



TRANSPORTING QUÉBEC TOWARDS MODERNITY

SUSTAINABLE MOBILITY POLICY - 2030

Maritime Transport
Intervention Framework

This publication was prepared by the Direction générale de la Politique de mobilité durable et de l'Électrification and edited by the Direction des communications of the ministère des Transports.

The content of this publication can be found on the Ministère's website at the following address: www.transports.gouv.qc.ca.

Cette publication est également disponible en français sous le titre Politique de mobilité durable – 2030 - *Cadre d'intervention en transport maritime*.

For more information, you can:

- dial 511 (in Québec) or 1-888-355-0511 (elsewhere in North America)
- visit the website of the ministère des Transports at www.transports.gouv.qc.ca.
- write to: Direction des communications
Ministère des Transports
500, boul. René-Lévesque Ouest, bureau 4.010
Montréal (Québec) H2Z 1W7

© Gouvernement du Québec, ministère des Transports, 2019

ISBN 978-2-550-83413-7 (PDF)

(Original edition: ISBN 978-2-550-81193-0 [PDF])

Legal deposit – 2019

Bibliothèque et Archives nationales du Québec

All rights reserved. Translation of any part of this document or reproduction by any means, in whole or in part, for commercial purposes is prohibited without written permission from Les Publications du Québec.

1. Maritime Transport in Québec

This document is an integral part of the Sustainable Mobility Policy to 2030. It presents an overall portrait of the maritime transport sector in Québec, its issues and all measures related to the 2018-2023 Maritime Transport Action Plan. The most promising and cross-sectional measures in this sectoral action plan also appear in the Sustainable Mobility Policy Comprehensive Action Plan.

The Maritime Transport Intervention Framework is a key component of the Sustainable Mobility Policy vision: in 2030, Québec will be a North American leader in 21st-century sustainable and integrated mobility. In a territory planned with a view to sustainable mobility, it will have a high-performance, safe, connected and low-carbon transport ecosystem that contributes to Québec's prosperity and meets the needs of people and businesses.

Current Situation

Maritime transport and its related services in the St. Lawrence River–Great Lakes trade corridor are essential to the operation and prosperity of the Québec economy, for both internal trade (home trade, service to remote and isolated regions) and external trade (imports and exports). Maritime passenger transportation is as important as trade in goods, as it plays an important part in the public services plan (ferry services) and tourism (excursion cruises, international cruises). Between 110 and 120 million tons of goods pass through Québec's ports each year, and various ferry services transport over five million passengers. International cruises make about 350 stopovers and carry 261,000 passengers annually. According to the June 5, 2017, newsletter published by the Système d'information maritime¹ (SIM), in 2016, the number of vessel voyages on the St. Lawrence River to the seaway was 987. Eastbound voyages, that is, from the seaway downstream, numbered 983 in 2016.

From an economic and social point of view, the 3,700-km St. Lawrence–Great Lakes trade corridor, 1,200 km of which are in Québec, constitutes the main gateway to the industrial and demographic heart of North America. The area crossed by this corridor is the fourth most important economic area in North America, after California, Texas and New York, and it accommodates almost 45% of the international goods trade in Canada. For all regions of Québec combined, the maritime transport industry represents 27,000 jobs (direct, indirect and induced), 366 businesses, \$2.3 billion towards the gross domestic product (GDP), \$1 billion in salaries and \$680 million in tax income².

The Importance of Maritime Transport for Sustainable Mobility in Québec

The St. Lawrence River and its navigable tributaries cross through many parts of Québec and provide extraordinary mobility corridors for passengers and freight.

¹ http://www.st-laurent.org/wp-content/uploads/2016/06/SIM_bulletin-juin-2017.pdf.

² Étude de l'impact économique de l'industrie maritime au Québec, SODES, 2012.

> **Passenger transportation**

Ferry and river shuttle services connect two shores quickly and avoid long detours on the roads (Figure 1). In combination with road transportation, they enhance the fluidity of transportation, save time and money for users, help unclog the road network and promote more energy-efficient or active types of transportation. For example, a user may get to a ferry or shuttle using one mode of transportation (bicycle, car) and then continue by bus, bike path or on foot.

Example of the maritime sector's contribution to sustainable mobility

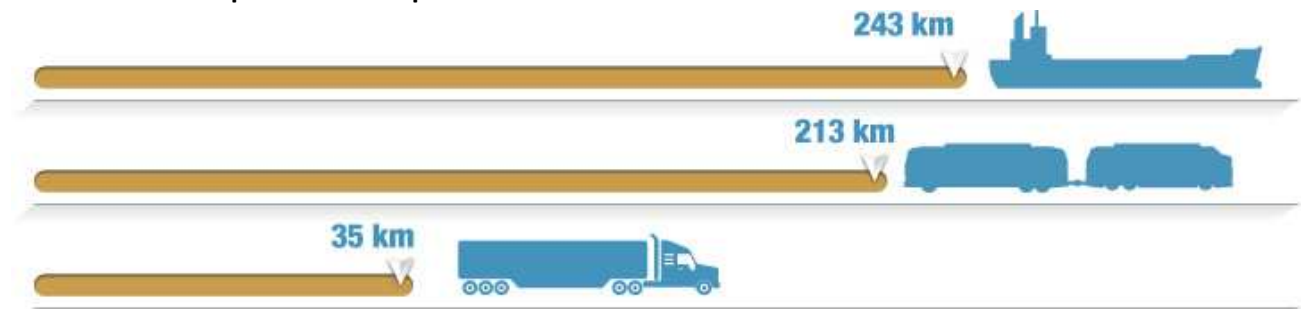
The private ferry service offered between Trois-Pistoles and Les Escoumins provides a good example of the contribution that maritime transport makes to interregional mobility for passengers and freight. This link offers a faster, more economical option for users and allows them to avoid long detours by road.

