Prepared for: WASHINGTON PORTS

WASHINGTON STATE FREIGHT MOBILITY STRATEGIC INVESTMENT BOARD

WASHINGTON MARINE CARGO FORECAST 2024

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In association with: HIGH PEAK STRATEGY, THE KEMMSIES GROUP, EBP

MARCH 2025

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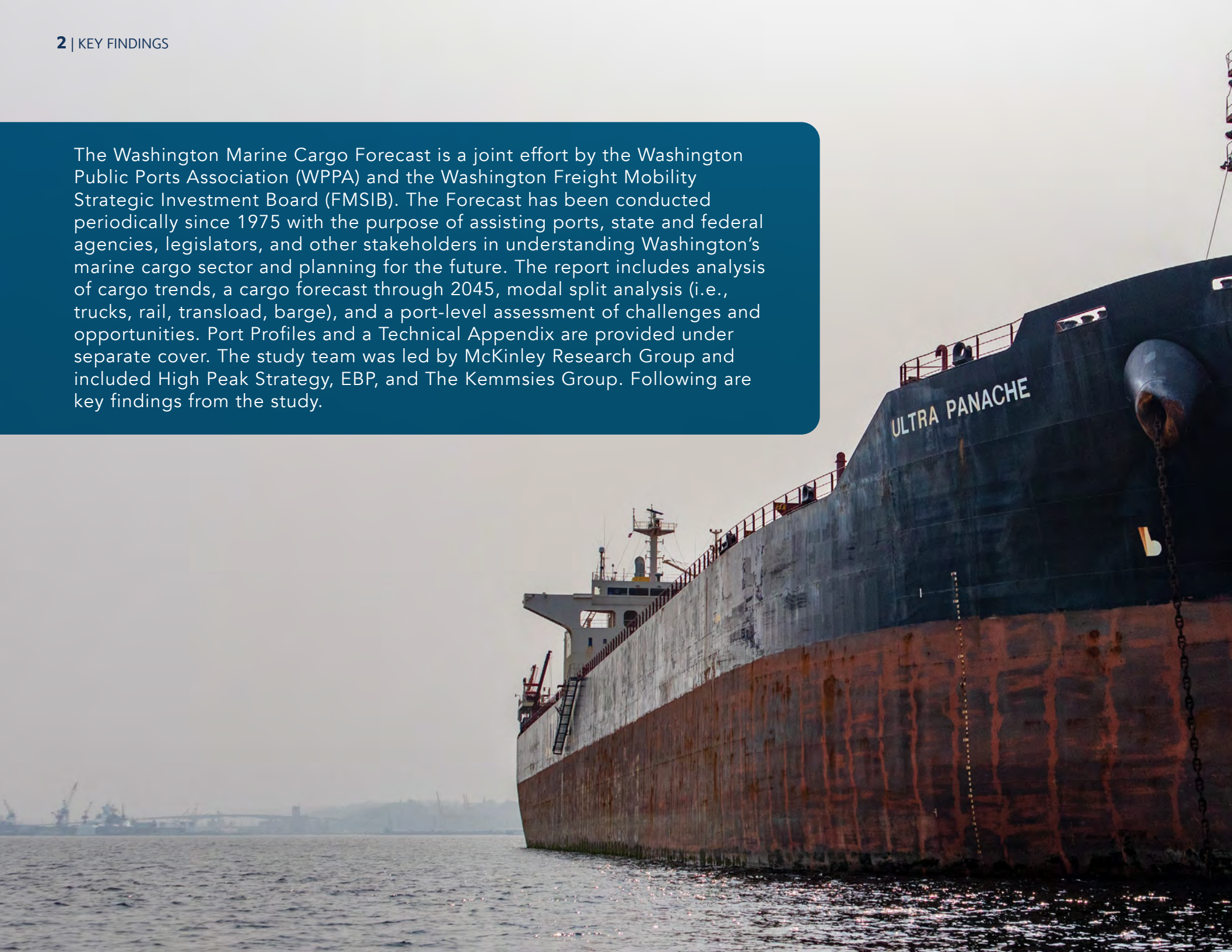
Port of Olympia

KEY FINDINGS

The Washington Marine Cargo Forecast is a joint effort by the Washington Public Ports Association (WPPA) and the Washington Freight Mobility Strategic Investment Board (FMSIB). The Forecast has been conducted periodically since 1975 with the purpose of assisting ports, state and federal agencies, legislators, and other stakeholders in understanding Washington's marine cargo sector and planning for the future. The report includes analysis of cargo trends, a cargo forecast through 2045, modal split analysis (i.e., trucks, rail, transload, barge), and a port-level assessment of challenges and opportunities. Port Profiles and a Technical Appendix are provided under separate cover. The study team was led by McKinley Research Group and included High Peak Strategy, EBP, and The Kemmsies Group. Following are key findings from the study.



Cargo Trends

- Total marine cargo tonnage handled at Washington state ports has been declining in recent years, down 34% between 2018 and 2023 – largely attributable to the downturn in U.S.-China trade.
- Exports of key bulk commodities, including soybeans and wheat, remain strong, with the Columbia-Snake River System playing a crucial role in grain shipments.
- While China remains a major trade partner, its share of containerized trade has declined, with Vietnam emerging as an alternative manufacturing hub.
- Supply chain diversification, geopolitical tensions, and environmental regulations are reshaping trade routes. New investments in Mexico, Southeast Asia, and South Asia may divert cargo volumes away from the Pacific Northwest.
- Disruptions from climate change, such as droughts impacting the Panama Canal, will likely persist and alter global shipping patterns.
- New Trump Administration tariffs and threatened tariffs, as of the time of this report (February 2025), will have an adverse effect on cargo volumes, similar to the decline in U.S.-China trade since the beginning of the Trade War in 2018.
- Washington's domestic trade (primarily with Alaska and Hawaii) fell 48% by tonnage between 2013 and 2022, largely driven by a downturn in crude oil shipments from Alaska. However, containerized cargo rose 41% between 2017 and 2022.

Cargo Forecast

The international marine cargo forecast was developed using a freight economy model. This approach forecasts future marine cargo flows based on a number of factors, including future growth among freight-intensive industries, the extent to which businesses as far east as the Midwest utilize Washington state ports for imports and exports, and population growth (and household demand) for tradable goods. Domestic containerized cargo was forecasted based on an econometric method leveraging historic cargo data and regional economic trends and outlooks.

