Anchorage Use in the Canadian Waters of the Salish Sea

June 2026

About Us

Clear Seas is a Canadian not-for-profit organization that provides independent fact-based information to enable governments, industry, and the public to make informed decisions on marine shipping issues. We work to build awareness and trust so that all people can feel a part of the marine sector. Our vision is a sustainable marine shipping sector that is safe, vibrant, and inclusive, both now and for future generations.

Clear Seas' research and publications are made available at clearseas.org.

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Executive Summary

Commercial anchorage use in the Canadian waters of the Salish Sea changed significantly between 2016 and 2025. Clear Seas undertook a research project using the Pacific Pilotage Authority's Vessel Movement Data to examine anchorage use across 71 commercial anchorages within this region. This report summarizes the findings from this research project.

Between 2016 and 2023, demand for commercial anchorages, expressed as total time at anchor, nearly doubled while vessel traffic fell. Anchorage use appears to be shaped less by vessel traffic alone than by how often vessels anchor and how long they remain at anchor. Although anchorage use has declined since 2023, demand for anchorages remains elevated compared with earlier years.

Gulf Islands anchorages have absorbed most of the increased anchorage demand over the past 10 years, although usage varies seasonally. Bulk carriers account for approximately 85% of this demand, and just two commodities, grain and coal, account for 70% of all time spent at anchor in the Canadian waters of the Salish Sea. Tanker traffic has risen sharply since the completion of the Trans Mountain Expansion project, but tanker anchorage use has grown more modestly because Trans Mountain tankers average less time at anchor than other tankers. Container anchorage use spiked during the 2021 and 2022 supply-chain disruptions and remains above pre-disruption levels. The biggest surges in anchorage use over the past 10 years have occurred during disruptions that impacted terminal operations and rail movements, highlighting the interconnectedness of the supply chain and its vulnerability to shocks.

Overall, anchorage use is a visible symptom of broader system performance. Stronger coordination among the port authorities, terminals, railway operators, vessel operators, pilots, and ports is needed if anchorage use is to be effectively managed. Policy and regulatory improvements that reduce avoidable waiting and better manage where anchorage impacts are felt would reduce the demand for anchorages in sensitive areas. Future research should focus on anchorage projections and practical coordination, policy, and regulatory options.

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Acronyms and Abbreviations

AIS Automatic Identification System

BC British Columbia

CIFFA Canadian International Freight Forwarders Association

DFO Department of Fisheries and Oceans Canada

DND Department of National Defence

IMO International Maritime Organization

LOA Length Overall

LNG Liquefied Natural Gas

PPA Pacific Pilotage Authority

TC Transport Canada

TMX Trans Mountain Expansion Project

US United States

VFPA Vancouver Fraser Port Authority

YVR Vancouver International Airport

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1. Understanding Anchorage Use in the Salish Sea

1.1 Anchorage Use Is Changing in Ways That Traffic Alone Does Not Explain

The Canadian waters of the Salish Sea are a major gateway for global marine trade. The region, encompassing the coastal waters near Vancouver, Nanaimo, and the Gulf Islands, contains over 40 commercial shipping terminals. These terminals handle energy products, consumer goods, and bulk commodities that are important to both Canadian and international supply chains.

Given the scale and complexity of this system, vessels are not always able to load or unload immediately upon arrival. Vessels may need to wait because of weather, tides, terminal delays, inspections, or other constraints. Commercial shipping anchorages help absorb these delays. A commercial shipping anchorage is defined as a designated area in a body of water where merchant vessels temporarily stop and anchor while waiting for port entry, cargo operations, or further instructions. There are 81 commercial shipping anchorages in the Canadian waters of the Salish Sea, and they play an important role in the marine transportation system.

Commercial anchorage use in the Canadian waters of the Salish Sea has changed significantly over the past decade. Between 2016 and 2023, anchorage use, defined as the total time commercial vessels spent at anchor, increased by 90%. Over the same period, however, commercial vessel traffic, measured as the number of commercial vessel trips to the region,[1] fell by 14%. This suggests that the rise in anchorage use was driven less by traffic growth than by longer and more frequent delays across the system. As shown in Figure 1, the largest regional increase occurred in the Gulf Islands, where the total time that vessels spent at anchor grew by 470% between 2016 and 2025. Major disruptions over this period, including the COVID-19 pandemic and the 2021 Pacific Northwest floods, contributed to longer terminal wait times and increased pressure on anchorages.

[1] Defined as a tanker, bulk carrier, vehicle carrier, container vessel, or other type of cargo vessel arriving in the Salish Sea to load or unload cargo at a Canadian port.

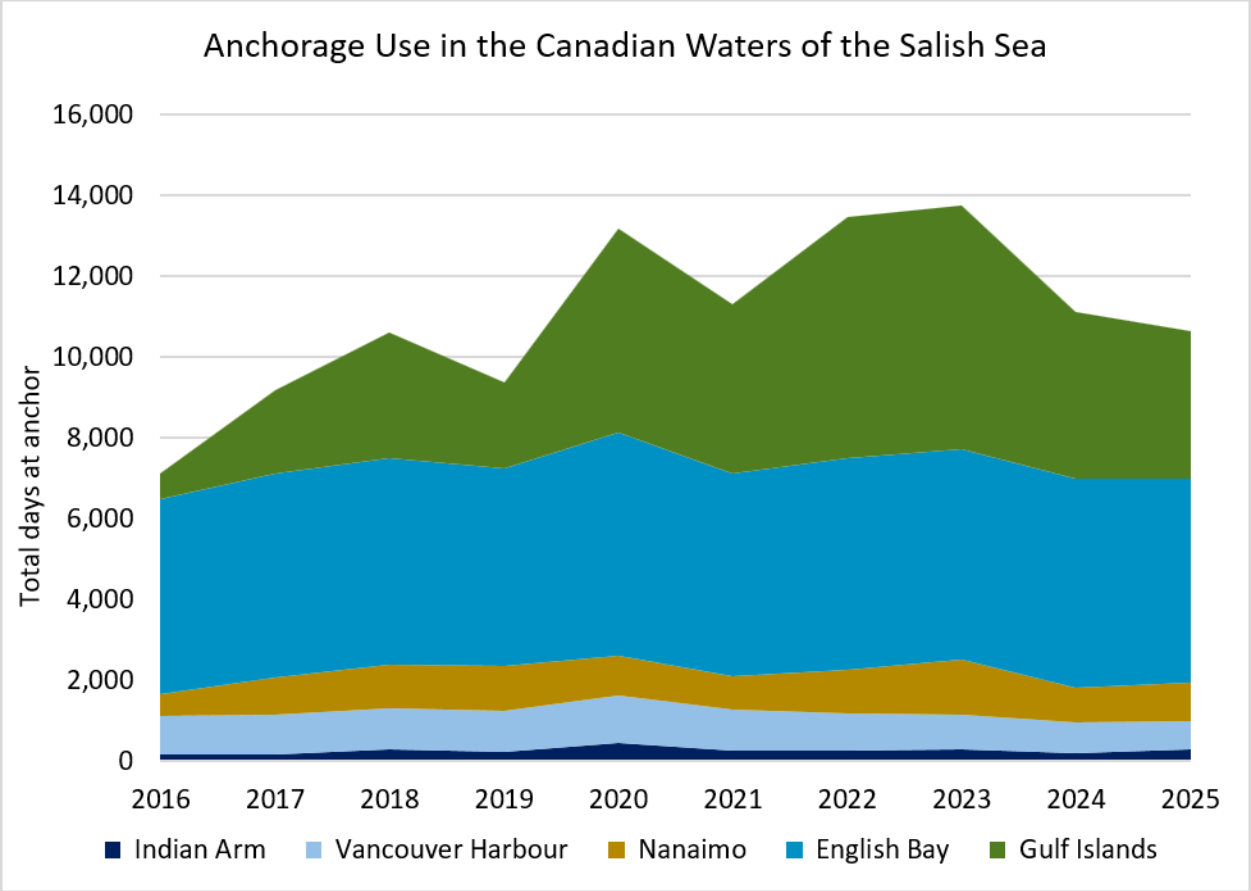

Figure 1 Anchorage Use in the Canadian Waters of the Salish Sea (2016–2025)
Total time at anchor increased sharply between 2016 and 2023, driven primarily by growth in Gulf Islands anchorage use, while English Bay remained consistently high throughout the last 10 years.

These changes matter because anchorage use has environmental, community, and economic impacts. Vessels at anchor generate less underwater noise than vessels in transit, but can still produce noise from generators, auxiliary engines, ventilation systems, heating, and onboard work. They can also create light pollution and disturb the seabed through anchor drag (Government of Canada, 2025). From an economic perspective, excessive time at anchor is a sign of inefficiencies within the system; vessels are waiting rather than loading, unloading, or moving cargo. These delays increase operational costs, reduce supply chain reliability, and contribute to higher prices for consumers (Heaver & Atkins, 2024).

Since 2023, anchorage use has begun to ease from its recent peak. However, vessel traffic in the Canadian Salish Sea is projected to grow by more than one-third over the next 15 years (Clear Seas, 2025). This makes it important to understand what has driven

recent anchorage pressure, where that pressure has been concentrated, and which parts of the system may be most exposed if future traffic or disruption increases.

1.2 What This Report Covers and What It Leaves Out

This report examines changing anchorage use across the Canadian waters of the Salish Sea. It considers where and when growth has occurred, which vessel types, commodities, and terminals have driven it, and how recent changes in anchorage use reflect broader supply-chain pressures across the marine transportation system. The analytical basis of the report is the Excel-based analysis of the Pacific Pilotage Authority's (PPA) Vessel Movement Data. A full description of methods is provided in Appendix A.

Several regional and vessel-type assumptions should be noted. Although the Salish Sea includes the Strait of Georgia, the Strait of Juan de Fuca, and Puget Sound, this report examines only Canadian-bound traffic, meaning traffic destined for a terminal or anchorage in British Columbia (BC) (Figure 2).

Figure 2 Map of the Canadian and US Waters of the Salish Sea
While the Salish Sea encompasses the entire shaded area, this analysis only considers anchorage use in the Canadian waters of the Salish Sea, the area shaded in light green.

The report focuses on 71 individual anchorages within the PPA's mandatory pilotage zone[2] that make up the core of commercial anchorage use in the Canadian waters of the Salish Sea. However, two Canadian anchorage groups are left out. The Constance Bank anchorage group, which consists of five individual anchorages off Victoria, is excluded because it is not within the mandatory pilotage zone. Clear Seas is also

[2] Pilotage refers to the practice of taking a licensed marine pilot aboard so the ship can be navigated safely through designated waters by someone with expert local knowledge. Pilotage is legally required for vessels navigating within the PPA's mandatory pilotage zone, including when proceeding to or departing from an assigned anchorage (Pacific Pilotage Authority, n.d.).

preparing a separate report on the Constance Bank anchorage group. The Royal Roads anchorage group also consists of five individual anchorages and is excluded because it operates differently from most commercial anchorages in the Salish Sea. Located within DND-controlled Esquimalt Harbour in Victoria, it is managed by the King's Harbour Master rather than the Vancouver Fraser Port Authority (VFPA) (Government of Canada, 2021).

Additionally, the vessel type analysis is limited to six commercial vessel types: bulk carriers, container vessels, general cargo vessels, vehicle carriers, tankers, and liquefied natural gas (LNG) bunkering tankers (see Section 3.1 for definitions). These are the vessel types that account for the majority of commercial anchorage use in the Salish Sea. However, a small amount of commercial anchorage use by other vessel types (such as passenger vessels, tugs, and fishing vessels) may be excluded.

2. The Anchorage System Serves Different Functions Across the Salish Sea

2.1 Five Anchorage Groups Play Distinct Roles in the System

Within the Canadian waters of the Salish Sea, there are 20 anchorages in English Bay, eight in Vancouver Harbour, four in Indian Arm, six in Nanaimo, and 33 in the Gulf Islands. These 71 anchorages, shown in Figure 3, will be the focus of this analysis. A summary of each anchorage group is provided in Table 1.

Figure 3 Map of Canadian Salish Sea Commercial Anchorages

The Gulf Islands anchorage group is the largest and most complex in the Canadian waters of the Salish Sea, with 33 individual anchorages spread across seven smaller anchorage areas. These are Trincomali, Kulleet Bay, Ladysmith, Houston Pass, Captain's Pass, Cowichan Bay, and Plumper Sound. Trincomali is the largest subgroup, with nine anchorages, followed by Ladysmith and Cowichan Bay with six each, Plumper Sound with five, Houston Pass with three, and Kulleet Bay and Captain's Pass with two each. These are shown in Figure 4.