The service also reduces greenhouse gas emissions because users no longer have to drive long distances to get to their destination. Without this service, they would use another ferry service or drive further, or both. The 11,000 vehicles that embark would have driven hundreds of thousands of kilometres. This example helps depict the tens of millions of kilometres on the roads that passengers who use ferry and river shuttle services would have driven.

Figure 2: Environmental advantages of freight shortsea shipping compared to train and truck transport
CO2 emissions en grams per metric tons per km



Distance traveled per metric ton per liter of fuel



Freight equivalents



Based on the maximum carrying capacity of Seaway-size vessel

Taken from: Research and Traffic Group and the Chamber Marine Commerce (2013). Environmental and Social Impacts of Marine Transport in the Great Lakes-St. Lawrence Seaway Region.

In the current competitive landscape in North America, there is reason to preserve and reinforce the competitiveness of maritime transport and the St. Lawrence–Great Lakes trade corridor and the overland networks that support it and allow it to serve a vast area that includes Ontario, the American Midwest and the north-eastern United States. The Port of Montréal is the hub of an international multimodal chain of primary importance. It boasts high-quality infrastructures, effective handling services and high-performance pre- and post-delivery ferry and road networks.

The SODES has produced economic information documents that provide an overview of the beneficial effects of the maritime industry for Québec and its regions⁵.

Changes in container traffic at the Port of Montréal

In the last 50 years, nearly 35 million TEU (twenty-foot equivalent unit) containers have passed through the port facilities in Montréal. The growth of this type of traffic has been remarkable.

- In 1967, over **11,300 TEUs** were handled.
- In 2016, **1,447,566 TEUs** were transported by six maritime lines serving Montréal.

The Gouvernement du Québec's Role in Maritime Transport

Despite the federal government's predominant role in maritime infrastructures, including the ports on the St. Lawrence and the Seaway itself, navigation services and the legislative and regulatory framework, the gouvernement du Québec is taking greater and greater leadership and responsibility in this sector through its economic and social missions.

Québec's engagement in this means of transportation was recently reinforced with the adoption of the Maritime Strategy⁶, which offers guidelines and actions that are mainly (but not exclusively) related to maritime transport: the financing of port infrastructures and interfaces with overland networks, the creation of logistics hubs for the ports, support for the development of industrial port zones and support for the development of shortsea shipping. As part of the same process, the gouvernement du Québec established the Programme de soutien aux investissements dans les infrastructures de transport maritime (PSIITM – maritime transport infrastructure investment support program), with a budget of \$200 million for 2015-2020⁷.

⁵ <http://www.st-laurent.org/bim/wp-content/uploads/sites/3/2015/04/Fiche-économie.pdf>.

⁶ <https://strategiemaritime.gouv.qc.ca/en/>.

⁷ <https://www.transports.gouv.qc.ca/fr/aide-finan/programmes-aide/Pages/Programme-soutien-investissements-infrastructures-transport-maritime.aspx>.

Québec Maritime Strategy and Policy

In the early 2000s, the gouvernement du Québec adopted guidelines and action plans for maritime transport. The Maritime and River Transport Policy (2001) and, more recently, the Maritime Strategy (2015) outlined guidelines and means to support this important sector. These two initiatives also report on the role of the maritime sector with regard to sustainable development objectives. The 2001 policy mentioned the high energy efficiency of maritime transport and its potential for reducing the social and environmental impacts of heavy road traffic, especially in terms of road safety. To support the crucial collaboration of the industry stakeholders in the implementation of these policies, a collaborative forum was set up and is still active. To make the proposed actions a reality, financial assistance programs were launched, campaigns were held to promote maritime transport and research and training support was suggested.

The 2015 Maritime Strategy is an integrated approach that leverages the St. Lawrence River to boost the Québec economy while protecting the maritime territory and its ecosystems and safeguarding the wellbeing of the communities. To this end, three orientations were retained, including areas related to the sustainable development of maritime transport:

1. Develop the maritime economy sustainably:

- Invest in infrastructures
- Create logistics hubs
- Develop industrial port areas
- Develop shortsea shipping
- Develop and modernize maritime tourism
- Train qualified workers and develop their competencies
- Encourage the development of maritime knowledge
- Promote Québec's maritime industries internationally

2. Protect the maritime territory and its ecosystems:

- Protect the biodiversity of fresh and salt water ecosystems
- Improve maritime transport risk management
- Contribute to the battle against climate change

3. Improve the quality of life of local residents:

- Stimulate local economic benefits
- Improve the ferry service and the opening-up of the communities in question
- Promote the social acceptability and engagement of the communities
- Foster the attraction and retention of young people
- Fight coastal erosion and support the affected communities

The ministère des Transports, de la Mobilité durable et de l'Électrification des transports (MTMDET) is in continuous discussions with the maritime industry and holds more formal talks in the meetings of the maritime transport collaborative forum, which is co-chaired by the Ministry for Maritime Affairs and the SODES Board of Directors. It maintains close channels of communication with the appropriate federal institutions (Transport Canada, Fisheries and Oceans Canada, Canadian Coast Guard) at the regional and national levels. The MTMDET defends Québec's interests in maritime transport, particularly when federal legislative and regulatory initiatives are put forward, expressing its opinions and requests. It also legislates on passenger safety where the federal regulations are inadequate, that is, certain categories of excursion cruises for others and ferry services (Regulation respecting the transport of passengers by water, enacted by the Commission des transports du Québec [CTQ]).

