Final report submitted to the
Vancouver Fraser Port Authority (VFPA)

March 31, 2022

Active Vessel Traffic Management (AVTM) Advisory Panel

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Executive Summary

The Vancouver Gateway has reached an inflection point. Cargo is projected to continue to grow leading to attendant immediate and future challenges for Canada's largest and busiest port. Absent a strategy to address how to service this growth, the Vancouver Gateway could become inefficient and negatively affect the competitiveness of Canadian exports.

Whereas optimized individual supply chains for the various cargo streams were once sufficient, new growth will require system-wide optimization to maximize the use of shared resources, such as pilot and tug services, railway capacity, anchorages, and common confined waters. As such, a new role for the Vancouver Fraser Port Authority (VFPA) is required – above and beyond its current responsibilities for ensuring safety – so that port efficiencies and port optimization at the Port of Vancouver achieve operational reliability on the marine side.

The AVTM Advisory Panel has concluded that an AVTM system is a prudent and sensible response to address the various complex supply chain issues facing the Vancouver Gateway. But the VFPA is facing two notable challenges in developing such a system.

The industry associations with whom the AVTM Advisory Panel met expressed a lack of trust and confidence in the VFPA. The Panel is convinced this obstacle can be overcome, however, since the VFPA has had previous successful collaborations with industry that demonstrate cooperation is possible.

The VFPA is also impeded by lack of jurisdiction over all the anchorages for vessels serving the port, namely those adjacent to the Southern Gulf Islands (SGI).

While the establishment of an AVTM system will require time, there are a series of short- and medium-term actions that can immediately begin to address the Minister of Transport's objectives for marine vessel management outlined in his August 2021 announcement.

Specifically, the VFPA should:

- focus on the immediate challenges related to passage into and within the Inner Harbour, namely access to the Second Narrows, increased rail movements to service the North Shore terminals, and increased demand to manage vessel traffic through the First Narrows;
- investigate the reasons that the number of days and duration of anchorages is increasing faster than cargo growth;
- apply the learnings from the above two activities as part of an incremental and sequenced approach to introducing an AVTM system;
- implement or augment mechanisms aimed at ongoing collaboration, transparency, and accountability with industry, local communities, and Indigenous groups;
- promote and implement dynamic root cause analysis and collaborative approaches with industry and other stakeholders to investigate and address current and future challenges by replicating past successful collaborations that leveraged the expertise of active port traffic participants to evaluate, recommend, and implement solutions; and

- clarify the governance structure and authorities over the SGI anchorages,[1] including ensuring clear jurisdiction over these anchorages.

[1] As per Transport Canada's Interim Protocol for the Use of Southern BC Anchorages introduced on February 8, 2018, the VFPA has the authority to manage the assignment of anchorage locations outside its jurisdiction in the Southern Gulf Islands but does not have authority to enforce the guidelines contained in the protocol. This Interim Protocol is expected to be replaced as and when a more permanent approach is articulated.

Message from the Panel Chair

This report, prepared by the Active Vessel Traffic Management (AVTM) Advisory Panel, represents the shared views of eight individuals with industry experience and knowledge in supply chains that rely on the Port of Vancouver (the port). Our experience ranges from the production and sale of major export commodities to transportation modes. Most of us are retired or semi-retired and none of us are actively involved in a business that would be affected by an AVTM system. We were assisted by representatives of the Vancouver Fraser Port Authority (VFPA), Transport Canada (TC), and the British Columbia Ministry of Transportation and Infrastructure. Inter*VISTAS* Consulting provided secretariat support to the Advisory Panel.

We approached the task outlined in the Panel's Terms of Reference determined to learn about, understand, question, and ultimately offer unbiased advice on how to approach and operationalize the concept of active vessel traffic management. But our starting point was to ask ourselves whether an AVTM system was necessary.

What we discovered through our eight-week journey, beginning on February 10, 2022, was an appreciation of the complexity of the task we had been asked to complete, the many challenges associated with accommodating increased export volumes from multiple commodity streams through the port, and the notable apprehension on the part of port-dependent industries and stakeholders that would be affected by an AVTM system. We also became aware of the sensitive nature of the related issue of anchorage usage on local and Indigenous communities.

In the end, we concluded that an AVTM system is a vital and necessary next step in the evolution of the Vancouver Gateway, which connects Canadian consumers and businesses with the global marketplace. Without an AVTM system, the port will become increasingly constrained by physical, social, and environmental parameters, thereby jeopardizing existing and new investments and limiting its potential to handle the majority of Canada's seaborne trade.

The successful implementation of an AVTM system will facilitate sustainable trade growth through the port, thus giving Canadian companies the confidence they need to invest in the growth of their own businesses. Such investments will benefit all Canadians. An AVTM system presents an opportunity for the port and all its participants to proactively manage – rather than simply react – to growth in trade, decreased supply chain reliability due to climate change, and evolving shipping patterns, as well as challenges unique to the West Coast of Canada.

Success is not guaranteed. Creating an AVTM system will be challenging and difficult and will require the input, support, and participation of all those who rely on the Vancouver Gateway – exporters and importers, terminal operators, and all manner of transporters and supporting industries, as well as governments. While challenging due to the number of participants involved, an AVTM system is a necessary and progressive step that has been taken by other large ports around the world to handle increasing traffic in a smart, integrated manner.

The key to the success of an AVTM system will very much depend on how it is developed, introduced, operationalized, managed, and governed. Success will also require the VFPA, industry, and governments to be responsive to the concerns of local and Indigenous communities by minimizing environmental and social impacts.

Panel Terms of Reference & Report Structure

The Panel's Terms of Reference (see Annex 1) reflected the August 12, 2021 announcement by the Minister of Transport Honourable Omar Alghabra that the VFPA would be working with various partners to develop the design of a new collaborative system to manage marine vessel traffic and optimize the supply chain flow for the Port of Vancouver.

The four key objectives for the Panel were aligned with those outlined by Minister Alghabra, namely:

a) **Strengthen marine safety** – by reducing congestion and actively managing marine traffic in the busiest, most confined waters of the port;

b) **Improve the efficiency and reliability of the flow of goods** – through this strategic gateway for all supply chain partners;

c) **Reduce environmental impacts** – including noise impacts in Southern Resident killer whale habitat, by limiting unnecessary vessel movements; and

d) **Reduce negative social impacts** – like ambient noise and light pollution by reducing overall anchorage usage in Southern British Columbia and implementing a Code of Conduct for vessels at anchorage.

The AVTM Advisory Panel's Final Report is structured around these four objectives.

Sources of Recommendations

Our final recommendations were prepared based on:

- a series of internal discussions by members of the AVTM Advisory Panel,
- themed workshops conducted between February 10 and March 16, 2022,
- our own professional experience and technical knowledge (Annex 2),
- input provided by various subject-matter experts (Annex 3),
- consultations with industry associations held between February 24 and March 4, 2022 (Annex 4), and
- a report from the VFPA on the concerns, suggestions, and feedback from local communities and Indigenous groups stemming from ongoing consultations the VFPA conducts with them.