Figure 4 Map of Canadian Gulf Islands Anchorages

Table 1 Summary of Anchorage Groups in the Canadian Waters of the Salish Sea

Anchorage group	Number of anchorages	Purpose
English Bay	20	Priority anchorage for vessels waiting for a berth at Vancouver terminals. Vessels remain there for about four days on average. It is heavily used throughout the year, with utilization[3] generally above 75%. All major vessel types use this anchorage.
Vancouver Harbour	8	Functions mainly as a short-term anchorage area for vessels awaiting berth, with average stays of about two days. It is used by all vessel types.
Indian Arm	4	Serves as a short-term anchorage area, with average stays of roughly two days. It is used mainly by tankers calling on Westridge and Suncor terminals.
Nanaimo	6	Functions as a longer-term anchorage area, with average stays of about eight days. Utilization has increased over time, rising from roughly 30% in 2016 to 40% in 2025. The area is used by all vessel types.
Gulf Islands	33	Designated long-term anchorage area, with vessels staying for about 10 days on average. Use is highly seasonal, with much higher utilization in winter and little to no use during the summer. Utilization has also risen over time, increasing from about 5% in 2016 to 30% in 2025. The area is used mainly by bulk carriers and is typically accessed via Swanson Channel or Plumper Sound.

[3] Defined as the percentage of days the anchorage group is occupied over the course of a year.

2.2 Anchorage Allocation Depends on Jurisdiction, Pilotage, and Vessel Size

The VFPA directs vessels to anchorages in English Bay, Vancouver Harbour, and Indian Arm. Anchorage assignments in the Gulf Islands are also currently coordinated through the VFPA under Transport Canada's *Interim Protocol for the Use of Southern B.C. Anchorages*. Introduced in 2018, the protocol is a temporary, voluntary measure intended to respond to increased anchorage use by distributing vessels more evenly across the south coast. The protocol does not apply to the six Nanaimo anchorages; requests for these anchorages remain the responsibility of the Port of Nanaimo (Transport Canada, 2021). Compulsory pilotage, administered by the PPA, is mandatory for all 71 anchorages included in this analysis (Pacific Pilotage Authority, n.d.).

A further relevant consideration for anchorage allocation is vessel size, specifically vessel draft[4] and length overall (LOA).[5] Maximum vessel draft is limited by the controlling depth of the anchorage, which is its minimum depth during low tide. Vessel LOA is limited by the radius of the anchorage. Each Canadian Salish Sea anchorage has a unique depth and LOA value. The controlling depth of Canadian Salish Sea anchorages varies from nine to 50 metres.[6] Maximum LOA varies from 100 to 400 metres (Pacific Pilotage Authority, 2025).

2.3 Winter Places the Greatest Pressure on the Anchorage System

A closer look at anchorage use over the course of the year shows that anchorage demand in the Canadian Salish Sea is highly seasonal. Anchorages are generally busiest in winter, between January and March, and quietest in summer, between June and August, reflecting broader seasonal patterns in marine traffic. Much of this additional winter demand is absorbed by the Gulf Islands, which see very little activity during the summer months. Figure 5 shows the total time at anchor by month in 2025.

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[4] Ship draft is the vertical distance between the waterline and the lowest point of a ship's hull (usually the keel), indicating how deep the vessel sits in the water.

[5] Vessel LOA is the total length of a ship measured from the foremost point of the bow to the rearmost point of the stern, including any fixed extensions.

[6] Controlling depth figures are missing for some of the Salish Sea anchorages, so this may not capture the full range of values.

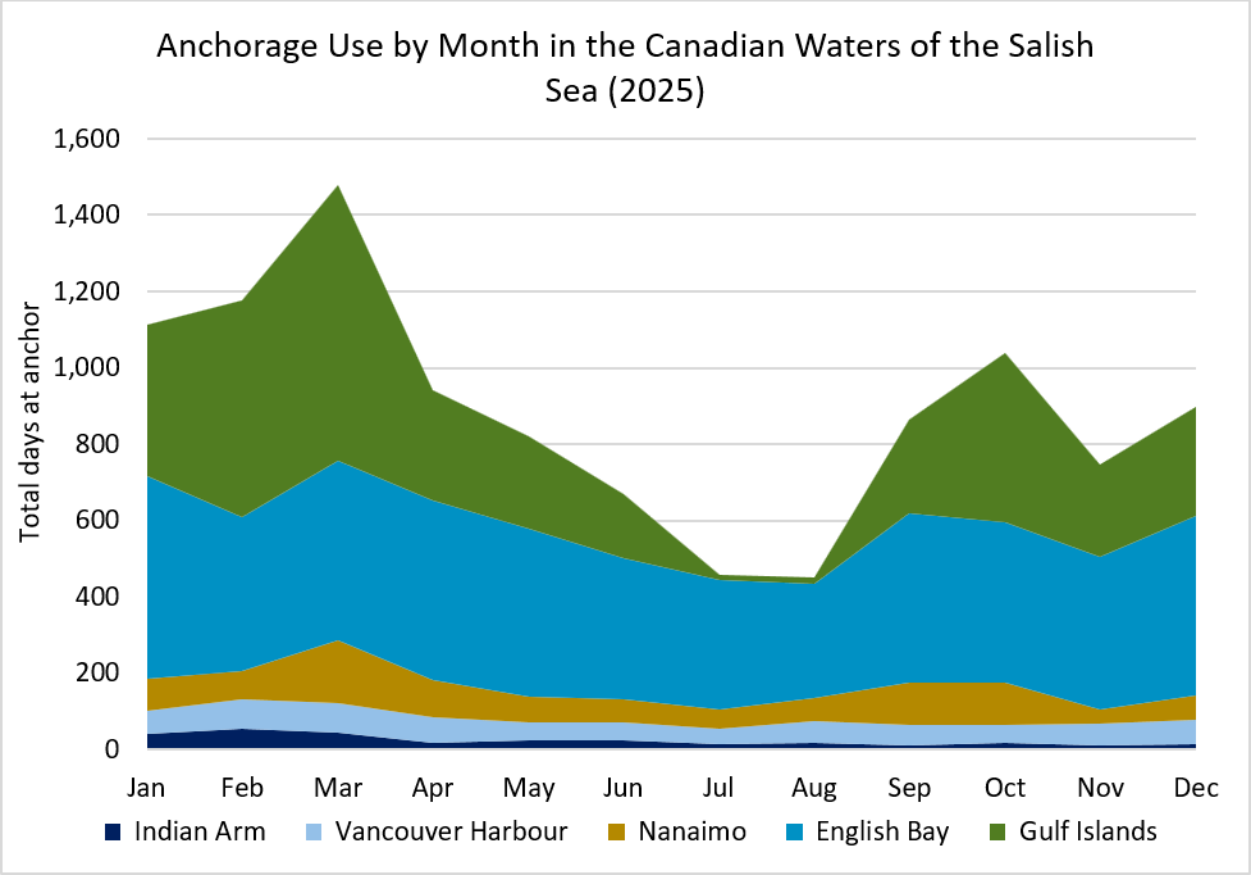

Figure 5 Anchorage Use by Month in the Canadian Waters of the Salish Sea (2025)
Anchorage use peaked in late winter and early fall in 2025, driven primarily by increased use of Gulf Islands anchorages, while the summer months saw comparatively low occupancy.

3. Six Vessel Types Account for Most Commercial Anchorage Use

3.1 Bulk Carriers Drive Most Anchorage Demand

Several types of commercial vessels operate in the Canadian Salish Sea, each serving a different purpose in regional and international trade. Bulk carriers transport unpackaged raw materials such as grain, coal, potash, and sulphur. Container vessels carry standardized containers filled with manufactured goods and consumer products. General cargo vessels carry a wide range of breakbulk goods, including machinery, steel, lumber, and oversized project cargo. Vehicle carriers transport cars, trucks, and other wheeled equipment on enclosed decks. Tankers transport liquid cargoes such as crude oil, refined petroleum products, and chemicals. LNG bunkering tankers supply liquefied natural gas to vessels for use as marine fuel.

As shown in Figure 6, bulk carriers account for the vast majority of anchorage use in the Salish Sea and encompass most of the growth over the past decade. These trends are examined in greater detail in the sections that follow.

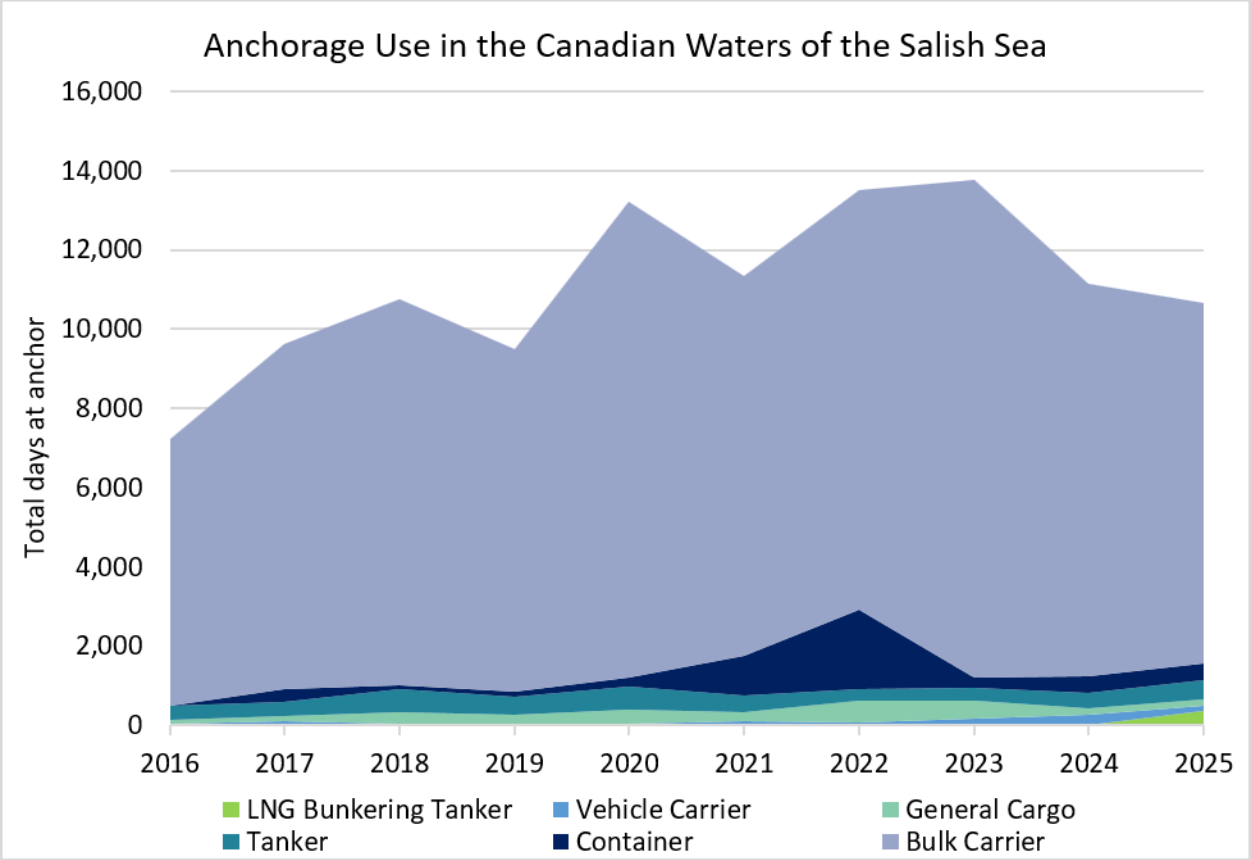

Figure 6 Anchorage Use by Vessel Type in the Canadian Waters of the Salish Sea (2016–2025)
Bulk carriers accounted for the vast majority of anchorage use between 2016 and 2025, with peaks in 2020 and 2023.

Bulk carriers are the most common commercial vessel type in the Salish Sea, averaging more than 1,400 trips per year. They are followed by container vessels, which average approximately 675 trips annually. Overall, the total number of vessel trips declined slightly between 2016 and 2023, averaging around 2,750 trips per year. Tanker activity increased in 2024 and 2025 because of the Trans Mountain Expansion (TMX) project, which brought the total number of trips to over 3,000 for 2025. LNG bunkering tankers are also now operating in the Salish Sea, following the introduction of three new LNG bunkering tankers by Seaspan. Figure 7 provides an overview of historical traffic flows for each vessel type.