Sustainable Development of Navigation Activities on the St. Lawrence River

The Navigation Coordination Committee (NCC), established in 1998, is co-chaired by representatives of Transport Canada and the ministère des Transports, de la Mobilité durable et de l'Électrification des transports. This committee is made up of 25 members from various Québec and Canadian government departments, maritime industry and pleasure cruising associations, and environmental groups. Its purpose is to align commercial and recreational navigation practices with the protection of ecosystems. In 2012, the members of the NCC published a second edition of their Sustainable Navigation Strategy (SNS), which reports on the outcome of the previous strategy and presents an action plan to implement the sustainable navigation issues retained. Guiding principles and principles of application were defined to ensure that navigation actions can meet the requirements of sustainable navigation:

1. Protection of ecosystems and water resources: Assure the sustainability of the St. Lawrence ecosystems, their productivity and the essential roles they play, and not disrupt the quality and quantity of water available.
2. Safety of persons and ships: Follow the recognized safety principles and measures for crews, users, cargo and ships.
3. Development of commercial navigation activities: Observe the requirements of economic development of navigation activities and ensure their harmonization with environmental and social imperatives; maintain port access supporting these activities and optimize reliance on navigation in situations where this mode of transport offers comparatively more environmental gains.
4. Development of recreational and pleasure boating activities: Promote the development and practice of these activities and ensure their harmonization with environmental and social imperatives.
5. Harmonization of uses and involvement of riverside communities: Meet the needs of the different users of the St. Lawrence, particularly in matters of accessibility, and ensure the participation of coastal communities in the decision-making process.

Thanks to the Société des traversiers du Québec (STQ), the gouvernement du Québec has 13 ferry services that transport over 5.2 million passengers and 2.1 million vehicles each year. Concerning the ownership of maritime infrastructures, the gouvernement du Québec owns a single commercial port (Bécancour), which belongs to the Société du parc industriel et portuaire de Bécancour, and some twenty ferry docks and terminals. As part of the Maritime Strategy and the strategic consolidation of the port network, and with the goal of protecting the future of these regional economic development tools, the gouvernement du Québec is preparing to negotiate taking over certain regional commercial ports from Transport Canada (TC), which no longer wishes to manage them. The federal government has wanted to hand over the ownership and financing of a number of maritime transport infrastructures since 1994.

**Main ministère des Transports, de la Mobilité durable et de l'Électrification des transports
Programs/Subsidies that Contribute to Sustainable Mobility in Maritime Transport**

1. Programme d'aide à l'amélioration de l'efficacité du transport maritime, aérien et ferroviaire (PETMAF) en matière de réduction ou d'évitement des émissions de gaz à effet de serre (GES) (Assistance program to improve the efficiency of maritime, air and rail transportation in the reduction or elimination of greenhouse gas emissions). This program, funded by the Fonds vert, seeks to reduce or eliminate GHG emissions by improving the energy efficiency of maritime, air and rail transportation through the use of more efficient transportation materials and equipment and the use of low-GHG energy sources.

Under the gouvernement du Québec's 2013-2020 Climate Change Action Plan (CCAP), the MTMDET is tasked with the implementation of Priority 16, improving the efficiency of maritime, rail, air and off-road transportation. It has a potential budget of \$56.45 million to March 31, 2020. The budget authorized by the Conseil du trésor on March 31, 2018, is \$25.2 million. **Beyond March 31, 2020, additional credits will be subject to the approval of the Fonds vert and the Conseil du trésor.**

2. Programme visant la réduction ou l'évitement des émissions de gaz à effet de serre par le développement du transport intermodal (PREGTI) (Program for the reduction and elimination of greenhouse gases emissions by the development of intermodal transportation). This program is funded by the Fonds vert, and its objective is to reduce or eliminate the GHG emissions generated by freight and passenger transportation by introducing multimodal transport solutions and promoting maritime and rail services. Under the gouvernement du Québec's 2013-2020 Climate Change Action Plan (CCAP), the MTMDET is tasked with the implementation of Priority 15, which is to invest in intermodality and logistics to optimize the transportation of freight and passengers. The PREGTI was established and is funded by the Fonds vert. It has a potential budget of \$82 million to March 31, 2020. The budget authorized by the Conseil du trésor on March 31, 2018, is \$44.25 million. **Beyond March 31, 2020, additional credits will be subject to the approval of the Fonds vert and the Conseil du trésor.**

3. Programme de soutien aux investissements dans les infrastructures de transport maritime (PSIITM) (Support program for investments in maritime transport infrastructures). This program supports investment in maritime transport infrastructures for freight and passengers in Québec, with a view to competitiveness and sustainable development. It has three parts:
 - Maritime and intermodal infrastructures for freight transportation
 - Freight transportation pilot projects
 - Maritime infrastructures for passenger transportation

This program is managed by the MTMDET and has a budget of \$200 million for the period from 2015 to 2020. **The remaining budget for this program is estimated at \$88 million for 2018-2020. Beyond March 31, 2020, additional credits will be subject to the approval of the Conseil du trésor.**

4. **Société des traversiers du Québec**

The MTMDET has given a subsidy of \$116.4 million to the Société des traversiers du Québec for 2017-2018. Its independent income amounts to about \$25 million.

Trends and outlook to 2030

Trend 1: Sustained growth of international trade

Recent years have confirmed the sustained growth of global trade and the maritime transport of freight. Another important finding has been the spectacular increase, in the last 20 years, of the size of certain types of ships, and the ripple effect this has had in the world fleet. On the St. Lawrence River, this trend has led to an increase in the load capacity of ships. Between 2006 and 2015, the average transport capacity of bulk carriers increased from just over 40,000 tons to nearly 55,000 tons. The same is true of tankers, for which the maximum load has risen, on average, from over 30,000 tons in 2006 to nearly 40,000 tons in 2015⁸.