The Problem Statement: The Evolving Port Traffic Landscape

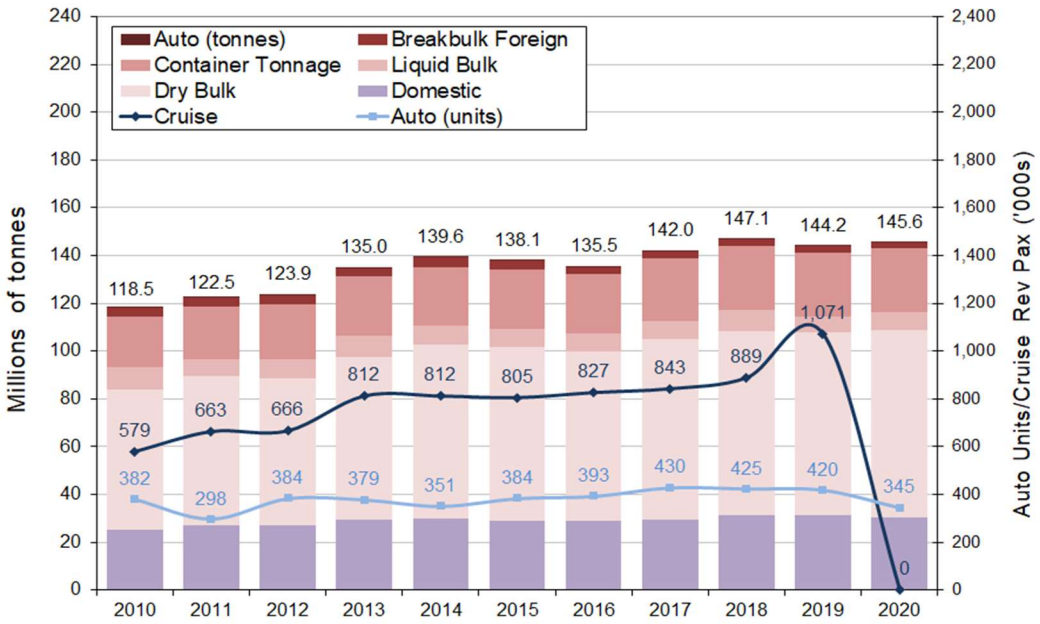
The Panel's recommendations are based on an acknowledgement of the challenges outlined below facing the Port of Vancouver. These challenges make, and will continue to make, transporting goods and passengers through the port more complex.

- **Diversified Cargo and Wide Range of Players.** The port handles the most diversified range of cargo in North America: dry bulk, containers, breakbulk, liquid bulk, automobiles, and cruise. The diversity of cargo with the seasonal addition of cruise ships, as well as public transit, pleasure craft and tourism operators, into and out of the Inner Harbour complicate the movement of marine vessel traffic. This traffic consists of a wide range of players, including tugs, barges, and pilots, which support a variety of transportation needs from short-sea shipments to major international loads.

- **Multiple Individually-Managed Supply Chains Draw from Common Resources.** Individual companies responsible for commodities such as coal, fertilizer, grain, and container each have highly skilled logistics teams that optimize their individual supply chains. These supply chains rely on common resources such as anchorages, the Marine Traffic and Communication Services of the Canadian Coast Guard (CCG), and the Pacific Pilotage Authority (PPA) services to transit through common, confined waters. Use of such common resources is carried out in accordance with accepted operating and safety regulations. To date, current processes have been sufficient to address immediate needs, but the present system lacks a tool or process that lets companies that rely on these common resources to optimize the entire system.

  Figure 1 illustrates the growth trend for the various cargo types, including passenger traffic, through the port from 2010 to 2020.

Figure 1: 2010-2020 Total Cargo and Passenger Traffic

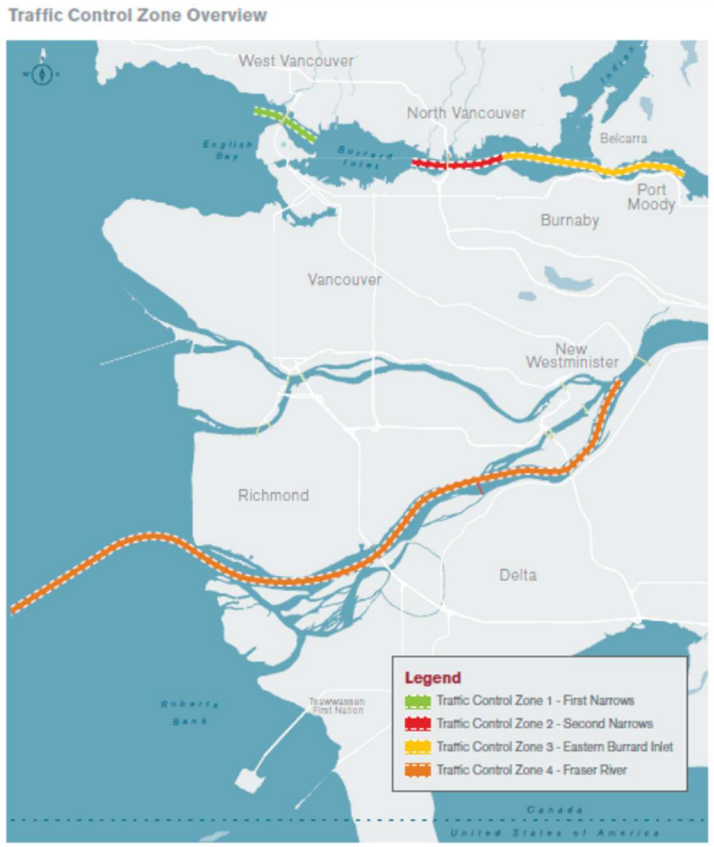


Source: Vancouver Fraser Port Authority

- **Restricted Traffic Control Zones.** All of the natural resource cargo exported and imported from the North Shore are handled via rail movements by BNSF, CN, and CP over the Second Narrows rail lift bridge. As the bridge is low in clearance over the water, it must be lifted each time a vessel higher than 10.8 metres passes under the Ironworkers Memorial Bridge, effectively shutting down the railway for an average of 45 minutes for every vessel transit. (These interruptions also include recreational vessels, tugs, and barges.) The terminal activities and investments designed to increase cargo throughput east of the bridge will increase this rail outage time. Since the majority of the terminals loading ships on the North Shore are dependent on getting the full and final tally of cargo transported by rail to complete vessel loading, improved logistics planning for this restricted area will help to improve throughput for all parties.

  Figure 2 below shows the location of the traffic control zones.