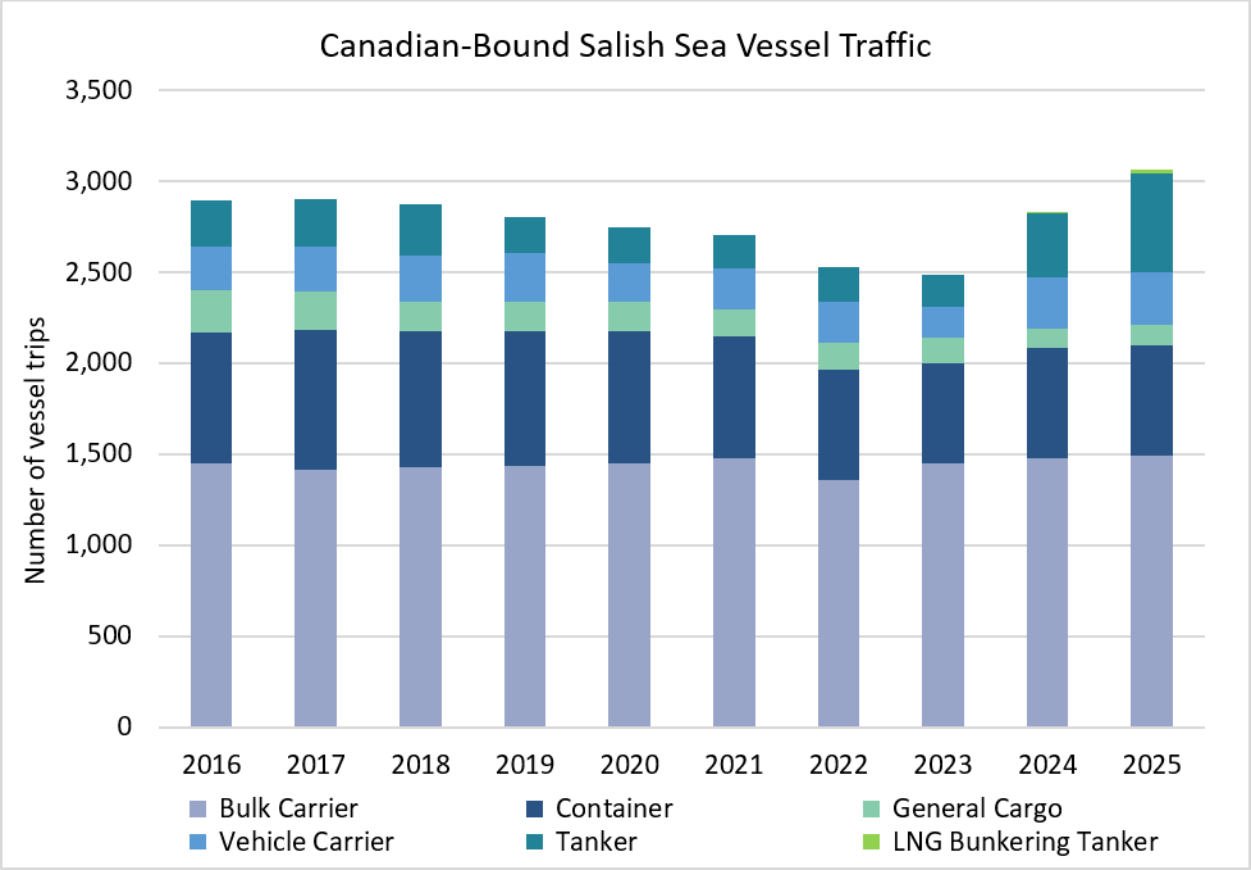

Figure 7 Canadian-Bound Salish Sea Vessel Traffic, by Vessel Type (2016–2025)
Canadian-bound vessel traffic in the Salish Sea declined modestly between 2016 and 2023 before increasing again in 2024 and 2025, with bulk carriers consistently accounting for the largest share of vessel trips and tanker traffic rising sharply in 2024 and 2025.

In addition to being the most common vessel type, bulk carriers have the second highest average time at anchor (behind only LNG bunkering tankers, which have a very small number of trips). In 2025, bulk carrier trips that anchored had an average anchorage stay of 7.7 days per trip. Table 2 provides an overview of anchorage behaviour by vessel type.

Table 2 Overview of Anchorage Use by Vessel Type in the Canadian Waters of the Salish Sea (2025)

Vessel type	Number of trips	Trips that anchor (%)	Average time at anchor (days)	Total time at anchor (days)
Bulk Carrier	1,488	80%	7.7	9,158
Container	610	19%	4.4	512
General Cargo	114	41%	3.5	162
Vehicle Carrier	286	16%	2.8	129
Tanker	520	55%	1.7	492
LNG Bunkering Tanker	23	87%	18.6	372
Grand Total	3,041	56%	6.4	10,825

In the following sections, the analysis focuses in greater detail on the three vessel types most central to anchorage demand in the Canadian Salish Sea: bulk carriers, tankers, and container vessels.

3.1.1. Bulk Carriers Anchor Most in English Bay and, Increasingly, the Gulf Islands

English Bay is the priority anchorage for bulk carriers, accounting for 47% of all bulk carrier anchorage use in 2025. As anchorage demand has increased, bulk carriers have also been spending more time in the Gulf Islands while waiting to visit terminals or anchorages in Vancouver. This reflects the VFPA's anchorage assignment practices, where anchorages in English Bay and Indian Arm are generally assigned for up to seven days, meaning vessels facing longer expected waits may be shifted to the Gulf Islands (Port of Vancouver, 2025). Between 2016 and 2025, the total time bulk carriers spent at anchor in the Gulf Islands increased by more than 460%. Figure 8 provides an overview of regional anchorage use by bulk carriers.

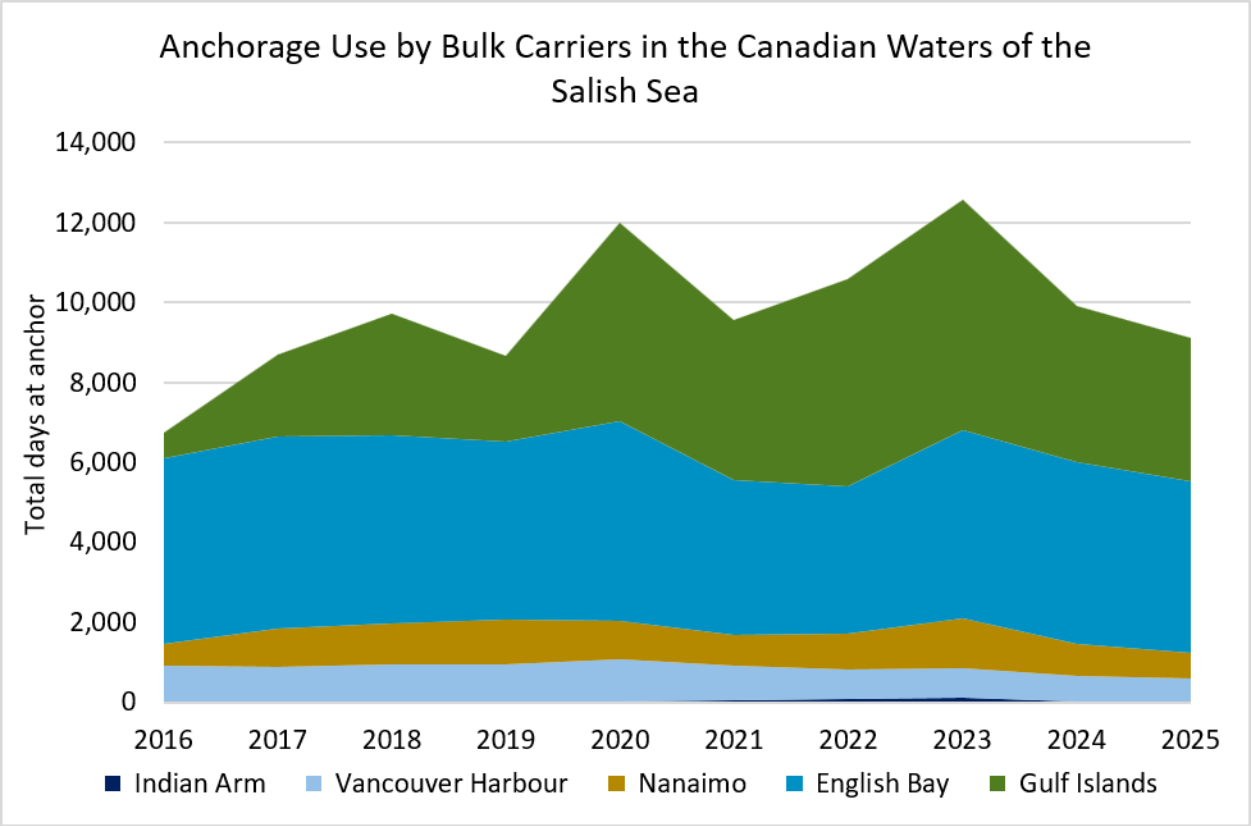

Figure 8 Bulk Carrier Anchorage Use in the Canadian Waters of the Salish Sea (2016–2025)
Bulk carrier anchorage use increased sharply between 2016 and 2023, driven primarily by growing use of Gulf Islands anchorages, before declining in 2024 and 2025.

During a single trip to the Salish Sea, a bulk carrier may call at multiple terminals and anchorages. The time that bulk carriers spend at anchor varies depending on whether it occurs before the first terminal visit, between terminal visits, or after the final terminal visit.

Waiting at anchor before the first terminal visit is by far the largest component of bulk carrier anchorage use. In 2025, bulk carriers spent an average of 6.2 days at anchor before their first terminal visit and 5.9 days at anchor between terminal visits. However, while 74% of trips anchored before their first terminal visit, only 24% anchored in between terminal visits. Bulk carriers spent only one day at anchor on average after their final terminal visit, typically for refuelling, crew changes, or tidal timing. Trips that anchored but did not visit a terminal were very rare, accounting for approximately 1% of trips. Table 3 shows total and average bulk carrier time at anchor across these three phases of a trip, as well as for trips that did not visit a terminal.

Table 3 Share of Bulk Carrier Trips that Anchored Before, Between, and After Terminal Visits (Including No Terminal Visit), With Average and Total Days at Anchor (2025)

Anchorage phase	Trips that anchored in phase (%)	Average days at anchor	Total days at anchor
Before terminal	74%	6.2	6,733
Between terminals	24%	5.9	2,081
After terminal	19%	1.0	275
No terminal	1%	3.3	69

3.1.2. Grain and Coal Account for Most Bulk Carrier Anchorage Use

Most anchorage time in the Salish Sea is occupied by bulk carriers carrying grain and coal. In 2025, bulk carriers carrying grain and coal accounted for 70% of all time spent at anchor in the Salish Sea, across all vessel types.

While grain was responsible for the highest total time at anchor in 2025, coal has made the single largest contribution to the overall increase in anchorage use in the Canadian Salish Sea over the last decade. Wait times rose sharply in 2022 and 2023 due to a combination of factors. These include the 2021 Pacific Northwest floods, when a series of atmospheric river events triggered severe flooding and landslides across southern BC, severing rail links between Kamloops and Vancouver (Canadian International Freight Forwarders Association, 2021). These disruptions coincided with a rail dispute involving the Spring Creek Mine in Montana, which further delayed coal shipments to Westshore, as well as a 22-day strike at Westshore Terminals in September 2022 (The Canadian Press, 2022). Figure 9 shows the total time at anchor for grain and coal compared to the other bulk commodity types.

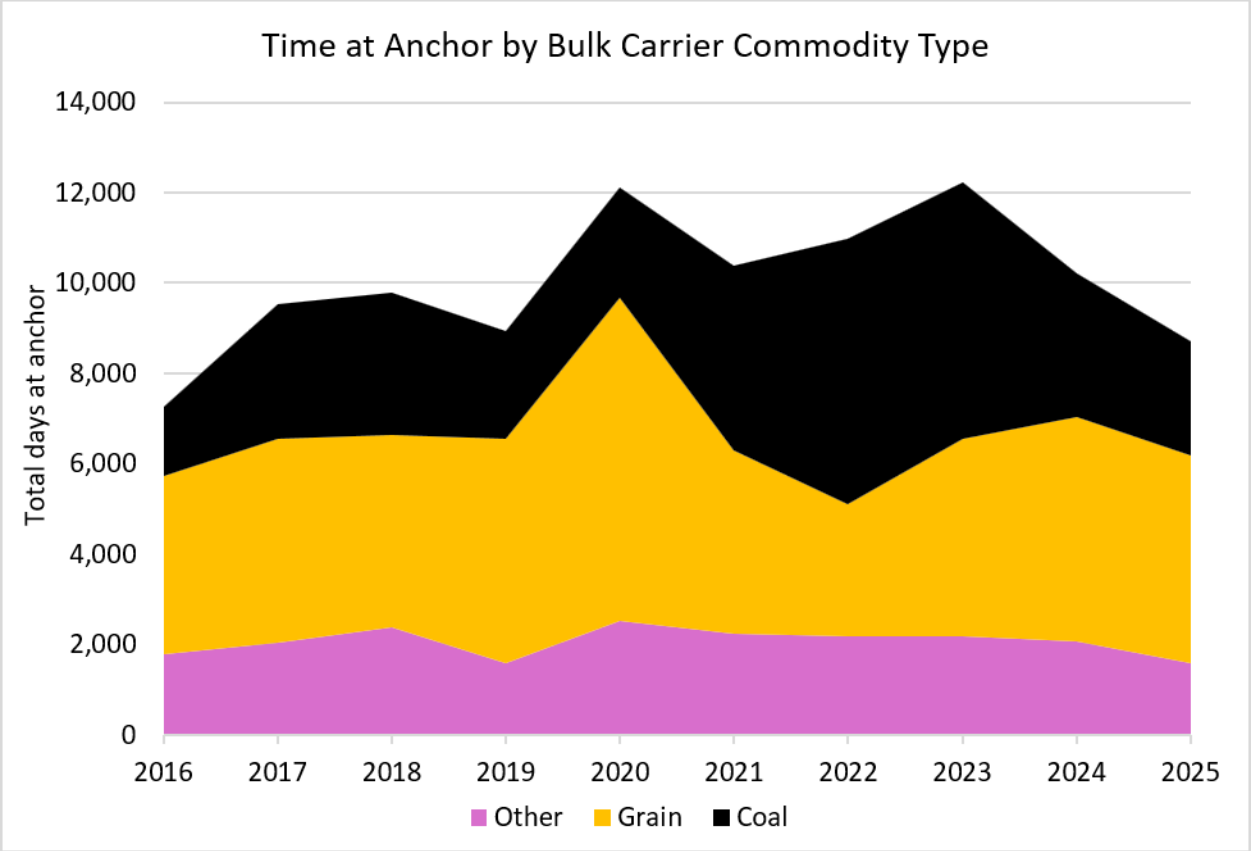

Figure 9 Total Time at Anchor for Bulk Carriers in the Canadian Waters of the Salish Sea, Organized by Commodity Type (2016–2025)
Grain and coal bulk carriers accounted for the vast majority of bulk carrier anchorage use between 2016 and 2025, with grain-related anchorage time peaking in 2020 and coal-related anchorage time peaking in 2022 and 2023.