The increase in the size of ships has also had repercussions on ports and other players in the maritime transport system, who have to adapt their port infrastructures, their locks and their navigation channels. For example, in the ports on the US east coast, governments have invested massively in navigation channels, transshipment equipment and terrestrial interfaces. In other parts of the world, this has led to the reconfiguration of container transportation and the development of major logistics centres for some ports, such as Anvers, in Belgium, and Rotterdam, in Holland.

Trend 2: Stagnation and reconfiguration of traffic in ports on the St. Lawrence

In Québec, there has been a general stagnation of overall transshipment activities in the ports on the St. Lawrence River. They have remained between 110 and 130 million tons per year for the last 20 years. The Port of Montréal has seen modest but sustained growth, thanks to the reconfiguration of container transport with the arrival of containers from Asia through the Suez Canal and the transshipment ports in the Mediterranean.

On the other hand, there has been a slight reduction of movements between Northern Europe and North America, in favour of other regions of the world. An increase in maritime transport between Europe and Canada is expected due to the conclusions of several economic and trade agreements, and the St. Lawrence has seen new traffic arrive in recent years, such as the explosion of international cruises and the shipment of crude oil exported from certain ports on the St. Lawrence. The oil exports led to a reduction in international crude oil imports.

Trend 3: Self-regulation and cooperation initiatives to support sustainable maritime transport exceeding regulatory requirements

Another trend involves self-regulation initiatives instituted by shipowners and port administrators and operations leading them to exceed the regulatory objectives related to the environmental impacts of their activities. For example, two speed limitation measures have been put in place, one in the region of îles de Sorel to reduce erosion due to the action of waves caused by ships, and one in the Saguenay–Saint-Laurent marine park to prevent collisions with sea mammals. An environmental certification program for the North American maritime industry, Green Marine⁹, has been widely welcomed in Québec, and the initiative has been exported to other Canadian provinces and US states. Cooperation efforts in favour of sustainable maritime transport are also present in Québec in the form of discussion platforms such as those established by the Navigation Coordination Committee, the St. Lawrence Action Plan and the Marine Industry Forum.

⁸ Système d'information maritime, Newsletter no. 1, June 2016.

⁹ <https://www.green-marine.org/>.

The governance of the integrated management of the St. Lawrence is also relevant, as it encourages cooperation among all players for sustainable planning and harmonization of protection measures and resource use, through the areas of prime concern committees¹⁰ and regional round tables (RRTs)¹¹. Binational governance efforts are also in place, such as the International Joint Commission for the management of water levels and flows. This type of governance was renewed with the Lake Ontario–St. Lawrence River Plan 2014¹² and it will become more important with the trend to greater variability in water levels in the watersheds affecting the downstream ports on the St. Lawrence and Great Lakes.

Trend 4: Use of less polluting energy sources for maritime transport

Major efforts have been invested in recent years to reduce emissions of atmospheric contaminants by maritime transport. The new vessels will lead to significantly lower emissions. Once all the new regulatory conditions come into effect in the next few years, we can estimate that the combined fleet in the Great Lakes–Seaway network¹³ will reduce its NO_x emissions by 86%, its SO_x emissions by 99.9% and its particulate matter emissions by 85%. This means that maritime transport will emit less NO_x and SO_x than road and rail transportation¹⁴.

Another trend can be seen in the increase in the use of liquefied natural gas (LNG) to propel ships. This is the case in Québec, with the new LNG-diesel and LNG-diesel-oil ships that belong to the Société des traversiers du Québec (STQ) and Groupe Desgagnés. The use of electricity to propel ferries, either alone or in hybrid drive, is another increasingly valued option, as the STQ showed with the 2014 launch of a hybrid ship, the *Peter Fraser*, which connects the mainland with île Verte. Another noteworthy effort is connecting ships to the electric system while in port, which allows the Port of Montréal to temporarily avoid burning fuel for generator sets for cruise ships and eventually other types of ships. On a smaller scale, sailing ships are also being used for transatlantic freight transportation, with carbon-neutral or ecological certification, as was done in Québec with the Montréal import company Portfranc.

Trend 5: The age of the ships

The average age of most types of ships has been decreasing since 2006. The rejuvenation of the fleet is particularly significant for bulk carriers and general freighters. This can be explained in part by the abolition of the 25% customs duty on the import of merchant ships, adopted in 2010 by the Canadian government, as several Canadian shipowners have invested in the renewal of their fleets since then¹⁵.

¹⁰ <http://www.strategieisl.qc.ca/english>.

¹¹ http://planstlaurent.qc.ca/en/integrated_management/regional_round_tables.html.

¹² http://www.ijc.org/fr/_Plan2014/home.

¹³ The combined fleet of the Great Lakes–Seaway network includes all the types of ships that use the network, that is, Canadian and American domestic shippers and international vessels.

¹⁴ Environmental and Social Impacts of Marine Transport in the Great Lakes–St. Lawrence Seaway Region, prepared by the Green Marine Research and Traffic Group, January 2013.

¹⁵ Système d'information maritime, Newsletter No. 1, June 2016.

2. Sustainable Mobility Issues Related to Maritime Transport

Issue 1: Future and competitiveness of a multimodal maritime transport system that meets the needs of trade, the industry and the public

> Modernize maritime infrastructures

Port infrastructures are one of the fundamental components of the maritime transport system, and some of them need major repair or upgrading work in order to continue to fulfil their role effectively. The market needs modern, competitive maritime infrastructures to serve as the foundation for the equipment and services offered by the private sector. An investigation held in 2014 by the MTMDET revealed that in the following ten years an investment of \$400 million for maintenance and \$1 billion for the development of public port infrastructures was required.

The main navigation channel of the St. Lawrence is another fundamental component of the maritime transport system, since the natural depth of the river beginning at Cap-Tourmente is not deep enough for modern freighters. Shipowners and port administrations have exploited all the possibilities to adapt the ships and manage the water column available upstream from the city of Québec, i.e. 11.3 metres. This channel can be considered to be a transportation infrastructure that needs to be adapted to respond to the challenges of maritime transport in the decades ahead.