- Marine cargo tonnage in Washington state is projected to grow at an annual rate of 1.9% through 2045.
- The Columbia-Snake River System is expected to see slightly more rapid growth (2.0%), driven by agricultural exports.
- Imported containerized cargo is anticipated to grow at 2.2% annually, reaching 2.7 million loaded TEUs by 2045.
- Forecasted future cargo flows are driven by projected growth in freight-intensive industries, population growth, and industry reliance by state on Washington ports for imports and exports by commodity.
- In terms of commodities, oil seeds are projected to see the greatest net increase in tonnage between now and 2045, followed by mineral fuels, cereals (primarily wheat), salt, sulphur & related materials, and inorganic chemicals.
- Commodities with the highest growth rates include fertilizers (+179%), furniture and bedding (+100%), inorganic chemicals (+95%), and plastics (+87%).
- Neo-bulk cargo, including automobiles and construction equipment, is projected to increase, necessitating new port infrastructure investments.
- Domestic containerized volumes are projected to decline slightly in the coming years, largely driven by projected population decline in Alaska.

Port Assessment

- Washington's ports face a number of challenges in maintaining and strengthening competitiveness in global maritime trade.
- Many ports are in need of new and/or upgraded cargo infrastructure. Some projects are underway and fully funded while others are in need of further investment.
- Modal connectivity is a major limit to growth. The need for extended arrival and departure tracks at Tacoma Rail is an example of a capacity constraint, while congestion on critical roadways, such as SR 18 and the I-5 Nisqually River Viaduct, affects truck transport.
- Power supply limitations at select ports may hinder industrial expansion, and environmental regulations are driving investment in port electrification and shore power.
- Emerging opportunities include offshore wind energy development, inland port expansion, and short-sea shipping along the M5 Marine Corridor, which could help alleviate congestion and improve regional freight mobility.

Although Trump-associated tariffs may impact global trade in the short-term, it is difficult to predict how long the tariffs will be in effect, or to what extent they will impact Washington's maritime cargo sector. An update to the assumptions in this analysis will likely be warranted after the market is given a chance to settle in the coming year.

Port of Walla Walla

Port of Kalama

Port of Walla Walla

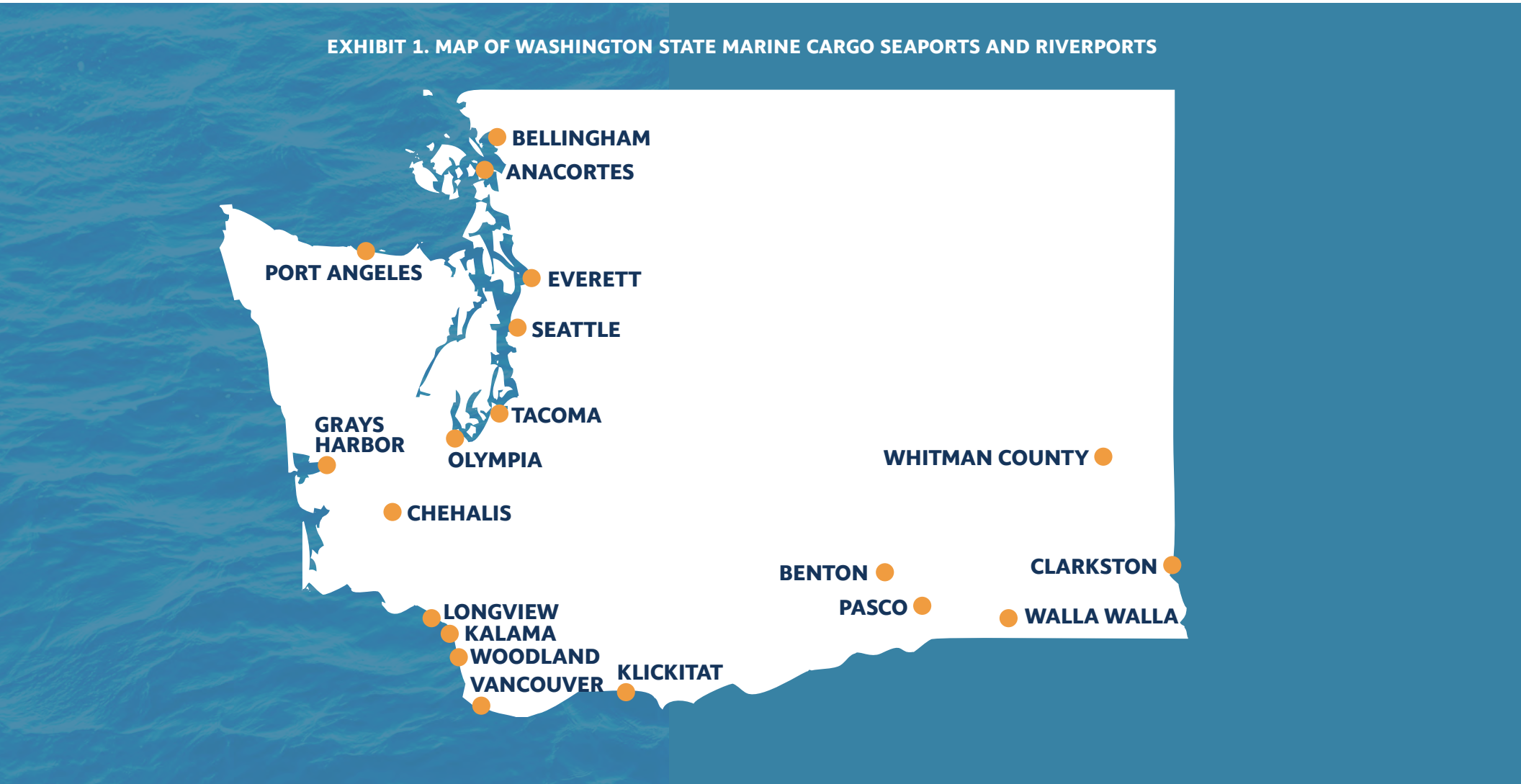
INTRODUCTION AND METHODS

INTRODUCTION

Washington state is among the nation's largest marine cargo gateways. The state marine cargo system is vast, encompassing seaports, riverports, intermodal cargo facilities, barging, rail, trucking, and transloading. This study assesses the current port capabilities, cargo trends, future growth opportunities and challenges, and long-term outlook for marine cargo flows. Findings will inform capital expenditure planning by state and local agencies, as well as port-level growth strategies.