In addition to spending the most time at anchor, grain and coal also comprise a significant portion of bulk carrier vessel traffic. In 2025, grain and coal accounted for 60% of all bulk carrier trips and 30% of all vessel traffic in the Canadian Salish Sea. Figure 10 shows Canadian-bound bulk carrier trips in the Salish Sea by commodity.

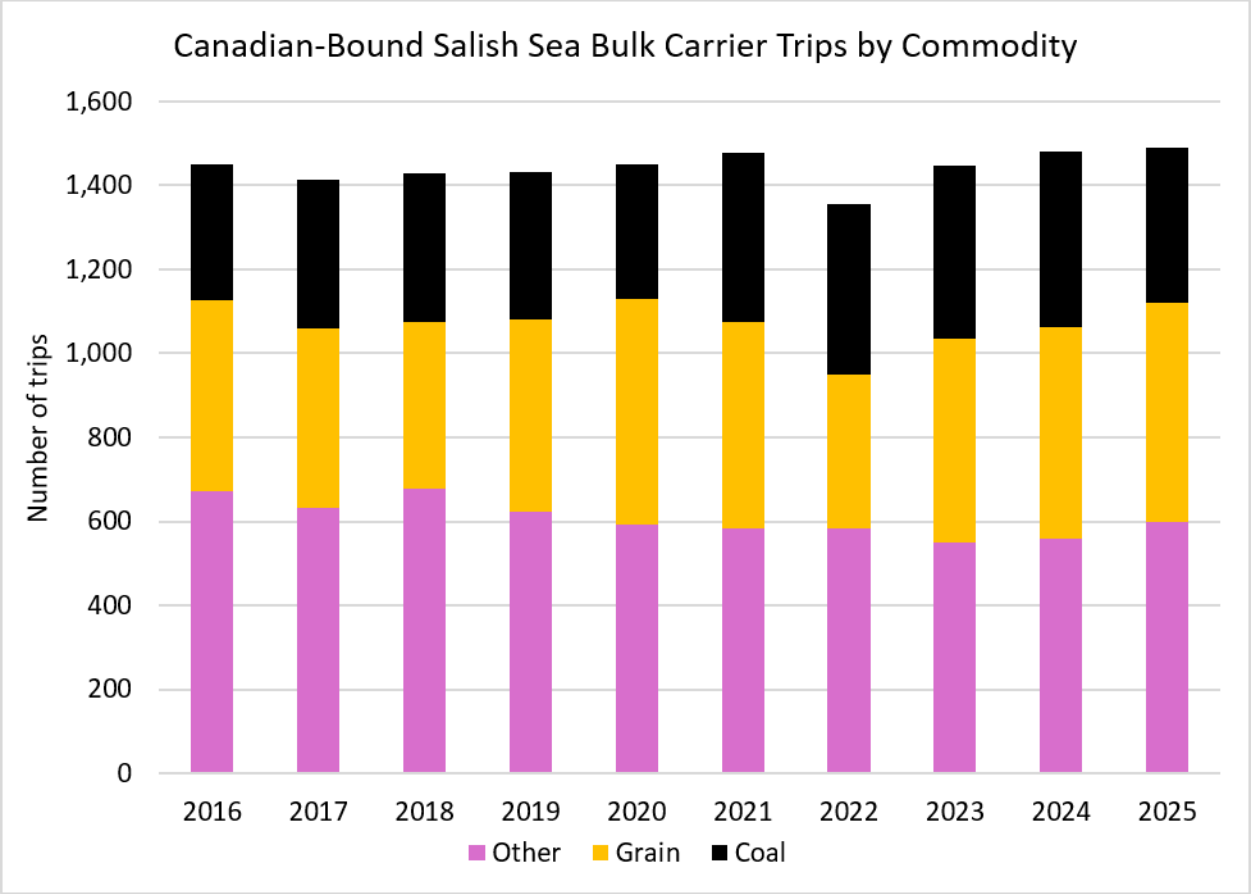

Figure 10 Canadian-Bound Salish Sea Bulk Carrier Trips by Commodity Type (2016–2025)
Bulk carrier traffic remained relatively stable between 2016 and 2025, with grain and coal accounting for the majority of bulk carrier trips.

Bulk carriers carrying grain and coal anchor more frequently than other bulk commodities. As shown in Figure 11, the percentage of coal trips that anchor has risen from approximately 82% in 2016 to 94% in 2025. During this period, the percentage of grain trips that anchor remained consistent, at approximately 95%. The percentage of other commodity trips that anchor rose in 2020 and 2022 but has otherwise remained steady, at approximately 60%.

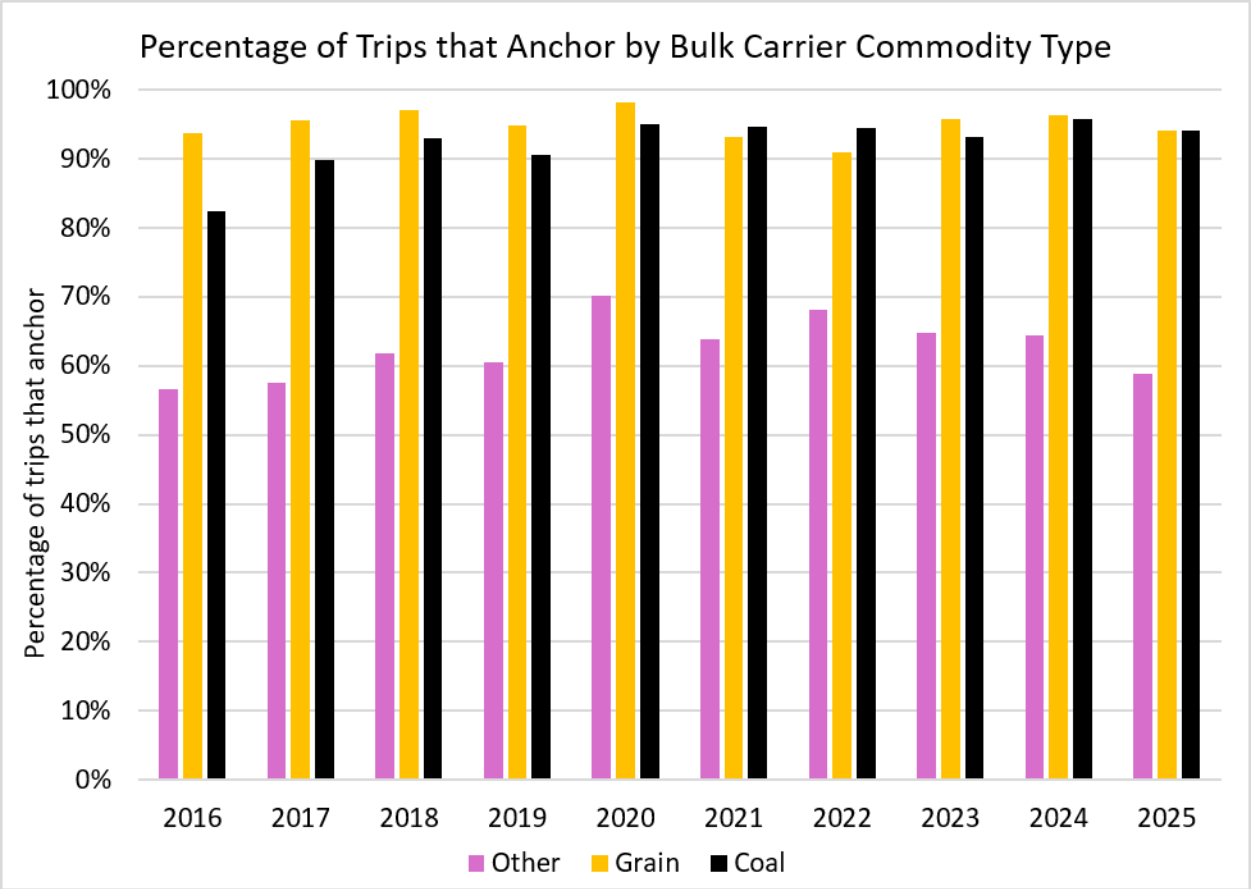

Figure 11 Percentage of Canadian-Bound Salish Sea Bulk Carrier Trips that Anchor by Commodity Type (2016-2025)
Grain and coal bulk carriers anchored on more than 90% of trips in most years, while other bulk commodities anchored less frequently, generally around 60%.

As shown in Figure 12, bulk carriers carrying grain and coal that anchor tend to spend significantly longer at anchor on average per trip than other bulk commodity types. Note the significant increase in average time at anchor for coal in 2022 and 2023, coinciding with the shocks mentioned above.

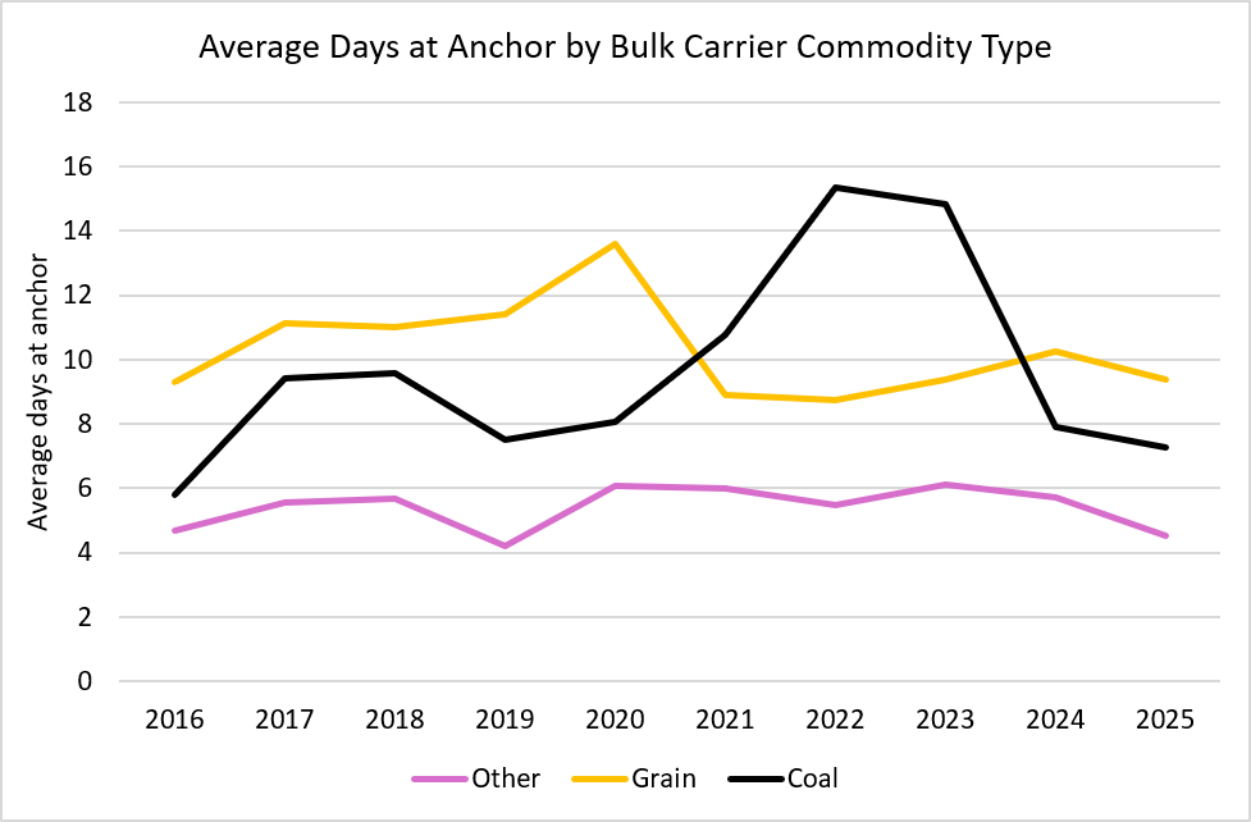

Figure 12 Average Days at Anchor by Bulk Carrier Commodity Type in the Canadian Waters of the Salish Sea (2016–2025)
Average anchorage times for grain and coal bulk carriers increased significantly during major supply chain disruption years, with grain vessels peaking in 2020 and coal vessels peaking in 2022 and 2023, while other bulk commodities remained comparatively stable.

