

## Options for Reducing Anchorage Demand: Vessel Traffic Management

Ships commonly use anchorages before loading bulk commodities such as grain and coal at the Port of Vancouver. Too many ships waiting at anchor are not a sign of positive growth but of inefficiencies that lead to long vessel lineups at port, which translate into serious economic and environmental costs.<sup>1</sup>

Solutions to the problem of port congestion and expanding anchorage use have been promised by the Minister of Transport for a number of years.<sup>2,3</sup> In August 2021, Transport Canada announced a new traffic management system that will “reduce environmental impacts” by “reducing overall anchorage usage in Southern British Columbia.”<sup>4</sup>

In 2022 the Vancouver Fraser Port Authority (VFPA, or “Port of Vancouver”) prepared more details about a proposed new Active Vessel Management System (AVTM).<sup>5</sup>

This brief policy review highlights some important aspects and recommendations to be considered.

### WHY REDUCE SHIP NUMBERS WAITING AT ANCHOR?

**Greenhouse Gas Emissions:** The Port of Vancouver could eliminate about 20% of its marine greenhouse gases by reducing wasteful and avoidable vessel lineups at anchorages. Two thirds of freighter emissions are from parked ships that idle at anchor or at berth.<sup>6</sup> Each ship at anchor produces about 10 tonnes of greenhouse gases every day<sup>7</sup>. Increasing efficiency has both economic and environmental benefits. Avoidable annual greenhouse gas production by idling bulk freighters in the Southern Gulf Islands exceeded 50,000 tonnes in 2020.<sup>8</sup>

**First Nations Rights:** Recent expansion of anchorage use into the Southern Gulf Islands by bulk carriers destined for the Port of Vancouver is opposed by First Nations<sup>9</sup>, and is not consistent with legislation regarding the Declaration on the Rights of Indigenous Peoples.<sup>10,11,12</sup> Local governments, coastal communities, environmental organizations, and the provincial government, have all called for elimination of these anchorages in these sensitive waters of the Salish Sea.<sup>13,14,15</sup>

**Significant Conservation Areas:** Environmental effects of anchored bulk carriers are severe.<sup>16</sup> Anchorage use is not compatible with the following longstanding conservation efforts for the sensitive area of the Southern Gulf Islands: A proposed National Marine Conservation Area (NMCA)<sup>17,18</sup>, Ecologically and Biologically Significant Areas (EBSAs) identified by DFO under provision of the Oceans Act<sup>19</sup>, the Islands Trust Act Trust Area protection mandate<sup>20</sup>, and coastal protection zones of official community plans and bylaws. The Port of Vancouver, with a mission to be the world’s most sustainable port,<sup>21</sup> should support federal efforts and commitments<sup>22</sup> towards marine conservation by reducing vessel lineups and avoid using this area for industrial purposes such as anchorages for bulk carriers.

**Accidents & Spills, Endangered Killer Whales:** Remote anchorages require unnecessary trips by empty and partially loaded ships from and to port.<sup>23</sup> This additional traffic volume through Haro Strait and critical orca habitat is wasteful and could be avoided entirely. Less traffic means less pollution, lower risk of accidents, and economic benefits.

**Economic benefits:** Delayed loading of a single bulk carrier costs the Canadian economy US\$ 11,000 to US\$15,000 per day, depending on vessel size<sup>24</sup>. Reducing waiting time for ships at anchor saves fuel, gives prairie farmers better grain profits, and makes the market place Vancouver more attractive with reliable, efficient, and greener export services.<sup>25</sup>

## 1. Understanding Anchorage Use: Demand vs Supply

For at least half a decade, repeated promises have been made to “reduce anchorage use” at the Port of Vancouver, and the term has almost become a buzzword.<sup>26,27,28,29,30,31</sup>

But what does “anchorage use” actually mean, and why have efforts failed to reduce it?

For understanding how different policies will affect anchorage use, it is important to understand the definitions and basic relationships involving demand and supply, as explained for commodity exports in the text box below.

### Anchorage Demand

Demand for anchorages is created by the number of ships that have arrived at port at a given time and are waiting to proceed to terminals for loading.