There are 18 public seaports and riverports in Washington state (**Exhibit 1**). In addition, there are private terminals handling liquid and bulk commodities, such as those along the Columbia River and Salish Sea,and inland ports that facilitate rail cargo destined for or originating from international and domestic markets. This study groups ports into two main categories for much of the forecast: Seaports and the Columbia-Snake River System.

EXHIBIT 1. MAP OF WASHINGTON STATE MARINE CARGO SEAPORTS AND RIVERPORTS



METHODS

This analysis draws upon federal, state, local, and private vendor data sources, including U.S. Census Bureau and WISER Trade import and export data; domestic cargo data published by the U.S. Army Corp of Engineers; input-output tables for freight intensity analysis; and macroeconomic forecasts. The study team conducted in-depth interviews with participating ports and toured nine ports in person. Additional interviews were conducted with representatives of stakeholder groups such as railroads, Washington Department of Transportation, and MARAD (Maritime Administration).

A detailed discussion of sources and methods is provided in the accompanying Technical Appendix.

ORGANIZATION OF REPORT

The report is organized as follows:

ONE

International and Domestic Trade Trends

Key trends in cargo flows, including commodity, market, and macroeconomic and geopolitical factors shaping cargo flows.

TWO

Marine Cargo Forecast

Detailed projections statewide and by substate region, broken out by cargo type and specific commodities.

THREE

Modal Split

Estimated modal shares for cargo originating from or destined for Washington's seaports and riverports, such as by rail, barge, truck, or transload.

FOUR

Port Assessment

Transportation bottlenecks, infrastructure needs, and key port-level factors that may shape or inhibit future cargo flows, and a detailed matrix presenting port attributes.

Port Profiles are provided under separate cover.

Port of Kalama

ONE

INTERNATIONAL AND DOMESTIC TRADE TRENDS

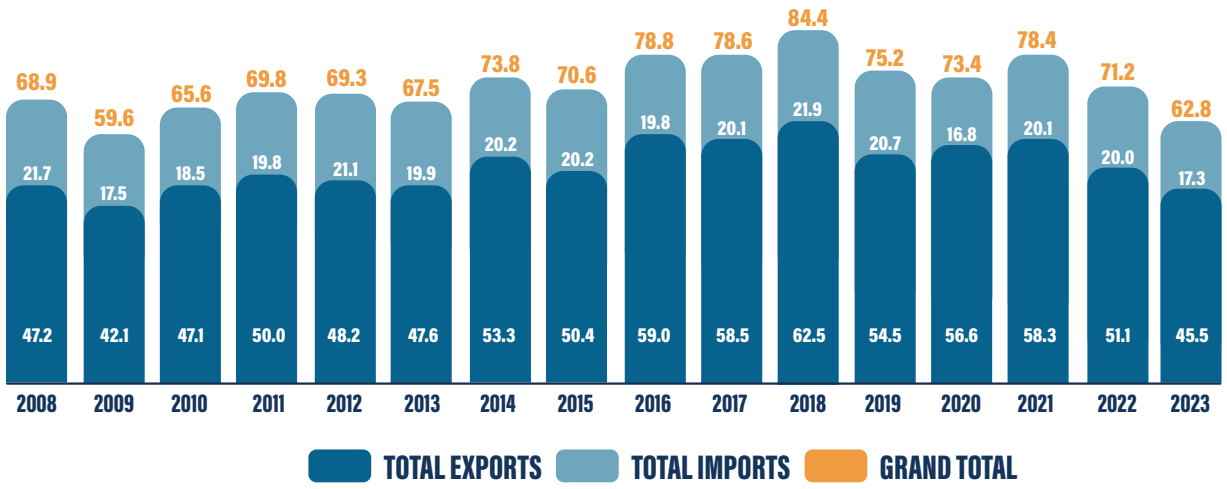
TOTAL MARINE CARGO

There are multiple ways to measure marine cargo volumes; these include by tonnage, by cargo type (dry bulk, liquid bulk, break bulk, neo-bulk, and containerized), twenty-foot equivalent units (TEUs, for containers), by direction (imports, exports), and by market (domestic, overseas).

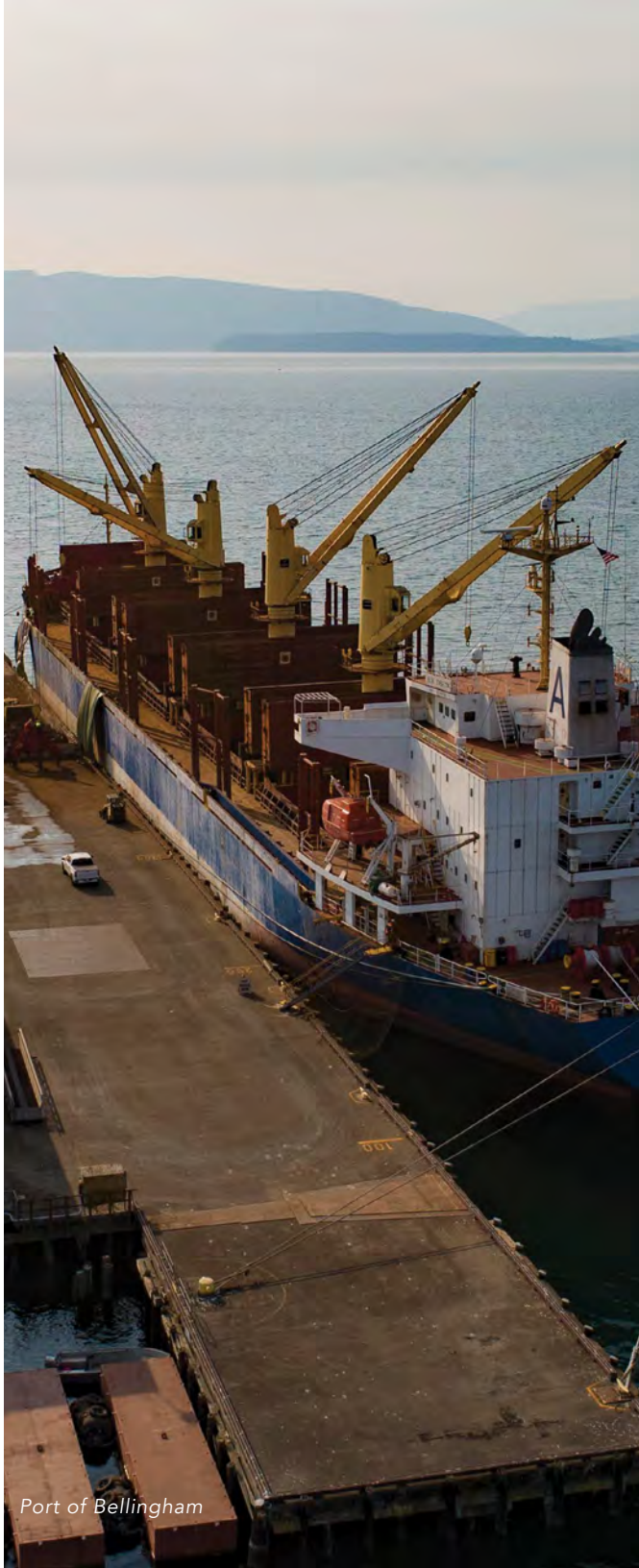
The distinction between tonnage and TEUs is important. Trade volumes through Washington state ports skew heavily toward dry bulk exports, driven by export shipments of bulk commodities such as cereals and oil seeds. However, containerized cargo is heavily skewed to imports, reflecting the U.S.'s longstanding trade deficit, particularly with China. Both types of categories of cargo—dry bulk and containers—generate economic activity, though containerized cargo supports a much denser network of logistics and intermodal operations.