The following subsections further examine anchorage use by bulk carriers carrying grain and coal.

3.1.2.1. Grain Vessels Wait the Longest and Multi-Terminal Calls Add to the Delay

There are seven grain terminals in the Salish Sea: Cargill, G3, and Richardson International are located in North Vancouver on the north shore of Burrard Inlet; Alliance, Cascadia, and Pacific Elevators are located in Vancouver on the south shore of Burrard Inlet; and Fraser Grain Terminal is located in Surrey on the Fraser River. Together, these terminals export a range of grain products, including wheat, barley, oilseeds, pulses, and specialty grains to international markets. Although Fibreco and PKM Marine Terminal also handle grain, they are not classified here as grain terminals because they also handle non-grain commodities, specifically wood pellets and sulphur (BC Marine Terminal Operators Association, 2026).

Bulk carriers carrying grain have historically had both the highest share of trips that anchor and the longest average wait times. Grain loading is especially vulnerable to rainfall, which has led to the adage "no grain in the rain." In dry conditions, grain can be loaded rapidly through open hatches. In wet conditions, however, terminals must either suspend operations or use feeder-hole loading, which helps protect grain from moisture but is slower and more labour-intensive. As a result, rainfall can increase delays and anchorage demand (Transport Canada, 2024).

Grain also contributes to the seasonality of Salish Sea anchorage use. The Canadian crop year runs from August to July, and grain shipping typically peaks from September to December and again from February to April (Government of Canada, 2026). These peak periods tend to experience greater precipitation, which can slow or interrupt grain loading. As a result, grain vessels place greater pressure on anchorages during the winter and shoulder seasons. This contributes to the high seasonal fluctuations seen in the Gulf Islands, which functions as a longer-term waiting area when Vancouver-area anchorages are under strain.

Bulk carriers carrying grain tend to spend most of their time at anchor before their first terminal visit. However, they make a greater share of multi-terminal trips and anchor between terminal visits on approximately half their trips. Table 4 shows total and average time at anchor for bulk carriers carrying grain before, between, and after terminal visits.

Table 4 Share of Bulk Carrier Trips Carrying Grain that Anchored Before, Between, and After Terminal Visits (Including No Terminal Visit), With Average and Total Days at Anchor (2025)

Anchorage phase	Trips that anchored in phase (%)	Average days at anchor	Total days at anchor
Before terminal	84%	6.8	2,966
Between terminals	52%	6.0	1,641
After terminal	36%	1.1	218
No terminal	0%	n/a	0

Average days at anchor before the first terminal visit varies by grain terminal. Among the seven grain terminals in the Salish Sea, Alliance Grain Terminal recorded the shortest average wait time before first terminal visit in 2025, at 6.0 days, while Cargill recorded the longest, at 9.1 days. Table 5 ranks average time at anchor before first terminal visit for each grain terminal.

Table 5 Average Wait Time Before First Terminal Visit for Canadian Salish Sea Grain Terminals (2025)

Terminal	2025 Average wait time (days)
Alliance Grain Terminal	6.0
Pacific Elevators	6.1
Cascadia	6.1
G3 Terminal Vancouver	6.3
Richardson International	6.9
Fraser Grain Terminal	8.2
Cargill	9.1

3.1.2.2. Coal Vessels Rarely Anchor Between or After Terminal Visits

There are two coal terminals in the Canadian waters of the Salish Sea. Neptune Terminals in North Vancouver exports Canadian steelmaking coal from mines in British Columbia and Alberta to steel mills around the world (Neptune Terminals, n.d.). Westshore Terminals in Delta handles coal from both Canadian mines and US mines in the Powder River Basin of Montana and Wyoming; it ships both thermal and steelmaking coal, although thermal coal has made up more than half of its throughput in recent years (Westshore Terminals Investment Corporation, 2025).

Bulk carriers carrying coal spend almost all their time at anchor before their first terminal visit. Table 6 shows total and average time at anchor before, between, and after terminal visits for bulk carriers carrying coal.

Table 6 Share of Bulk Carrier Trips Carrying Coal that Anchored Before, Between, and After Terminal Visits (Including No Terminal Visit), With Average and Total Days at Anchor (2025)

Anchorage phase	Trips that anchored in phase (%)	Average days at anchor	Total days at anchor
Before terminal	96%	7.2	2,560
Between terminals	6%	5.1	108
After terminal	13%	0.5	21
No terminal	0%	n/a	0

Table 7 shows average time at anchor before the first terminal visit for vessels calling at both Neptune and Westshore terminals. In 2025, vessels waited approximately 0.4 days (10 hours) longer on average before visiting Westshore compared to Neptune terminal.

Table 7 Average Wait Time Before First Terminal Visit for Canadian Salish Sea Coal Terminals (2025)

Terminal	2025 Average wait time (days)
Neptune Bulk Terminals	7.0
Westshore Terminals	7.4

3.2 Tanker Traffic Has Risen Sharply But Anchorage Use Has Grown More Modestly

Tanker traffic in the Canadian waters of the Salish Sea increased sharply in 2024 and 2025, largely because of the TMX project. The Canadian Salish Sea includes several terminals that receive tankers, most of them clustered around Burnaby and the North Shore. Westridge Marine Terminal in Burnaby handles crude oil exports associated with the Trans Mountain pipeline as well as jet fuel deliveries for Vancouver International Airport (YVR). Other Burnaby-area facilities, including Shellburn, Parkland, and Suncor, handle petroleum products. Additional tanker terminals in the region handle products such as canola oil, ethylene glycol, caustic soda, sodium chlorate, diesel, and recently, LNG fuel.

While past Clear Seas work has included LNG bunkering tankers within the broader tanker category, this report considers LNG bunkering tankers a separate category and does not include them in the following tanker analysis. The reason for this is twofold. First, LNG bunkering tankers are a new phenomenon in the Canadian waters of the Salish Sea, consisting entirely of three new vessels launched by Seaspan in 2024: the Seaspan Lions, Seaspan Baker, and Seaspan Garibaldi (Seaspan, 2024). Second, these vessels behave differently than typical international tanker trips, which come to the Canadian waters of the Salish Sea before loading or unloading, and then depart for international markets. While the three Seaspan vessels do spend time in the western US, automatic identification system (AIS) data shows that they typically spend longer in the Canadian Salish Sea than typical tanker trips. They deliver fuel from Tilbury on the Fraser River to vessels in the waters around Vancouver and ports on the Pacific Coast of North America (MarineTraffic, 2026).

In 2025, there were 520 tanker trips in the Canadian Salish Sea. Anchorage use by tankers increased to 492 days at anchor in 2025. Figure 13 shows tanker anchorage use in the Canadian waters of the Salish Sea.

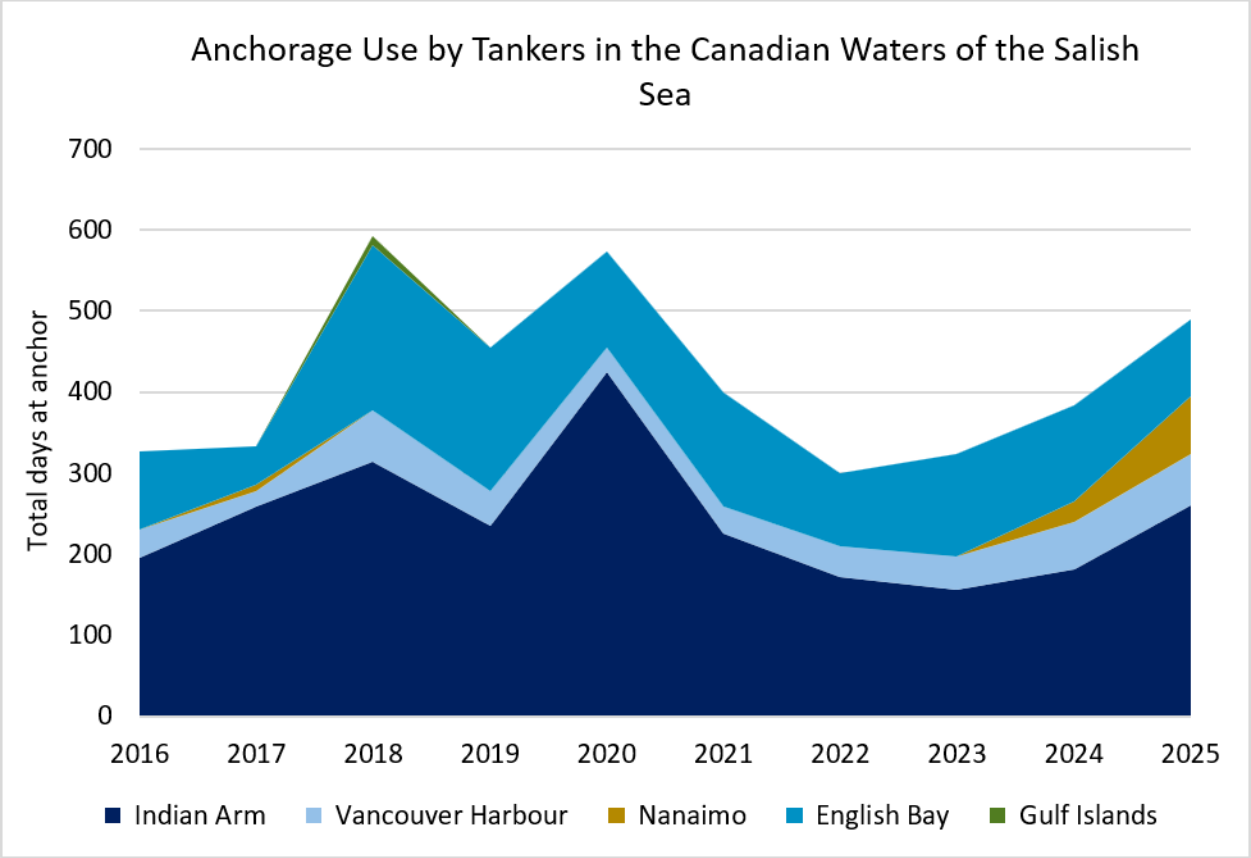

Figure 13 Canadian-Bound Salish Sea Anchorage Use for Tankers (2016–2025)

Tanker anchorage use declined between 2021 and 2023 before increasing again in 2024 and 2025, driven primarily by growing use of Indian Arm and Nanaimo anchorages associated with Trans Mountain export traffic.

The TMX project is the main reason for the recent increase in tanker traffic. Completed in May 2024, TMX added three new berths at Westridge Marine Terminal for crude oil exports (Trans Mountain, n.d.). As a result, Westridge tanker traffic has risen sharply, from an average of 29 tanker trips per year before TMX (2016–2023) to 289 trips in 2025. These tankers typically anchor in Indian Arm before or after loading, and occasionally in Nanaimo or English Bay for refuelling, supplies, or crew changes. Table 8 compares the total time at anchor and number of trips for Trans Mountain versus other tankers.

Table 8 Number of trips, Average Time at Anchor, and Total Time at Anchor for Trans Mountain Versus Other Tankers in the Canadian Waters of the Salish Sea (2025)

Type	Number of trips	Trips that anchor (%)	Average days at anchor	Total days at anchor
Trans Mountain Tankers	289	46%	1.4	191
Other Tankers	231	67%	1.9	301
Grand Total	520	55%	1.7	492

Compared with bulk carriers, tankers anchor less frequently and for less time on average across all trip phases. Table 9 shows total and average time at anchor for tankers before, between, and after terminal visits, as well as for trips that do not visit a terminal.

Table 9 Share of Tanker Trips that Anchored Before, Between, and After Terminal Visits (Including No Terminal Visit), With Average and Total Days at Anchor (2025)

Anchorage phase	Trips that anchored in phase (%)	Average days at anchor	Total days at anchor
Before terminal	44%	1.5	347
Between terminals	7%	2.6	97
After terminal	13%	0.6	37
No terminal	1%	2.1	11

3.3 Container Vessel Anchorage Use Remains Elevated After System Shocks

There are five container terminals in the Canadian Salish Sea: Centerm and Vanterm are located in Vancouver; Deltaport is in Delta; Duke Point is in Nanaimo; and Fraser Surrey is in Surrey. English Bay is the priority anchorage area for container vessels waiting to berth at these terminals.

