

POSITION PAPER:

Policy and Principles of a Canadian National Maritime Single Window

October 3rd, 2022

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Policies and Principles of a Canadian National Maritime Single Window

Executive Summary

The increasing quantity and availability of data, along with advances in Communication and Information Technologies is changing how we think, live and work. Large-scale digital transformations across Canada's industrial sectors are required to ensure global competitiveness and compliance with evolving international regulation, notably, in the area of cybersecurity. Establishing integrated, efficient, safe, secure and reliable data flows is a priority for all sectors, including Canada's domestic marine supply chains.

As a signatory to the IMO FAL Convention, Canada has an obligation to ensure that the maritime single window and digital communications required by FAL are implemented in Canada. However, beyond this obligation is the reality of digitalization and single window reporting that is transforming global port and marine operations. While other countries have moved to develop integrated national and maritime single windows to digitally collect transit-related regulatory and customs data, Canada continues to use highly inefficient systems of multiple and duplicative reporting processes that reflect both a lack of governance and the absence of an overarching standards-based interoperability strategy. As a result, there is no common multimodal supply chain vision or single picture of maritime data that are available resulting in inefficiencies and missed opportunities to enhance safety, security, sustainability, and reliability of Canada's supply chains.

Recognizing the need for efficiency and interoperability to ensure safe, secure and reliable marine transport, an essential component of Canada's supply chains, and considering the progress of the rest of the world, leading Canadian maritime sector industry and government stakeholders have come together to clarify the drivers and key needs of a Canadian National Maritime Single Window policy and provide recommendations. The recommendations presented in this document represent the collective thinking and expertise of industry and government participants who agree with the need to immediately develop a strategy for a Canadian National Maritime Single Window and have been informed by existing regulatory and industry frameworks and examples from similar initiatives worldwide. Over 2021 and 2022, this group has collaborated to clarify and communicate the following recommendations for establishing a Canadian single maritime window:

- Transport Canada should form a working group to develop a National Maritime Single Window,*
- The Working Group, as a first task, should establish, with stakeholders, a clear governance for defining, implementing and maintaining a National Maritime Single Window, including principles to protect and ensure appropriate and confidential data collection and usage,*
- The Single Window should address both single window reporting and supply chain efficiency,*
- The WG should define an overarching Canadian Multimodal Supply Chain Interoperability Strategy, with a focus on increasing the fluidity and resilience of Canada's supply chains,*

This paper offers a starting point for developing a roadmap to define and implement a Canadian National Maritime Single Window based on the pillars of supply chain, governance, development and resources.

Canada needs a National Maritime Single Window now.

Global maritime systems are moving to single window reporting.

Age-old, established industries, such as trade and transportation, that rely on vessels, ports and people to move tangible goods, are also becoming reliant on digital technologies. Globally, governments have always required reporting on various maritime regulatory and customs related matters. Over the last two decades many have launched initiatives to streamline, harmonize and integrate data collection processes into a common single digital reporting window and these initiatives provide opportunities to improve supply chain efficiency and resiliency. For example, they have created opportunities to reduce the occurrence and impact of global supply chains disruptions over the last few years due to COVID, geopolitical issues, and climate change induced weather events.

Decreasing the occurrence and impact of supply chain disruptions is a priority.

The number of supply chain disruptions worldwide has increased threefold from 2019 to 2021, with North America experiencing about half of disruptive events, the highest share by region. Human causes were attributed for 90% of the events with an average annual cost of \$235 million CAD per country [1]. In Canada, a recent survey [2] indicated that 9 out of 10 Canadian companies from the manufacturing sector were affected by SUPPLY CHAIN disruptions in 2020 and 2021, with the average yearly cost of approximately \$500 million CAD, more than twice the international average, with an additional \$5.3 billion lost sales [2][3][4][5][6]. We know, with rising inflation rates, that supply chain transformation is also affecting customers.

Canada has maritime single window international regulatory obligations.

In addition to these market forces, regulatory reporting requirements and international obligations are compelling countries to improve and digitalize required reporting. The IMO's FAL Convention requires Member States party to the convention (including Canada) to have a Maritime single window in place by January 2024.