In 2023, two-way (imports plus exports) marine cargo metric tonnage handled at Washington state ports totaled 62.8 million metric tons (**Exhibit 2**). The 2023 total was down from 71.2 million metric tons in 2022 and a peak of 84.4 million metric tons in 2018, at the start of the U.S.-China Trade War and imposition of punitive tariff rates and retaliatory tariff rates.

EXHIBIT 2. WATERBORNE IMPORTS AND EXPORTS THROUGH WASHINGTON STATE PORTS,
MILLIONS OF METRIC TONS, 2008-2023



DATA SOURCE: U.S. CENSUS BUREAU, USA TRADE® ONLINE, 2024.



Port of Bellingham

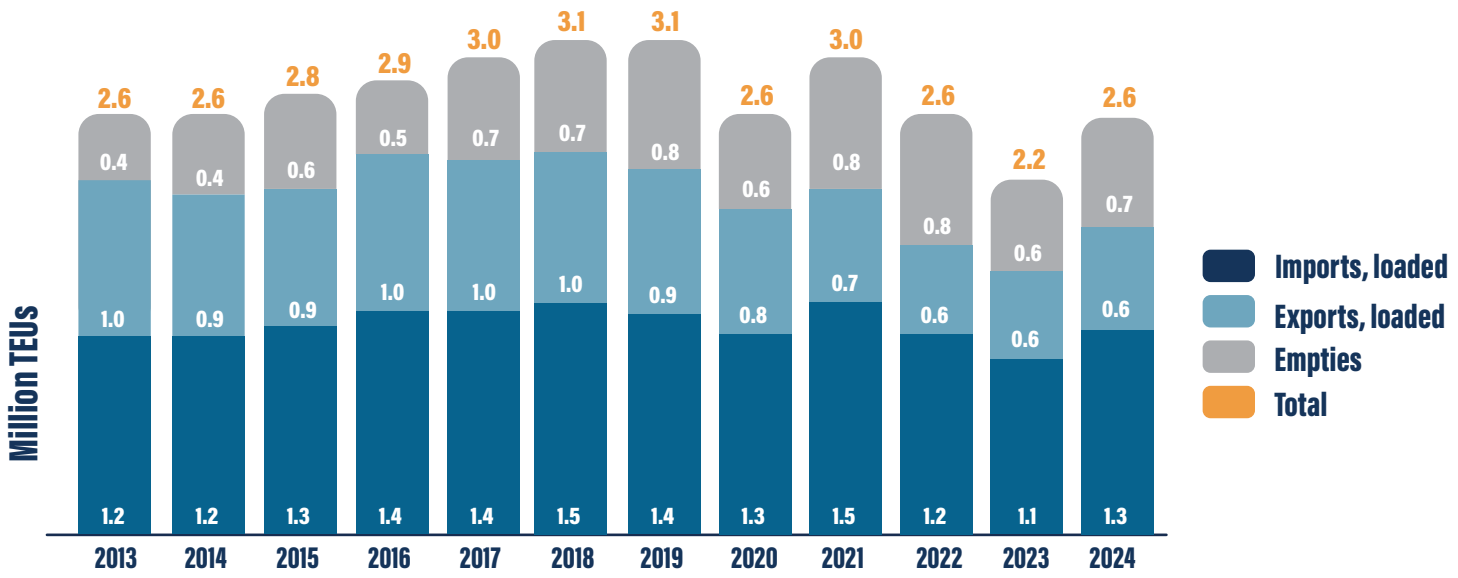
CONTAINERIZED CARGO

International containers (loaded and empty) handled at the NWSA in 2024 totaled 2.6 million TEUs, up 17% year-over-year but still 16% below a historic peak of 3.1 million TEUs in 2018 (**Exhibit 3**). The most recent uptick—after two years of consecutive declines—may be attributable to an increase in advance orders ahead of anticipated higher tariffs on China and other trading partners.

Some markets have emerged as major trading partners in recent years. For example, containerized trade with Vietnam increased 127% between 2017 and 2023, from 70,169 to 159,478 TEUs (loaded imports and exports combined).

Between 2013 and 2024, imports represented an average of 61% of all loaded international containers handled at the NWSA. This imbalance reflects the U.S.'s ongoing trade deficit in containerized physical goods, most notably with China. Empty containers have averaged about 23% of total international TEUs handled at the NWSA over the same period.

EXHIBIT 3. CONTAINERIZED INTERNATIONAL TRADE, LOADED AND EMPTY CONTAINERS, WASHINGTON STATE PORTS, 2013-2024



TEUs from China down 41% between 2018 and 2023.