Anchorage use by container vessels is still recovering from broader system shocks. The total time at anchor for container vessels surged by more than 1,650% between 2019 and 2022. Although anchorage use has since declined from that peak, it remained more than 260% above 2019 levels in 2025. Figure 14 provides an overview of anchorage use by container vessels.

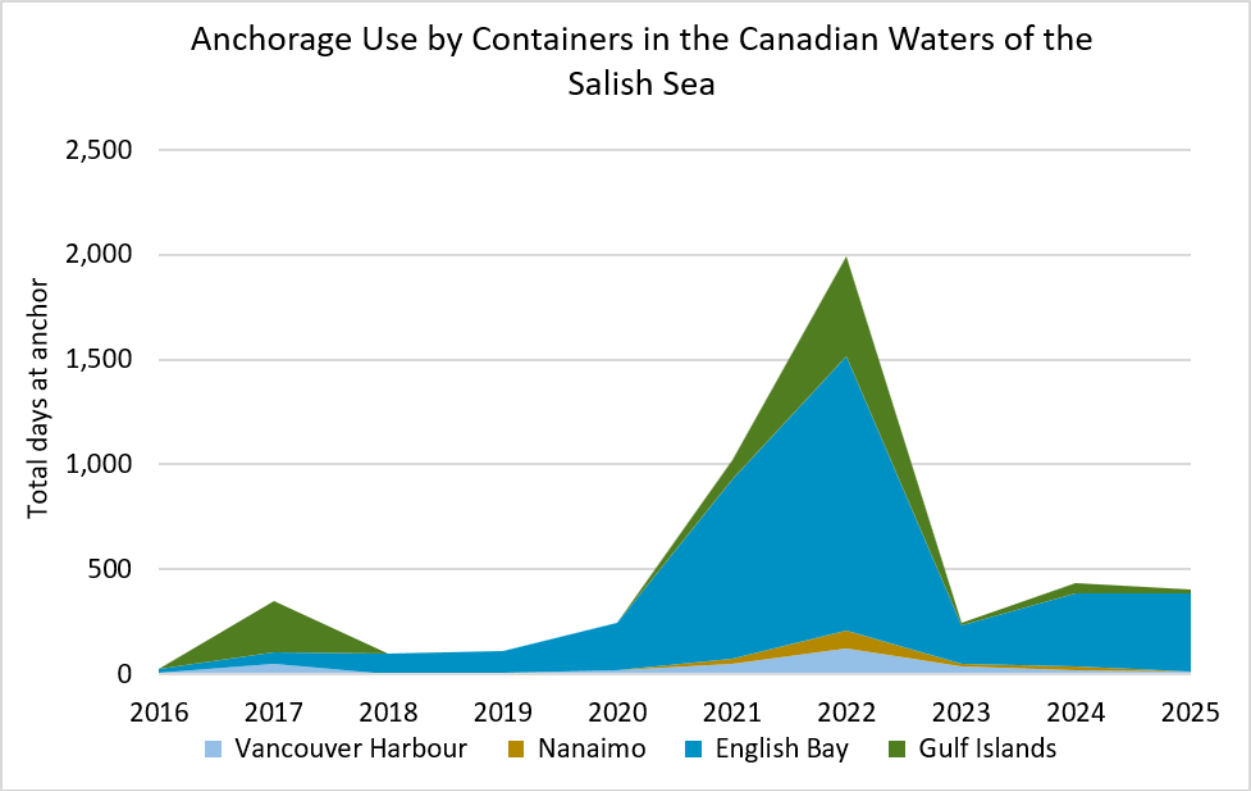

Figure 14 Container Vessel Anchorage Use in the Canadian Waters of the Salish Sea (2016–2025)
Container vessel anchorage use increased sharply in 2021 and 2022, driven primarily by the Pacific Northwest floods. It has since declined but has not yet returned to pre-2021 levels.

Anchorage use by container vessels began to increase in late 2020 due to the supply chain disruption that occurred during the COVID-19 pandemic. This was followed by a surge in November 2021 following the atmospheric river events in BC that destroyed important rail and road infrastructure. These shocks are highlighted in Figure 15.

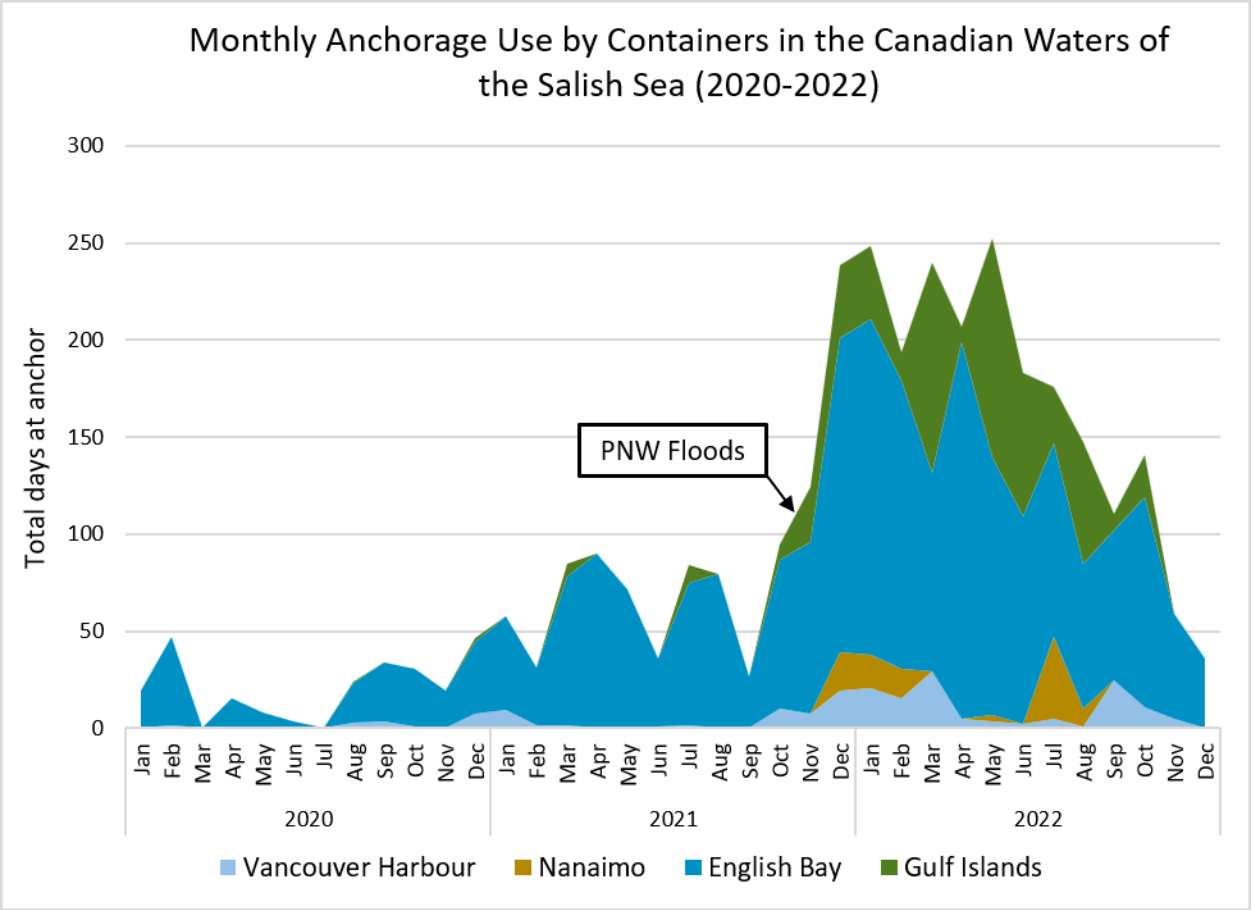

Figure 15 Monthly Time at Anchor for Container Vessels in the Canadian Waters of the Salish Sea (2020-2022)

Container anchorage use increased sharply following the 2021 Pacific Northwest floods, with sustained congestion through 2022 concentrated primarily at English Bay and Gulf Islands anchorages.

Although time at anchor for container vessels has declined from the exceptionally high levels seen in 2021 and 2022, it remains well above the levels observed between 2016 and 2020. Table 10 shows that a higher share of container trips continues to anchor compared to before 2021.

Table 10 Percentage of Container Trips that Anchor in the Canadian Waters of the Salish Sea (2016-2025)

Year	Percentage of trips that anchor
2016	4%
2017	8%
2018	7%
2019	8%
2020	14%
2021	37%
2022	43%
2023	18%
2024	22%
2025	19%

4. Managing Anchorage Use Requires Systemic Intervention

The key conclusion from this research project is that anchorage use cannot be understood as a simple function of vessel traffic. More vessels can increase pressure on anchorages, but the more important driver is how long vessels wait, where they are sent while they wait, and how quickly the system recovers when disruptions occur. In practice, anchorage demand is shaped by terminal readiness, cargo availability, rail performance, vessel scheduling, pilotage, and anchorage allocation.

The findings from this report suggest that managing future anchorage demand will require more targeted action than simply adding capacity or monitoring total vessel trips. The most useful interventions are likely to come from improving coordination and regulations around the vessel types and commodities that drive the most waiting. For bulk carriers, this means focusing on grain and coal movements, pre-terminal delays, multi-terminal calls, and the conditions that push vessels from Vancouver-area anchorages into longer-term waiting areas. For tankers, it means maintaining the relatively short anchorage stays observed among Trans Mountain tankers and understanding whether similar coordination practices could reduce waiting in other tanker movements. For container vessels, it means developing a better understanding of why anchorage use remains elevated despite the supply chain disruption and flood-related shocks of 2021 and 2022 having receded.

Overall, the central lesson is that anchorages are a symptom of wider system performance. Reducing pressure on the Salish Sea anchorage system will depend less on managing anchorages in isolation than on improving the flow of vessels, cargo, and information through the marine transportation network, creating stronger incentives to reduce avoidable waiting, and building resilience to future shocks.

Future research should build on these findings by examining how anchorage demand may change under the future traffic scenarios outlined in Clear Seas' Vessel Traffic Forecast. It should also assess practical coordination, policy, and regulatory options, including how changes in terminal scheduling, berth readiness, cargo flows, and anchorage allocation could reduce avoidable waiting and better manage where anchorage impacts are felt. As traffic grows and supply chains face continued disruption, the key question will not only be how many vessels arrive, but how well the system can keep them moving.

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Appendix A: Methodology

Data source

This report uses the Pacific Pilotage Authority's (PPA) Vessel Movement Data as the primary source for inferring vessel traffic and anchorage use in the Canadian waters of the Salish Sea. The PPA data records compulsory pilotage movements in BC coastal waters and includes vessel name, IMO number, vessel type, vessel dimensions, movement times, and origin and destination locations.

The PPA dataset is an operational pilotage dataset rather than a purpose-built anchorage dataset. Each row represents a pilotage movement from one location to another, not necessarily a complete vessel trip. For this reason, Clear Seas cleaned and categorized the data, grouped sequential vessel movements into trips, identified terminal and anchorage stops, and calculated time spent at anchor based on the sequence of pilotage movements. The underlying Clear Seas workflow uses lookup tables for location type, vessel type, terminal names, commodity categories, tanker subtypes, and trip start/end locations.

Anchorages included and excluded from the analysis

Table 11 shows all anchorages in the Canadian waters of the Salish Sea. As most anchorages are listed under more than one naming convention in the PPA dataset, the table includes all naming conventions included in the data. The final column shows whether the individual anchorage was included in the analysis. There are 71 Canadian Salish Sea anchorages included in the analysis and 10 excluded (all excluded anchorages are part of the Royal Roads and Constance Bank anchorage groups).

