Canada and 5 in the U.S.
Air Transat	• Air Transat is the largest leisure carrier, with a fleet of 42 aircraft serving 55 international destinations in 26 countries
Sunwing Airlines	• Sunwing Airlines is Canada's second largest leisure operator, with 34 aircraft serving 29 international destinations in 15 countries

COMPETITIVENESS AND EFFICIENCY

Improving Canada's air passenger rights regime

In June 2023, legislative amendments to the *Canada Transportation Act* were approved in the *Budget Implementation Act, 2023, No.1*, to strengthen Canada's air passenger rights regime and increase confidence in our air industry. These changes aim to:

- put the onus on air carriers to compensate passengers unless they can demonstrate otherwise
- streamline the processes for administering air travel complaints before the Canadian Transportation Agency
- increase air carrier accountability, and
- provide the Agency with enhanced enforcement authorities for non-compliance issues with the *Air Passenger Protection Regulations*

Acquisition of Sunwing Vacations and Sunwing Airlines by WestJet Airlines Ltd.

During the year, Transport Canada conducted an extensive public interest assessment of the proposed acquisition of Sunwing (primarily selling vacation packages) by WestJet (the second largest Canadian operator), which included comprehensive consultations with all stakeholders, and review of submissions made by the parties as well as the assessment of the Competition Bureau. The department helped negotiate merger terms and conditions to mitigate some of the public interest concerns raised by the merger, including ensuring connectivity on some routes. The Governor in Council approved the merger in March 2023.

Improving transparency and accountability in air transportation

The department consulted air sector stakeholders in April 2023, on a range of key issues impacting the future of Canada's air transportation system, including airport modernization, coordination, information sharing, service standards, regional connectivity, and labour challenges.

Building on the results of this consultation, in June 2023, the Minister of Transport introduced Bill C-52, which includes a proposed *Air Transportation Accountability Act* that would authorize the creation of air transport service standard regulations for air transport and establish an oversight framework for airports with a primary focus on noise consultations, climate change planning, and diversity.

Air transport agreements

Canada expanded our air transport agreements with several bilateral partners in 2023, in response to growing passenger traffic and trade. Canada's expanded air transport agreements with Ethiopia will permit each country's airlines to operate up to 7 flights per week, enhancing Canada's connectivity to both Ethiopia and Africa. The expansion of Canada's air transport agreements with the United Arab Emirates will now permit each country's airlines to operate up to 14 flights per week, and expanding the Canada-Türkiye air transport agreement will now permit up to 7 cargo flights per week, per country.

With Jordan, Canada expanded our air transport agreement to permit up to 7 flights per week, per country. These 3 expansions significantly enhance Canada's people-to-people and commercial connectivity to the Middle East region. Finally, Canada's expansion of our air transport agreement with Panama offers increased options for travelers and shippers by increasing the number of passenger flights available to each country's airlines to 14 and removing all restrictions on cargo services.

Permanent mission to the International Civil Aviation Organization (ICAO)

Canada played a key role in the global aviation community as a member of the council and as host country to the ICAO. Canada contributed to the organization's work adopting standards and recommended practices and promoting safe, secure, environmentally sustainable, and accessible air travel in collaboration with ICAO Member States.

SAFETY AND SECURITY

Mutual recognition of air cargo security programs

Mutual recognition of air cargo security programs has become increasingly important for Canada's economy as international air cargo volumes rise and international standards are updated. Mutual recognition agreements streamline air cargo movements by reducing costs and eliminating redundant screening processes. While Canada and the U.S. have had a mutual recognition agreement for air cargo on passenger flights in place since 2012. Recent reviews of both countries' air cargo security programs were conducted to consider new international requirements for all-cargo flights.

Consequently, as of November 30, 2023, both countries formally recognized each other's all-cargo security programs as equal. This mutual recognition includes acknowledging screening measures for expedited couriers (like FedEx, UPS), and Canada's *Explosives Detection Dog and Handler Team* certification program (introduced in June 2021 and uses trained detection dogs as an efficient and effective means of screening air cargo). Signing this mutual recognition agreement helps facilitate the smooth movement of Canadian goods through major U.S. airport hubs, enhancing access of Canadian goods to international markets.

Verified traveller program

Transport Canada is always working to improve the air traveller experience while keeping everyone safe. In June 2023, the Canadian Air Transport Security Authority (CATSA), working with TC, launched the Verified Traveller Program which provides approved air travellers with access to faster security screening. The program was first launched at airports in Calgary, Edmonton, Montreal, Toronto, Vancouver, and Winnipeg, and expanded with "peak time" pilots at airports in Halifax and Ottawa in August 2023.

Over time, the program aims to reduce airport crowding by moving approved travellers move efficiently through screening. Approved travellers receive benefits including being able to leave laptops, electronics, and permitted liquids, aerosols, and gels in their carry-on luggage, as well as keeping shoes, belts, and light jackets on while going through screening checkpoints. Travellers who can benefit from this program include members of NEXUS and Global Entry, active members of the Canadian and U.S. military, Canadian and foreign aircrew with valid work ID, and members of the RCMP. Canadians who want to take advantage of these verified traveller lines should consider applying for the NEXUS Program.

Air right touch

In 2023, the government began an initiative to make the airport experience smoother for travellers, from check-in to boarding. Air right touch lets passengers choose to use a self-service, automated, and touchless system for travel. The key feature is creating a digital identity at the start of the trip. This makes it easy for facial recognition technology to verify passengers' IDs at different points in the airport, like when boarding. We will keep working with different airlines, airports, the Canadian Air Transport Security Authority (CATSA), the Canada Border Services Agency (CBSA), and Immigration, Refugees, and Citizenship Canada (IRCC) to make air travel smoother and more convenient while keeping security measures and identity verifications strong.

GREEN TRANSPORTATION

Aviation in Canada is of vital economic importance. Canadians and visitors to the country rely on aviation, as it's the most capable mode of transport to cover Canada's vast distance. Aircraft service is also vital to Northern and remote communities, where it's often the only way to move people and goods. While there are significant benefits to aviation, fossil fuel use in the sector results in greenhouse gas emissions (GHGs). Canada is taking action domestically and internationally to support the use of low-carbon solutions, including sustainable aviation fuels.

ICAO and CORSIA

Transport Canada continues to be actively involved in maintaining the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). The program addresses increases in international aviation emissions by requiring aircraft operators to buy emission units on the open market to offset a portion of their GHG emissions on international flights. This applies to any operator that will emit more than 10,000 tonnes of carbon dioxide emissions on international flights from 2019 to 2035.

In November 2023, Canada participated in ICAO's Third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) where an ambitious Global Framework for aviation fuels was agreed. Canada—along with other ICAO Member States—will work towards reducing aviation's carbon intensity by 5% by 2030 using sustainable aviation fuels and other cleaner energies.

Aviation climate action plan

On September 27, 2022, Canada released its Aviation Climate Action Plan (2022-2030). This plan uses a whole-of-government approach that sets a net-zero vision for aircraft emissions by 2050 and defines key decarbonization measures and activities. These include:

- developing and adopting new green aircraft technologies, like electric and hydrogen powered aircraft
- continuing to improve in air and on the ground operations, and
- using sustainable aviation fuel, which is expected to have the biggest emissions reduction impact, on a life-cycle basis, by 2050

The plan sets out an ambitious goal of 10% sustainable aviation fuel use by 2030 to send a clear signal of the importance of sustainable aviation fuels in emission reductions.

Sustainable aviation task force

In June 2023, Transport Canada and the National Airlines Council of Canada launched and now co-lead a new Sustainable Aviation Task Force, dedicated to overseeing and ensuring the implementation of the Aviation Climate Action Plan. Its membership is made-up of representatives of federal departments, provinces, territories, industry associations, non-governmental organizations, and academia.

Sustainable aviation fuels blueprint for Canada

In 2023, the Sustainable Aviation Task Force began working across government, industry, academia, and non-governmental associations to develop a Sustainable Aviation Fuels Blueprint for Canada. The blueprint's goal is to lay out what is needed from both the public and private sector to make sure that Canada has enough sustainable fuel available to meet the goal of 10% sustainable aviation fuel use by 2030, while also including deployment forecasts for 2040 and 2050. The blueprint will be published by end of summer 2024.

Marine

KEY TRAFFIC AND VOLUME STATISTICS

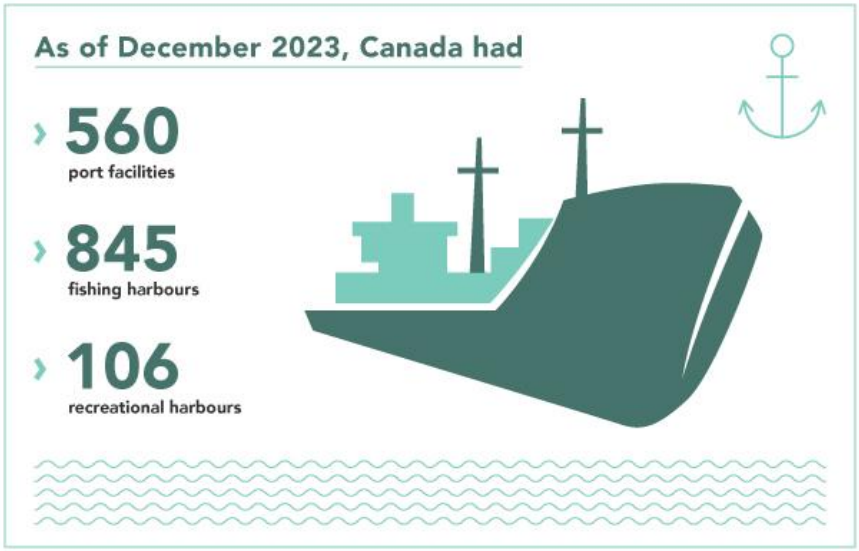
Canadian ports allow Canadian bulk commodities to reach overseas markets, and they are the main point of entry for imported containerized manufactured goods. Ports are also important hubs that connect Canada's coastlines to domestic and U.S. markets where the goods are shipped by railways and trucks.

TC oversees 2 types of ports:

- 17 ports that are independently managed by Canada Port Authorities
- 34 port facilities that we owned and operated

Canadian registered vessels carry around 99% of domestic tonnage. Canadian vessels also support trade between Canada and the U.S. In contrast, foreign registered fleets carry goods to and from non-U.S. destinations.

The domestic marine sector's focus is transporting bulk cargo. The sector is also key to supplying Northern communities and developing offshore resources. In 2023, Canada's Port Authorities oversaw around 351 million tonnes of cargo, an increase of 3.4% from 2022.



In 2023, Canada's commercial registered fleet, which is made up of vessels that weigh 1,000 gross tonnage and above, numbered 210 and boasted a total gross tonnage of around 2.3 million. Of these, cargo ships took the lead with 55 vessels, followed by dry bulk with 40, tankers with 25 and other vessels with 22.

In addition to these commercial vessels, passenger ferries play a crucial role in connecting coastal, island, and remote communities throughout Canada. In 2023, a total of 68 registered ferries operated across the country. Every year, members of the Canadian Ferry Association, which represent all major ferry companies in Canada, transport over 60 million passengers and more than 22 million vehicles.

COMPETITIVENESS AND EFFICIENCY

St. Lawrence Seaway

Transport Canada continues to focus on making sure the St. Lawrence Seaway stays a competitive and sustainable transportation corridor that continues to offer economic opportunities for Canada, seaway users, and all Canadians.

Port modernization review/Bill C-33

The Minister of Transport introduced Bill C-33, *Strengthening the Port System and Railway Safety in Canada Act*, on November 17, 2022. The proposed legislative changes will allow Canadian Port Authorities to better respond to increasingly complex economic, social, and environmental operating environments and stay competitive, efficient, and sustainable. Bill C-33 is currently moving through Parliament.