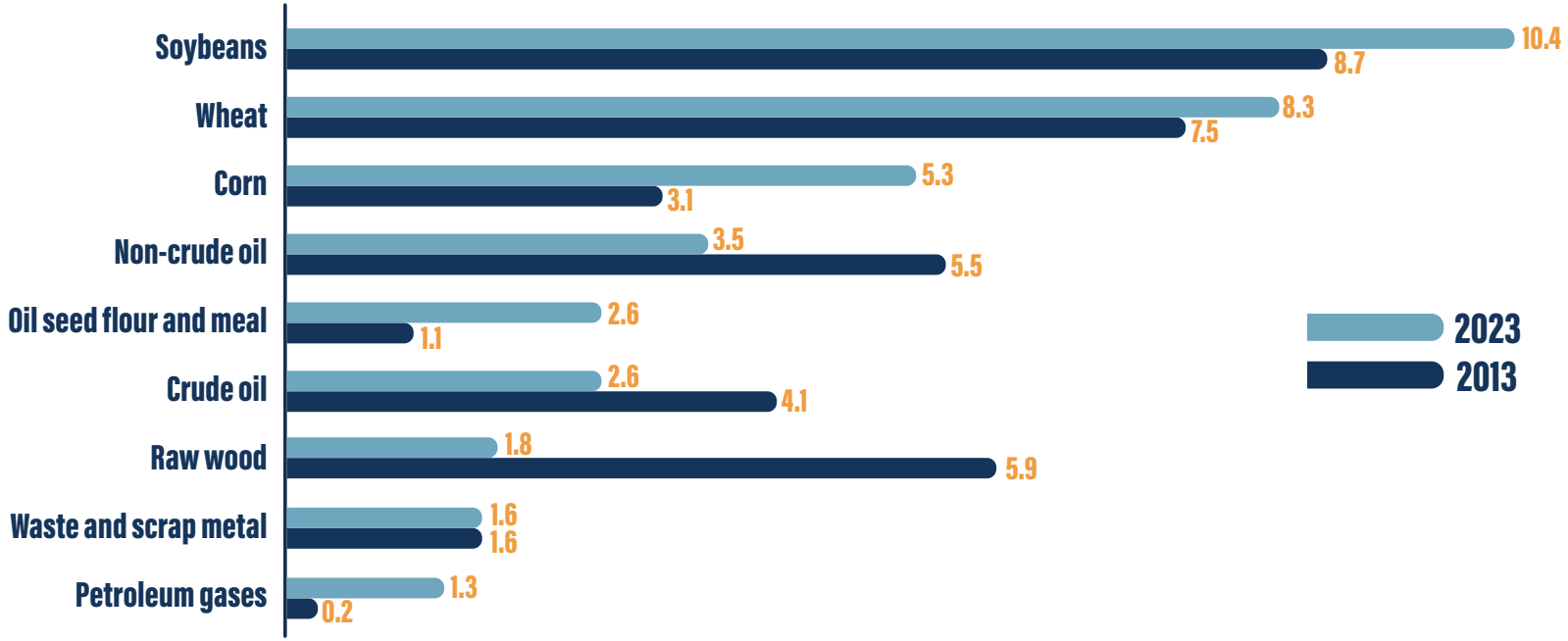
Containers from or to Vietnam through The NWSA up 127% between 2017 and 2023.

Port of Seattle

BULK, BREAK BULK, AND NEO-BULK CARGO

Washington is a major international gateway for grain exports to Asia. By volume, soybeans are the largest commodity handled at Washington ports, totaling 10.4 million metric tons in 2023 (**Exhibit 4**). Soybeans are typically railed from the U.S. Midwest to Washington state ports, such as Kalama, Grays Harbor, and Tacoma, to be loaded onto vessels for export to Asia. The second largest product by tonnage in 2023 was wheat exports (8.3 million metric tons), much of which originates in Eastern Washington, Montana, and the Midwest, arriving at Columbia River ports via barge or by rail to the Puget Sound.

EXHIBIT 4. LEADING INTERNATIONAL BULK, BREAK BULK, AND NEO-BULK CARGO THROUGH WASHINGTON STATE PORTS, BY MILLIONS OF METRIC TONS, TWO-WAY (IMPORTS AND EXPORTS), 2013 AND 2023



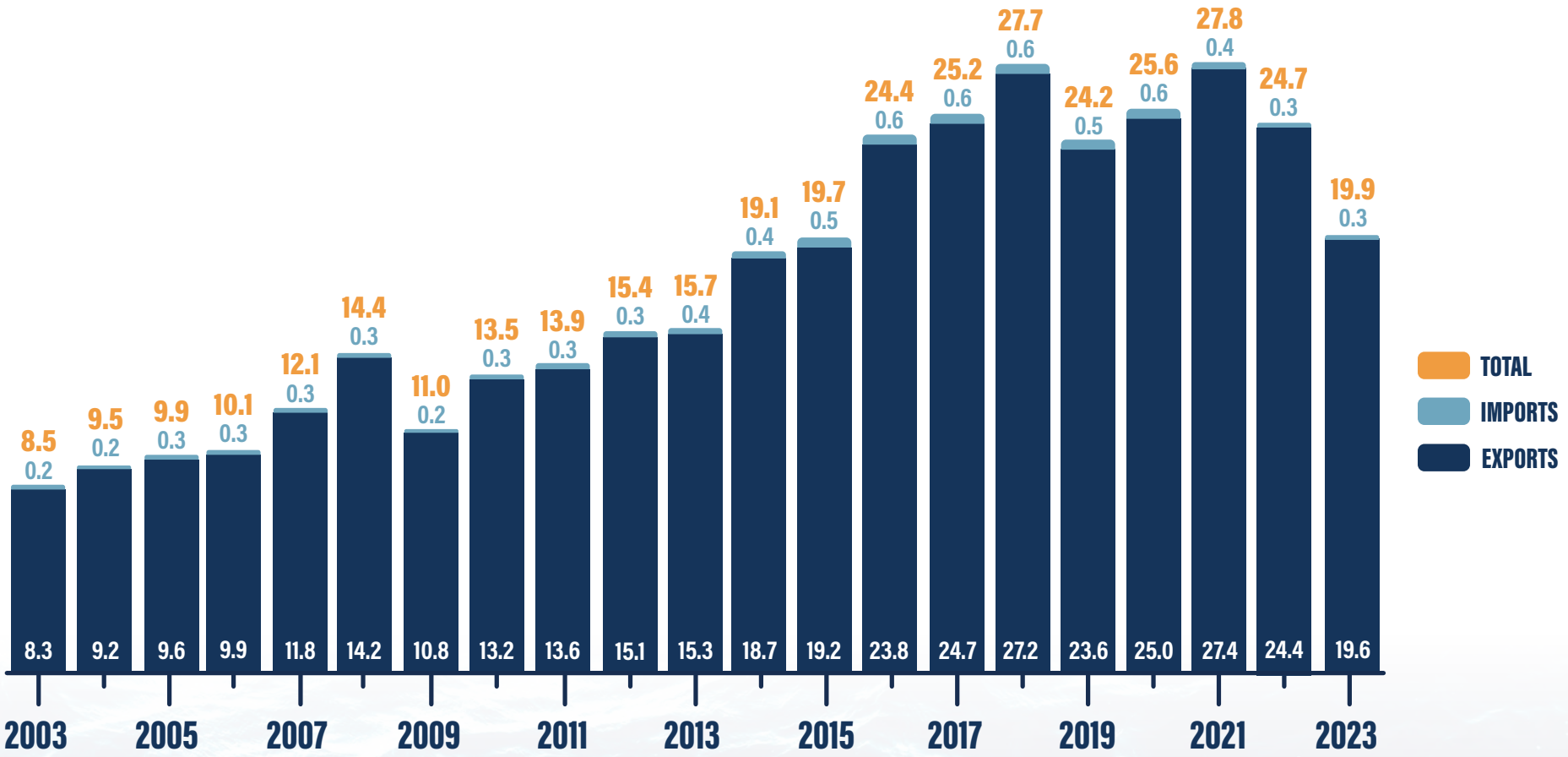
DATA SOURCE: U.S. CENSUS BUREAU, USA TRADE® ONLINE, 2024.