### Anchorage Supply

Supply of anchorages is determined by the number of anchorage locations near port where ships are allowed to wait.

### Anchorage Use

Result of both demand and supply. Anchorage use is measured as the sum of **time at anchor** by all vessels over a given time period, usually the total of anchorage days per year (or per month). Sometimes the number of ships using anchorages per time period is counted, but this number is less accurate because it does not take the duration at anchor into account.

Demand for anchorages started to reach supply and capacity at the Port of Vancouver about ten years ago. *The initial response from industry and port was to look for ways to increase anchorage supply by identifying additional sites, expand beyond port jurisdiction, and involve Transport Canada which had created the National Anchorages Initiative (NAI).*<sup>32,33</sup>

Temporary measures, including the Interim Protocol in 2018 for the Southern Gulf Islands were announced as a remedy to the public containing a voluntary code of conduct by anchored ships, “balanced use of these sites across the region”, and “explore ways to reduce anchorage use”.<sup>34</sup>

*Whether intended or not, developing an algorithm at the Port Operations Centre to allocate vessels to all anchorage sites more efficiently had the simple effect of increasing anchorage supply. New anchorages sites that in the past had been used by ships destined for local ports and had not seen any vessels in years were now suddenly activated and repurposed for the use by the Port of Vancouver. Even anchorage sites that had been used above average in recent years now received even more anchorage use than ever, instead of being relieved.*<sup>35,36</sup>

What happened? Increasing anchorage supply is only a temporary and not a sustainable solution. The Interim Protocol only bought some time for port and industry but eventually even this newly added anchorage supply reached capacity.<sup>37</sup> Quite possibly the added supply actually caused additional demand, by offering easily “available” anchorages and by procrastinating the necessary collaboration between industry and port to address the root causes of the problem.

Based on these observations, “reducing anchorage use” appears to be a vague concept for marine traffic planners at VFPA and Transport Canada, with the Interim Protocol having the opposite effect.

Exponential growth in anchorage use in the Southern Gulf Islands resulted in worsened environmental, socio-cultural, and even economic conditions. In 2020, avoidable greenhouse gas production by ships anchored in the Southern Gulf Islands exceeded 50,000 tonnes.<sup>38</sup>

Even more seriously, without any consultations or transparency, Transport Canada appears to have shifted from the explanation that they had to “find temporary anchorage points” before they can “find a better solution” to now considering these anchorages as “available” without any options to reverse the temporary expansion.<sup>39</sup>

The project summary of the AVTM appears similarly vague in the description of the exact components of the new system that apparently should lead to “reduced anchorage use”.<sup>40</sup> Also, VFPA is reporting gross underestimates of the quantitative dimension of their anchorage problem<sup>41</sup>, and may not be fully aware of appropriate and necessary measures needed for the design of AVTM.

This leads to the concern that similar to the Interim Protocol, the AVTM will only increase the efficiency of allocating ships to anchorage sites, or in other words, the new system will try to cope with rising marine traffic volumes by managing to pack more ships into traffic lanes and existing anchorages. This would again have the opposite effect of “reducing anchorage use”.

There is one aspect where reducing transit times for packing ships more seamlessly into anchorages may be beneficial. If port anchorages can be used more efficiently, this would relieve anchorage demand on the Southern Gulf Islands.

*The only sustainable solution is to reduce anchorage demand itself.* The root causes of escalating anchorage demand are a lack of efficiency and a lack of integration of the maritime component into commodity supply chains, in particular regarding vessel arrival. Regarding anchorage demand and marine traffic congestion, increasing traffic fluidity may bring benefits of hours, virtual queuing and arrival procedures may bring benefits of days, and proactive flexible contingency plans by exporters in response to delays in supply chains may bring benefits of weeks in reduced anchorage use.

## **2. Approach: Process-oriented vs Result-oriented**

There is a temptation for government to engage in management that is oriented towards programs and processes rather than results, and to avoid such inefficiencies and to increase accountability the Government of Canada enacted a policy on results-based management in 2016.<sup>42,43</sup>

It is difficult to assess the AVTM program unless objectives are formulated as specific results, with specific projections in the amount of reduction in anchorage use to be provided by VFPA.