Bill C-52

The Minister of Transport introduced Bill C-52, *Enhancing Transparency and Accountability in the Transportation System Act*, on June 20, 2023. Part III of the bill would introduce updates to the *Canada Marine Act* that would improve transparency and accountability for Canada Port Authorities.

SAFETY AND SECURITY

In 2023, Transport Canada continued work on the Domestic Vessel Regulatory Oversight Initiative, which is conducting a holistic review of the program and introducing a risk-based oversight model that will incorporate best practices, technology, and align with current government priorities. This work began in 2022 and will continue through to 2027.

We also made good progress on implementing online services. Not only did Transport Canada launch a secure validation website that enabled digital certificates for the marine insurance program, but we also onboarded Medical Examiners to a new online medical hub allowing marine medical reports to be issued digitally. By adopting these new digital methods, Transport Canada was able to offer better service delivery and program integrity to marine stakeholders.

Regulations

On June 23, 2023, Transport Canada announced enhanced mandatory environmental measures for cruise ships to address discharges of greywater and sewage within Canada's territorial waters. These measures are enforced under the *Canada Shipping Act, 2001* and provide stronger protection to Canada's oceans and marine ecosystems.

In addition, 3 proposals for regulatory amendments were pre-published in the Canada Gazette, Part I:

- *Regulations Amending the Small Vessel Regulations (Pleasure Craft Licensing)*
- *Regulations Amending the Administrative Monetary Penalties and Notices (CSA 2001) Regulations*, and
- the *Regulations Amending the Marine Safety Fees Regulations (Vessel Registry Fees)*

Two regulations were also published in the Canada Gazette, Part II:

- the Vessel Construction and Equipment Regulations, and

- Regulations Amending the Vessel Operation Restriction Regulations

Furthermore, we held online consultations in fall 2023 on approaches to modernizing the *Vessel Operation Restriction Regulations* (VORR). We asked for feedback on how local authorities could have more of a direct role in identifying safety and environmental issues on local waterways and putting restrictions in place to address these issues, along with any other potential issues not currently being addressed by the regulations. Results from the consultations will be used to inform upcoming amendments.

Seafarer credentials and fatigue management

In 2023, Transport Canada continued addressing the shortage of seafarers in Canada by streamlining the recognition of seafarer credentials and signing further reciprocal arrangements with the United Kingdom, the Republic of the Philippines, Jamaica, and the Republic of Panama.

Work also continued to address fatigue management in the marine sector. In August 2023, following an assessment of the issues identified by the Transportation Safety Board and consultations with industry and stakeholders, we finalized a report that proposed options to better manage fatigue in the marine sector. In November 2023, this report was delivered and presented at the Standing Committee on Personnel at the Canadian Marine Advisory Council.

Security administration

In 2023, Transport Canada engaged with marine facility operators to discuss the use of ship-to-shore cranes, facilitating an improved mutual understanding of potential cyber security risks and vulnerabilities, and mitigation measures. We also continued to work closely with other federal agencies to administer the Marine Enforcement Plan for the Special Economic Measures Regulations (Russia).

International Maritime Organization

In December 2023, Canada was re-elected by all International Maritime Organization (IMO) Member States to serve on the Council of the International Maritime Organization for the 2024-2025 term. Throughout 2023, Canada worked with other IMO Member States to advance safety, security, and environmental initiatives, including:

- the IMO's new GHG emission strategy adopted in July 2023
- measures to address underwater noise
- ship design and construction standards, and
- incorporating new technologies in the regulatory framework

Canada's continued leadership at the IMO was shown by chairing correspondence groups and committees, including serving as Chair of a working group for IMO Assembly, the IMO's highest governing body.

Canada continued to support the IMO in the creation of an international regulatory framework for the shipping industry that is fair, effective, and universally implemented, by being an active member in auditing and evaluating other Member States.

GREEN TRANSPORTATION

Canada has more coastline than any other country. Canada's marine transportation system connects us with the world – fundamentally underpinning the supply chain. As the world recovers from COVID-19, marine transportation is resurging, creating an urgent need to mitigate impacts, while ensuring supply chain resiliency. Currently, the marine sector is the most efficient mode of moving goods in terms of greenhouse gas emissions per tonne/KM. However, more must be done to make this sector even more efficient as we strive towards zero emissions by 2050.

Public consultations were launched on the draft *Voluntary Guidance for Relevant Authorities on In-Water Cleaning of Vessels*. The voluntary guidance clarifies the recommended best practices that stakeholders can use to manage the risks of cleaning vessels in-water.

Building off momentum where Canada signed the Clydebank Declaration at the 26th Conference of the Parties (COP 26) to the United Nations Framework Convention on Climate Change and the release of the Canadian Green Shipping Corridors Framework at COP 27, Transport Canada launched our Green Shipping Corridor Program at COP 28, in December 2023.

The program, announced in the 2023 federal budget, will:

- help develop green shipping corridors
- spur the launch of next generation clean ships
- support deployment of green technology at ports, and
- help Canadian ports attract low- or zero-emission and low-noise vessels

Transport Canada and the U.S. Department of Transportation also continue to advance the Great Lakes – St. Lawrence Seaway System Green Shipping Corridors Network Initiative. Through this initiative, Canada and the United States are working together to establish green corridors in the Great Lakes and St. Lawrence Seaway, including by convening stakeholders and supporting assessments and analyses in the region. This initiative sets out shared commitments by both Transport Canada and the U.S. Department of Transportation to support the development of green transport infrastructure along the border. This includes managing the Great Lakes and St. Lawrence Seaway for maritime navigation, and work to advance cleaner, sustainable, and renewable fuels for shipping.

Also at COP 28, Canada launched a multi-port and multi-jurisdictional Memorandum of Understanding with more than 10 private sector entities to explore opportunities to develop a green shipping corridor from Canada's west coast to ports in Asia and the Middle East.

In July 2023, Canada joined more that 150 other countries to endorse the adoption of a new International Maritime Organization Greenhouse Gas Strategy, which includes a goal of net-zero greenhouse gas (GHG) emissions from international shipping around 2050, as well as indicative checkpoints for 2030 and 2040 that are close to the Paris Agreement.

The Strategy also calls for new regulatory measures, including a goal-based marine fuel standard and a maritime GHG pollution pricing mechanism, for adoption in 2025. Transport Canada will continue to work with all maritime countries, the marine industry, and domestic partners to develop ambitious and feasible new measures.

Transport Canada is also moving to designate an Emissions Control Area (ECA) in Canadian Arctic waters to reduce emissions of sulphur oxides, nitrogen oxides and particulate matter from the marine sector, consistent with air pollution standards already in place across North America.

OCEANS PROTECTION PLAN

Launched in 2016 and renewed in 2022, the Oceans Protection Plan continues to improve Canada's marine safety and environmental protection system. The plan supports proactive approaches to marine safety and ocean stewardship, while also improving capacity to respond to marine incidents.

Further improving marine safety

In 2023, several statutes were amended to strengthen marine safety, environmental protection, liability and compensation. The *Canada Shipping Act, 2001* was amended to improve how marine emergencies are managed, cover more types of pollutants (like hazardous and noxious substances) in addition to oil, and strengthen compliance and enforcement.

The *Marine Liability Act* was amended to improve the compensation available and expand the amount for future losses after an oil spill for all types of harvesting such as fishing, hunting, and gathering. The *Wrecked, Abandoned or Hazardous Vessels Act* was amended to enable the establishment of a Vessel Remediation Fund to finance activities that will assess, address, and prevent problem vessels from becoming hazards to navigation and local marine environments.

The *Administrative Monetary Penalties and Notices (CSA 2001) Regulations* were also amended to strengthen compliance with and enforcement of marine safety and environmental protection regulations.

In 2023, Transport Canada continued to deliver training sessions in Northern communities for the Enhanced Maritime Situational Awareness (EMSA) system, which is a user-friendly web-based software platform that provides near real-time information. The system is used by Indigenous peoples, coastal communities, and other participants in the marine safety system and is being adopted by industry stakeholders to provide valuable information on vessel traffic, weather and tidal data, and potential pollution events. The system has more than 900 total users, and to date, 90 individual Indigenous communities across Canada benefit from and contribute to the system.

Transport Canada is also improving infrastructure in the Arctic with the addition of the new Aircraft Services Directorate's base in Iqaluit, NU. This new hangar will be used as a base of operations for the National Aerial Surveillance Program (NASP) and will support the NASP team in operating in the Arctic by extending their flying season, allowing the program to operate year-round, as needed. This is making shipping safer, increasing protection for marine species and ecosystems, and improving how we prevent and respond to marine incidents. This hangar was funded through Canada's Oceans Protection Plan

Protecting and restoring marine ecosystems

In 2023, Transport Canada continued to take measures to address abandoned, hazardous, and wrecked vessels in Canada's waterways. We addressed 184 wrecked or abandoned vessels in 2023, removing them from the waterway or otherwise mitigating damage to the ecosystem.

In December, $10.9 million was committed through the Ballast Water Innovation Program to support industry-led projects that address challenges with the installation, operation and maintenance of ballast water technology utilized in the Great Lakes to reduce the risk of the introduction or spread of invasive aquatic species. Transport Canada also advanced work related to research on the cumulative effects of

marine shipping, building an understanding of how best to protect, restore or mitigate negative impacts of marine vessel traffic on marine ecosystems.

Advancing Indigenous partnerships and engaging Canadians

Making sure that Indigenous peoples can meaningfully participate in the marine safety system is a key part of the Oceans Protection Plan. In 2023, the plan took major steps to foster meaningful participation of Indigenous peoples in the marine safety system. Efforts included establishing the Regulatory Roundtable Initiative to deepen collaboration and support an inclusive regulatory development process. Continued collaboration with Pacific North Coast and Central Coast Nations through Reconciliation Framework Agreements further underscored the commitment to ocean management and protection.

We also made progress on the plan's Commitment to Action and Results with the First Nations Fisheries Council of British Columbia by strengthening partnerships in fisheries management. Regional Marine Dialogue Forums provided local engagement opportunities, fostering bilateral collaboration on marine issues. Lastly, the Salish Sea Symposium convened over 500 attendees facilitating dialogue on marine safety and environmental stewardship.

PROTECTING WHALES

In 2023, Transport Canada continued to take action under a renewed Whales Initiative to limit the impacts of increasing vessel traffic on at-risk whale populations, complementing efforts from other federal departments to address threats to marine mammals. Our efforts included both immediate vessel management measures to redirect or slow vessels in whale habitat as well as work on longer-term solutions relating to underwater radiated noise from vessels.

Southern resident killer whales

For a fifth year, Transport Canada put in place measures to protect Southern Resident killer whales, including limits on approaching killer whales, creating interim sanctuary zones and seasonal slowdown areas to reduce acoustic and physical disturbance from vessels on Southern Resident killer whales.

Under the Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation (ECHO) Program, we implemented an inshore lateral displacement in the Strait of Juan de Fuca where vessels

are asked to move south when transiting the known feeding area and vessel slowdowns in Haro Strait, Boundary Pass and at Swiftsure Bank.

North Atlantic right whales

Transport Canada has been implementing mandatory and voluntary vessel traffic management measures in the Gulf of St. Lawrence for the last 7 years to reduce the risk of ship strikes on the North Atlantic right whale, while balancing the safe and efficient movement of people and goods. In 2023, measures were in place from April 19 to November 15. The mandatory speed restrictions have proven very effective, with a 99% compliance rate.

Transport Canada was heavily involved in monitoring right whales in the Gulf through its National Aerial Surveillance Program aircraft as well as using acoustic underwater gliders. Drones and infrared camera technologies were also tested.