Port of Port Angeles

AGRICULTURAL CARGO

In 2023, agricultural commodities shipped through Washington state ports summed to 19.9 million metric tons, down from a peak of more than 27.8 million metric tons in 2021 (**Exhibit 5**). Between 2009 and 2021, tonnage of agricultural shipments through Washington's ports increased 152%, driven largely by significant gains in oil seeds and cereals. The large declines between 2021 and 2023 were attributable to cereals (down nearly 5.0 million metric tons, -29%) and oil seeds (down 2.8 million metric tons, -28%). China was a major source for these declines; between 2021 and 2023, cereal and oil seed exports to China fell by 1.2 million metric tons and 2.6 million metric tons, respectively.

EXHIBIT 5. WASHINGTON PORTS AGRICULTURAL COMMODITIES TWO-WAY TRADE,
MILLIONS OF METRIC TONS, 2003-2023

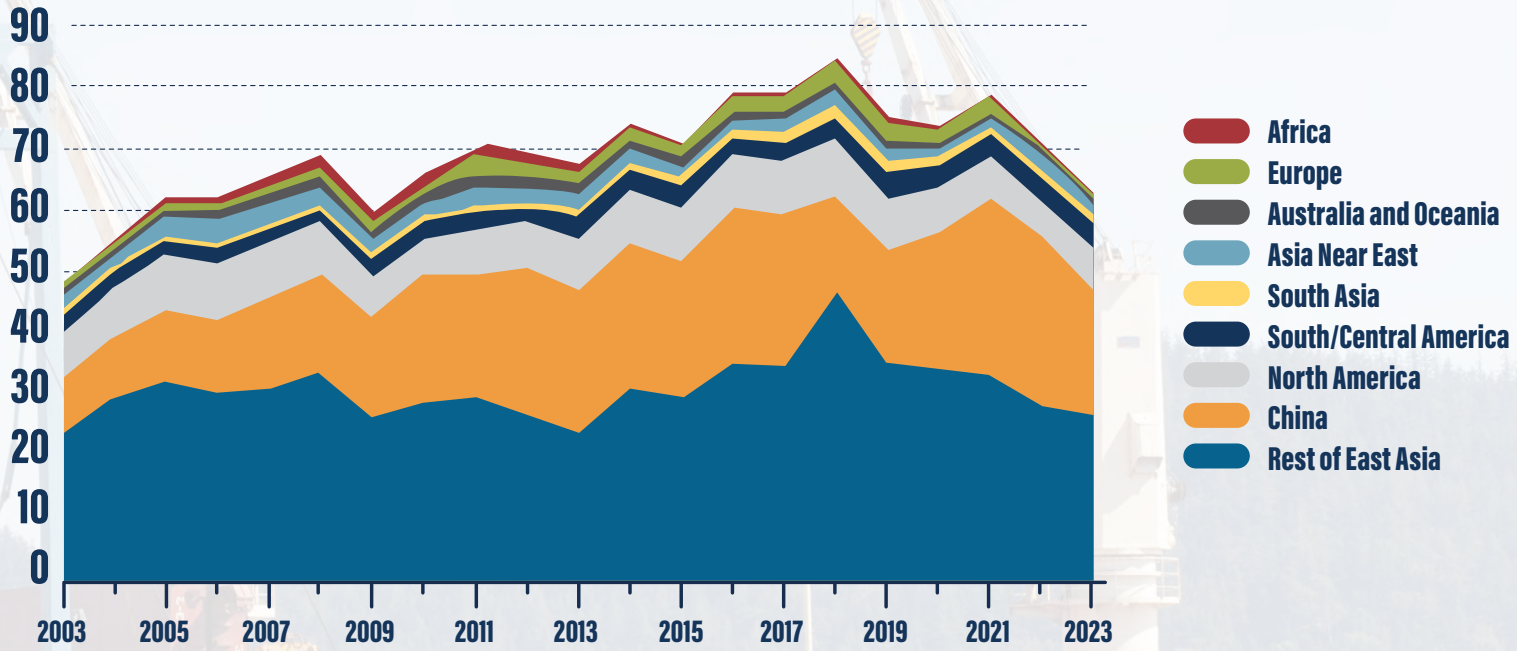


INTERNATIONAL TRADE PARTNER OVERVIEW

China has historically been Washington's largest single international trade partner measured both in terms tonnage and containers. Between 2009 and 2023, China averaged 31% of all two-way trade by tonnage through Washington state ports, with a peak of 38% in 2022 (**Exhibit 6**). Soybeans have been the dominant bulk commodity shipped to China over this period.

In terms of containerized trade (measured in TEUs), China represented 40% of all cargo volume handled at Washington state ports in 2023, followed by Japan (13%) and Vietnam (10%). Between 2017 and 2023, containerized imports (TEUs) from Vietnam grew 140%, surging to 13% of all containerized imports, while China's share has fallen from a peak of 62% in 2018 to 52% in 2023.[1]

EXHIBIT 6. TOP TWO-WAY WATERBORNE TRADING PARTNERS (COUNTRIES AND REGIONS) WITH WASHINGTON STATE PORTS, 2003-2023, MILS METRIC TON



DATA SOURCE: U.S. CENSUS BUREAU, USA TRADE® ONLINE, 2024.