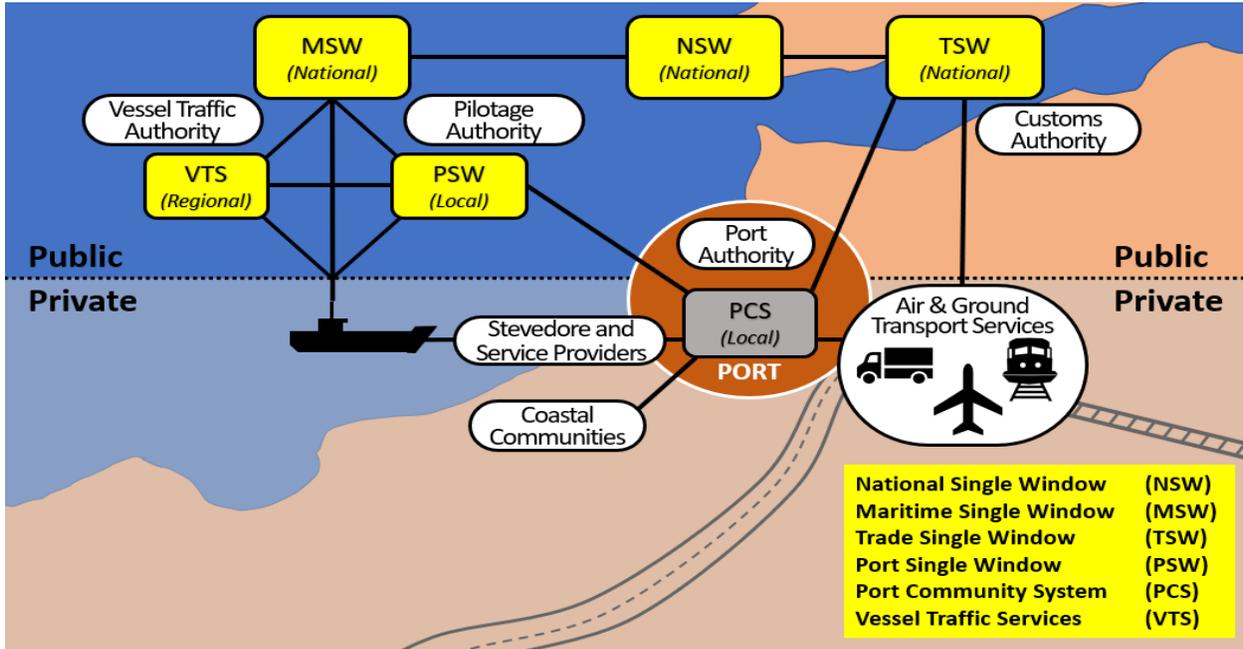
Compliance with the IMO's Convention on FAL: During the 45th session of the Facilitation Committee (FAL 45), draft amendments to the FAL Convention were approved that would make maritime single windows mandatory. The proposed amendments also update the definition of a single window to "An environment that allows for the submission or provision of standardized and harmonized information and declarations to a single-entry point, typically by electronic means." The amendments were adopted by the Committee during FAL 46 in May 2022 and they will come into force on January 1, 2024.

- Single Window solutions have already been implemented and deployed by many nations.
- These solutions contribute to reducing the occurrence and impact of supply chain disruptions.
- Canada has an obligation to implement a Maritime Single Window solution by January 2024.

Single Window Definitions

What is a single window?

A single window is a concept for information sharing and processing among private and public sector organizations through a unique access point that facilitates import/export, and transit related regulatory requirements and coordination. An underlying principle of single window systems is that individual data elements or documents should only be submitted once. This is also referred to as “Single Reporting”.



A single window environment allows for single window systems to interoperate.

Single window environments is a term used by the World Customs Organization (WCO) and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). A single window, in practice, is a collection of heterogeneous, interdependent systems, as well as the business processes of regulatory agencies. Once information has been submitted to the *environment*, it is available to all organizations that are connected to the single window. The environment includes the single window system (i.e., the software system), the procedures, collaboration agreements, and legal issues [7][8].