The emergence of ports as leaders in the competitive environment relies increasingly on not just their performance with regard to handling, storage or redirecting freight, but also their capacity to create the conditions for the deployment of logistics hubs and industrial port areas.

> Invest in an effective intermodal system and fluid logistics chains

Better cohesion is required among the players in the freight transportation logistics chain. Maritime transport must also be promoted to shippers and the public if the changes are to occur. Users demand smart, connected, efficient intermodality. As such, innovations are needed in terms of fluidity and the time required for the entire transportation chain, such as the development of applications to demonstrate the multimodal transportation offer to users.

> Encourage the accessibility of public services to the public

The accessibility of services to all residents is a basic principle for maritime service in remote and isolated areas of Québec. This is a social obligation that also reflects the government's desire to develop all regions of Québec.

> Encourage the training and retention of sufficient numbers of qualified workers

One of the decisive factors for the sustainable development of maritime transport is the availability of qualified workers and the increased retention of experienced workers. This objective would increase the safety of maritime operations, improve the competency levels of the workers in the field and maintain a sufficient number of qualified workers.

- > Ensure that the government departments and bodies that deal with the safety and efficiency of maritime transport have the capacity to fulfil their mandates

While some of these issues are under federal jurisdiction, Québec needs to have a fleet of flexible, effective icebreakers and enough maritime inspectors and experts to accomplish key missions that have become the responsibility of various organizations, to optimize the use of the St. Lawrence River as a key transportation route for Québec.

Issue 2: The under-use and underestimation of maritime transport for domestic and continental transportation (shortsea shipping) and passengers transportation (ferry and shuttle)

Maritime transport, in combination with overland transportation, offers significant benefits thanks to its generally better performance in terms of GHG emissions, air quality, safety and sound pollution. Furthermore, the use of “truck-ship-truck” transportation to complement “door-to-door trucking” directly reduces road safety risks as well as road maintenance costs and congestion, thanks to reduced trucking distances.

The freight transportation market is not neutral. It is biased towards trucking in many regards. According to one study^{16, 16}, the financial cost recovery rate (not taking environmental or social costs into account) by public authorities is 100%, 68% and 40%, respectively, for rail, maritime and road transportation.

In addition to the financial costs, which are borne by the operators or the governments, the quantification of the environmental and social costs and their allocation to the operators are becoming increasingly pressing. It is important to more accurately quantify the environmental and social costs that would be avoided by using multimodal transportation solutions and to take this into account when planning transportation.

Issue 3: The environmental performance of maritime transport

- > Air quality

Maritime transport offers significant benefits thanks to its generally superior performance in terms of GHG emissions. Major efforts have been invested in recent years to reduce emissions of atmospheric contaminants by maritime transport. The new vessels will lead to significantly lower emissions.

- > Water quality

Prevention and intervention efforts for spills of hydrocarbons and hazardous products must be undertaken to maintain the quality of the drinking water supply.

- > Coastal erosion

Erosion is a phenomenon that affects all waterways, and there are many causes for it. Natural waves and waves generated by ships and pleasure craft can erode banks. The amplitude of the waves depends on the size of the vessel, the shape of its hull, its draught, its speed and the characteristics of the channel it is travelling in.

¹⁶ Gaudry et al. (2002). Tome I du rapport final du contrat de recherche, “Coûts totaux des modes pour le transport des marchandises,” p. viii.

> Protection of marine mammals and other plant and wildlife resources

As in any land environment, the preservation of marine biodiversity is an integral part of the sustainable development activities related to navigation. Several endangered species, including marine mammals, live in various parts of the St. Lawrence River. Concrete measures have been put in place for several years to minimize the introduction of alien invasive species (AIS) in ship ballast systems. Since 2008, no AISs have been introduced to the Great Lakes by maritime transport. The integrated management of sediment dredging is another environmental issue. Maintenance dredging, which removes naturally deposited sediment from the bottom of navigation channels to allow for safe navigation requires a full accounting of the complete activity cycle, from removal to deposit.

> Adaptation to climate change

Climate change is making significant changes to navigation. The industry must adjust to the impacts of this change, which are demonstrated through more severe storms, changes in precipitation and temperature patterns and a change in water levels and flows.

3. 2018-2023 Maritime Transport Action Plan

Issue 1: Sustainability and competitiveness of a multimodal maritime transport system that meets the needs of trade, the industry and the public

INTERVENTION PRIORITY 1.1: INVEST IN THE MARITIME INFRASTRUCTURES THAT NEED TO BE MODERNIZED, AN EFFECTIVE INTERMODAL SYSTEM AND FLUID LOGISTICS CHAINS

Port infrastructures are one of the fundamental components of the maritime transport system, and some of them need major repair or upgrading work in order to continue to fulfil their role effectively. The market needs modern, competitive maritime infrastructures to serve as the foundation for the equipment and services offered by the private sector. The importance of an efficient intermodal system and fluid logistics chains should not be underestimated. The Québec Maritime Strategy has implemented measures to modernize the maritime and intermodal infrastructures and improve the competitiveness of the ports, with the goal of using maritime transport as a vector for the economic development of Québec.

Measure 1: Financially support major repair and upgrading work or the construction of new port infrastructures and improvement work on the interface between ports and overland networks through the PREGTI and the PSSITM

1.1 The **PREGTI** offers financial support for projects that reduce or eliminate GHG emissions. One of its objectives is to reduce or eliminate the GHGs generated by freight and passenger transportation by introducing intermodal projects.