Port of Kalama

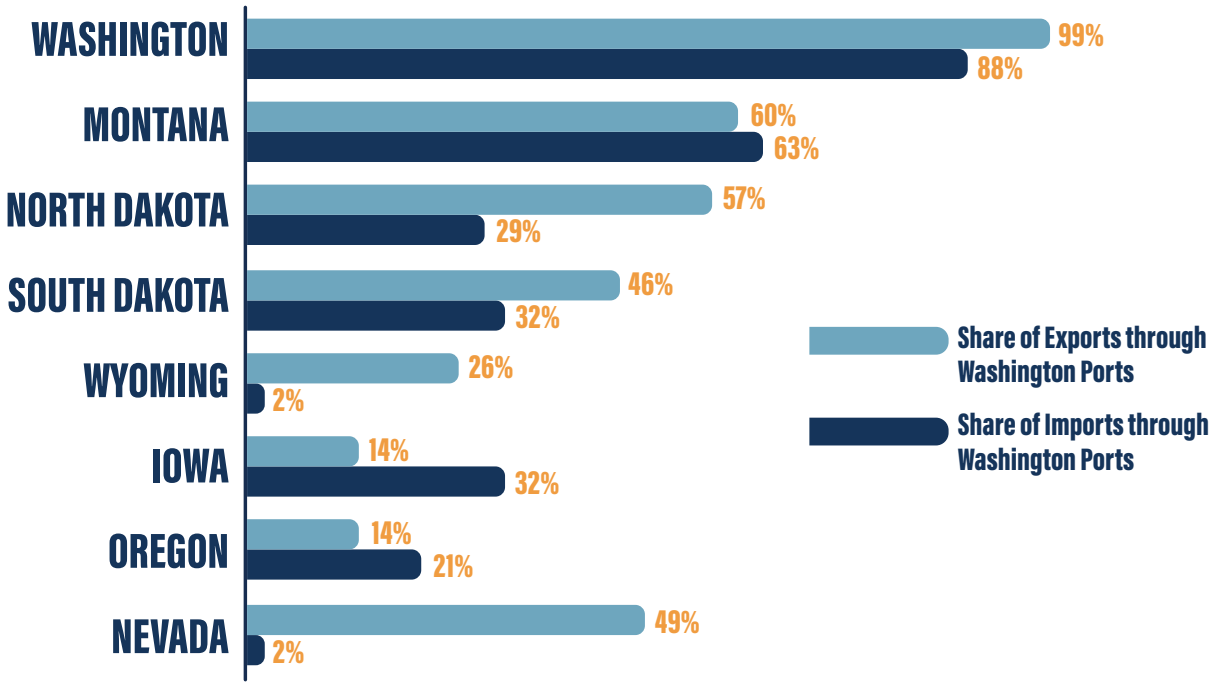
Port of Grays Harbor

HINTERLAND CONNECTIONS

Hinterlands are inland areas served by seaports and riverports, including regions where goods are sourced, distributed, or consumed. These areas are connected to ports through transportation networks such as railroads, highways, and inland waterways.

Washington state ports serve a hinterland region that extends into the Midwest, including the Dakotas. Measured in metric tonnage, an estimated 60% of all Montana exports, 57% of North Dakota exports, and 46% of South Dakota exports are shipped via Washington state ports (**Exhibit 7**).

EXHIBIT 7. STATES WITH HIGHEST INTENSIVE USE OF WASHINGTON STATE PORTS FOR IMPORTS AND EXPORTS, 2023, BY TONNAGE



DATA SOURCES: WISER TRADE, 2024; U.S. CENSUS BUREAU, 2024; U.S. DEPARTMENT OF AGRICULTURE, 2023.

DOMESTIC TRADE TRENDS

Washington state is a key port for trade between Alaska, Hawaii, and the rest of the U.S. In 2022, Washington state ports handled 28.4 million short tons of domestic cargo, including shipments to and from Alaska and Hawaii **(Exhibit 8**). Domestic cargo volume was lowest in 2020 at 28.6 million tons and peaked in 2013 at 42.0 million tons. Alaska is the primary market for Washington state domestic containerized cargo: in 2023 The NWSA handled 614,765 TEUs of containerized cargo to or from Alaska, compared with 122,884 TEUs to or from Hawaii.

Petroleum products (crude and non-crude) have historically been the largest marine domestic commodity by tonnage moved through Washington state ports, averaging 70% of total tonnage; Much of this is moved short distances by barge as well as between Alaska and refineries in Northwest Washington. Washington ports handled an average of five million tons annually of crude oil between 2012 and 2022, largely inbound from Alaska. Domestic tonnage has fallen in recent years, from a peak of 42.0 million short tons in 2013 to 28.4 million in 2022; however, this was primarily driven by the decline in one commodity, crude oil shipments.

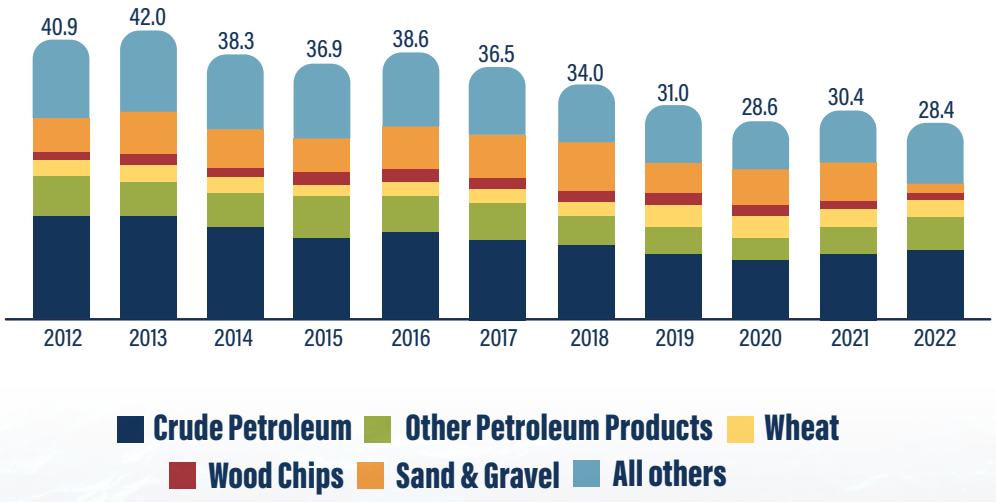
Consumer goods include manufactured products such as toys and furniture, groceries, and other food products; these products comprised between 15% and 18% of total domestic cargo tonnage handled between 2013 and 2022. Wood products include raw wood (or green timber), dimensional lumber, and wood chips. In 2022, Washington state ports handled 1.5 million short tons in domestic shipments of wood products, both inbound and outbound shipments.[2]

Fish (excluding shellfish) comprised most of the seafood volume, which peaked in 2022 at 189,000 tons, up 53% from the 2013 volume of 123,000 tons and up 88% from the 2020 low of 101,000 tons. Domestic automobile and parts tonnage has remained a steady 1% share of total tonnage since 2013.