Underwater vessel noise management plans (UVNMPs)

Nationally, Transport Canada completed the coordination of an Underwater Vessel Noise Reduction Target Advisory Committee and started addressing the recommendations from the Committee, including two technical contracts to further inform the development of a policy on UVNMPs.

International Maritime Organization

Canada continued our work at the IMO to promote long-term action and initiatives on underwater vessel noise. With support from other IMO member states and organisations, Transport Canada led the work that culminated in the adoption of the *Revised Guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life* in July of 2023.

We also pursued the coordination of the Underwater Radiated Noise (URN) Correspondence Group for a second year, focusing on identifying next steps, including developing an IMO Underwater Radiated Noise Action Plan.

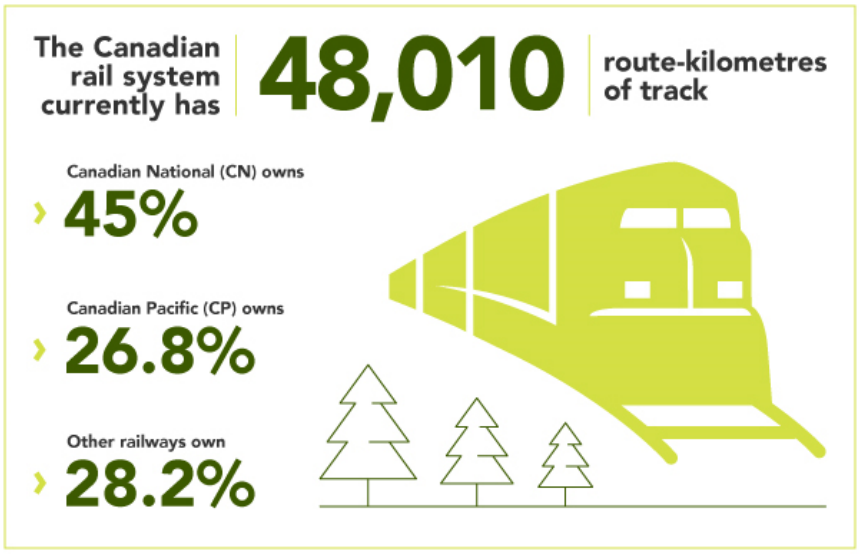
Rail

KEY TRAFFIC AND VOLUME STATISTICS

Rail transportation plays a critical role in serving nearly every sector of the Canadian economy. With an extensive railway system, Canada efficiently moves freight to and from the U.S. and international markets through coastal ports, while also offering numerous passenger lines across the country.

Freight sector

In the freight rail sector, the focus is on transporting heavy, bulk commodities and container traffic over long distances. Canada is home to 2 major Class I freight railways, Canadian National (CN) and Canadian Pacific (CP), which handle most freight rail traffic. Large U.S.-based carriers like the Burlington Northern Santa Fe Railway Company and CSX Transportation Inc. also operate in Canada, facilitating trade between Canada, the U.S., and Mexico.



Together, CN, CP, and Burlington Northern Santa Fe Railway Company link trade routes, with Burlington Northern Santa Fe Railway Company uniquely serving Canada's Pacific Gateway, offering access to the Vancouver Fraser Port Authority—the only port on the West Coast served by 3 Class I railroads.

As of 2022, Class I railway carriers in Canada had 2,121 locomotives, 46,807 freight cars (including hopper cars, boxcars, flatcars, and gondolas), and 393 passenger cars. Moreover, 79 companies hold a Railway Operating Certificate, comprising 26 federal railway companies and 53 local railway companies.

In addition to the Class I railways, federally or provincially regulated shortline railways play a vital role in connecting shippers with Class I railways and other shortlines and ports, facilitating the movement of products across longer distances.

Passenger sector

The passenger rail sector provides commuter, intercity and tourist transportation services. National rail passenger services are mostly provided by VIA Rail on behalf of the Government of Canada. VIA Rail is an independent Crown Corporation created in 1977 that operates Canada's national passenger rail service from coast to coast. It mainly uses tracks owned by freight rail companies.

Most of its services are in central Canada along the Québec-Windsor Corridor. VIA Rail also operates long-haul passenger routes between Toronto-Vancouver and Montréal-Halifax, as well as regional services to destinations such as Jasper, Prince Rupert, Winnipeg, and Churchill. In addition to shortlines that move freight, some also provide passenger rail services or tourism services, like the Rocky Mountaineer Railway.

COMPETITIVENESS AND EFFICIENCY

Amendments to the *Transportation Information Regulations* came into force on April 4, 2023. The new regulations provide for additional geographic dimensions and a broader range of commodities to be reported. Freight rail service and performance information is now updated weekly and is available on the Transportation Data and Information Hub.

The National Supply Chain Task Force's Final Report identified several rail-related recommendations for supporting fluid, integrated, and efficient supply chains. To further examine these recommendations,

Transport Canada initiated a Freight Rail Review in fall 2023 with a lens to make sure the economic framework governing the federal freight rail sector continues to evolve and meets the needs of Canada's supply chains. The Review is focused on four main areas of work, including:

- efficiency and effectiveness of the freight sector
- mandate and powers of the agency
- long-term investment in a robust and resilient network, and
- efficiency and integration of shortlines

Throughout the fall and winter, Transport Canada heard from a diverse set of rail stakeholders, including shippers, shortlines, industry associations, ports, other government departments, and provincial and territorial counterparts as part of the Freight Rail Review. The review is ongoing, and we continue to engage with transportation stakeholders from across Canada in 2024.

The National Supply Chain Task Force recommended that the regulated interswitching distance of 30 km be expanded across Canada to improve the resilience of the rail transportation system. Interswitching is a competitive access measure that allows rail shippers to access an alternate rail carrier at a nearby interchange, at a regulated rate set by the Canadian Transportation Agency. By creating access to an alternate railway, interswitching can create competition between railways that would otherwise not exist.

To this end, the Government of Canada introduced a measure in the 2023 *Budget Implementation Act* to extend the interswitching limit in the Prairie provinces to 160 km for 18 months, starting on September 20, 2023. The Government will be closely monitoring the use of extended interswitching and assessing any supply chain impacts resulting from its implementation, while the time-limited nature and geographic restrictions of the pilot limit the potential for unintended consequences.

In 2023, the Government of Canada continued to work with an external advisor to analyze options to improve passenger rail frequencies, on-time performance and shorten travel times in Southwestern Ontario. Notably, Transport Canada is in the review process of the report, which is aimed at assessing concrete options to enhance passenger service in Southwestern Ontario. The final report was delivered at the end of the fiscal year and will be used to inform next steps on how to improve intercity passenger rail in Southwestern Ontario.

SAFETY AND SECURITY

Duty and rest period rules for railway operating employees

In 2018, the *Railway Safety Act* Review Panel recommended that Transport Canada take a leadership role with respect to fatigue in the railway industry and regulate "prescriptive minimum criteria and non-prescriptive measures based on fatigue science". The *Duty and Rest Period Rules for Railway Operating Employees* were approved on November 25, 2020, came fully into effect for freight railways in May 2023, and will come into effect for passenger railways in November 2024.

The new rules represent a historic improvement over the existing rules, such as placing new limits on the length of a duty period and increasing the length of the minimum rest period between shifts.

Rules respecting track safety

In response to several derailments in 2019-2020, Transport Canada required railway companies to review the *Rules Respecting Track Safety* to include key performance indicators for track analysis, reinforcing crosstie inspection requirements, and granting Transport Canada inspectors access to more track standard information for consistent oversight nationwide. The required changes were implemented in 3 phases. The latest phase came into effect on May 31, 2023, and Transport Canada has now started oversight on the new requirements.

Railway freight and passenger train brake inspection and safety rules

In response to a 2022 recommendation made by the Transportation Safety Board, and following the 2019 fatal train derailment near Field, British Columbia, Transport Canada required the rail industry to revise and strengthen the *Railway Freight and Passenger Train Brake Inspection and Safety Rules*. The primary goal of these measures was to mitigate the inherent risk of uncontrolled movements, fostering nationally consistent standards for enhanced air brake performance. The rules were amended in 2 phases.

- Phase I came into effect on May 1, 2023. It strengthened regular air brake inspection requirements and procedures and introduced a new requirement for railway companies to develop a Train Brake Winter Operating Plan
- Phase II was approved on September 29, 2023, and will come into effect in December 2025

Once in place, they will require railway companies to establish enhanced standards for brake cylinder testing and maintenance of freight cars and allow for the use of new technology-based testing of air brakes performed by automated trackside wheel temperature detectors.

GREEN TRANSPORTATION

Rail transportation makes Canada's transportation network more efficient by reducing congestion and wear-and-tear on roads and highways. A 100-car freight train carrying 10,000 tonnes of goods can replace 300 trucks. Railways can also play an important role in supporting the Government's goal of reducing greenhouse gas emissions by 2030.

Under a series of voluntary agreements with the Railway Association of Canada, Transport Canada has been working with the rail industry to reduce greenhouse gas emissions and track emissions intensity levels through annual reporting. The 2018-2022 version of the agreement set greenhouse gas emissions intensity reduction targets for 2022, including a 6% reduction for Class 1 freight and intercity passenger, and a 3% drop for regional and shortlines.

In December 2023, Transport Canada and the Railway Association of Canada published a renewed agreement for the 2023-2030 period that reflects a shared vision of working toward net-zero emissions by 2050, and includes several areas for collaboration and sustainability milestones.

For example, Class I freight railways will continue to reduce emissions intensity in accordance with their Science Based Targets (SBTi) and have committed to achieve absolute emission reductions by 2030 aligned with SBTi-modeled pathways. Areas of collaboration include working to advance low-carbon fuel use, moving more goods and people by rail where possible, and accelerating the development of advanced net-zero solutions for locomotives.

Also in December 2023, Transport Canada and the U.S. Departments of Energy and Transportation made a joint statement to announce the creation of a Canada-U.S. Rail Decarbonization Task Force. Through

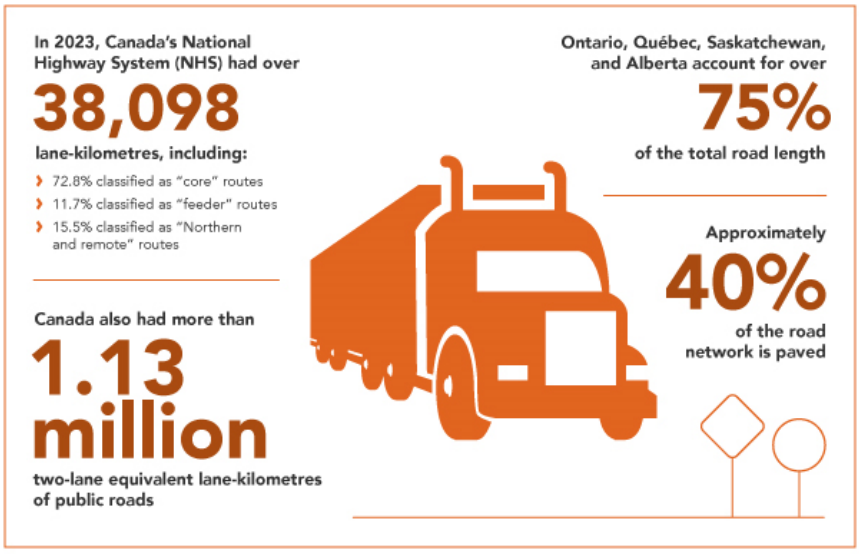
this forum, Canada and the U.S. are working on a joint research agenda to test the safe integration of emerging technologies and coordinating strategies to accelerate the rail sector's safe transition from diesel-powered locomotives to zero-emission technologies.

Road

KEY TRAFFIC AND VOLUME STATISTICS

Roads are the main way we move freight and passengers across Canada. Canada's highways run from the Pacific to Atlantic coasts, anchored by the Trans-Canada Highway. Canada also has large road networks across southern, more populated areas.