Indicator: % annual reduction in CO₂
Target: 250 kt CO₂ equivalent in 2020
Budget: \$44.25 million for 2018-2020 (funds already planned)

1.2 The government's Maritime Strategy led to the **PSIITM**, managed by the MTMDET, which has a budget of \$88 million for 2018-2020. Part 1 of this program (maritime and intermodal infrastructures for freight transportation) meets these objectives. This part of the program will:

- Support investments in maritime freight transportation infrastructures and in the interfaces between the port terminals and the overland networks;
- Promote the integration of a maritime segment into the domestic and continental freight transportation chains (shortsea shipping);
- Foster the competitive positioning and competitiveness of Québec's maritime transport system.

Indicator: Amounts invested by entities other than Québec government departments and bodies in projects that receive a financial contribution under the PSIITM
Target: \$88 million between 2018 and 2020
Budget: \$88 million for 2018-2020 (funds already planned)

Measure 2: Support the deployment of logistics hubs and industrial port areas to promote the assets of the port network and multimodal corridor in Québec and increase its activities and competitiveness by means of synergies and critical mass

The gouvernement du Québec's Maritime Strategy involves specific measures to support the deployment of industrial port zones and logistics hubs. These measures are managed by the ministère de l'Économie, de la Science et de l'Innovation. Investments totalling \$500 million have been made available for 2015-2020 to support these goals, \$200 million for logistics hubs and \$300 million for industrial port zones.

Indicator: Number of industrial port zones and logistics hubs
Target: 16 industrial port zones and 2 logistics hubs by 2020
Budget: \$500 million (funds already planned)

Measure 3: Carry out studies on the possibility of increasing the depth of the water column in the St. Lawrence navigation channel

The studies will examine the possibility of dredging to increase the depth of water upstream of the city of Québec in order to accommodate larger ships and meet the imperatives of competitiveness, mainly to compete with US container terminals on the Atlantic coast.

Indicator: Number of studies conducted
Target: 2 studies by 2023
Budget: \$400,000 (additional funds)

INTERVENTION PRIORITY 1.2: SUPPORT THE TRAINING AND RETENTION OF MARITIME TRANSPORT WORKERS

One of the decisive factors for the sustainable development of maritime transport is the availability of qualified workers and the increased retention of experienced workers. This objective would increase the safety of maritime operations and improve the competency levels of the workers.

Measure 4: Support the development of training and improvement programs in trades related to maritime transport

The MTMDET will continue to provide financial support for professional development and career advancement for navigation crews.

Indicator:	Number of crew members
Target:	20 crew members per year
Budget:	\$0.3 million (funds already planned)

Issue 2: The under-use and underestimation of maritime transport for domestic and continental transportation (shortsea shipping) and passengers transportation (ferry and shuttle)

INTERVENTION PRIORITY 2.1: SUPPORT THE USE OF MULTIMODAL TRANSPORTATION SOLUTIONS

Maritime transport, in combination with overland transportation, offers significant benefits thanks to its generally better performance in terms of GHG emissions, air quality, safety and sound pollution. Furthermore, the use of truck-ship-truck transportation to complement door-to-door trucking directly reduces road safety risks as well as road maintenance costs and congestion, thanks to reduced trucking distances.

Measure 5: Financially support projects to deploy multimodal transportation solutions

The MTMDET will help expand maritime transport's share of freight and passenger transportation by promoting and supporting the use of maritime transport with shippers, by means of the PREGTI and the PSIITM.

5.1 For projects that reduce or eliminate GHG emissions, financial support can be offered through the **PREGTI**. One of the objectives is to reduce or eliminate GHG emissions generated by freight and passenger transportation by establishing intermodal projects (such as encouraging the transportation of freight by barge over short distances to reduce road congestion, particular in Montréal).

Indicator:	% annual reduction in CO ₂
Target:	250 kt CO ₂ equivalent in 2020
Budget:	\$44.25 million for 2018-2020 (funds already planned)

5.2 The government's Maritime Strategy led to the PSIITM, managed by the MTMDET, which has a budget of \$88 million for 2018-2020. Part 2 of this program meets these objectives. It supports projects to test new commercial or technical logistics solutions for maritime and intermodal freight transportation and to improve the transportation offer to better meet the needs of shippers.

Indicator: Amounts invested by entities other than Québec government departments and bodies in projects that receive a financial contribution under the PSIITM
Target: For the entire program, \$88 million between 2018 and 2020
Budget: \$88 million for 2018-2020 (funds already planned)

INTERVENTION PRIORITY 2.2: PROMOTE AND SUPPORT THE USE OF FERRY AND RIVER SHUTTLE SERVICES

In addition to reducing pressure on the road network, the use of ferries and river shuttles meets the following mobility objectives: reduce the number of accidents, reduce travel time, reduce congestion, and reduce pollution and GHG emissions.

Measure 6: Promote and support ferry and river shuttle services and their connectivity with other means of transportation

In addition to granting a subsidy to the Société des traversiers du Québec, the MTMDET intends to support the intermodality of passenger transportation using ferries and river shuttles to establish adequate connectivity between active/public overland transportation services and the ferry and shuttle services. To achieve this, the government created the **PSIITM**, managed by the MTMDET, and gave it a budget of \$88 million for 2018-2020. Part 3 of this program (maritime infrastructures for passenger transportation – intermediary crossings) meets these objectives. This part of the program will:

- Support investment in maritime passenger transportation infrastructures to ensure their long-term future and the quality and safety of intermediary crossings in Québec;
- Encourage sustainable passenger mobility and improve the transportation offer to better meet the needs of the users.

Indicator: Amounts invested by entities other than Québec government departments and bodies in projects that receive a financial contribution under the PSIITM
Target: For the entire program, \$88 million between 2018 and 2020
Budget: \$88 million for 2018-2020 (funds already planned)

INTERVENTION PRIORITY 2.3: SUPPORT APPLIED, TECHNOLOGICAL AND PROSPECTIVE RESEARCH IN MARITIME TRANSPORT AND DISSEMINATE THE RESULTS

Technological developments are important in order to achieve the objectives of a sustainable mobility policy. This support will allow for the innovation and transfer of technological applications.