Figure 2 Port of Vancouver Traffic Control Zones

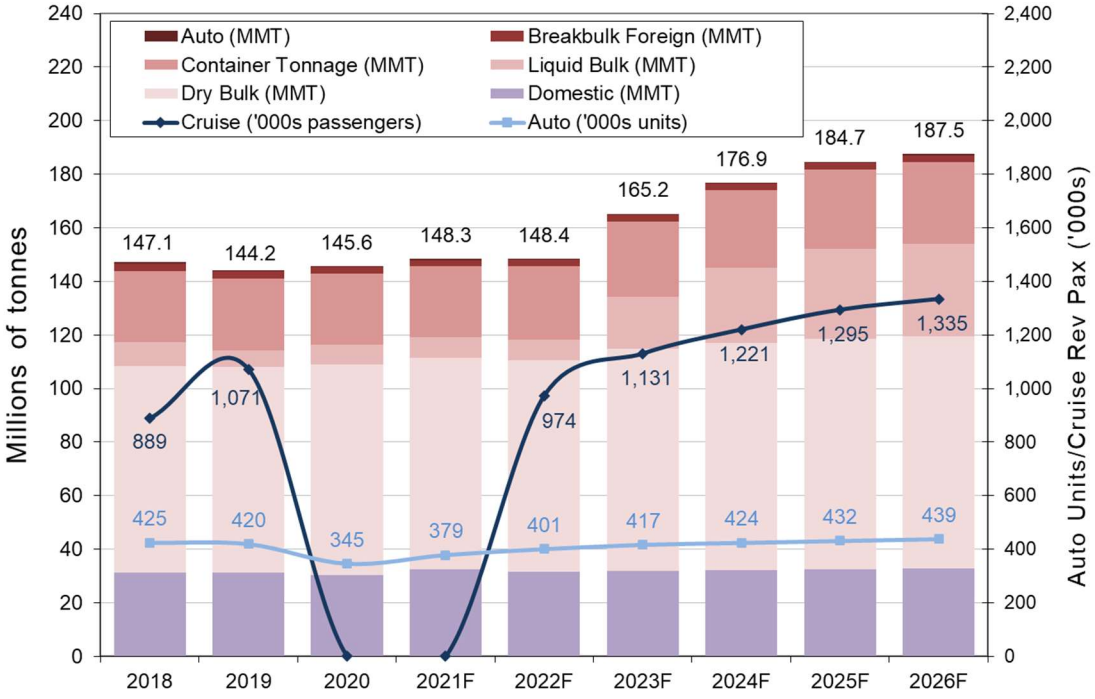


Source: Vancouver Fraser Port Authority

- **Future Growth.** Cargo and passenger traffic through the Port of Vancouver has generally been increasing and is projected to continue to grow. The most significant short- to medium-term increase is expected in the liquid bulk sector with the expansion of the Trans Mountain pipeline. Once completed, the Westridge terminal is projected to serve up to 37 vessels per month in "Tier 1 vessel"[2] moves beneath the Second Narrows rail lift bridge. Liquid bulk vessel traffic will increase from 1 vessel per week to 1 vessel per day. In 2018, the CN Second Narrows bridge utilization for marine vessel transit was 26.5% or 2,326 hours, thus the bridge was available for rail activities 73.5% of the time. Since 2018, there has been significant investment in expansions in export terminal capacity on the North Shore (Neptune and G3 in particular), which serve commodities primarily transported by train over this bridge. To support continued growth, the bridge will require more allocation for rail service, which will require coordination between marine and rail transportation modes. Overall, the volume of goods shipped through Canada's West Coast is forecasted to grow at a 6% Compounded Annual Growth Rate (CAGR) between 2022 and 2026, in terms of tonnage. This significant growth further emphasizes the importance of proactively managing marine vessel traffic and optimizing the entire port supply chain flow.

  Figure 3 below illustrates the projected growth for the various cargo types, including cruise passenger traffic, from 2022 to 2026.

Figure 3: 2018-2026 Total Cargo and Passenger Traffic (Actual and Forecast)



Source: Vancouver Fraser Port Authority

[2]According to the Port of Vancouver Port Information Guide (May 2018), a Tier 1 vessels is defined as:

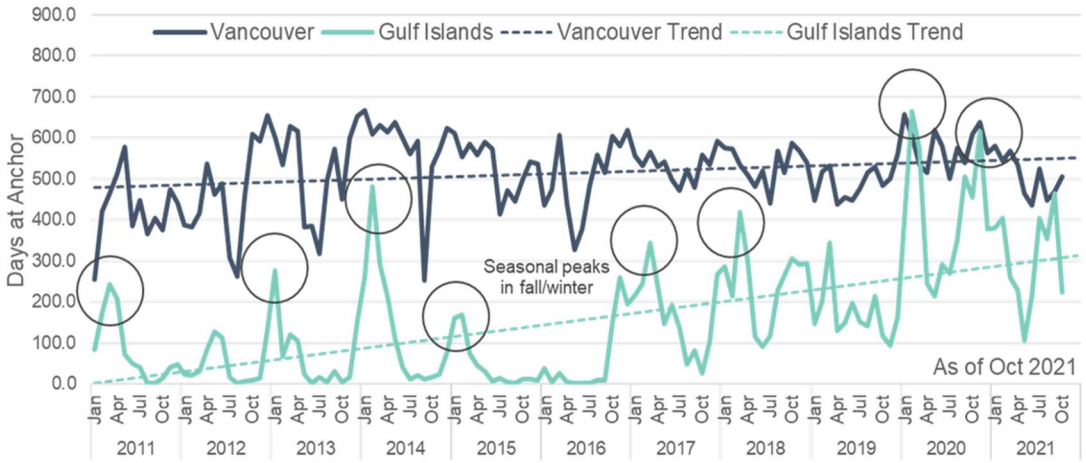
- All piloted vessels and tug and barge combinations when piloted, regardless of tonnage
- All non-piloted tug and barge combinations with a barge of 10,000 tonnes or more carrying capacity
- All non-piloted vessels ships, including barges and articulated tugs and barges (ATBs) when in product

- **Larger Vessel Size.** International marine shipping is moving towards larger vessel sizes to capture efficiencies. The pace of vessel size growth has increased in the last decade. The port has natural limitations that impacts navigation, and this poses a new challenge. The port expects higher throughput of larger vessels within the Burrard Inlet, which will challenge supply chain dynamics in a variety of ways including:
  - increasing scheduling complexity since deeper draft vessels must transit the Narrows during high slack tide and have more significant sea air draft clearance issues meaning their transit windows via confined narrow locations in Vancouver are much more restricted, and
  - the existing first-come first serve principle placing an increasing demand on the limited number of large anchorages as larger vessels require larger anchorage areas for safety considerations.

- **Increased Use of Anchorages.** Anchorages provide commercial vessels with a suitable area to anchor temporarily to wait for clearance to enter a port, wait for a berth, maintain safety and security, or undergo maintenance and repairs. Vessels also anchor for other reasons, such as unavailability of government inspectors, weather (in particular, reduced loading capacity due to inclement weather), railway failures to deliver specific commodities on time to meet vessels, labour disruptions, and, more recently, natural disasters, which create inefficiencies and can result in multiple berthing. As seaborne trade increases, anchorages are being used more frequently and for lengthier periods.