VFPA needs to present a cohesive road map on how the port congestion problem will be solved and provide a reasonable time frame when specific objectives are expected to be met.

AVTM needs to contain a schedule for scaling back and eliminating anchorage use by VFPA in the Southern Gulf Islands with specific targets over a specific time period.<sup>44</sup>

### **3. Feedback Necessary to Avoid Vessel Lineups**

There is an apparent lack of feedback mechanisms to adjust the scheduling of deliveries for new contracts and contingency planning to avoid such overbooking of commodity supply channels.

Disruption of supply lines causes port congestion and long vessel lineups for unnecessarily extended periods of time.

The problem does not appear to be the actual disruption, but the continuous addition of new vessels that keep arriving ‘as if nothing happened’. The ‘snowballing’ effect in ship waiting times comes from the cumulative number of ships in the lineup and not from the disruption itself.

Detailed research<sup>45,46</sup> with analysis and computer simulations identified that there appears to be a lack of information flow and early warnings about delays in supply chains reported back to logistics planners located at exporter’s headquarters at the far back of supply lines.

Information should be digitized and made available to flow not only one direction along commodity supply chains, but in both directions to allow flexible responses and invoking of contingency plans by exporters. Vessel scheduling needs to be adjusted in response to experienced delays.

If this mechanism is not addressed there is little hope for a sizeable reduction in anchorage demand.

### **4. Incentives Needed for Industry**

Reducing anchorage demand requires improved collaboration between commodity exporters transporting commodities to the coast, the port overseeing infrastructure and traffic management, and buyers with their representatives managing ships to receive bulk cargo at terminals.<sup>47,48,49</sup>

The root cause for inefficiencies is the lacking integration of the maritime component into commodity supply chains.<sup>50</sup> In other words, the challenge is to bridge the gap between the logistics of sellers and buyers, who are different legal entities and do not share their logistics planning. The port has a pivotal opportunity and responsibility to bridge this gap with safe digital information systems.

Currently, exporters do not have sufficient incentives to care beyond port terminals, which they consider the end of the supply chain and the end of their responsibility. The main concern of exporters is that ships are available for loading, but not how many ships are waiting at anchor.

Exporters have an incentive for minimizing anchorage demand, because they have to pay the buyer a penalty in the form of demurrage for every applicable day of delayed delivery. In recent years in Vancouver, these fees have cost exporters tens of millions of dollars, and the extent of these economic damages to Canadian exporters have been directly related to the number of days at anchor.<sup>51</sup> Transportation costs are on the rise, with the daily cost of operating a typical freighter of the Panamax class reaching highs of USD 36,000 in September 2021.<sup>52</sup>

It is unclear why these incentives are not more effective. It is possible that exporters are not sufficiently aware of these hidden costs, or that commodity providers such as Canadian farmers are not aware that these hidden costs will reduce the price they receive for grain, or if the amount of hidden costs is not high enough to motivate changes in current practices.

Regarding Active Vessel Traffic Management by the Port of Vancouver, the following solutions should be considered:

**(a) Voluntary Industry Collaboration:** A best case scenario would be for industry representatives to assume positive leadership for voluntary collaboration to bridge these gaps, increase efficiencies, and get anchorage demand under control by minimizing the need for wasteful time at anchor.<sup>53</sup>

The AVTM Advisory Panel<sup>54</sup> would be of an ideal composition to facilitate this much needed cross-industry collaboration for a full integration of the maritime component into commodity supply chains.

**(b) Financial Incentives at Port, Proportional to Anchorage Use:** Incentives or disincentives at port should be in proportion to vessel turnaround time in the entire Salish Sea.<sup>55</sup> Commodity exporters that can efficiently process arriving ships faster should be given financial incentives, while inefficiencies with longer stays of ships should be discouraged with financial disincentives.

**(c) Stricter Port Rules:** Limiting the total number of days<sup>56</sup> that ships destined for the port can stay in the entire Salish Sea. This would free space at the preferred and most valuable port anchorages close to terminals (with endorsement by with Transport Canada, for example by adding to existing Interim Protocol).

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