In 2022, 26.3 million road motor vehicles were registered in Canada. This is up 0.3% from 2021 and 14.3% from 2013. Around 91.7% were vehicles that weighed less than 4,535 kilograms, mainly passenger automobiles, pickups, SUVs, and minivans. 5.1% were medium and heavy trucks weighing 4,500 kilograms or more. 3.2% were other vehicles such as buses, motorcycles and mopeds.



As of December 2023, there were 146,248 trucking businesses. 54,080 of these companies had employees and 92,168 didn't. The trucking industry includes many small for-hire carriers and owner-operators, and some medium and large for-hire companies that operate fleets of trucks and offer logistic services. Trucking companies are mostly located in Ontario (49.7%), Quebec (14.2%), Alberta (14.6%), and British Columbia (10.4%).

COMPETITIVENESS AND EFFICIENCY

In 2023, the cyclical nature of trucking was evident, with a downturn following the post-pandemic consumer spending boom. Passenger and freight volumes normalized; however, the efficiency of national supply chains and trucking services continued to be impacted, as economy and freight industry adopted to the new normal. Passenger volumes continued to recover well along with the return of

traffic congestion in major cities. Although demand for freight and trucking services was healthy and in-line with previous years, some downward trends in freight demand and freight rates were observed during the year, in part due to inflation, rising interest costs, and overall lower freight demand.

There were 20 merger and acquisition activities, demonstrating a strategic approach to enhancing efficiency, and expanding market reach as an opportunity for future growth.

SAFETY & SECURITY

There has been a significant downward trend in motor vehicle casualties for decades in Canada. Since their peak in the mid-1970s, fatalities have decreased by over two-thirds while serious injuries have declined over 60% even though the number of vehicles and kilometres driven by Canadians have increased significantly.

Over the years, TC has introduced or updated a significant number of vehicle safety standards, regulations, technical standards and test methods concerning vehicle safety features, such as electronic stability control, door lock and door retention, truck anti-lock brakes, steering control systems, head restraints, child restraints, seat anchorage strength, occupant protection in frontal collisions, tires, headlights, rear view mirror visibility, helmet and seatbelt use.

In 2023, TC continued to support the safety and security of the road network with the following initiatives:

- Supported the completion of international guidelines on Functional Safety and Validation Methods for automated driving, and committed to co-sponsoring a new Global Technical Regulation on Automated Driving Systems with international partners through the World Forum for the Harmonization of Vehicle Regulations.
- Advanced research on driver assistance technologies, simulation and scenarios-based approaches for testing automated vehicle technologies to inform future guidance and regulatory work.
- Continued to advance vehicle cyber security by progressing on the priorities set out in Transport Canada's Vehicle Cyber Security Strategy including research on emerging issues, such as supply chain cyber security and automotive cyber talent and skills development.
- Continuation of the school bus safety pilot projects and recommendations from the *Strengthening School Bus Safety in Canada* report from the Task Force on School Bus Safety facilitated the development of the proposed regulations in the *Canada Gazette Part I* published in July 2022. Stakeholder comments on these proposed regulations are being reviewed with a view to publishing final regulations in 2024.
- The Enhanced Road Safety Transfer Payment Program initiated a new call for proposals to support projects that advance road safety innovation from 2023-26. These projects will support nationally consistent road safety objectives (e.g., measures to address impaired and distracted driving, safe use of new vehicle technologies).

GREEN TRANSPORTATION

The Pan-Canadian Framework on Clean Growth and Climate Change committed the federal government to work with provinces, territories, and industry to explore options for retrofitting heavy-duty vehicles with fuel-saving technologies to reduce greenhouse gas emissions.

The Government of Canada released its 2030 Emissions Reduction Plan (ERP) in March 2022, which included several commitments and investments that target emissions from on-road vehicles. In December 2023, the Government of Canada released the 2023 Progress Report on the Emissions Reduction Plan showing Canada's progress on the path laid out in the ERP:

ERP Commitment	Progress Made
Develop zero-emission vehicle sales regulations for both the light-duty vehicle sector and the medium- and heavy-duty vehicle sector.	Final regulations for light-duty vehicles were released in December 2022. Proposed regulations for medium- and heavy-duty vehicles are targeted for Canada Gazette, Part I in 2024. Final regulations are expected in 2025.
Invest $1.7 billion to extend and expand the Incentives for Zero-Emission Vehicles (iZEV) Program for light-duty vehicles for 3 years until March 31, 2025	The Incentives for Zero-Emission Vehicles Program for light-duty vehicles was extended for 3 years until March 31, 2025. The eligibility of several larger vehicles was expanded. Since May 2019, over 330,000 vehicles have been incentivized through the Program. In 2023, Transport Canada made 2 key changes to the Incentives for Zero-Emission Vehicles Program: • a new mandatory pre-eligibility assessment to make the claims review process easier and assure dealerships that individuals/businesses are not going over their incentive caps • expanded the annual limit on incentives received for eligible carsharing companies from 10 per calendar year to 50 following the *Budget 2023* decision

Investing $547.5 million to launch the Incentives for Medium- and Heavy-Duty Zero-Emission Vehicles (iMHZEV) Program	In October 2023, adjustments were made to better ensure program integrity and efficient use of funding towards commercial vehicles. The adjustments include:
	• revised vehicle eligibility criteria to determine if vehicles in classes 2B and 3 are considered commercial vehicles or medium-duty passenger vehicles
	• a new incentive rate of $5,000 for class 2B and 3 medium-duty passenger vehicles
	• $100,000 manufacturer's suggested retail price limit for medium-duty passenger vehicles
	  ○ Vehicles with a retail price below the limit are eligible for the new incentive rate
	  ○ Vehicles with a retail price above the limit are ineligible

Invest $75.8 million to contribute to the safe deployment of medium-	Over $1.3M in contribution funding was approved to gather data on zero-emission truck performance to support the safe deployment of zero-emission trucking technologies. A $1.5 million Trucking Testbed

and heavy-duty zero-emission vehicles on Canadian roads	contract was issued to deploy heavy-duty zero-emission trucks into Canadian commercial freight haul operations. Three Zero-Emission Trucking Workshops were hosted to share information and guide future program activities.
Invest $199.6 million to retrofit large trucks currently on the road.	Two streams of the Green Freight Program have been launched to accept applications for funding: • Stream 1 (December 2022 to March 2027) is accepting applications for fleet energy assessments and retrofits that would result in lower greenhouse gas emissions • Stream 2 (August 2023 to November 2023) accepted applications for projects that repower existing medium- and heavy-duty fleets and offset the incremental cost of new trucks powered by lower carbon fuels
Invest $400 million in support of the Government's objective of adding zero-emission vehicle chargers to Canada's network aided by an additional $500 million from the Canada Infrastructure Bank.	As of June 2023, over 42,000 electric chargers and 16 hydrogen refuelling stations have been selected for funding (over 6,000 have been installed) under the Zero-Emission Vehicle Infrastructure Program (ZEVIP). A continuous intake pilot for Indigenous streams of ZEVIP and Awareness programs was also launched in April 2023.
Investing $2.2 million to support Greening Government fleet electrification commitments.	The proportion of green vehicles in the Government of Canada's light-duty conventional fleet continues to grow. In 2022-23, 14% of the light-duty conventional fleet was green vehicles, up from 10.8% in 2021-2022.

Progress toward these commitments has helped Canada reach a light-duty zero-emission vehicle market share of 11.7% in 2023. This increased from 8.9% in 2022, 5.6% in 2021, and 3.8% in 2020. Similarly, medium- and heavy-duty zero-emission vehicle market share reached 2.1% in 2023. This increased from 0.8% in 2022.

The Government of Canada launched the Zero-Emission Vehicle Council in March 2023 to help decarbonize roads by adopting zero-emission vehicles. This council is helping to track progress towards Canada's zero-emission vehicle sales targets. It provides advice for improving existing zero-emission vehicle policies or finding other measures to pursue. It's a solutions-focused group made up of experts from federal, provincial, and territorial governments, industry, non-governmental organizations, and academia.

The council has chosen three areas to focus on first for light, medium and heavy-duty vehicles:

- affordability
- charging and refueling
- public and industry confidence

A working group has been created for each area. They will look at barriers, opportunities and find practical solutions. So far, working groups have focused on further research, analysis, environmental scanning, engagement on specific topics, sharing information with relevant stakeholders, identifying programs and policies used in other jurisdictions, and piloting specific projects.

Canada and United States have integrated automotive markets. There needs to be a coordinated approach to reducing transportation emissions on roads. Transport Canada launched the Canada-United States Zero-Emission Vehicle Taskforce in February 2023.

The taskforce advances zero-emission vehicle goals shared between Canada and the US. It focuses on key areas of the zero-emission vehicle transition, such as charging and awareness, Indigenous engagement and changing medium- and heavy-duty vehicles to zero emission vehicles. The taskforce has led to creating the first binational alternative fuels corridor between Kalamazoo and Quebec City.

Transportation of dangerous goods

IMPROVING TRANSPORTATION OF DANGEROUS GOODS OVERSIGHT

Transport Canada has continued to oversee improvements to the safe and secure transportation of dangerous goods (TDG). In 2023, 93 inspectors carried out 4,046 inspections and completed 4,980 enforcement actions and risk reduction measures. In comparison, 96 inspectors carried out 3,689 inspections and completed 5,039 enforcement actions in 2022.

RESEARCH PROJECTS AND KEY RESEARCH RESULTS

TC continues to conduct research to inform decision-making in the TDG Program. This includes 23 research projects being initiated with $3.6 million provided through court settlements paid in connection with the tragic 2013 Lac-Mégantic train derailment.

Key research completed by the TDG Program in 2023 included:

- validation of recommended emergency actions for liquefied natural gas (LNG) in the Emergency Response Guidebook (ERG)
- lithium battery testing to support the development of a new classification system for lithium batteries, for inclusion into the UN Model Regulations (publication in progress)
- sustainable practices in industrial explosives packaging (publication in progress)

RESPONDING TO EMERGENCIES

The Canadian Transport Emergency Centre (CANUTEC) continued operating its national advisory service. This helps emergency response personnel handle dangerous goods emergencies at all times. CANUTEC also continued to distribute the Emergency Response Guidebook 2020 to Canadian first responders. This guide is designed for incidents involving dangerous goods on highways or rail lines. It helps first responders identify hazards based on the material involved in an incident and protect themselves and the public during the first response to an incident.

In 2023, the 2024 version of the Emergency Response Guidebook was developed in collaboration with the United States, Mexico, and Argentina. The 2024 Emergency Response Guidebook is now accessible through different channels. There is the option to purchase a physical copy, or get it for free through a PDF download or the mobile app.

RESPONDING TO THE HOUSE OF COMMONS STANDING COMMITTEE ON PUBLIC ACCOUNTS

In November 2020, the Commissioner for the Environment and Sustainable Development released the follow up audit of the Transportation of Dangerous Goods Program and the Canada Energy Regulator. The Commissioner concluded that the program has improved, but that there was still work to be done.

In response, the program committed to addressing the findings, guided by a Management Action Plan to track progress. As of December 2023, 4 out of the 5 recommendations from the audit have been completed, and the TDG program continues to work on the remaining 1.

EXERCISE DYNAMIC RESPONSE

The Transportation of Dangerous Goods Directorate developed and conducted Exercise “Dynamic Response”. This was a large-scale field exercise designed to test the Government of Canada's response to a national security event involving dangerous goods in transport.

The exercise simulated the coordinated response from several organizations, including the RCMP’s National Chemical, Biological, Radiological, Nuclear and Explosives Response Team and municipal first responders. The focus was on using resources from Transportation of Dangerous Goods' Emergency Response Assistance Plan program to help with the response. Over 100 participants from 15 organizations helped make the exercise a success and make the Government of Canada more prepared to respond to such an event.