  Since 2011, anchoring time has increased by 32.7% with relative consistency across commodities.[3] Notably, whereas overall tonnage grew by 19% in from 2011 to 2020,[4] anchorage days increased at a faster rate than the underlying growth in cargo. As mentioned earlier, with cargo projected to grow at 6% CAGR, increased demand for anchorages can be expected. This situation requires better vessel flow management, anchorage usage and timing, as well as improved overall vessel forecasting information.

Figure 4: Total Anchorage Time Spent in Vancouver and SGI by Month (2011-2021)



Source: Transport Canada calculated using INNAV

[3] Active Vessel Traffic Management Project Summary & Information Package January 18, 2022, p 1-2.
[4] See **Figure 1** that shows cargo tonnage of 122.5 million tonnes in 2011 to 145.6 million tonnes in 2020. Note that the year 2020 was an exceptional year in the data given global supply challenges and the pandemic.

- **The Legal Framework.** The legal framework for anchorages does not provide authorities that fully align with the objectives of an AVTM system, such as the efficient flow of goods or reducing social and environmental impacts. Under the common law right of navigation, a vessel is free to anchor temporarily in any appropriate location, unless specifically prohibited, and the notion of appropriate is linked to both the qualities of the vessel and the seabed or anchorage site. Inside a port's boundaries, port authorities have legal authority to assign and manage anchorage sites. However, outside port boundaries marine pilots and vessel masters take on anchoring decisions. Under the Interim Protocol,[5] the VFPA has responsibility to manage the assignment of anchorages in the SGI, including the equitable rotation of anchorage sites; however, the VFPA has no authority over compliance and enforcement.

Of all these challenges, the most immediate involve addressing anticipated bottlenecks related to:

- increased vessel traffic at the Second Narrows (i.e., Traffic Zone 2) anticipated due to the short-and medium-term increase in liquid bulk exports,
- increased train movements to and from the North Shore transporting coal, potash, grain, sulphur, metal concentrates, and breakbulk to earn a return on the recent significant capital investments made in terminals serving these commodities,
- increased demand to manage vessel movements for draft at high slack tide at First Narrows (i.e., Traffic Zone 1), and
- increased use of anchorages for extended periods of time.

A. What could an AVTM System Accomplish?

Against this backdrop, the Panel considered whether and how an AVTM system would help to improve the efficiency of vessel movements while increasing safety. It also considered how anchorage usage and oversight could be restructured to reduce negative social and environmental impacts on affected local and Indigenous communities.

Canada's trade tonnage through the port has been increasing steadily for a decade. With more growth in Canadian exports expected, the port now needs to develop and implement a system to manage its inbound and outbound marine traffic much like the way air traffic control systems help control the flow of aircraft to and from landing and arrival slots at an airport. Like airports, the port also has to be mindful of neighbouring communities and manage noise and disruption by actively monitoring traffic patterns and engaging with the community. An AVTM system can also help to manage these growth consequences.

Like other large ports worldwide, the Port of Vancouver is having to adapt to meet the needs of growing global trade and Canada's desire to increase its export trade. Other large ports around the world dealing with growth in trade, particularly in confined geographic areas, have already evolved to managing traffic in this type of smart, inclusive manner.

[5] As per Transport Canada's Interim Protocol for the Use of Southern BC Anchorages introduced on February 8, 2018, the VFPA has the authority to manage the assignment of anchorage locations outside its jurisdiction in the Southern Gulf Islands but does not have authority to enforce the guidelines contained in the protocol. This Interim Protocol is expected to be replaced as and when the Oceans Protection Plan consultation with affected parties is completed.

Ultimately, the goal of an AVTM system is to enable supply chain collaboration and optimization of the overall gateway by managing the prioritization and sequencing of marine vessels through the Port of Vancouver. Properly executed, port users will benefit from more transparent, efficient, and reliable information, as well as formalized marine traffic governance guidelines. Critically, the system also expects to increase the throughput capacity of trade-enabling vessels in the port, thereby addressing the forecasted cargo volume growth.

An AVTM system will allow the port to proactively evolve its practices, which is essential given its place as Canada's largest port.

B. Guiding Principles for All Recommendations

In developing our recommendations, the Panel followed the guiding principles listed in this section. These fundamental principles encompass and bolster all recommendations put forward by the Panel.

- **Clarify the governance structure and authorities over SGI anchorages.**[6] This includes ensuring clear jurisdiction over these anchorages. The Panel recommends that this be defined by the federal government in partnership with the Government of BC as required.

- **Promote and implement dynamic root cause analysis and collaborative approaches with industry and other stakeholders to investigate and address current and future challenges.** This approach should replicate past successful collaborations that leveraged the expertise of active port traffic participants to evaluate, recommend, and implement solutions. These projects include the Asia-Pacific Gateway and Trade Corridor Initiative, the establishment of Traffic Control Zones, and applications to the National Trade Corridors Fund. It should also leverage data that is already being collected and reported to enhance data transparency.

- **Implement or augment mechanisms aimed at ongoing collaboration, transparency, and accountability with the industry, local communities, and Indigenous groups**, preferably by way of scope-oriented task forces or working groups. Where appropriate, VFPA should work in concert with Transport Canada or the relevant government agency.

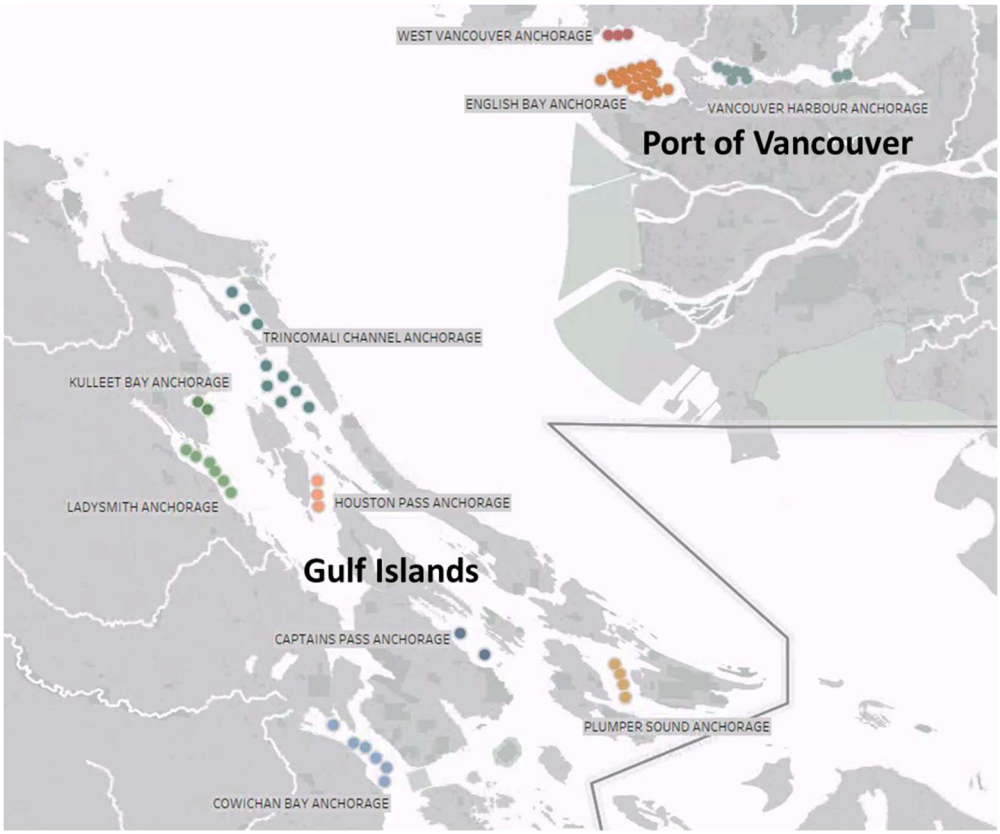
- **Adopt an incremental and sequenced approach to introducing an AVTM system** by focusing first on the immediate challenges related to the following:

    - Inner Harbour: increased vessel traffic requiring access to the Second Narrows, increased train movements to service the North Shore terminals, and increased demand to manage vessel traffic through the First Narrows while continuing to meet today's high safety performance.
    - Anchorages: increased anchorage usage, both number of anchorages and duration.

[6] Ibid.

Figure 5 below illustrates the location of the SGI anchorage sites.

Figure 5: Southern Gulf Island Anchorage Sites



Source: Transport Canada

Recommendations, Observations, and Caveats

In this section, the Panel offers specific recommendations to the VFPA, related to the four (4) Ministerial Objectives identified in our Terms of Reference. Each objective is preceded by an opening narrative that provides context for the Panel's perspective. As previously referenced, the Objectives are as follows:

A. **Strengthen marine safety** – by reducing congestion and actively managing marine traffic in the busiest, most confined waters of the port;
B. **Improve the efficiency and reliability of the flow of goods** – through this strategic gateway for all supply chain partners;
C. **Reduce environmental impacts** – including noise impacts in Southern Resident killer whale habitat, by limiting unnecessary vessel movements; and
D. **Reduce negative social impacts** – like ambient noise and light pollution by reducing overall anchorage usage in Southern British Columbia and implementing a Code of Conduct for vessels at anchorage.

A. Strengthening Marine Safety

The Panel recognizes the contributions and the safety records of the CCG and the PPA to ensure the safety of marine operations along the coastal waters of British Columbia, including the Fraser River. We also acknowledge the significant investments made by key players (e.g., terminals, railways) to support the growth in exports and imports, address cargo growth, and improve efficiencies at all levels of the supply chain. Finally, we note that the VFPA and industry have demonstrated the ability to successfully collaborate to identify and find solutions to complex issues that have impacted the Port of Vancouver. While the impetus for these investments and collaboration may have primarily been about supporting economic activity, in many cases they also improved safety or, at the very least, did not compromise safety.

With the overall growth in marine traffic, we anticipate an increase in tension between vessels, but also between vessels and rail, so the need to implement a process to adequately manage traffic and maximize resources (i.e., human, infrastructure, technological) is more urgent than ever. Our view is that the VFPA should focus in the short-term on delivering solutions to already identified challenges, namely: Second Narrows, First Narrows, and the SGI anchorages. Each project should build on the successes and lessons of the previous ones so as to help build support and trust in an overall AVTM system. In other words, start with a pilot project or projects, gather user feedback, and expand to wider port jurisdiction.

Below are some specific recommendations (listed in no particular order of priority) under the Ministerial objective of *strengthening marine safety*, namely:

- Advance a national single-window approach to manage multiple data submission points to encourage collaboration across Canadian ports and regulatory agencies by leveraging the AVTM system.
- Develop an AVTM system based on a solid governance framework that guarantees continuous engagement with industry, local communities, and Indigenous groups.

- Ensure that data management and related protections (i.e., confidentiality of information, privacy safeguards), including the implementation of a national standard for the management of data, be as transparent as possible without compromising commercially sensitive information.
- Maximize the transparency of currently available data to reduce unnecessary duplication.
- "Sweat" the assets we already have and avoid unnecessarily building more infrastructure to manage future growth and improve marine safety.
- Concentrate on creating/maintaining communication protocols between the VFPA and vessels to ensure optimal levels of safety.
- Establish key performance indicators (KPIs) for expected AVTM system outcomes; revisit and revise the system if KPIs are not met within an agreed-upon timeframe.
- Champion virtual inspections within the framework of a Transport Canada-led pilot project on maritime digitalization, such as drone or camera-based remote examinations by the Canadian Food Inspection Agency (CFIA) of grain holds etc.

B. Improving the Efficiency and Reliability of the Flow of Goods

We recognize that the Port of Vancouver hosts a number of distinct traffic segments (i.e., dry bulk, liquid bulk, breakbulk, car carriers, container liners, cruise ships, and numerous tug/tow arrangements), each with people and resources dedicated to supporting their particular supply chain.

The question of whether the implementation of an AVTM system can support the VFPA in making efficiency and reliability improvements has network and systemic implications. At the same time, we also recognize that anchorages are fundamental to support supply chain safety and fluidity and create current and future benefits for all supply chain partners. Future improvements can result in a reduction of waiting times at the port, thus providing greater flexibility in case of unexpected events (e.g., weather or other shocks to the supply chain).

However, there are some challenges. For instance, the increase in liquid bulk vessels will contribute to greater congestion and further constrain movements to the North Shore. More liquid bulk vessels will have an impact on the Second Narrows rail bridge likely resulting in the need for changes to existing operating procedures. These changes should involve enhanced coordination and collaboration amongst the VFPA, Marine Communications and Traffic Services (MCTS), PPA, terminals, and vessel agents. Traditional vessel movement plans for terminals both west and east of the bridge will also be impacted. Increased traffic requires better coordination and leadership by the VFPA, CCG, and PPA to guide new traffic into/out of the Inner Harbour. The trend towards larger vessels also compounds the complexities of managing vessel traffic.

In our view, a new role for the VFPA is required – above and beyond ensuring safety – to enhance operational reliability on the marine side by focusing on port efficiencies and optimization. For example, an AVTM system could help to better coordinate the flow and throughput of cargo transported by rail with the marine side of operations to extend throughput efficiency. Like the port, railways handle many different cargo types and shippers and try to optimize their combined supply chain, working closely with producers in country, the rail network, and terminals. That efficiency could be improved and extended.

Below are some specific recommendations (listed in no particular order of priority) under the Ministerial objective of *improving the efficiency and reliability of the flow of goods*, namely:

- Establish working groups to develop each aspect of the AVTM system. These groups should gather the necessary data, define the issues, develop solutions, and oversee the implementation of the project. These groups should, as much as possible, make their work visible to industry and local communities to help build trust in the system.
- Promote the benefits of data sharing among users, including the establishment of standards that support consistency and reliability of EDI data. For example, data is already being shared by vessels with various entities (e.g., TC, CCG, and Canada Border Services Agency) prior to their arrival at the port. Is there an opportunity to share this data with other stakeholders to encourage greater efficiency and collaboration?
- Provide adequate levels of confidentiality and privacy protection when leveraging data, including transparency regarding the reasons data are being collected.
- Have a reliable system to ensure a "ready-to-load" (cargo readiness) approach that tackles delays on vessel arrivals and terminal authorizations.
- Orient data gathering towards finding proactive solutions to current problems and future challenges.
- Conduct a review of recreational traffic and how it impacts the Second Narrows rail bridge to establish procedures designed to minimize their impacts on commercial vessels.
- Consider other technology innovations such as digitalization, camera technologies, and the use of real-time data to improve efficiencies.
- Utilize advanced analytical methods, taking advantage of available data to assist in vessel movement optimization.