Measure 7: Finance innovation research, research projects and student specialization through scholarships and internships

The MTMDET will document the benefits of maritime and multimodal transport in terms of the avoided environmental and social costs (GHG emissions, other pollutants, safety, congestion, noise pollution, road maintenance costs, etc.), to produce a report that offers recommendations for promoting the development of sustainable mobility by means of maritime transport. The MTMDET also intends to seek advice concerning the long-term prospects for maritime transport on the St. Lawrence in light of the limited depth of the navigation channel, the increased variability of water levels and competition from other ports on the Atlantic coast.

Indicator:	Number of research projects
Target:	5 research projects for 2023
Budget:	Measures already authorized by various programs run by the ministère de l'Économie, de la Science et de l'Innovation and the ministère de l'Éducation et de l'Enseignement supérieur

Issue 3: The environmental performance of maritime transport

INTERVENTION PRIORITY 3.1: SUPPORT INITIATIVES THAT FOSTER THE DEVELOPMENT AND IMPLEMENTATION OF TECHNOLOGIES AND BEST PRACTICES THAT REDUCE POLLUTION AND GHG EMISSIONS

The development and deployment of technologies that reduce GHG emitted by maritime transportation increase air quality and combat climate change, but they also boost economic competitiveness.

The gouvernement du Québec is already supporting several initiatives to protect water quality. For example, there are a number of guidelines and projects related to the Québec Water Policy and the St. Lawrence Action Plan with which the Sustainable Mobility Policy could be harmonized. Furthermore, under the Québec Maritime Strategy, the Centre d'expertise en gestion des risques d'incidents maritimes (CEGRIM – centre of expertise in maritime incident risk management) was established in Îles-de-la-Madeleine in 2017, and its team of experts, who come from several Québec government departments, are tasked with developing maritime and fluvial knowledge to improve the management of risks related to the consequences of maritime incidents on the St. Lawrence, including impacts on the environment, aquatic habitats, wildlife, coast communities, the fishing industry and other uses related to maritime Québec.

The gouvernement du Québec will also continue to support Green Marine's environmental certification program, which encourages the initiatives of the maritime industry to reduce its environmental footprint through concrete, measurable actions.

Measure 8: Contribute to the reduction of GHG emissions through the PETMAF

The MTMDET will continue to provide government support through the Programme d'aide à l'amélioration de l'efficacité du transport maritime, aérien et ferroviaire en matière de réduction ou d'évitement des émissions de gaz à effet de serre (PETMAF – assistance program to improve the efficiency of maritime, air and rail transportation in the reduction or elimination of greenhouse gas emissions), a financial incentive administered by the MTMDET and included in the 2015-2020 Transportation Electrification Action Plan. Through this program, the MTMDET encourages innovation, the use of green transportation technologies and energy audits for all transportation sector activities.

Indicator:	% annual reduction in CO2
Target:	135 kt CO2 equivalent in 2020
Budget:	\$25.2 million for 2018-2020 (funds already planned)

Measure 9: Participate in and support the CEGRIM action plan

The gouvernement du Québec established the CEGRIM to give Québec a team of experts specifically assigned to support prevention, preparation, intervention and recovery activities related to maritime incidents. By supporting the CEGRIM in the development of research, innovation and expertise to respond to the risks of maritime spills of hazardous products, the MTMDET is supporting water quality protection measures.

Indicator:	Number of meetings
Target:	4 meetings per year

INTERVENTION PRIORITY 3.2: CONTRIBUTE TO THE REDUCTION OF COASTAL EROSION

Coastal erosion occurs on most waterways. One of its causes is the action of waves against the shores. As part of the St. Lawrence Action Plan (PASL), the Navigation Coordination Committee (NCC) introduced a speed reduction measure in fall 2000. Along a stretch nearly 25 kilometres long, in the Sorel-Varenes area, this measure strongly encourages pilots not to exceed a speed of 10 knots (18.5 km/h) relative to the bottom when travelling upstream and 14 knots (25.9 km/hr) downstream, that is, 12 knots (22.2 km/hr) relative to the water. Further research is required on the effect of such voluntary measures in order to fine-tune them to be more effective.

The Réseau Québec maritime (RQM) was created under the Québec Maritime Strategy as an umbrella organization for the stakeholders in maritime research.

Measure 10: Support and evaluate the voluntary speed reduction measure for commercial ships through a technical study

In addition to continuing to support the NCC's collaboration efforts and the actions of the RQM, the MTMDET will conduct a technical study on the effects of wave action to support research and document best practices.

Indicator:	Number of studies
Target:	1 study by 2023
Budget:	\$0.3 million (funds already planned)

INTERVENTION PRIORITY 3.3: PARTICIPATE IN THE IMPLEMENTATION OF MEASURES TO SUPPORT MARINE MAMMALS AND OTHER FAUNA AND FLORA RESOURCES

For many years, efforts have been deployed to limit the impact of navigation on marine mammals. For example, the Working Group on Marine Traffic and Protection of Marine Mammals in the Gulf of St. Lawrence (G2T3M) was created in 2011. This group proposes practical solutions to reduce the risks associated with maritime transport to which marine mammals are exposed in the St. Lawrence estuary while allowing maritime trade activities to proceed without compromising safety. Practical measures have been in place for several years to reduce the introduction of alien invasive species through ship ballast systems.

Measure 11: Support the protection of marine mammals and other fauna and flora resources by participating in various committees and initiatives

Through its activities, the MTMDET supports collaborative actions and the development of research to protect marine mammals and other fauna and flora resources and also supports Canada's participation in international agreements concerning effective, flexible management of vessel ballast water.