- **Maritime single window:** Maritime and port administrative procedures, including making information available to private sector maritime transport actors. It covers primarily ship and port clearances and authorizations, e.g., Vessel Traffic Services.
- **Trade single window:** Procedures for trade activities related to the cargo, e.g., importing and exporting goods such as customs clearances. They are also referred to as Customs single window.
- **National single window:** Covers exchange of information for national authorities in support of maritime, port and trade activities. Provides access to maritime and trade single windows.
- A maritime single window may also serve as a national single window and may be referred to as *national maritime single window* [7].

Benefits of Maritime Single Windows

Europe has led the way for improving maritime transport safety and efficiency.

To improve safety and efficiency of maritime transport, in 1965, the IMO Facilitation Convention, known as FAL, first adopted a set of standards and recommended practises and rules for simplifying the formalities and procedures, and reporting requirements for ships' arrival, stay and departure. FAL has since adopted amendments for handling of cargo, dangerous goods, stowaways, persons rescued at sea, maritime corruption, and public health measures, including recent lessons learned from COVID-19. EU Directive 2002/59/EC established the need to develop *SafeSeaNet*, an operational European vessel traffic monitoring and information system for which the European Maritime Safety Agency was given the mandate to develop in 2004. Directive 2010/65/EU establishes maritime single window guidelines and became regulation under 2019/1239/EC with an obligation for European Union member states to implement single windows that can interoperate within the European Maritime Single Window environment by 2025. The IMO mirrored the European directives in 2003, 2012, and 2022 with guidelines and recommendations for maritime single windows with an obligation to implement by 2024. Norway's effort to develop *SafeSeaNet-Norway* is noteworthy, first deployed in 2005 for vessel arrival/departure and hazardous material reporting, with messaging for pilotage services added in 2010, followed by customs document reporting by 2015. The European SafeSeaNet became operational in 2009 and subsequently became a key module of the European Maritime Single Window Environment, a broader effort to achieve simplified, harmonized, digitized reporting and information sharing among vessels and ports. A 2019 EU study estimated the total CapEx and OpEx for the period from 2020 to 2030 for the European Maritime Single Window Environment to be approximately \$38M CAD, with expected benefits of around \$900M CAD solely from reduced reporting staff hours for shipping operators [9].

Marine emissions reductions contributes to global decarbonization.

Digitalization and single window reporting contributes to decarbonization and reducing marine emissions. The IMO has set an international shipping emissions reduction target of 50% by 2050, compared to 2008 levels. Digitalization and single windows are required to achieve a sustainable ecosystem [1][9]. Optimizing cargo flows and reducing dwell times and congestion helps reduce transport-related carbon emissions [8]. Canadian carbon reduction policy targets are also in play. As carbon tax legislation comes into effect, shipping industry stakeholders will face fuel surcharge costs, an additional incentive to reduce fuel consumption and improve overall transport efficiency [10][11][12].

Single widows contribute to improving supply chain efficiency and resilience.

A 2012 study suggests that national efficiency gains in cross-border trading of 25% over 5 years using trade single windows [13]. A 2019 study estimates that the use of automated systems alone can account for a 13 to 15% reduction in overall supply chain operating costs [1]. In a recent report published by the World Ports Sustainability Program, the implementation of maritime single windows, along with trade single windows, is cited as one of several key short-term measures of a proposed Maritime Trade Logistics Digitization Road Map, to strengthen the resilience of supply chains and ensure gains in efficiency [14].

A Canadian maritime single window capability is required to maintain Canada's competitiveness as an international trade partner. Approved in June 2022, the IMO maritime single window regulation requires compliance by all IMO members. nations, including Canada, by January 2024.

Where is Canada's National Maritime Single Window?

Currently there is no Canadian National Maritime Single Window.

Developing a maritime single window presents challenges due to the vastness of Canada's territories, harsh weather conditions, ice navigation, the unique USA-CAN relationship and data access and governance. Maritime single window services must allow ships to interact with multiple pilotage, port, and marine traffic authorities. Achieving Canada's strategic objectives such as supply chain resiliency, efficiency, and sustainability, requires provisions for a broader national single window capability that includes the maritime single window, and trade components.