National supply chain office

On December 1, 2023, the Minister of Transport launched the National Supply Chain Office to strengthen Canada’s transportation supply chains and grow the economy, while contributing to the Government of Canada’s priority to help make life more affordable for Canadians. The Office will:

- examine domestic and international supply chain issues;
- encourage data sharing and using digital tools;
- help government and industry make smarter policy, regulatory, investment and operational decisions;
- develop and implement a National Supply Chain Strategy; and,
- help the federal government respond to major supply chain disruptions.

Freight

The ongoing war in Ukraine, Panama Canal drought restrictions and Red Sea disruptions have generated a great level of uncertainty for Canadian and global supply chains.

In Canada, the past year had slow economic growth, tightening monetary policy and high inflation. Several climate and labour related disruptions also impacted the transportation network. Nova Scotia, Québec, Ontario, the Northwest Territories, Alberta, and British Columbia all experienced devastating wildfires during the summer. These impacted the fluidity of the transportation sector and the movement of key commodities.

Regionally, work stoppages at West Coast Ports (Vancouver and Prince Rupert) and at the St. Lawrence Seaway Management Corporation in Eastern Canada also disrupted the movement of goods domestically, as well as internationally for various transportation stakeholders.

Despite these disruptions, the Canadian transportation system remained resilient throughout 2023 and adapted quickly to meet demand. For example, during the summer wildfires, the network continued to move freight across Canada by road and rail. It adapted as needed to rebuild affected areas of the transportation network.

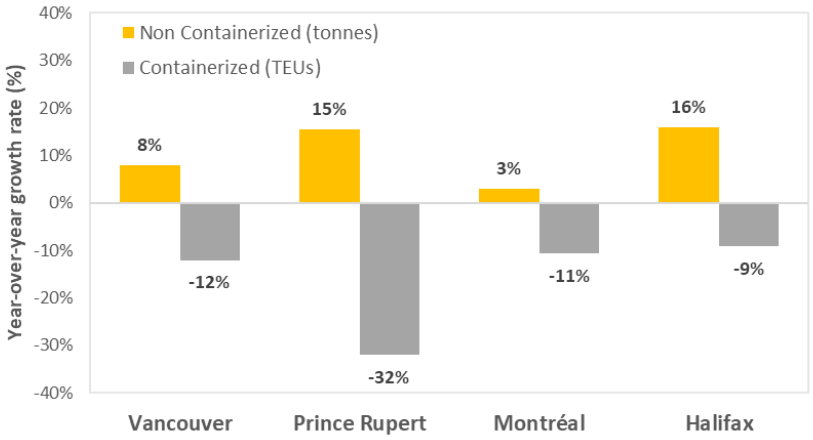
In 2023, volume and performance levels were mixed across the Canadian transportation sector. There was a low volume of commodities sensitive to cycles like imported containerized goods, wood products and crude oil. Rising interest rates impacted consumer spending habits and reduced residential construction. This lowered the demand for containerized goods and wood products respectively.

Demand for crude oil was impacted by weaker than expected demand in Asia, combined with high levels of production in Canada. Demand for the export of certain bulk commodities such as autos, coal and grain remained strong. Demand for vehicle sales remained consistent because of mobility needs. Coal exports were driven by stable demand in Asia. Limited global supplies of grain and recovery of Canadian production after a poor harvest led to strong demand for grain exports.

Softer demand of commodities has contributed to easing overall supply chain pressure. Various transportation performance indicators have returned to pre-pandemic levels, notably schedule integrity and inventory levels at the marine ports, and rail sector productivity and traffic (tonnage). However, some challenges remain. These include low connectivity at Canadian airports and ports, high container dwell times at ports, lower train speeds and higher delays in the rail sector. On the passenger side, performance indicators on international passenger traffic in the air sector have largely returned to pre-pandemic levels.

Marine

Figure 1: Port Volume Growth Rates



Sources: Vancouver Fraser Port Authority, Prince Rupert Port Authority, Montréal Port Authority, Halifax Port Authority.

Containerized throughput (in 20-foot equivalent units – TEU) decreased by 14.5% at the 4 largest Canadian container ports in 2023. This is after a peak during the pandemic caused by a surge in consumer spending. This decrease in demand for containerized goods has also been impacted by the macroeconomic context, namely the high inflation and monetary policy tightening, as well as high inventory levels built by retailers in 2022.

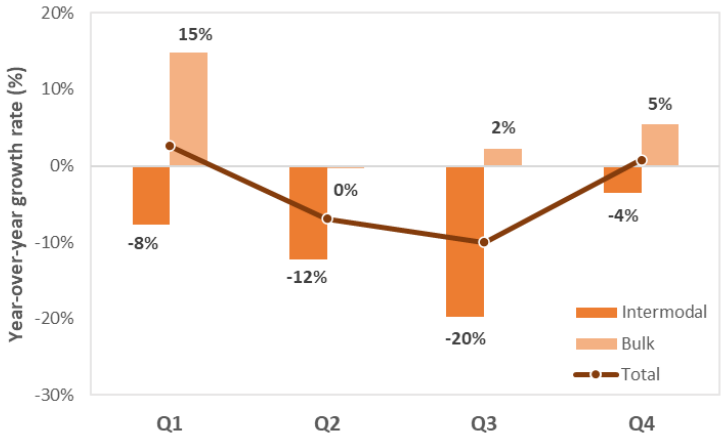
There were also several supply chain disruptions, including the major wildfires across British Columbia and Alberta and the longshoremen strike at West Coast ports in the summer of 2023. These trends and supply chain disruptions impacted Western Canadian ports, a key gateway for marine trade with Asia. This led to a 12.1% decrease of container throughput at the Port of Vancouver, and a large 32% decrease at the port of Prince Rupert.

Eastern Canadian ports are a key entry and exit gateway for marine trade with European, Mediterranean, and Southeast Asian countries. In 2023, the port of Montréal saw a large 10.7% decrease in container throughput. Halifax had a similar 9.2% decrease. The major United States ports of New York-New Jersey, Savannah, Long Beach, and Los Angeles also recorded similar declines in container throughputs in 2023.

While containerized throughput decreased, non-containerized throughputs at the four largest Canadian Ports increased by 8.1% in 2023 compared to 2022. On the West Coast, the Port of Vancouver recorded an increase of 7.8%, mostly from dry bulk such as grain and coal. A large 15.5% increase was observed at the Port of Prince Rupert, also because of an increase in coal and grain. On the East Coast, The Port of Halifax saw a large 15.9% increase of non-containerized throughput, largely based on the growth of liquid bulk commodities. The Port of Montreal had an increase of 2.9%, mostly from growth in crude, fuel, and diesel oil year-over-year.

Rail

Figure 2: Rail Volume Growth Rates



Source: Transport Canada, Class I Railways

In 2023, system-wide rail traffic of Class I Railways was below 2022 levels (-3.6%).

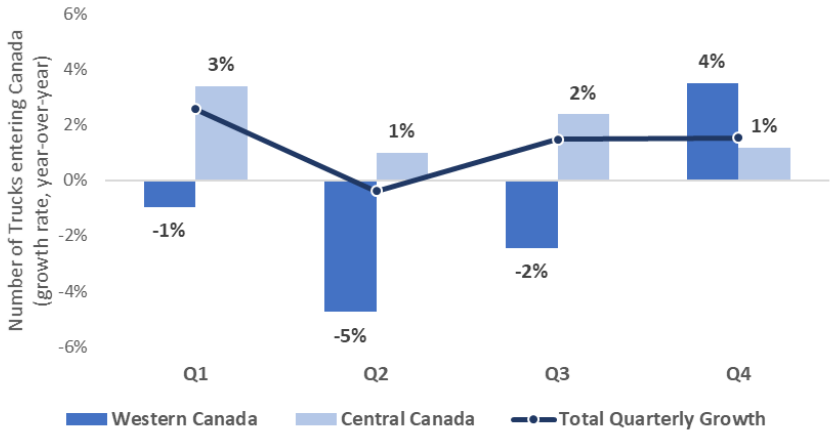
Overall, bulk commodity volumes increased 5.3% in 2023 compared to 2022 thanks to the strong demand for grain and coal exports. In contrast, containerized rail traffic decreased by 11.2% in 2023 compared to 2022, largely because of the macroeconomic context impacting the demand for containerized goods.

The Western Canada rail corridor is the main trade corridor supporting the export of bulk natural resources such as grain, coal and potash to overseas markets and the United States. It also moves imported containerized goods from Asia to Central Canada and the United States.

In 2023, rail shipments to and from Western Canada decreased by -3.1% in 2023 compared to 2022. This was during a longshoremen strike at West Coast ports and the impact of wildfires in several provinces during the summer. In Central Canada, the Greater Toronto Area is the main destination for containerized rail imports from West Coast ports. In 2023, this region had a 3.5% decrease in rail shipments. For Eastern Canada, rail shipments decreased by 4% over the same period.

Road

Figure 3: Trucking Volume Growth Rates (2023 vs 2022)



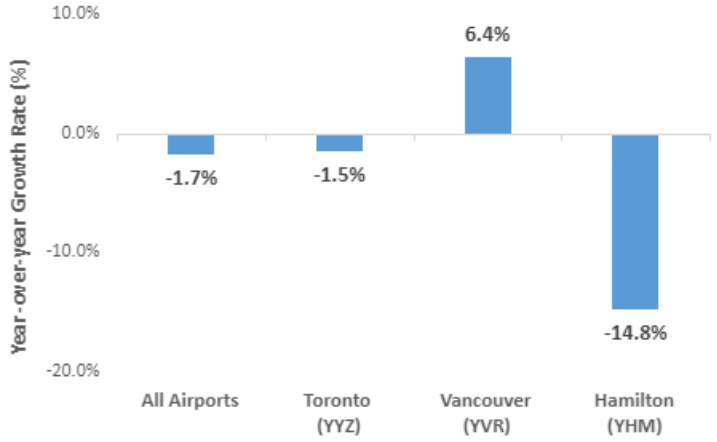
Source: Statistics Canada, Table 24-10-0052-01

In 2023, truck border crossings in Canada increased by 1.3% compared to 2022. Trade by truck to and from the United States is concentrated in Central Canada. The Québec-Windsor corridor remains the busiest trucking corridor. Truck border crossings increased by 2.0% in Central Canada and decreased by 1.3% in Western Canada in 2023 compared to 2022.

Border crossing flows in both directions remained fluid throughout 2023 with an average of 9 minutes for the top 15 busiest crossings. This is about a 2% decrease in wait times overall when comparing to the 3-year historical average. Sarnia and Fort-Erie/Peace Bridge were the only two border crossings that showed an increase in wait times greater than 1 minute in 2023 when compared to the 3-year historical average. They had median border wait times of 12.9 minutes and 15.6 minutes, respectively.

Air cargo

Figure 4: Air Cargo Volume Growth Rates



Source: ECATS

After a strong emergence of e-commerce during the pandemic, softer macroeconomic conditions have slightly reduced overall demand for air cargo in 2023. Airports in Canada oversaw 1.5 million tonnes of cargo loaded and unloaded from domestic and foreign carriers in 2023, a slight 1.7% decrease compared to 2022 volumes.

The 3 busiest airports for air cargo were:

- Toronto Pearson International Airport (423,400 tonnes in 2023, 1.5% less than in 2022)
- Vancouver International Airport (290,400 tonnes in 2023, 6.4% more than in 2022)
- Hamilton International Airport (139,300 tonnes in 2023, a significant change at 14.8% less than in 2022)

Supply chains

CONTAINER SUPPLY CHAIN

The supply chain of import containers improved in fluidity in 2023, largely because of the cooling of macroeconomic conditions. However, it was also challenged by disruptions, notably the longshoremen strike at West Coast ports.