These activities include working with the ministère des Forêts, de la Faune et des Parcs and the G2T3M and contributing to the initiatives of Green Marine, NCC and PASL projects, the federal government's Oceans Protection Plan and the International Maritime Organization (IMO) action plan.

Indicator: Number of annual activities

Target: 10 activities for 2023

INTERVENTION PRIORITY 3.4: CONTRIBUTE TO THE DEPLOYMENT OF CLIMATE CHANGE ADAPTATION MEASURES

Climate change is creating major changes for navigation, with increased storm frequency, different precipitation and temperature patterns, altered water levels and flows, and so on. To respond to the impact of these changes, steps must be taken to increase our understanding of these phenomena and adjust development strategies.

Measure 12: Reduce the use of pollution-causing energy sources that contribute to climate change through the PETMAF

The MTMDET will continue to provide financial support through the PETMAF, a financial incentive that is part of the 2015-2020 Transportation Electrification Action Plan. Through this program, the MTMDET encourages innovation, the use of green transportation technologies and energy audits for all transportation sector activities.

Indicator: % annual reduction in CO₂

Target: 135 kt CO₂ equivalent in 2020

Budget: \$25.2 million for 2018-2020 (funds already planned)

SUMMARY TABLE

Maritime Transport Intervention Framework	Indicator	Target	Contribution to aspects of the Sustainable Mobility Policy					
			SMP aspect 1	SMP aspect 2	SMP aspect 3	SMP aspect 4	SMP aspect 5	Winning conditions
ISSUE 1: Sustainability and competitiveness of a multimodal maritime transport system that meets the needs of trade, the industry and the public								
Intervention priority 1.1: Invest in maritime infrastructures, an effective intermodal system and fluid logistics chains								
Measure1: Financially support major repair and upgrading work or the construction of new port infrastructures and improvement work on the interface between ports and overland networks through PREGTI and the PSSITM (MTMDET) A) PREGTI B) PSIITM	A) % annual reduction in CO ₂ B) Amounts invested	A) 250 kt CO ₂ eq in 2020 B) \$88 million invested between 2018 and 2020			X			
Measure 2: Support the deployment of logistics hubs and industrial port areas to promote the assets of the port network and multimodal corridor in Québec and increase its activities and competitiveness by means of synergies and critical mass (MTMDET, MESI)	Number of industrial port zones and logistics hubs	16 industrial port zones and 2 logistics hubs 2020		X				
Measure 3: Carry out studies on the possibility of increasing the depth of the water column in the St. Lawrence navigation channel (MTMDET)	Number of studies conducted	2 studies conducted by 2023			X			
Intervention priority 1.2: Support the training and retention of maritime transport workers								
Measure 4: Support and development of training and improvement programs in trades related to maritime transportation (MTMDET)	Number of crew members	20 crew members per year		X				

Maritime Transport Intervention Framework Issues, Intervention Priorities and Measures	Indicator	Target	Contribution to aspects of the Sustainable Mobility Policy					
			SMP aspect 1	SMP aspect 2	SMP aspect 3	SMP aspect 4	SMP aspect 5	Winning conditions
ISSUE 2: The under-use and underestimation of maritime transport for domestic and continental transportation (shortsea shipping) and passengers transportation (ferry and shuttle)								
Intervention priority 2.1: Support the use of multimodal transportation solutions								
Measure 5: Financially support projects to deploy multimodal transportation solutions (MTMDET) A) PREGTI B) PSIITM	A) % annual reduction in CO ₂ B) Amounts invested	A) 250 kt CO ₂ eq in 2020 B) \$88 million for 2018-2020		X				
Intervention priority 2.2: Promote and support the use of ferry and river shuttle services								
Measure 6: Promote and support ferry and river shuttle services and their connectivity with other means of transportation (PSIITM) (MTMDET)	Amounts invested	\$88 million between 2018 and 2020			X			
Intervention priority 2.3: Support applied, technological and prospective research in maritime transport and disseminate the results								
Measure 7: Finance innovation research, research projects and student specialization through scholarships and internships (MTMDET)	Number of research projects	5 projects for 2023					X	
ISSUE 3: The environmental performance of maritime transport								
Intervention priority 3.1: Support initiatives that foster the development and implementation of technologies and best practices that reduce pollution and GHG emissions								
Measure 8: Contribute to the reduction of GHG emissions through the PETMAF (MTMDET)	% annual reduction in CO ₂	135 kt CO ₂ eq in 2020				X		
Measure 9: Participate in and support the CEGRIM action plan (MTMDET)	Number of meetings	4 meetings per year			X			

Maritime Transport Intervention Framework Issues, Intervention Priorities and Measures	Indicator	Target	Contribution to aspects of the Sustainable Mobility Policy					
			SMP aspect 1	SMP aspect 2	SMP aspect 3	SMP aspect 4	SMP aspect 5	Winning conditions
Intervention priority 3.2: Contribute to the reduction of coastal erosion								
Measure 10: Support and evaluate the voluntary speed reduction measure for commercial ships through a technical study (MTMDET)	Number of studies	1 study completed by 2023					X	
Intervention priority 3.3: Participate in the implementation of measures to support marine mammals and other fauna and flora resources								
Measure 11: Support the protection of marine mammals and other fauna and flora resources by participating in various committees and initiatives (MTMDET)	Number of annual activities	10 activities for 2023					X	
Intervention priority 3.4: Contribute to the deployment of climate change adaptation measures								
Measure 12: Reduce the use of pollution-causing energy sources that contribute to climate change through the PETMAF (MTMDET)	% annual reduction in CO ₂	135 kt CO ₂ eq in 2020				X		