Despite Canada's obligation to the FAL Convention and the proven benefits experienced by other countries who have implemented maritime single windows, Canada currently does not have a maritime single window, nor does it have a roadmap to define and implement one. There are however government efforts in Canada to develop digital portals and various government entities with a role in the maritime world are piloting and exploring concepts.

What's been done thus far?

From 2012 to 2017 the Canada Border Services Agency led the implementation of the Canadian Single Window Initiative, a trade single window. The focus of this initiative was on facilitating the customs clearance process and reducing the related administrative burden and has operation since 2017. In 2021 Transport Canada announced a proposal for a multi-year analysis with CBSA regarding the advancement of a Canadian maritime single window.

The Canadian Coast Guard (CCG), who is responsible for operating Canada's Marine Communications and Traffic Services centers, has been providing VTS and other marine services via INNAV, the Vessel Traffic Maritime Information System (VT-MIS) for over 20 years. In the CCG 2021 Integrated Business and Human Resource Plan, the modernization of marine navigation program and safety services including e-Navigation services, plans the development of the Collaboration Voyage Management System (CVMS), scheduled for release in Spring 2023 [15]. Currently in the stakeholder engagement phase, the [AVTM program](#) is expected to provide an initial implementation by the end of 2022 with an expanded implementation in 2023 [16].

The good news is that Canada does not need to start from scratch.

These same pressures that Canada is facing have already driven other nations to accelerate the digitalization of global supply chains and this has led to numerous implementations worldwide of maritime single windows. This is good news for Canada who does not need to start from scratch but can incorporate small-scale domestic pilots and global success stories as models for replication, including applying standards such as the 2017 IMO guidelines on maritime cyber risk management [17].

An implementation plan for a Canadian National Maritime Single Window Environment is needed today. This plan should be part of an overall Multimodal Supply Chain Interoperability Strategy whose strategic objectives include increasing the competitiveness of Canadian businesses, improving safety of maritime transport, contributing to meeting climate change commitments, increasing the resiliency supply chains, and complying with international regulation.

Contemporary solutions for building a Canadian Maritime Single Window

The underlying technologies are available.

The technologies required to develop single window solutions are already available. Increasingly mature, efficient, and robust web-based and cloud technologies are available and cybersecurity concerns have largely been addressed although it remains a critical issue [17] [18].

Most reporting and authorization/clearance request use cases require minimal connectivity, most of which already exists, but for future capabilities involving maritime autonomous surface ships, a more comprehensive telecommunications infrastructure (e.g., with 5G capabilities) will be required to support ship-to-ship and ship-to-shore information exchanges. Gartner predicts that by 2025, 25% of logistics supply decisions will be made via edge intelligent logistics ecosystems, i.e., smart logistics applications powered by predictive analytics and technologies such as Bluetooth, 5G, and Wifi, RFID and QR code, that have already transformed vessel and cargo tracking activities.

Key challenges are data governance, technology adoption, and system integration.

A major finding of the MMSC Technical Committee is that identifying the required technologies will not be the major obstacle. *Data governance, technology adoption* and *system integration* have been identified as key challenges, consistent with the 2018 Joint Industry position paper on revising EU Directive 2010/65/EU[19]. Like the European model, *harmonization* and *interoperability* are the key to establishing a cost-effective, sustainable single window environment that allows for the use of existing fully functional systems. This can be achieved through the use of standardized interfaces and information services to facilitate information exchange among authorities, between authorities and the private sector, and among private sector entities.

For several decades, Canada and the USA have collaborated to create an interoperability framework with systems engineering tools and reference architectures that have proven useful for planning and specifying ground transport systems, included mass transportation systems road and rail infrastructures, and connected vehicle networks. A maritime extension that includes port operations already has been initiated and could, in theory, be extended to specify supply chains. Adopting an intelligent transportation system perspective for defining a transport logistics and supply chains is not a new idea and continues to be explored [20].

Canada has already created and successfully used a methodology that can be useful.

In 2008-2010 Public Safety Canada led an effort to develop the [Communications Interoperability Strategy for Canada](#), a strategic document that defined a national policy framework and action plan including regulatory changes for spectrum allocations to promote local and regional interoperability for emergency response communications [21].