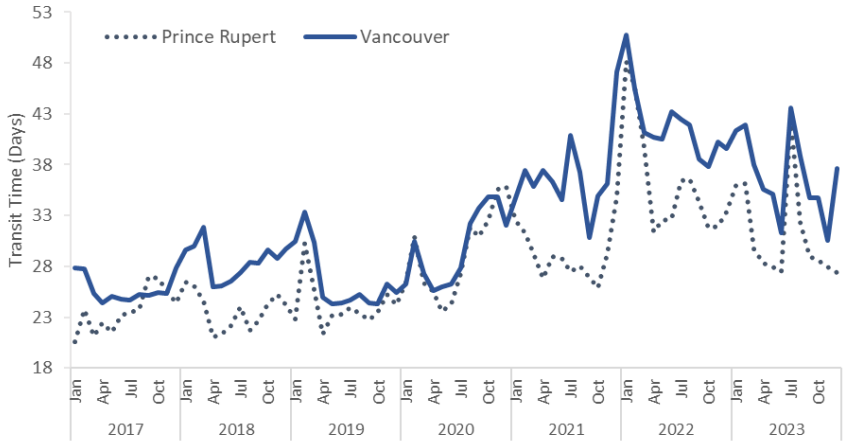
The average end-to-end transit time to import a container from Shanghai to Toronto via West Coast ports improved significantly in 2023 compared to the 2022 levels. However, it remains higher than pre-pandemic levels. On average, the end-to-end transit time for import containers was 35.0 days in 2023. This is lower than the 2022 average (39.9 days) but remains slightly above the 3-year average of 34.7 days.

Transit times peaked in July 2023 during the 13-day longshoremen strike at West Coast Ports in the late summer 2023. Transit times averaged 42.5 days when transiting through the port of Vancouver and 43.62 days through the port of Prince Rupert. The strike stopped vessel unloading and rail activity at the ports. This caused congestion and a backlog of cargo transiting through the port. Despite these challenges, Canadian ports remained time competitive with their U.S. counterparts.

On Canada's East Coast, import container end-to-end transit time from Antwerp to Toronto averaged 21.1 days in 2023. This is slightly below the 3-year average of 21.7 days. Lower import container volumes at East Coast ports also help explain improved end-to-end transit time.

Container freight rates on key Canadian routes have returned to pre-pandemic levels after record peaks at the end of 2021 and beginning of 2022. There is lower demand for import containers and overcapacity of ocean liners. Import container freight rates on the West Coast remained close to pre-pandemic levels throughout 2023. On the East Coast, import container freight rates remained high at the beginning of 2023 and saw a large decrease and hovered close to pre-pandemic levels at the end of 2023.

Figure 5: End-to-end transit time for inbound containers via West Coast ports (Shanghai to Toronto)



Source: Transport Canada, Class 1 Railways, Canadian Port Authorities

GRAIN SUPPLY CHAIN

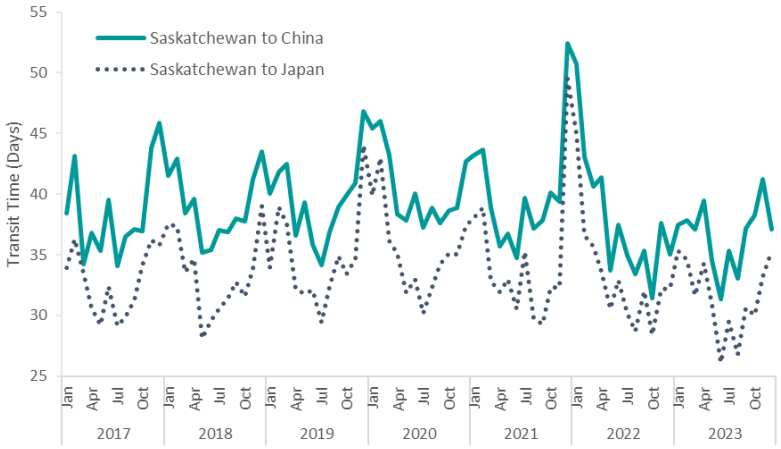
Challenging growing conditions in Western Canada led to a smaller harvest, which led to reduced demand for transportation by rail and truck. The harvest for the 2023-2024 crop year was 67.2 million tonnes, around 10% less than what Western Canada grew in 2022-2023. Shipments from the Prairies were down by 9.7%, and the amount of grain exported from Western ports was 11.8% lower in the first 21 weeks of the 2023-2024 crop year.

Western grain supply chain performance has stayed relatively stable over the last couple of years. There are some seasonal changes, such as transit times peaking during the winter months. It is measured using the end-to-end transit time to ship grain from Saskatchewan to Asia through the Port of Vancouver.

During Winter 2023, transportation performance was not impacted by any major supply chain or weather-related disruptions. This led to similar transit time results from the previous year. End-to-end transit times for grain from Saskatchewan to China via the Port of Vancouver averaged 36.7 days in

2023, slightly below the 3-year average of 39.4 days. For grain going to Japan, the 2023 end-to-end transit time averaged 31.5 days, just below the 3-year average of 34.3 days.

Figure 6: End-to-end transit time for grain from Saskatchewan to Asia via the Port of Vancouver



Source: Transport Canada, Class 1 Railways, Port of Vancouver, Lloyds List intelligence

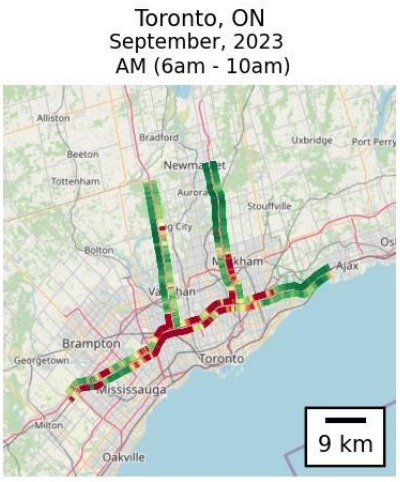
URBAN MOBILITY

The COVID-19 pandemic led to a significant change in commuting behaviour in Canada. Work from home and hybrid working models becoming popular contributed significantly. Road congestion levels varied across urban areas.

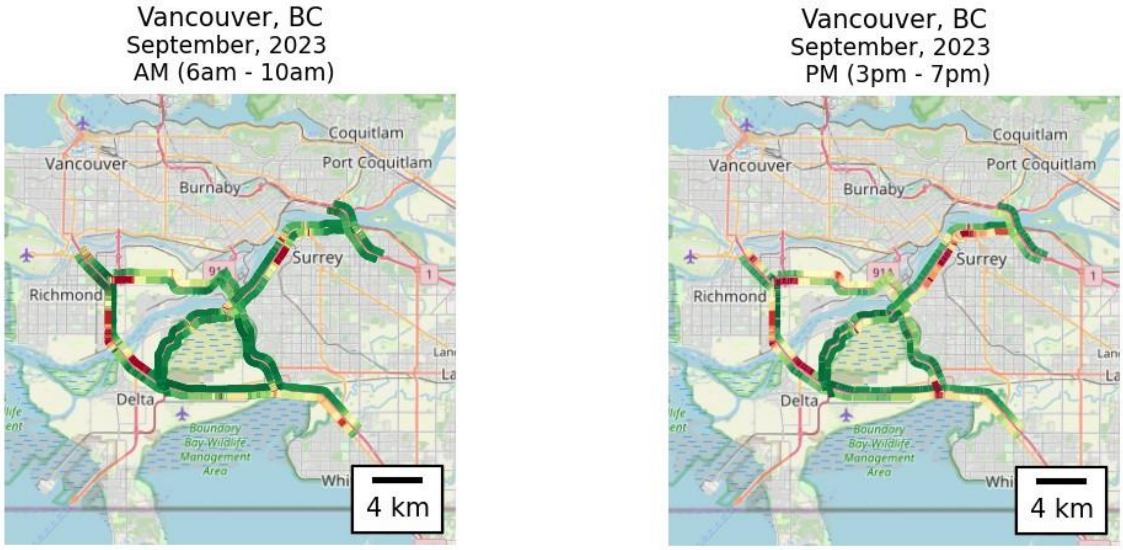
In Montréal, traffic congestion remained steadily above pre pandemic levels last year, with the average 2023 traffic congestion level being 18% higher than in 2019.

In Vancouver, traffic congestion has been mostly below pre-pandemic levels in 2023. The average traffic congestion level in 2023 was 6% lower than in 2019. Traffic congestion has steadily fallen below pre-pandemic levels by 20% in Toronto and 11% in Calgary on average.

Map 3: Monthly Travel Time Index for Toronto (Ontario), Monday-Friday by Peak Period



Map 4: Monthly Travel Time Index for Vancouver (British Columbia), Monday-Friday by Peak Period



Passenger performance

AIR

The air industry has continued to recover from the pandemic in 2023, with the number of passengers in 2023 remaining below pre-pandemic levels:

- 85 million passengers on domestic services (compared to 73 million in 2022),
- 29 million passengers on services between Canada and the U.S. (compared to 21 million in 2022), and
- 39 million passengers on other international services (compared to 27 million in 2022).

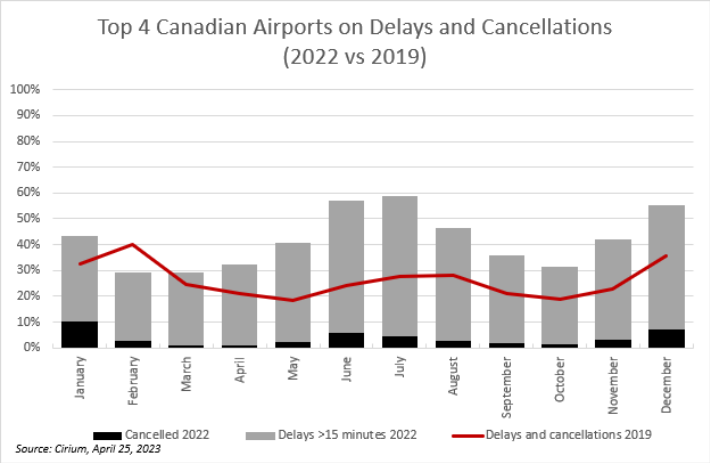
Around 92.7% (142.1 million) of all air passenger traffic was managed at Canada's Top 20 airports. Of those, the top 4 airports oversaw roughly 70.2% (82.4 million) of Canada's total enplaned/deplaned passengers in 2022:

- Toronto Pearson International served 44.9 million passengers, representing 29.3% of national air passenger traffic.
- Vancouver International served 24.3 million passengers, representing 15.9% of national air passenger traffic.
- Montréal-Trudeau International served 21.3 million passengers, representing 13.9% of national air passenger traffic.
- Calgary International served 13.8 million passengers, representing 11.8% of national air passenger traffic.

Flight delays decreased incrementally in 2023. 33.4% of all flights were delayed, compared to 40.7% in 2022. Despite this improvement, the delay rate remained approximately 10% higher than the 2019 average of 24.7%. This could partly be explained by multiple challenges in the air sector in Canada, namely climate-related weather events such as wildfires.

In summer 2023, Canada experienced its worst wildfire season on record, shutting down some airports and affecting operations at others because of smoke causing low visibility. Extreme weather events, such as severe thunderstorms and floods, also caused disruptions.

Figure 7: Top 4 Canadian Airports on Delays and Cancellations (2022 vs 2019)



MARINE

The cruise industry in Canada displayed strong growth in 2023, with around 3.1 million passengers in 2023, compared to 2.2 million passengers in 2022. This growth has put the industry in a strong position and ridership is above pre-pandemic levels (2.7 million in 2019).

RAIL

VIA rail carried 4.1 million passengers in 2022, a 25% increase from the 3.3 million passengers in 2022. Ridership reached 82% of the pre-pandemic level of 5 million in 2019. The Québec City-Windsor corridor was the busiest segment of VIA Rail's network, handling 96% of total passengers in 2022.