In addition, we would like to provide the following observations and caveats:

- Industry associations we consulted with unanimously voiced concerns about which entity will have decision-making authority to prioritize vessel movements (e.g., Will liquid bulk vessels have precedence over a grain vessel? What is the decision matrix? Will the process be transparent?). The Panel suggests this concern be dealt with directly and clearly through a robust governance structure that addresses these issues. Doing so will help to gain support for the AVTM system.
- While it is important to focus on the efficiency of port operations and optimization solutions, Canada's economic competitiveness and access to markets should remain key guiding principles of future changes.
- Regardless of the success of the AVTM system and associated initiatives, Port of Vancouver growth will continue to be affected by transportation challenges related to the rail and trucking modes.
- Cargo tonnage growth should ideally be addressed by eliminating chokepoints rather than adding infrastructure as a first response.

C. Reducing Environmental Impacts

We recognize the value in identifying non-productive vessel movements so they can be eliminated or reduced whenever possible. At the same time, we acknowledge that industry players are already incented to limit the number of vessel movements because movements and wait times are expensive since they result in unwarranted fuel consumption, pilotage costs, and demurrage fees. These types of inefficiencies cause negative environmental consequences.

We also note that work has been conducted by a variety of stakeholders (i.e., governments, industry associations, ferries, scientists) and Indigenous communities to mitigate environmental harm, such as those exerted on whales by marine traffic activities. In the long-run, the growth of the Port of Vancouver will inevitably be affected by environmental factors, weather events, and climate change. In our view, monitoring and mitigating environmental impacts is fundamental to sound and sustainable anchorage management.

Below are some specific recommendations (listed in no particular order of priority) under the Ministerial objective of *reducing environmental aspects*, namely:

- Identify the non-productive vessel moves by engaging industry stakeholders who are best placed to conduct these investigations. Ask questions like: why do these moves occur, what are their root causes and what changes are required to reduce or eliminate them?
- Respect and support seasonal restrictions – both regulatory and voluntary – and best practices such as those developed through the federal government's Whales Initiative and related programming,[7] i.e., reducing speeds if safe to do so, avoiding sanctuary zones, reducing noise, reducing the potential for vessel strikes, reducing unproductive trips back and forth to anchorage in developing an AVTM system.
- Use the AVTM system to optimize the port-wide supply chain system and allow each commodity segment to continue to optimize their individual operations.
- Apply for funding from the National Trade Corridors Fund to investigate possible solutions to such issues as the inability to load grain in inclement weather as this can cause increased use of anchorages due to loading delays.
- Offer financial incentives to port stakeholders to purchase and install fuel-efficient equipment or equipment with alternative fuel engines that would not be otherwise financially viable.
- Advocate that an appropriate government authority take responsibility for monitoring and enforcing vessel compliance in the community (i.e., wastewater, scrubber water, etc.) using the AVTM system.

In addition, we would like to offer the following observations and caveats:

- Consider potential rebates on eco-actions related to underwater noise, protection of habitats, and the optimal use of shore power as potential incentives to promote better anchorage management, which may also result in social benefits of reduced noise and light pollution for SGI residents.

[7] https://tc.canada.ca/en/initiatives/oceans-protection-plan/whales-initiative-protecting-southern-resident-killer-whale

- Achieving improved anchorage management can also contribute to decarbonization and increased competitiveness.

D. Reducing Negative Social Impacts

There is a clear linkage between growth in trade and anchorage days. In fact, as noted earlier, total days at anchor between 2011 and 2020 increased faster than growth in port tonnage. When thinking about reducing overall anchorage days, it will be important to examine the data to identify the pockets of inefficiency.

We must keep in mind that future port growth may be affected by local community concerns. There is a need to reasonably mitigate the negative consequences for local communities while allowing for economic growth. Building trust and confidence in the AVTM system is fundamental, and adequate governance and robust dispute resolution mechanisms should be implemented to minimize potential negative social impacts.

Although *reducing social impacts* is a Ministerial objective, our recommendations under other themes may not align perfectly with this aim. The balancing act between promoting economic growth and addressing social concerns is a very delicate one.

Below are some specific recommendations (listed in no particular order of priority) to address the Ministerial objective of *reducing negative social impacts*, namely:

- Clearly define administrative responsibilities, in particular the specific role of Transport Canada and the VFPA in revamping anchorage management and expand VFPA jurisdiction to include SGI anchorages except for those falling within other port authority(s) jurisdiction. In doing so, care will need to be taken to ensure that broadening VFPA's jurisdictional oversight will not result in any unintended negative consequences.
- Create opportunities for local residents and Indigenous communities to be part of the solution. For example, set up a program of "Marine Guardians" and equip them with a code of conduct and the ability to address concerns (e.g., noise/light complaints) as they happen, not after the fact.
- Consider new techniques and locations for anchorage and moorage, and leverage insights and recommendations from the National Anchorage Initiative and industry experts.
- Use the AVTM system to communicate with a vessel at sea, via its local agent, about berth and anchorage availability thereby allowing the vessel operator to potentially slow its advance towards the port pending availability of an anchorage and possibly eliminating an extra vessel move in the SGI.
- Investigate initiatives such as Single Buoy Moorings (SBM) as an alternative to anchorages. Although they are a more costly approach, the social and environmental benefits may, in the long run, outweigh the costs.

In addition, we would like to offer the following observations and caveats:

- In the context of anchorage management, balance short-term and long-term actions and commit to continuously engage with community stakeholders and Indigenous groups.
- Lack of trust from both users and local communities (i.e., perception of not being heard by Transport Canada and VFPA) has been flagged as an impediment to achieve progress.
- Communicate the value and benefit of active, efficient, and successful port operations and explain the role of anchorages to ensure local communities are informed.
- Build mechanisms that focus on problem-solving and collaboration across different stakeholders.
- Lack of labour to work vessels (especially during the winter months) may affect optimal and efficient loading.
- Canadian Food Inspection Agency (CFIA) inspections may be the cause of some delays. This may be due to insufficient labour exacerbated by distance to travel for in-person inspections. Remote inspections as well as other opportunities involving single-window government reporting may help to address these delays.

Conclusion

The practical benefits of an AVTM system are a logical conclusion when the challenges facing the port supply chain are known. The technical aspects of creating a new system like AVTM can be accomplished with relative ease provided there is a will to do so and there are sufficient resources.