Table 11 Canadian Salish Sea Anchorages Included and Excluded from the Analysis

Anchorage name	Also listed as	Anchorage group	Included in analysis?
CAPTAIN'S PASS ANCHORAGE 1	CAPTAIN'S PASS ANCHORAGE 1 (CPA)	Gulf Islands	Yes
CAPTAIN'S PASS ANCHORAGE 2	CAPTAIN'S PASS ANCHORAGE 2 (CPB)	Gulf Islands	Yes
CONSTANCE BANK 1		Constance Bank	No

Anchorage name	Also listed as	Anchorage group	Included in analysis?
CONSTANCE BANK 2		Constance Bank	No
CONSTANCE BANK 3		Constance Bank	No
CONSTANCE BANK 4		Constance Bank	No
CONSTANCE BANK 5		Constance Bank	No
COWICHAN BAY ANCHORAGE A	COWICHAN BAY ANCHORAGE A (CAA)	Gulf Islands	Yes
COWICHAN BAY ANCHORAGE B	COWICHAN BAY ANCHORAGE B (CAB)	Gulf Islands	Yes
COWICHAN BAY ANCHORAGE C	COWICHAN BAY ANCHORAGE C (CAC)	Gulf Islands	Yes
COWICHAN BAY ANCHORAGE D	COWICHAN BAY ANCHORAGE D (CAD)	Gulf Islands	Yes
COWICHAN BAY ANCHORAGE E	COWICHAN BAY ANCHORAGE E (CAE)	Gulf Islands	Yes
COWICHAN BAY ANCHORAGE F	COWICHAN BAY ANCHORAGE F (CAF)	Gulf Islands	Yes
ENGLISH BAY	ENGLISH BAY ANCHORAGE 01 / ENGLISH BAY ANCHORAGE 01 (E01)	English Bay	Yes
ENGLISH BAY ANCHORAGE 02	ENGLISH BAY ANCHORAGE 02 (E02)	English Bay	Yes
ENGLISH BAY ANCHORAGE 03	ENGLISH BAY ANCHORAGE 03 (E03)	English Bay	Yes
ENGLISH BAY ANCHORAGE 04	ENGLISH BAY ANCHORAGE 04 (E04)	English Bay	Yes
ENGLISH BAY ANCHORAGE 05	ENGLISH BAY ANCHORAGE 05 (E05)	English Bay	Yes
ENGLISH BAY ANCHORAGE 06	ENGLISH BAY ANCHORAGE 06 (E06)	English Bay	Yes

Anchorage name	Also listed as	Anchorage group	Included in analysis?
ENGLISH BAY ANCHORAGE 07	ENGLISH BAY ANCHORAGE 07 (E07)	English Bay	Yes
ENGLISH BAY ANCHORAGE 08	ENGLISH BAY ANCHORAGE 08 (E08)	English Bay	Yes
ENGLISH BAY ANCHORAGE 09	ENGLISH BAY ANCHORAGE 09 (E09)	English Bay	Yes
ENGLISH BAY ANCHORAGE 10	ENGLISH BAY ANCHORAGE 10 (E10)	English Bay	Yes
ENGLISH BAY ANCHORAGE 11	ENGLISH BAY ANCHORAGE 11 (E11)	English Bay	Yes
ENGLISH BAY ANCHORAGE 12	ENGLISH BAY ANCHORAGE 12 (E12)	English Bay	Yes
ENGLISH BAY ANCHORAGE 13	ENGLISH BAY ANCHORAGE 13 (E13)	English Bay	Yes
ENGLISH BAY ANCHORAGE 14	ENGLISH BAY ANCHORAGE 14 (E14)	English Bay	Yes
ENGLISH BAY ANCHORAGE 15	ENGLISH BAY ANCHORAGE 15 (E15)	English Bay	Yes
ENGLISH BAY ANCHORAGE 16	ENGLISH BAY ANCHORAGE 16 (E16)	English Bay	Yes
ENGLISH BAY ANCHORAGE 17	ENGLISH BAY ANCHORAGE 17 (E17)	English Bay	Yes
ENGLISH BAY ANCHORAGE 18	ENGLISH BAY ANCHORAGE 18 (E18)	English Bay	Yes
ENGLISH BAY ANCHORAGE UNIFORM	ENGLISH BAY ANCHORAGE UNIFORM (EBU)	English Bay	Yes
ENGLISH BAY ANCHORAGE ZULU	ENGLISH BAY ANCHORAGE ZULU (E0Z)	English Bay	Yes

Anchorage name	Also listed as	Anchorage group	Included in analysis?
HOUSTON PASS ANCHORAGE 1	HOUSTON PASS ANCHORAGE 1 (HP1)	Gulf Islands	Yes
HOUSTON PASS ANCHORAGE 2	HOUSTON PASS ANCHORAGE 2 (HP2)	Gulf Islands	Yes
HOUSTON PASS ANCHORAGE 3	HOUSTON PASS ANCHORAGE 3 (HP3)	Gulf Islands	Yes
INDIAN ARM ANCHORAGE K (VHK)	VANCOUVER HARBOUR ANCHORAGE K	Indian Arm	Yes
INDIAN ARM ANCHORAGE L (VHL)	VANCOUVER HARBOUR ANCHORAGE L	Indian Arm	Yes
INDIAN ARM ANCHORAGE M (VHM)	VANCOUVER HARBOUR ANCHORAGE M	Indian Arm	Yes
INDIAN ARM ANCHORAGE N (VHN)	VANCOUVER HARBOUR ANCHORAGE N	Indian Arm	Yes
KULLEET BAY ANCHORAGE 1	KULLEET BAY ANCHORAGE 1 (KB1)	Gulf Islands	Yes
KULLEET BAY ANCHORAGE 2	KULLEET BAY ANCHORAGE 2 (KB2)	Gulf Islands	Yes
LADYSMITH ANCHORAGE A	LADYSMITH ANCHORAGE A (LSA)	Gulf Islands	Yes
LADYSMITH ANCHORAGE B	LADYSMITH ANCHORAGE B (LSB)	Gulf Islands	Yes
LADYSMITH ANCHORAGE C	LADYSMITH ANCHORAGE C (LSC)	Gulf Islands	Yes
LADYSMITH ANCHORAGE D	LADYSMITH ANCHORAGE D (LSD)	Gulf Islands	Yes

Anchorage name	Also listed as	Anchorage group	Included in analysis?
LADYSMITH ANCHORAGE E	LADYSMITH ANCHORAGE E (LSE)	Gulf Islands	Yes
LADYSMITH ANCHORAGE F	LADYSMITH ANCHORAGE F (LSF)	Gulf Islands	Yes
NANAIMO ANCHORAGE	NANAIMO ANCHORAGE 1 / NANAIMO ANCHORAGE 1 (NA1)	Nanaimo	Yes
NANAIMO ANCHORAGE 2	NANAIMO ANCHORAGE 2 (NA2)	Nanaimo	Yes
NANAIMO ANCHORAGE 3	NANAIMO ANCHORAGE 3 (NA3)	Nanaimo	Yes
NANAIMO ANCHORAGE 4	NANAIMO ANCHORAGE 4 (NA4)	Nanaimo	Yes
NANAIMO ANCHORAGE 5	NANAIMO ANCHORAGE 5 (NA5)	Nanaimo	Yes
NANAIMO ANCHORAGE 6	NANAIMO ANCHORAGE 6 (NA6)	Nanaimo	Yes
PLUMPER SOUND ANCHORAGE A	PLUMPER SOUND ANCHORAGE A (PSA)	Gulf Islands	Yes
PLUMPER SOUND ANCHORAGE B	PLUMPER SOUND ANCHORAGE B (PSB)	Gulf Islands	Yes
PLUMPER SOUND ANCHORAGE C	PLUMPER SOUND ANCHORAGE C (PSC)	Gulf Islands	Yes
PLUMPER SOUND ANCHORAGE D	PLUMPER SOUND ANCHORAGE D (PSD)	Gulf Islands	Yes
PLUMPER SOUND ANCHORAGE X	PLUMPER SOUND ANCHORAGE X (PSX)	Gulf Islands	Yes
ROYAL ROADS ANCHORAGE A	ROYAL ROADS ANCHORAGE A (RRA)	Royal Roads	No

Anchorage name	Also listed as	Anchorage group	Included in analysis?
ROYAL ROADS ANCHORAGE B	ROYAL ROADS ANCHORAGE B (RRB)	Royal Roads	No
ROYAL ROADS ANCHORAGE C	ROYAL ROADS ANCHORAGE C (RRC)	Royal Roads	No
ROYAL ROADS ANCHORAGE D	ROYAL ROADS ANCHORAGE D (RRD)	Royal Roads	No
ROYAL ROADS ANCHORAGE F	ROYAL ROADS ANCHORAGE F (RRF)	Royal Roads	No
TRINCOMALI ANCHORAGE 1	TRINCOMALI ANCHORAGE 1 (TR1)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 2	TRINCOMALI ANCHORAGE 2 (TR2)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 3	TRINCOMALI ANCHORAGE 3 (TR3)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 4	TRINCOMALI ANCHORAGE 4 (TR4)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 5	TRINCOMALI ANCHORAGE 5 (TR5)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 6	TRINCOMALI ANCHORAGE 6 (TR6)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 7	TRINCOMALI ANCHORAGE 7 (TR7)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 8	TRINCOMALI ANCHORAGE 8 (TR8)	Gulf Islands	Yes
TRINCOMALI ANCHORAGE 9	TRINCOMALI ANCHORAGE 9 (TR9)	Gulf Islands	Yes

Anchorage name	Also listed as	Anchorage group	Included in analysis?
VANCOUVER HARBOUR ANCHORAGE	VANCOUVER HARBOUR ANCHORAGE A / VANCOUVER HARBOUR ANCHORAGE A (VHA)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE B	VANCOUVER HARBOUR ANCHORAGE B (VHB)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE C	VANCOUVER HARBOUR ANCHORAGE C (VHC)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE D	VANCOUVER HARBOUR ANCHORAGE D (VHD)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE E	VANCOUVER HARBOUR ANCHORAGE E (VHE)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE W		Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE X	VANCOUVER HARBOUR ANCHORAGE X (VHX)	Vancouver Harbour	Yes
VANCOUVER HARBOUR ANCHORAGE Y	VANCOUVER HARBOUR ANCHORAGE Y (VHY)	Vancouver Harbour	Yes

Constructing vessel trips from pilotage movements

The PPA data records individual pilotage movements, not complete vessel trips. To estimate vessel traffic, Clear Seas grouped sequential pilotage movements into trip IDs. Before assigning trip IDs, the dataset was sorted by IMO, vessel name, and first pilot ordered time, from oldest to newest.

A new trip was started when one of the following conditions was met:

- the previous row had a different IMO number;
- the movement began at a location identified as a trip start/end point, such as a pilot station; or
- the previous movement ended at a trip start/end point and the current movement did not end at a pilot station, a rule used to avoid overcounting in cases where river and coastal pilotage reporting could otherwise create duplicate trip segments.

This approach allowed multiple pilotage movements, terminal calls, and anchorage stops to be grouped into a single trip. The resulting trip ID was then used to count unique vessel trips, rather than counting each pilotage movement as a separate trip.

Calculating time at anchor

Time at anchor was calculated from the sequence of pilotage movements within each trip. For each row, Clear Seas calculated the number of days spent at the vessel's origin location by comparing the previous movement's last pilot debarkation time with the current movement's first pilot ordered time, where both movements belonged to the same trip. In practical terms, this estimates how long a vessel remained at a location between arriving there and later departing from it. If the origin location was classified as an anchorage, this duration was counted as time at anchor.

For each trip, total time at anchor per trip was calculated by summing all time at anchor values within that trip. Average time at anchor was calculated by taking the average of the total trip at anchor value for trips that anchored within a particular year, month, anchorage group, vessel type, and/or commodity, depending on the analysis. All time at anchor values are measured in days at anchor.

Defining anchorage visits and trips that anchor

A trip was classified as a trip that anchored if it included at least one stop at a location classified as an anchorage. The "percentage of trips that anchor" is the share of trips in a given category that included at least one anchorage stop.

Average time at anchor values are calculated for trips that anchored, not for all trips in that category. Trips that did not anchor are included in the trip count and in the percentage of trips that anchor, but they do not contribute to the average duration of anchorage stays.

Utilization rate

Utilization refers to the percentage of days in a given period during which an anchorage or anchorage group was occupied. This is different from total days at anchor. Total days at anchor measures cumulative vessel waiting time, while utilization measures how consistently an anchorage or anchorage group is occupied. Utilization does not count the number of anchorage visits. For example, an individual anchorage would be considered 50% occupied on a day if one vessel spent 12 hours there, or if two vessels each spent six hours there one after the other.

Commodity classification

The PPA data does not directly report the commodity carried by each vessel. Commodity categories were therefore inferred by linking terminal calls to the commodities handled at specific terminals and berths.

Clear Seas reviewed each relevant terminal and berth using data from GSTS' OCIANA portal, desktop research, terminal information, port and operator materials, and satellite imagery such as Google Earth. Each terminal berth was then assigned a primary commodity category where this could be done with reasonable confidence. If the primary commodity was unclear or the berth did not handle any commodity, the commodity was labelled "Unknown/No Commodity." The full list of Salish Sea terminal berths and their respective commodities is shown in Table 12.