ROAD

Passenger counts at Canada's land borders experienced an increase of 33.9% in 2023, with 359,000 passengers entering the country.

The travel time index in the freight section is also a useful indicator of passenger travel performance. The index's values show the changes in traffic and congestion on the urban road network, which is used by both freight and passenger vehicles.

PUBLIC TRANSPORTATION

In 2023, Canada's urban transit networks continued to recover. There were an estimated 1.5 billion total passenger trips taken, up from 1.2 billion in 2022. However, this represents only 77.4% of the total

ridership from 2019. Although typical pre-pandemic activities have resumed, public commuting behaviour is still changed. While Canada's population has grown by almost 2.5 million between 2019 and 2023, there were 426.3 million fewer trips taken in 2023 vs 2019.

Total operating revenues for urban transit networks are improving, with an increase of 25.5% when comparing December 2023 to December 2022. Operating revenues have reached similar levels to 2019 while reporting fewer passenger trips. This is most likely because of cost increases per trip.

Incident and accident rates

AIR

In 2023, there were 136 recorded aviation accidents (under the *Canadian Aviation Regulations*) that involved Canadian-registered aircraft. This is down from a revised total of 139 recorded in 2022. This remains 13% lower than the 5-year average of 157. These accidents resulted in 33 deaths, 9 more than the 24 recorded in 2022.

In 2023, Canada continued to support the flow of legitimate air travellers and goods while keeping a high level of aviation security. The Canadian Air Transport Security Authority screened an estimated 57.6 million passengers in the 2022-2023 period.

MARINE

Canada has a strong record of safe and secure marine shipping. There are relatively few accidents given the thousands of ships that operate in Canadian waters. In 2023, there were 237 marine accidents reported to the Transportation Safety Board. 9 were fatal, resulting in 18 deaths.

RAIL

In 2023, there were around 913 recorded railway accidents. This is down from 2022, and 13% below the 5-year average of 1,045. These accidents resulted in 67 deaths, compared to 65 deaths in 2022. Accidents that involved dangerous goods decreased from 110 in in 2022 to 87 in 2023.

ROAD

In 2022, deaths from road collisions were around 1% lower compared to 2013, despite significant growth in the number of licensed drivers, vehicles registered, and vehicle kilometers driven. Canada's death rate per 10,000 registered motor vehicles was 0.73 in 2022. This rate has been relatively stable in recent years and is significantly lower (-14%) than a decade earlier (2013).

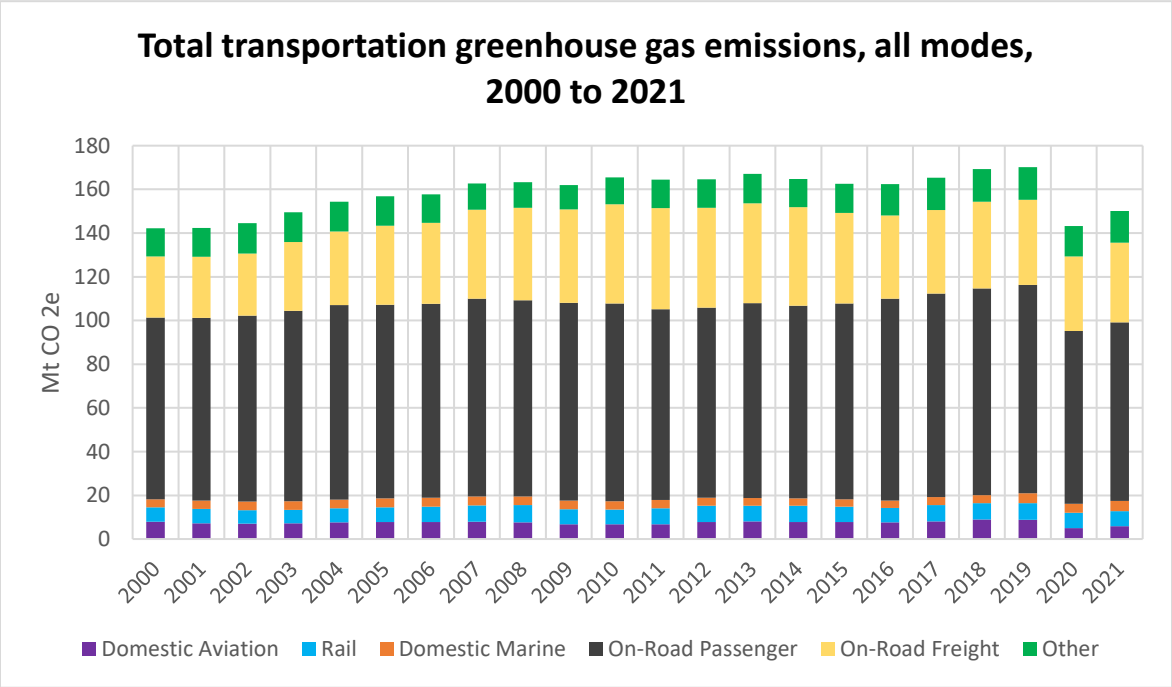
In 2023, manufacturers issued 710 recalls affecting a total of 4,601,253 vehicles, tires, and child car seats in Canada. Of these recalls, 32 (or 4.5%) were influenced by Transport Canada's interactions with manufacturers, affecting 20.5% (941,247) of the total recall population.

Greenhouse gas emissions

Domestic transport-related greenhouse gas emissions have increased by 2.8% from 2010 to 2019. However, they decreased by 11.8.% from 2019 to 2021 because of the COVID-19 pandemic. Canada's National Inventory Report 2000-2021 noted lower emissions for aviation transportation, and higher emissions for marine, rail and road transportation (see Figure).

For the latest historical emissions estimates for Canada, including for transportation, please see Canada's official greenhouse gas inventory.

Figure 8: Total Transportation Greenhouse Gas Emissions, All Modes, 2000 to 2021



The chart shows the total metric tonnes of greenhouse gas emissions, as well as the share of that total across 6 modes (aviation, rail, marine, on-road passenger, on-road freight and other) from the year 2000 to 2021. In 2021, aviation represented 5.83Mt of emissions, rail represented 7.00Mt of emissions, marine represented 4.56Mt of emissions, on-road passenger represented 81.74Mt of emissions and on-road freight represented 36.51Mt of emissions.

Year	Domestic Aviation	Rail	Domestic Marine	On-Road Passenger	On-Road Freight	Other
2000	7.86	6.64	3.74	83.17	27.90	12.93
2001	7.23	6.59	3.83	83.58	27.90	13.22
2002	7.10	6.09	3.92	85.14	28.43	13.81
2003	7.21	6.13	3.98	87.09	31.54	13.60
2004	7.71	6.30	4.07	88.93	33.70	13.59

2005	7.80	6.71	4.16	88.57	36.08	13.48
2006	7.83	7.03	4.10	88.68	36.99	13.02
2007	7.92	7.54	4.07	90.50	40.62	12.00
2008	7.57	7.96	4.01	89.72	42.36	11.60
2009	6.76	6.82	3.95	90.49	42.75	11.26
2010	6.81	6.65	3.88	90.51	45.29	12.36
2011	6.73	7.40	3.77	87.33	46.18	13.01
2012	7.75	7.58	3.66	86.94	45.64	13.05
2013	8.03	7.29	3.52	89.15	45.59	13.53
2014	7.73	7.46	3.40	88.11	45.17	12.83
2015	7.74	7.11	3.27	89.75	41.36	13.36
2016	7.68	6.53	3.45	92.30	38.14	14.28
2017	8.12	7.44	3.64	93.14	38.27	14.77
2018	8.89	7.61	3.66	94.50	39.73	14.93
2019	8.82	7.65	4.49	95.29	38.95	14.96
2020	4.98	7.10	4.02	79.06	34.19	13.87
2021	5.83	7.00	4.56	81.74	36.51	14.48

Source: Environment and Climate Change Canada, National Inventory Report, 2023
Note: Emissions expressed in megatonnes of carbon dioxide equivalent (Mt CO2e)

ROAD

In 2021, the road transportation sector emitted 118 megatonnes of CO2e (carbon dioxide equivalent). This was 79% of Canada's transportation related greenhouse gas emissions, and 18% of all Canadian greenhouse gas emissions.

From 2005 to 2021, greenhouse gas emissions from road transportation decreased by 5%. On-road activity and emissions were significantly reduced in 2021 from 2019 because of the COVID-19 pandemic and related travel restrictions. Despite fuel efficiency gains across all vehicle classes, the increase from 2005 to 2019 is from:

- a growth in passenger and freight activity
- a shift towards more greenhouse gas-intensive transportation, including heavy-duty trucks and larger passenger vehicles (like SUVs and light trucks)

Greenhouse gas emissions from on-road freight vehicles experienced a slight 1% increase between 2005 and 2021, from 36.1 to 36.5 megatonnes. Over the same period, road freight activity, measured in

tonne-kilometres, grew by 16.5%. This shows how important improved fuel efficiency and technology adoption gains are in the sector.

Greenhouse gas emissions from on-road passenger vehicles decreased by 8% between 2005 and 2021, from 89 to 82 megatonnes. Over the same period, road passenger activity measured in vehicle passenger-kilometres increased by about 7%. The decrease in emissions in 2020-21 is because of personal travel reductions related to the COVID-19 pandemic, vehicle fuel efficiency improvements and an increased share of zero-emission vehicles on the road.

Federal regulations have set greenhouse gas emission standards that are getting stricter for both new passenger automobiles and light trucks of model years 2017 to 2026, and new heavy-duty vehicles and engines of model years 2021 to 2027. This builds on existing standards covering earlier model years. In December 2023, the Government released the Electric Vehicle Availability Standard.

This created annual zero-emission vehicle requirements for manufacturers and importers of new light-duty vehicles for the purpose of sale. Requirements include 20% in model year 2026, 60% in model year 2030, and 100% in model year 2035 and beyond. The Government also announced its goal to have 35% of total medium- and heavy-duty vehicle sales to be zero-emission by 2030. It plans to require 100% to be zero-emission by 2040 for a subset of vehicle types based on feasibility.

AIR

In 2021, domestic aviation emitted 5.8 megatonnes of CO2e. This is 3.9% of Canada's transportation-related greenhouse gas emissions. Emissions from air travel have increased since 2005 because of increased air traffic. However, reports note a steady improvement in air carrier emission intensity performance.

RAIL

In 2021, the rail sector emitted 7.0 megatonnes of CO2e. This is 4.7% of domestic transportation-related greenhouse gas emissions.

According to the 2021 annual Locomotive Emissions Monitoring Report, published in 2023, the total greenhouse gas emissions from rail operations in Canada decreased by 2.8% between 2020 and 2021. This decrease was from emission intensity improvements of Class 1 freight railways (1.2% compared to 2020) and less traffic.

In 2021, the COVID-19 pandemic continued to affect greenhouse gas emissions intensities of intercity and commuter passenger railways. This is because of decreased ridership relative to pre-pandemic levels.

MARINE

In 2021, the domestic marine sector in Canada emitted 4.6 megatonnes of CO2e. This is 3.0% of the country's transportation-related greenhouse gas emissions. This is a 9.7% increase in emissions from 2005 to 2021. However, oil discharges from commercial vessels at sea have reduced. This is because of the increased use of regular aerial surveillance, which has made ships more aware that illegal polluting activities can be detected.

The trends and outlook of the Canadian transportation sector will be largely affected by long-term structural drivers.

- changes in demographics
- environment and climate initiatives
- changes in technology

This chapter will take a closer look into these long-term drivers and highlights the importance of understanding the impacts and implications they have on Canada's transportation sector. Furthermore, key factors affecting short-term recovery of the sector are also covered, such the impact of public investment and a shift in demand for transportation services across all modes.