The most difficult and challenging aspect of introducing a system like AVTM will be the change management aspect involving the Port of Vancouver supply chain participants. They will need to understand, embrace, and champion such a system. To gain that support, VFPA will need to not only engage and consult, but also rely on and partner with individual players and industry associations that responsibly and ably represent substantial numbers of them.

Communication, transparency, a sound governance structure, and robust dispute resolution mechanism will be vital elements.

Trade is the economic engine of Canada and benefits all Canadians. The activities associated with trade and transportation produce jobs and income that, in turn, support our social system and infrastructure. But the inconveniences associated with trade through the Vancouver Gateway are borne by those people who live and work in and near port activities. Their concerns cannot be ignored; they must be acknowledged and, where reasonable and possible, mitigated.

The qualities that make the Vancouver Gateway an attractive port also make it an attractive location for residents and has been the long-standing traditional home of Indigenous communities. They have expectations about quality of life, fishing rights, and other non-economic, but nonetheless, tangible and intangible benefits.

The Panel hopes that the advice provided in this Report provides a practical blueprint that will help to indicate a way forward.

Acknowledgements

The Panel would like to thank the knowledgeable experts from Transport Canada, the BC Ministry of Transportation and Infrastructure, and the Vancouver Fraser Port Authority who supported our efforts by attending workshops, sharing data and information, and offering important historical context.

The Panel also appreciates the five industry associations that agreed to meet with Panel members on very short notice and offered their insights and candid perspectives.

The Panel thanks the eight guest speakers who shared their expertise in their respective fields.

Finally, the Panel would not have been able to complete this report without the professional and hard-working support of Inter*VISTAS* Consulting, who provided us with superior secretariat support.

Annex 1:
Terms of Reference – Active Vessel Traffic Management Advisory Panel

Purpose

The function of the AVTM Industry Advisory Panel is to assist the Vancouver Fraser Port Authority (VFPA) to develop the Port of Vancouver's Port Optimization and Digitalization Vision for the future. The Panel is strictly an advisory body and not a decision-making authority.

Terms of Reference The terms of reference for the Industry Advisory Panel are to support the VFPA to meet the requirements set out on August 12, 2021 by Minister Alghabra that the VFPA "*…will work with partners to design, by March 31, 2022, a new collaborative system to manage marine vessel traffic and optimize the supply chain flow for this strategic gateway*".[8] 1

The anticipated outcomes are as follows:

- strengthen marine safety by reducing congestion and actively managing marine traffic in the busiest, most confined waters of the port;
- improve the efficiency and reliability of the flow of goods through this strategic gateway for all supply chain partners;
- reduce environmental impacts, including noise impacts in Southern Resident killer whale habitat, by limiting unnecessary vessel movements; and
- reduce negative social impacts (like ambient noise and light pollution) by reducing overall anchorage usage in Southern British Columbia and implementing a Code of Conduct for vessels at anchorage.

The pathway to these outcomes will be through the development of a combination of policies, procedures, practices, incentives, technologies, information, and data sharing. A collaborative approach between the VFPA, industry and communities will be key to achieving desired results for all stakeholders and interested parties.

The Industry Advisory Panel's role, is as follows:

- Provide industry knowledge and expertise in the development of future innovative concepts that will support operations and optimize the gateway.
- Review and assess potential system design options and direct associated analysis.
- Support industry outreach and engagement activities with the port authority.
- Advise on topics and share on past learnings regarding national supply chain issues and challenges.
- Provide the VFPA with its unbiased views and opinions regarding port optimization and digitalization at the Port of Vancouver.

[8] Source: https://www.canada.ca/en/transport-canada/news/2021/08/government-of-canada-announces-new-system-to-improvemarine-vessel-traffic-flow-at-the-port-of-vancouver-and-in-southern-british-columbia.html

Annex 2: Biographies of AVTM Advisory Panel

Chair AVTM Advisory Panel: Louise Yako

Louise Yako has extensive leadership experience in public policy, association management, human resources development, and safety programs. The advocacy she executed while serving as the first female President & CEO of the BC Trucking Association led to, among other things, effective reforms that improved industry safety, new and revised policy that increased industry productivity, and an industry-led development of a commercial truck operator training standard. For over 6 years, she was the chief spokesperson of the provincial industry and represented the BC industry at a national level as a regional vice president of the Canadian Trucking Alliance.

Louise is known for her ability to build consensus and foster partnerships. She has served on numerous national, provincial, and regional boards and committees including WorkSafeBC, the Greater Vancouver Gateway Council, the Canadian Trucking Human Resources Sector Council, and the Asia-Pacific Gateway Skills Table. Louise has a Master of Business Administration from UBC and a combined Bachelor of Journalism with Political Science from Carleton University.

Chris Badger

Chris Badger has over 40 years in the marine industry. Since retiring from the Vancouver Fraser Port Authority as Chief Operating Officer, he has facilitated and led a number of marine related projects including a review of marine pilotage in BC, and an assessment on the use of escort tugs in Haro Strait and Boundary Pass for tankers. Chris holds a certificate of competency as a Master Mariner foreign going, a Batchelor's of General Studies from Simon Fraser University (SFU) and a Diploma in Executive Management Development from SFU. He is an adjunct instructor at Western Maritime Institute on Vancouver Island where he primarily teaches in the college's full mission bridge simulator.

Robert (Bob) Bell

Bob is a mining engineer and business administration graduate with over 30 years experience in the Canadian coal industry and international coal markets. He brings executive management experience with a strong focus on coal marketing and rail, port and marine logistics. In addition, he brings experience in mine planning and operations, finance and treasury, technical marketing, business development and mergers and acquisitions.

Bob is currently the Chief Commercial Officer of Montem Resources, an Australian-based company seeking to develop steelmaking coal mines in Alberta's Crowsnest Pass region. He previously held executive roles with major coal producers including as Chief Commercial Officer, Coal with Teck Resources and Vice President, Marketing with Luscar Ltd. He sat on the Board of Neptune Bulk Terminals, one of Canada's coal export terminals, including two years as Chair, and held leadership roles with Canadian coal exploration and development companies. Bob has a well-established presence in the Canadian coal industry and currently

serves on the boards of the Western Canadian Shippers Coalition and the Western Canadian Coal Society.

Phillip Hulina

Phil began his career in the grain industry in Thunder Bay working for the Canadian Grain Commission as a Primary Product Inspector.

He then relocated to Winnipeg and joined Pioneer Grain as Chief Grain Inspector/Malt Barley Selector. He was then promoted to Regional Manager – Calgary overseeing the restructuring of all Pioneer Grain assets throughout Alberta and British Columbia including the building new high-throughput terminals. In addition to this role, he assumed the position of General Manager for Buckerfield's & Green Valley, Fertilizer/Home and Garden retail businesses.

He became involved in Canola oil processing when Richardson's acquired the Canbra Foods processing facility in Lethbridge in the role of Assistant Vice President, Operations. In this role he worked with multiple groups in driving process improvement / improving efficiencies and the integration of the business into the Richardson group of companies.