Table 12 Canadian Salish Sea Terminal Berths and Primary Commodity

Terminal Name	Commodity
ALLIANCE EAST	Grain
ALLIANCE EAST (AGE)	Grain
ALLIANCE WEST	Grain
ALLIANCE WEST (AGW)	Grain
BC SUGAR	Sugar
BC SUGAR (Lantic)	Sugar
BC SUGAR (LANTIC) (BCS)	Sugar
CAMPBELL RIVER ORE	Concentrates
CAMPBELL RIVER ORE (CRO)	Concentrates
CAMPBELL RIVER ORE (Nyrstar Discovery Terminal)	Concentrates
CANADA PLACE EAST	Unknown/No Commodity
CANADA PLACE EAST (CPE)	Unknown/No Commodity
CANADA PLACE NORTH	Unknown/No Commodity
CANADA PLACE NORTH (CPN)	Unknown/No Commodity
CANADA PLACE WEST	Unknown/No Commodity
CANADA PLACE WEST (CPW)	Unknown/No Commodity
CANADIAN OCCIDENTAL	Salt, Caustic Soda
CANADIAN OCCIDENTAL (Canexus / Nexen)	Salt, Caustic Soda
CANADIAN OCCIDENTAL(CANEXUS/NEXEN) (COC)	Salt, Caustic Soda
CARGILL 1	Grain
CARGILL 1 (CG1)	Grain
CARGILL 2	Grain
CARGILL 2 (CG2)	Grain
CASCADIA	Grain
CASCADIA (CAS)	Grain

Terminal Name	Commodity
CASCADIA 2.5 KNOT (CAS-2.5)	Grain
CENTERM 1	Unknown/No Commodity
CENTERM 1 (Ballentyne Pier)	Unknown/No Commodity
CENTERM 3 (CT3)	Containers
CENTERM 5	Containers
CENTERM 5 (CT5)	Containers
CENTERM 6	Containers
CENTERM 6 (CT6)	Containers
CHEMAINUS NORTH	Unknown/No Commodity
CROFTON 2	Unknown/No Commodity
CROFTON 2 (CR2)	Unknown/No Commodity
CROFTON 3	Unknown/No Commodity
CROFTON 3 (CR3)	Unknown/No Commodity
DELTA PORT 1	Containers
DELTA PORT 2	Containers
DELTA PORT 3	Containers
DELTA PORT/ROBERTS BANK (DP)	Unknown/No Commodity
DELTAPORT 1 (DP1)	Containers
DELTAPORT 2 (DP2)	Containers
DELTAPORT 3 (DP3)	Containers
DUKE POINT	Unknown/No Commodity
DUKE POINT (DPT)	Unknown/No Commodity
DUNCAN BAY PAPER (DBR)	Unknown/No Commodity
FIBRECO	Forest Products
FIBRECO (FBR)	Forest Products
FRASER SURREY 2 (FS2)	Grain
FRASER SURREY 10	Unknown/No Commodity

Terminal Name	Commodity
FRASER SURREY 2	Grain
FRASER SURREY 3	Unknown/No Commodity
FRASER SURREY 4	Grain
FRASER SURREY 4 (FS4)	Grain
FRASER SURREY 7	Containers
FRASER SURREY 7 (FS7)	Containers
FRASER SURREY 8	Containers
FRASER SURREY 8 (FS8)	Containers
FRASER SURREY 9	Containers
FRASER SURREY 9 (FS9)	Containers
FRASER SURREY TILBURY (FST1)	Unknown/No Commodity
FRASER SURREY TILBURY (TIL1)	Unknown/No Commodity
FRASER WHARVES	Car Carrier
FRASER WHARVES (FW)	Car Carrier
G3 TERMINAL	Grain
G3 TERMINAL (G3)	Grain
HARMAC EAST - ISLAND TERMINALS	Unknown/No Commodity
HARMAC EAST-ISLAND TERMINALS (HRE)	Unknown/No Commodity
HARMAC WEST - PULP	Forest Products
HARMAC WEST-PULP (HRW)	Forest Products
IMPERIAL OIL COMPANY	Liquid Bulk
IMPERIAL OIL COMPANY (Ioco)	Liquid Bulk
JAMES RICHARDSON	Grain
JAMES RICHARDSON INTERNATIONAL (JRI)	Grain
KINDER MORGAN 1	Concentrates
KINDER MORGAN 1 (Pembina - Vancouver Wharves)	Concentrates
KINDER MORGAN 1 (Vancouver Wharves)	Concentrates

Terminal Name	Commodity
KINDER MORGAN 1 (Vancouver Wharves) (KM1)	Concentrates
KINDER MORGAN 2	Unknown/No Commodity
KINDER MORGAN 2 (Pembina - Vancouver Wharves)	Unknown/No Commodity
KINDER MORGAN 2 (Vancouver Wharves)	Unknown/No Commodity
KINDER MORGAN 2 (Vancouver Wharves) (KM2)	Unknown/No Commodity
KINDER MORGAN 3 (Pembina - Vancouver Wharves)	Unknown/No Commodity
KINDER MORGAN 3 (Vancouver Wharves)	Unknown/No Commodity
KINDER MORGAN 4	Sulphur
KINDER MORGAN 4 (Pembina - Vancouver Wharves)	Sulphur
KINDER MORGAN 4 (Vancouver Wharves)	Sulphur
KINDER MORGAN 4 (Vancouver Wharves) (KM4)	Sulphur
KINDER MORGAN 5	Sulphur
KINDER MORGAN 5 (Pembina - Vancouver Wharves)	Sulphur
KINDER MORGAN 5 (Vancouver Wharves)	Sulphur
KINDER MORGAN 5 (Vancouver Wharves) (KM5)	Sulphur
LAFARGE RICHMOND (LFG)	Cement
LYNN TERM 1	Steel
LYNN TERM 2	Steel
LYNN TERM 3	General
LYNN TERM 4	Liquid Bulk
LYNN TERM 4 (Univar)	Liquid Bulk
LYNN TERM 5	Unknown/No Commodity
LYNN TERM 6	Unknown/No Commodity
LYNN TERM 7	Unknown/No Commodity
LYNNTERM 1 (LT1)	Steel
LYNNTERM 2 (LT2)	Steel
LYNNTERM 3 (LT3)	General

Terminal Name	Commodity
LYNNTERM 4 (Univar) (LT4)	Liquid Bulk
NANAIMO ASSEMBLY B	Unknown/No Commodity
NANAIMO ASSEMBLY B (NSB)	Unknown/No Commodity
NANAIMO ASSEMBLY C	Unknown/No Commodity
NANAIMO ASSEMBLY C (NSC)	Unknown/No Commodity
NANAIMO PASSENGER TERMINAL	Unknown/No Commodity
NANAIMO PASSENGER TERMINAL (NPT)	Unknown/No Commodity
NEPTUNE 1	Coal
NEPTUNE 1 (NP1)	Coal
NEPTUNE 2	Potash
NEPTUNE 2 (NP2)	Potash
NEPTUNE 3	Potash
NEPTUNE 3 (NP3)	Potash
OGDEN POINT NORTH A	Unknown/No Commodity
OGDEN POINT NORTH A (ONA)	Unknown/No Commodity
OGDEN POINT NORTH B	Unknown/No Commodity
OGDEN POINT NORTH B (ONB)	Unknown/No Commodity
OGDEN POINT SOUTH A	Unknown/No Commodity
OGDEN POINT SOUTH A (OSA)	Unknown/No Commodity
OGDEN POINT SOUTH B	Unknown/No Commodity
OGDEN POINT SOUTH B (OSB)	Unknown/No Commodity
PACIFIC ELEVATOR 2	Grain
PACIFIC ELEVATOR 4	Grain
PACIFIC ELEVATOR 4 (Viterra Pacific Terminal)	Grain
PACIFIC ELEVATOR 4 (Viterra Pacific Terminal) (PE4)	Grain
PARKLAND MARINE TERMINAL (STN)	Liquid Bulk
PETRO CANADA	Liquid Bulk

Terminal Name	Commodity
PETRO CANADA (SUNCOR)	Liquid Bulk
PETRO-CANADA (SUNCOR) (PET)	Liquid Bulk
PORT MELLON	Forest Products
PORT MELLON (Howe Sound Pulp & Paper)	Forest Products
PORT MELLON (HOWE SOUND PULP & PAPER) (PML)	Forest Products
PORT MOODY 1	Liquid Bulk
PORT MOODY 1 (Pacific Coast Terminals)	Liquid Bulk
PORT MOODY 1 (Pacific Coast Terminals) (PM1)	Liquid Bulk
PORT MOODY 2	Unknown/No Commodity
PORT MOODY 2 (Pacific Coast Terminals)	Unknown/No Commodity
PORT MOODY 2 (Pacific Coast Terminals) (PM2)	Unknown/No Commodity
ROBERTS BANK 1	Coal
ROBERTS BANK 1 (Westshore Terminals)	Coal
ROBERTS BANK 1 (WESTSHORE TERMINALS) (RB1)	Coal
ROBERTS BANK 2	Coal
ROBERTS BANK 2 (Westshore Terminals)	Coal
ROBERTS BANK 2(WESTSHORE TERMINALS) (RB2)	Coal
SHELLBURN OIL	Liquid Bulk
SHELLBURN TERMINAL (SHL)	Liquid Bulk
SOUTH FRASER MARINE TERMINAL (SFMT)	Liquid Bulk
SQUAMISH 1	Unknown/No Commodity
SQUAMISH 1 (EAST BERTH)	Unknown/No Commodity
SQUAMISH 1 (SQ1)	Unknown/No Commodity
SQUAMISH 2	Unknown/No Commodity
SQUAMISH 2 (SQ2)	Unknown/No Commodity
SQUAMISH 2 (WEST BERTH)	Unknown/No Commodity

Terminal Name	Commodity
STANOVAN REFINERY	Liquid Bulk
STANOVAN REFINERY (Parkland/Chevron)	Liquid Bulk
SYDNEY FERRY TERMINAL	Unknown/No Commodity
SYDNEY FERRY TERMINAL (SFT)	Unknown/No Commodity
TEXADA MINES	Unknown/No Commodity
Tilbury LNG (LNG)	Unknown/No Commodity
TIMBERLAND LOG STORAGE (TLS)	Unknown/No Commodity
VANCOUVER WHARVES 1 (Pembina) (KM1)	Concentrates
VANCOUVER WHARVES 2 (Pembina) (KM2)	Unknown/No Commodity
VANCOUVER WHARVES 4 (Pembina) (KM4)	Sulphur
VANCOUVER WHARVES 5 (Pembina) (KM5)	Sulphur
VANTERM 3	Unknown/No Commodity
VANTERM 4	Liquid Bulk
VANTERM 4 (VT4)	Liquid Bulk
VANTERM 5	Containers
VANTERM 5 (VT5)	Containers
VANTERM 6	Containers
VANTERM 6 (VT6)	Containers
WEI WAI KUM	Unknown/No Commodity
WESTRIDGE TERMINAL	Liquid Bulk
WESTRIDGE TERMINAL (WRT)	Liquid Bulk
WESTRIDGE TERMINAL BERTH 1 (WR1)	Liquid Bulk
WESTRIDGE TERMINAL BERTH 2 (WR2)	Liquid Bulk
WESTRIDGE TERMINAL BERTH 3 (WR3)	Liquid Bulk
WWL VEHICLE SERVICE 1	Car Carrier
WWL VEHICLE SERVICE 1 (ANNACIS 1) (AT1)	Car Carrier
WWL VEHICLE SERVICE 1(ANNACIS 1) (AT1)	Car Carrier

Terminal Name	Commodity
WWL VEHICLE SERVICE 2	Car Carrier
WWL VEHICLE SERVICE 2 (ANNACIS 2) (AT2)	Car Carrier
XLYNN TERM 4	Liquid Bulk
XLYNN TERM 5	Unknown/No Commodity
XLYNN TERM 6	Unknown/No Commodity
XLYNN TERM 7	Unknown/No Commodity

Phase analysis

In Section 3, the report separates anchorage use into three trip phases:

- Before terminal: anchorage time that occurred before the vessel's first terminal visit in the trip.
- Between terminals: anchorage time that occurred after one terminal visit and before a later terminal visit in the same trip.
- After terminal: anchorage time that occurred after the vessel's final terminal visit.

Additionally, the report also identifies anchorage time recorded during a trip that did not include a terminal visit, which is labelled "No terminal." For each vessel type or commodity group, Clear Seas calculated:

- the share of trips that anchored during each phase;
- the average days at anchor during that phase; and
- the total days at anchor during that phase.

The phase percentages are not mutually exclusive. A single trip can anchor before its first terminal visit, between terminal visits, and after its final terminal visit. For this reason, the percentages across phases may add to more or less than 100%.

For phase-level totals and averages, multiple anchorage stops within the same phase were combined at the trip level before calculating the average. For example, if a vessel waited at two different anchorages before its first terminal visit, both anchorage stays were counted as part of its pre-terminal anchorage time.

Incomplete and ambiguous trips

Because the PPA data records pilotage movements rather than complete voyages, some trips required additional review. Trips were flagged as incomplete or ambiguous where the sequence of movements did not clearly indicate a complete trip through the study area, where a trip was missing movements, or where a location could not be classified.

Treatment of year-end and month-end trips

Some vessel trips and anchorage stays cross month-end or year-end boundaries. In this analysis, time at anchor was assigned to the year and month associated with the departure movement from the anchorage, based on the "First Pilot Ordered" timestamp for the movement leaving the anchorage. For example, if a vessel arrived at an anchorage in late December and departed in early January, the anchorage duration was assigned to January. This approach is consistent with the movement-based structure of the PPA data, but it may shift some anchorage time across adjacent months or years.

Treatment of negative, zero, and implausibly long durations

Records producing negative durations were treated as data quality issues and flagged for review. Zero-duration records were retained where they reflected short operational movements, but they did not contribute materially to total time at anchor calculations. Very long anchorage durations were also flagged for review to determine whether they reflected a genuine extended anchorage stay or a sequencing/timestamp issue.