Trends in innovation

Technological advances are significantly changing nearly every sector of the economy, including transportation. Canada is improving the efficiency and safety of its transportation network with emerging technologies to make sure it stays world-class.

The transportation sector is transforming from the rise of electrification, autonomous vehicles, connected infrastructure, and sustainable aviation. Increasing electric vehicle adoption is central to Canada's strategy to reduce greenhouse gas emissions, supported by governmental incentives and investments.

Autonomous vehicle technologies are currently in the testing phase. They're positioned to make travel safer and traffic management more efficient. Connected infrastructure is improving the way vehicles, traffic management systems, and other infrastructure components communicate. This is leading to smarter and data-driven traffic solutions.

Initiatives exploring hydrogen fuel and expanding drone use are part of Canada's commitment to safer, more efficient, and eco-friendly transportation. This shift is complemented by both emerging and established technologies such as advanced driver-assistance systems and expanding electric vehicle infrastructure. These are changing consumer behaviors towards sustainable transportation options.

Digitalization and automation are also key drivers of change. They are rapidly advancing innovation and changing employment and supply chain management. The integration of artificial intelligence and the Internet of Things is improving the intelligence and resilience of infrastructure and logistics. This shift is crucial for adapting to fast-paced technological developments, optimizing systems, increasing productivity, and reducing operational costs.

These advancements provide greater throughput and improved visibility across transportation and trade flows. Artificial intelligence and the Internet of Things are increasingly used in systems management, cargo inspection, and real-time tracking of shipping containers to boost efficiency and transparency. The Government of Canada is playing a vital role by creating an environment for extensive information sharing and collaboration across sectors.

EMERGING INNOVATION TRENDS IN CANADA'S TRANSPORTATION SECTOR

- **Electrification of Transport:** Faster electric vehicle adoption is supported by government incentives and an expanding charging infrastructure. This includes integrating renewable energy sources such as solar and wind power to further reduce the carbon footprint
- **Autonomous, Connected, and Automated Systems:** This trend includes trials of autonomous buses and taxis which make urban mobility safer and more efficient. It also includes automating traffic management and logistics operations. This improves precision and reduces errors. Ongoing policy and regulatory updates ensure safety, efficiency, and equitable access to these technologies
- **Smart Transportation Systems and Internet of Things Integration:** Adopting data-driven and Internet of Things-enabled systems improves traffic management and reduces congestion. These systems improve safety, equity, and accessibility, providing more personalized services. However, there are still challenges related to privacy, data security, and the need for effective public-private partnerships to manage and safeguard data
- **Sustainable and Multimodal Transportation Networks:** Developing networks that allow smooth transitions between different modes of transport. This reduces reliance on personal vehicles and supports environmental sustainability
- **Digitalization of Operations:** This trend includes using advanced artificial intelligence for logistics software optimization, Internet of Things devices for predictive maintenance, and blockchain for secure processing. These technologies improve operational efficiency and security across the transportation sector
- **Enhanced Accessibility through Innovation:** Artificial intelligence and other emerging technologies are being used to create more accessible and smoother journeys, particularly for people with disabilities, seniors and other citizens with unique needs
- **Advanced Air Mobility:** Explorations into drone deliveries and passenger drones are preparing to introduce air mobility solutions into urban transportation networks. This could potentially reduce ground traffic congestion

The way Canada is using technological innovations to improve transportation aligns with other nations, like the United States, United Kingdom, the European Union and Japan. Collaborating with these nations is essential for innovation and addressing modern transportation challenges.

IMPLICATIONS FOR CANADA'S TRANSPORTATION SECTOR

Canada is embracing technological advancements. Both established and emerging technologies have crucial roles. Advanced driver-assistance systems and real-time data applications are now widely accepted. Expanding electric vehicle infrastructure is promoting more sustainable consumer behaviors.

New digital tools increase supply chain efficiency. They optimize service delivery and logistics management by helping to find problems and improve performance across different modes of transportation, including international dimensions. These innovations improve corridor flows and reduce costs. They also help collaboration and reduce safety and environmental risks, changing the entire transportation experience.

Canada's proactive approach to digitalization, automation, electrification, and sustainable aviation needs strong regulatory frameworks and large investments in infrastructure. It also needs more vigilance and stronger security measures to address evolving risks such as cyber-attacks and private and commercial data ownership issues. These technological advancements are also creating new job opportunities in technology. This shows the urgent need for retraining and upskilling programs to prepare the workforce for the future.

With strategic management, this transition can make Canada a global leader in transportation technology. Advancements in operational efficiency and sustainability from transportation innovations can match public policy outcomes to benefit all stakeholders.

Drivers that affect transportation

CHANGING DEMOGRAPHICS

In 2023, Canada had record population growth. The population reached an estimated 40.5 million by end of year, mostly from international migration. The population is expected to increase by more than 2.5 million by 2036. Canada has been leading the G7 countries in population growth for many years.

Most of this growth is in urban centres. The United Nations World Urbanization Prospect predicts that urbanization in Canada will reach 88% in 2050, up from 83% today. This will increase demand for urban travel and the risks of congestion. Higher urban congestion could also raise demand for public transit. According to the TomTom 2023 Traffic Index, Toronto is the most congested city in North America. This is the third highest in the world. It is followed by Vancouver and Winnipeg with congestion levels between 28% and 42%.

The growing population of Canadian seniors will increase the need for more flexible and accessible transportation. In 2036, Statistics Canada expects the population aged 65 and over to reach 24% of the population, up from 19% in 2023.

This will also impact the human resource availability of transportation activities and operations. As the population ages and more workers retire, there will be a smaller supply of skilled professionals to take their place.

GREEN TRANSPORTATION

In 2023, the Government of Canada continued to advance zero-emission vehicle adoption across the country. We committed to implementing zero-emission vehicle regulations in both the light-duty vehicle sector and the medium- and heavy-duty vehicle sector. These regulations will set requirements that increase each year towards having 100% light-duty vehicle zero-emission vehicle sales by 2035 and medium- and heavy-duty zero-emission vehicle sales by 2040 where feasible. The light-duty regulations include targets of at least 20% by 2026 and at least 60% by 2030. Interim targets for the medium- and heavy-duty regulations will be explored for different vehicle segments based on feasibility.

TECHNOLOGICAL ADVANCEMENTS

Canada needs to prepare for a future with emerging and disruptive technologies and new approaches. Connectivity and automation will have major impacts on the transportation sector and the economy. There is exponential growth in the rate of change of technological advancement. Canada must adapt to and apply the benefits of these advancements to improve the efficiency and safety of the transportation sector to keep a world class transportation network.

There have been significant advances in information, communication, and other technologies over the past two decades. These technologies have brought major change to nearly every sector of the economy, including transportation.

New technologies are being used for transportation infrastructure, equipment, and supply chain management to make them smarter and more efficient. Changes like ride sharing and “last mile” delivery services have changed both how and where transportation occurs and will continue to disrupt transportation.

This trend is not slowing down. It’s likely to speed up as the public and private sector adjust to new ways of working. Changes in technology and innovation will impact both demand and supply of transportation. Major upcoming disruptions include:

- recent technology (cloud logistics, internet of things)
- emerging technology (artificial intelligence, advanced analytics, blockchain)
- advanced technology (automated vehicles, robotics)

These innovations could improve corridor flows, reduce costs, help with collaboration, and reduce safety and environmental impacts. They could change the origin and destination of shipments, and the nature of transportation services.

Digitalization is also playing an important role in Transport Canada’s technological advance. This is shown in the Government of Canada’s announcement to launch a new digital infrastructure initiative to strengthen Canada’s Supply Chains. This initiative would form an important part of Canada’s National Supply Chain Strategy. It would improve the efficiency and resiliency of Canada’s supply chain by:

- making it easier to plan and coordinate transportation activities
    - This can reduce slowdowns, reduce congestion and be more resilient to disruptions by collecting and sharing data and analytics in real time
- supporting industry-driven approaches to digital solutions, especially in data collection, coordination, and improving the visibility of the transportation network for carriers, shippers and governments
- supporting evidence-based decision-making to optimize existing networks and better plan infrastructure investments

Recovery

AIR PASSENGER RECOVERY

Demand almost recovered from pre-Covid levels in 2023. In July, major Canadian airlines carried over 7 million passengers for the first time since the start of the COVID-19 pandemic (up 13% year over year). Departures by air in the last 3 months of 2023 were stable and approached 2019 levels (98.6%).

Domestic recovery was uneven, affecting remote and rural communities. Every province and territory has lost regional connectivity since the pandemic. This has been made worse by a global pilot shortage.

The Airport Recovery Operations Committee was established in May 2022 to identify and reduce slowdowns in the air transportation system. It continues to meet regularly to advance air sector recovery efforts. In 2023, the Committee worked to support better security screening wait times, on-time performance for flight cancellations and delays, communications with passengers, and stakeholder coordination during extreme weather and peak travel periods.

AIR PASSENGER TRAFFIC SHOWS RESILIENCY

In 2023, the number of passengers travelling by air was up 27% from 2022. This is about 6% below pre-pandemic levels. The number of passengers travelling internationally was above 2019 levels, followed by those travelling within Canada, and finally to or from United States. Global air travel demand has continued to grow during economic slowdown and geopolitical tensions.

Air passenger volumes are expected to recover to 2019 levels later in 2024. This is supported by strength in the international sector. Downside risks remain from higher costs of living in the short term, higher borrowing costs, changes in travel behavior, and industry supply-side concerns. Supported by the remnants of pent-up demand, the resilience of leisure travel continues to be an upside risk.

Over the next 20 years, air travel is likely to go back to its long-term relation to economic activity. However, there are still uncertainties. Borrowing costs could slow down fleet renewal, combined with the effects of environmental protection goals, other regulatory environment, and technological innovation.

FREIGHT RECOVERY

The freight sector in 2023 faced different challenges and opportunities affected recovery. Post-pandemic consumer spending and a large surge in demand for goods changed to a more stable environment influenced by global macroeconomic factors. While certain sectors such as the automotive industry have maintained their post-pandemic demand, the freight sector continues to face global supply chain issues and economic uncertainty.

High inflation rates and tightened spending affected consumer consumption patterns, reducing demand for imports and overall demand for freight transportation. Geopolitical conflicts also affect the demand for specific industries – particularly energy products, as the Ukraine-Russia conflict continues.

The long-term outlook for freight transportation is good. Growth is expected to return as global economic conditions evolve. Advancements in digitalization, data analytics, and smart infrastructure reduce costs through increased fright efficiency, oversight, and management. Factors like climate

change and sustainability are also changing freight transportation and suggest broader long-term transformation in the years to come.

Demand growth and outlook

The outlook for freight transportation services is a direct result of the outlook of supply and use of goods in Canada. We need to know the outlook for key sectors of the economy to understand the outlook for demand of transportation services.

Population growth and rising incomes in emerging markets will cause increasing demand for Canada's agricultural products abroad. Moderate domestic population growth will drive continued household demand for domestic shipments and imports of construction materials and consumer goods. Direct impacts of climate change and climate change policies will cause limited growth in exports and domestic use of forestry and fossil fuel products. However, climate change action and new technologies are significant opportunities for Canada's critical minerals and alternative fuels exports.

As the fastest growing commodities are mostly for overseas trade, transportation demand growth will focus on rail and road corridors connecting to major ports. Sustained increase in domestic commodities will still cause modest growth of inter-regional highways.

Figure 9. Transportation demand growth 2024-2034

High	Moderate	Low
Fertilizer	Consumer goods	Pulp and paper
Grain and oilseeds	Construction metals and minerals	Wood products
Critical minerals	Steel making coal	Refined fossil fuels
Hydrogen and feedstock	Automotives	Crude oil