- There are no major technology obstacles for building a Canadian National Maritime Single Window Environment.
- Canada has already developed a methodology that can be used to develop an implementation plan and overall strategy.
- The environment should support the reuse of existing systems.
- The main challenges are data governance, technology adoption, and system integration.
- There are several good examples that are available for Canada to build on.

Recommendations

The definition and development of a **Canadian National Maritime Single Window** requires an **interoperability strategy and implementation plan** captured in a strategic document and should be constructed using a holistic approach that includes a description of a unified conceptual multimodal supply chain architecture similar to the one depicted on page 4. The Canadian Single Window Environment should be considered as **an essential digital infrastructure** necessary to meet Canada's trade objectives and ensure supply chain efficiency and resiliency. The MMSC Technical Committee puts forth the following recommendations:

- 1. Canada should rapidly develop a multimodal supply chain interoperability strategy and implementation plan for a Canadian National Maritime Single Window.**
- 2. The strategy and plan should make use of existing, available, concepts, designs, prototypes, and implementations for single window environments and single window systems, in particular, those already developed in Europe.**
- 3. Canada should adopt a governance model and overall capability development methodology similar to the one developed by the Public Safety Canada for the Communications Interoperability Strategy for Canada.**

Interoperability Strategy and Single Window Implementation Plan

The **interoperability strategy and implementation plan** should address information exchange and data harmonization for the entire supply chain and should include but not be limited to Maritime Transport. However, it should focus on the urgent need for a Canadian National Maritime Single Window Environment and Maritime Single Window systems and should specify an approach to data governance. The main elements of the strategy are as follows:

Maritime Single Window Environment: The *environment* should be a technology-agnostic, open platform that facilitates the integration of existing and future systems and include provisions to **train, promote, facilitate, and enforce Canadian policy and procedures and comply with international regulations**. The environment should follow IMO FAL guidelines and regulations for maritime single window environments and should present a set of standardized interfaces and information services that facilitates the integration of authorities' and private sector actors' information systems, with a focus on the reuse of existing, operational, systems and provisions for the integration of future systems.

Maritime Single Window Systems: Maritime Single Window systems should be technology-agnostic software components that can be added to existing operational systems so that they can be readily integrated into the environment and access the information services.

Multiple maritime single window systems will be required to account for regional differences, including multiple waterway navigation authorities and jurisdictions, but to the extent that it is possible, they should be derived from a common software component that connects to the environment via the standardized interfaces and thus guarantees interoperability within the environment.

Port Call Optimization: Port Call Optimization is an enhancement that could be added to the Canadian National Maritime Single Window Environment and would be a key measure to improve and enhance ship to shore maritime trade and logistics activities [14][18].

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Trade Single Window: As per the FAL guidelines, the strategy should define a way forward to establish a trade single window by evolving or replacing the Canadian Single Window Initiative such that it can be **integrated into the environment** and therefore is **interoperable with other stakeholder systems**.

Roadmap and Timeline: The **implementation plan** should reflect the urgency for establishing a Canadian National Maritime Single Window Environment and developing Maritime Single Window systems in order to promote the competitiveness of Canadian businesses and to comply with international regulation. Once drafted, the roadmap and timeline should inform decisions concerning allocation of resources and funding for executing the implementation plan. The **timeline** should be consistent with **January 2024** deadline for compliance with the IMO Maritime Single Window regulation.

Capital Expenditures, Operating Expenses and Other Funding: **Funding** is required for all phases and should be considered as part of the implementation plan including provisions for funding to stakeholders and rightsholders for necessary costs related to testing and operationalization. For example, passing on the development and deployment costs of the environment and maritime single window systems in the form of port authority harbor dues is contradictory to increasing the Canada's competitiveness as a trade partner. **Operating Expenses Funding** provisions also should be made to allow for **indefinite operation**, including a team or secretariat responsible for seeing the effort through as per the governance model.

Additional government funding should be made available to incentivize participation and seek stakeholder and rightsholder inputs and proactively promulgate regulatory and Canadian Policy changes related to the use of the Canadian Single Window Environment. The interoperability strategy should specify areas where **investments are required** in specific areas such as cybersecurity and other technologies to ensure reliability, upgradability, and adaptability.