His most recent position was in Vancouver as the Senior Director of Richardson's export Terminal. In addition to overseeing the daily operations of the terminal, he restructured terminal operations and managed several major projects which positioned the business for the future, including doubling storage capacity while setting new handling records and comanaging a joint venture between competing North Shore grain terminals.

He has served as the Chairman of the Vancouver Terminal Operations Association for many years and participated in multiple industry committees.

Working alongside his many management teams to drive continuous improvement is what he enjoyed the most about his career.

In his retirement, he enjoys flyfishing, golf and spending time with sons Ian & Evan and wife of 42 years, Janice.

David J. Kushnier

David J. Kushnier was the CEO of Alliance Grain Terminal Ltd located on the South Shore of the Burrard Inlet. He has over 44 years of experience in the operation of a Grain Terminal. He started in Thunder Bay Ontario with Saskatchewan Wheat Pool and continued with them after moving to the west coast in British Columbia in 1993. He was then appointed General Manager of Alberta Wheat Pool in 1997 which later became Cascadia Terminal. In 2007 he was asked to be the CEO for Alliance Grain Terminal Ltd. Dave retired from this position in October of 2020.

Dave is well versed in the area of logistics, moving bulk grain from the prairies and on to ships destined around the world. He was a member and past Chairman of the Vancouver Terminal Elevators' Association, A director of the BC Marine Terminal Operators' Association as well as a

member of the Nominating Committee for Board members for the Vancouver Fraser Port Authority. He was also a Board Member of the Canada Ports Clearance Association for several years. Dave's interests include travel, outdoor activities, sports, and movies.

Peter Ladouceur

Peter Ladouceur worked at CN in many different departments over the course of three decades including Engineering, Operations, Sales and Marketing. While doing so, he learned the key principles of many lines of CN business: bulk, breakbulk and in particular, the overseas container segment. Based in Nanaimo, BC, Peter still follows international container trade closely and acts as a logistics consultant from time to time, in addition to his volunteer work in the marine and air search and rescue sectors. A lifelong learner, he holds a degree in Mechanical Engineering (McGill) and a M.B.A (University of Alberta) as well as various Transport Canada/Canadian Coast Guard Auxiliary emergency response qualifications.

Kerry Lige

High achiever with over 40 years of success in Operations and Commercial activities with Bulk and Break Bulk, Cruise and Container Terminal Operations in Vancouver. Proven knowledge with experience in Operations, Project Management, Strategic Planning, Leadership and Commercial Management with CEO experience for past 6 years.

Participated on Board of Directors with BCMEA, along with Chair of the Governance Committee and member of Finance and Audit Committee along with participating on the Board of the BC Maritime Terminal Operators Association and Board of the Wood Pellet Association of Canada.

Ruth Snowden

Since retirement in 2019 from her role as the Executive Director of the Canadian International Freight Forwarders Association (CIFFA), Ruth Snowden has continued to focus on her passion of helping build a vibrant community of professionals with a strong focus on sector education, networking and promotion of the industry. Following graduation from the University of Toronto's Trinity College with a BA in History, Ms. Snowden embarked on a then unusual career in global logistics, holding several senior operational, sales and executive roles during her 27 years as an international freight forwarder, including leadership positions at Fritz Companies and UPS Supply Chain Solutions before joining CIFFA.

During her tenure at CIFFA, Ms. Snowden represented her industry in the Canadian and global arenas, taking a strong leadership role in advocating on behalf of the freight forwarding industry. Hers was a well-respected voice at many stakeholder meetings and committees with Transport Canada and the Canada Border Services Agency on issues ranging from Marine Container Inspections to eManifest to Air Cargo Security.

Today, M. Snowden combines her active retirement lifestyle with a combination of consulting and volunteer work; volunteering as mentor in the UK based Woman in Aviation & Logistics program and a two-year stint as chairperson of the international IATA/ FIATA Governing Board are just two examples of how she continues to contribute.

Captain Shri Madiwal, Director Marine Operations, Harbour Master, Vancouver Fraser Port Authority

Shri Madiwal has 25+ years of extensive experience in marine transportation sector in multiple roles at sea and shore management. He joined the Vancouver Fraser Port Authority in 2019 as the Harbour Master. In his role, Shri is responsible for all facets of the port marine logistics and operations. He is leading the development and implementation of the AVTM initiative for the port authority.

During his sea career, he served as a Captain on large tankers internationally. He has a wide-ranging experience in national and international shipping and port logistics.

Shri holds a Master Mariner certificate of competency from India and Canada, and a Master in Business Administration from the Beedie School of Business at Simon Fraser University.

Kevin Volk, Assistant Deputy Minister, BC Ministry of Transportation and Infrastructure, BC Provincial Government

Kevin Volk is the Assistant Deputy Minister of the Major Projects, Infrastructure and Properties Department. In this role, he oversees all aspects of planning, programming, procurement and major project delivery within the province. This includes the development and management of the provincial 10-year Transportation Investment Plan, management of federal and community cost sharing programs, and delivery of the major transportation projects throughout the province.

Jennifer Carter, Director, Domestic Marine Policy, Transport Canada

Jennifer Carter joined Transport Canada in July 2021 as Director of Domestic Marine Policy. In this role she is responsible for specific initiatives under the Oceans Protection Plan, including the work with the VFPA to establish an AVTM system, as well as the administration and enforcement of the *Coasting Trade Act*. Prior to joining Transport Canada, she held positions at Employment and Social Development Canada, the Privy Council Office and Immigration, Refugees and Citizenship Canada. She joined the federal public service in 2006 through the Accelerated Economist Training Program. Jennifer holds a Master of Arts degree from the Norman Paterson School of International Affairs at Carleton University.

Annex 3: List of Guest Speakers

Meeting #	Guest Speaker(s)
#1: Central Scheduling System	Paul Hiom, Cascadia Partners Captain Stephen Brown, West Pacific Marine Ltd.
#2: Anchorage Management	Dr. Trevor Heaver, University of British Columbia Kevin Obermeyer, President & CEO, Pacific Pilotage Authority
#3: Port Call Optimization (JIT)	Dr. Patrick Verhoeven, Managing Director, International Association for Ports And Harbours (IAPH)
#4: Scenario Planning	None
#5: Association Meetings Overview + Review of Recommendations	None
#6: Port Community System + Review of Recommendations	Richard Morton – Secretary General, International Port Community System Association (IPCSA) Hans Rook - International Port Community System Association (IPCSA), Chairman Nico De Cauwer – International Port Community System Association (IPCSA), Lead for Standards and Technology

Annex 4: List of Industry Associations Consulted

Industry Association	Meeting Date/Time (PST)
1. BC Maritime Terminal Operators Association (BCMTOA)	Thursday, February 24, 430pm-530pm
2. BC Chamber of Shipping	Friday, February 25, 11am-noon
3. Western Grain Elevators Association (WGEA)	Tuesday, March 1, 7am-8am
4. Western Canadian Shippers Coalition (WCSC)	Friday, March 4, 9am-10am
5. Shipping Federation	Tuesday, March 1, 10am-11am