Accelerated development through reuse of existing, standards, designs and solutions

Compared to the rest of the world, Canada is late in developing a national Maritime Single Window solution. However, this allows Canada to benefit from mature standards and guidelines and the lessons learned from those who already have implemented such solutions.

Guidelines, Standards, and Regulations: The IMO FAL guidelines and regulations [7] not only specify requirements for a **streamlined, digitized reporting environment** but they also provide recommendations and examples for supporting mandatory information exchanges required to obtain clearances and authorizations for ships and their cargos and voluntary information sharing such as the location and status of containers. The guidelines include cybersecurity guidelines and procedures for tackling maritime corruption. Other examples of standards that may be useful are those published by the [Digital Container Shipping Association](#), including one for tracking and tracing of cross-carrier shipment tracking, and the IMO Reference Data Model [22].

Canadian Initiatives: The development approach should make full use of Canada single window and related initiatives. A critical first step is to stand up working groups to provide recommendations for improvements to and an integration path for existing and planned capabilities such as: the CBSA-led **single window Initiative**, and the CCG-led **Vessel Traffic Maritime Information System** and **Collaboration Voyage Management System**. The working groups should collect stakeholder and rightsholder feedback and formulate recommendations and provide a practical way forward as to how to best evolve and integrate these capabilities aligned with guidelines and in accordance with regulation from WCO, WTO, UNCTAD, and IMO, and part of an integrated Canadian Maritime Single Window Environment, specified as part of an overarching Canadian Single Window Architecture.

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European Maritime Single Window environment: A full implementation of the European Maritime Single Window environment is slated for 2025. This initiative provides an extensive set of blueprints from which Canada can draw to define their interoperability strategy and define the Single Window Environment [8].

Apply a simple, made-in-Canada, proven methodology and governance model.

The first step toward building a Canadian Single Window Environment is the elaboration of a Canadian Single Window Environment strategic document and implementation plan. For this, a clear **Governance structure** is required, like the [CISC](#) initiative led by Public Safety Canada. Beyond implementation and deployment, the governance structure should allow for regular updates and adaptation.

Single Agency Lead: Like the CISC initiative, Canadian National Maritime Single Window Environment should be **led by one government agency** that coordinates with other departments. This agency should ensure that a successful worldwide observed interoperability strategy translates into an “Executive office” with requisite cross-ministerial functionality and the power to better integrate and manage the intra-Minister harmonization of policies, regulations, and enforcement actions. This optimizes the operationalization of the Canadian National Maritime Single Window Environment and provide the required Environmental, Social and Governance framework. Transport Canada, as the Port State Control Authority, should be the lead agency.

Governance Model: The governance model needs to **recognize unique CAN-USA relationship**. *Governance* should be specified as part of the strategic document that should also address *procedures, technology, training, and usage (or operations and maintenance)*. Once developed and fielded, the Canadian National Maritime Single Window Environment should be managed by a public or private body that is perceived as neutral and trusted by stakeholders and rightsholders.

The governance model should include a **Facilitation committee (FC)** led by Transport Canada to coordinate the development of interoperability strategy and action plan, pilot projects, operationalization, and an overall roadmap. The FC will **ensure consultation with stakeholders and rightsholders during all phases** and should include dedicated working groups (WG) with representation from, but not limited to, the Canadian Coast Guard, Canada Border Services Agency, Innovation Science and Economic Development Canada, the Association of Canadian Port Authorities, the Shipping Federation of Canada, Natural Resources Canada, National Research Council, Terminal Operator Associations, Pilotage Authorities, Provincial Governments, and Municipalities.

One of the first tasks of the FC WG should be to be form a **Canadian Single Window Environment Architecture Working Group** that will define an overarching architecture based on Canadian requirements and informed by similar existing capabilities already developed and fielded in Europe and elsewhere. This is necessary to establish a consensus among stakeholders concerning the responsibilities, boundaries and functions of the systems identified in the architecture so that actors, such as the port authorities can develop and integrate PCS and PMIS.

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