Much of this domestic trade, particularly between Washington state, Alaska, and Hawaii, is via containerized cargo. These volumes increased from 700,000 TEUs in 2017 to 990,000 TEUs in 2022 (loaded and empties).

Port of Benton

EXHIBIT 8. DOMESTIC TRADE, TONNAGE HANDLED AT WASHINGTON STATE PORTS (MILLIONS OF SHORT TONS), 2012-2022



GLOBAL ECONOMIC OVERVIEW

Economic growth overseas is a critical driver of U.S. exports and marine cargo volumes through the Pacific Northwest—particularly in China, Washington's largest trade partner. According to the International Monetary Fund (IMF) and other economic forecasters, China is projected to experience a continued slowdown in growth, declining from a pandemic and post-pandemic growth rate of 5.5% per year to an average of 3.8% through 2029 (**Exhibit 9**). China's economy will continue to be saddled with the effects of low and even negative population growth, weak productivity growth, state enterprise debt, the ongoing real estate crisis, and harmful effects of U.S. punitive tariffs and export controls.

EXHIBIT 9. REAL GDP GROWTH, GLOBAL AND BY MAJOR REGION, 2020-2023 (ACTUAL) AND 2024-2029 (FORECAST)

	SHARE OF WASHINGTON STATE TRADE, 2023		COMPOUND ANNUAL GROWTH RATES	
REGION	*By Tonnage*	*By Value*	*2020-2023*	*2024-2029*
Advanced economies	35%	42%	3.3%	1.7%
Euro area	2%	2%	3.2%	1.3%
Major advanced economies (G7)	23%	25%	3.1%	1.6%
Other advanced economies*	16%	20%	3.4%	2.2%
European Union	2%	3%	3.4%	1.6%
ASEAN-5	10%	9%	4.5%	4.6%
Emerging market and developing economies	60%	53%	5.1%	4.1%
Emerging and developing Asia	44%	47%	5.9%	4.7%
Emerging and developing Europe	0%	0%	3.9%	2.7%
Latin America and the Caribbean	13%	5%	4.6%	2.5%
Middle East and Central Asia	2%	1%	3.9%	3.7%
Sub-Saharan Africa	1%	0%	4.0%	4.1%
World			**4.4%**	**3.1%**
Select Countries/Regions				
China	28%	28%	5.5%	3.8%
Japan	14%	22%	1.8%	0.7%
Taiwan Province of China	4%	4%	3.5%	2.5%
Hong Kong SAR	1%	0%	1.9%	2.7%
Vietnam	4%	8%	5.2%	6.4%
Korea	8%	13%	2.8%	2.2%

**Advanced economies excluding G7 and euro area.*

Real growth based on constant prices.

Source: International Monetary Fund, April 2024.[3]

However, China's middle class and consumer market is expected to continue to grow, with greater demand for household goods. And despite recent moves by many manufacturers to diversify production into other parts of Asia and Central and South America, China will remain a global hub for advanced manufactured goods.

Among other major trading partners for Washington state ports, the IMF projects Vietnam to experience accelerated growth in the coming years, with a compound annual growth rate of 6.4% between 2024 and 2029.

The IMF projects global trade volumes to increase 3.3% in 2025, up from 3.0% in 2024. Global export volumes are expected to increase 3.9% among "emerging and developing economies," and increase 4.1% for imports.[4] The World Trade Organization similarly projects global merchandise trade to expand 3.3% in 2025 as part of rebound from a contraction in 2023.[5]

GEOPOLITICAL AND POLICY ISSUES

The global shipping industry is sensitive to geopolitical risks, as it depends on secure trade routes, stable political relationships, and predictable regulatory environments. In 2025 and beyond, several key geopolitical factors are poised to shape the future of maritime shipping. These include tensions in the South China Sea, worsening U.S.-China relations, the impact of sanctions and trade disputes, energy security in the Middle East, and the effects of climate change on Arctic routes. These issues are discussed below.

U.S.-China Rift and Supply Chain Diversification

TARIFFS AND TRADE TENSIONS

China has long been the leading trade partner for Washington state ports. In 2018, at the cusp of the U.S.-China Trade War, containerized cargo handled from or to China at The Northwest Seaport Alliance peaked at nearly 1.1 million twenty-foot equivalent units (TEUs). Since then, containerized trade with China has fallen 41%, to 646,346 TEUs in 2023. Two-way non-containerized cargo trade with China handled at Washington state ports, such as grain exports, reached 17.6 million metric tons in 2017 before falling to less than 8 million in 2018. However, shipments (mostly exports) recovered and reached a new peak of 22.5 million metric tons in 2021.


Port of Whitman County

The Trade War began in 2018 with the introduction of punitive tariffs on Chinese imports. The Trump Administration invoked Section 232 of the Trade Expansion Act of 1962[6] and Section 301 of the U.S. Trade Act of 1974 to impose escalating tariff rates on Chinese imports.[7] At each stage of the Trade War, U.S. measures were met with retaliatory tariff rates by China on U.S. imports. These tit-for-tat actions culminated in the January 2020 U.S.-China Phase I Trade Deal, which called for significant trade expansion and greater access to the Chinese domestic market for U.S. goods. However, the deal came only shortly before the pandemic, and many of the goals of the deal (particularly doubling of U.S. exports to China) did not materialize.

The Biden Administration largely continued, and even expanded, many of the trade barriers and Trade War policies enacted during the Trump Administration. These include broadening the list of Chinese firms on the U.S. Department of Commerce's "Entity List," additional forms of export controls, and greater scrutiny of Chinese inbound investments. As discussed above, these growing uncertainties in the U.S.-China relationship are spurring many U.S. and foreign firms (including Chinese firms) to diversify manufacturing into other parts of the world.

The Chinese government has sought to reduce China's reliance on the U.S. and its allies for key technologies, such as advanced semiconductors (including foundries and fabrication equipment). This shift towards promoting a more insular, resilient domestic economy was codified in the Communist Party's 2020 "Dual Circulation" economic policy framework. The U.S. has also sought supply chain resiliency, guided by a deep suspicion of Chinese advanced manufactured products entering the U.S. market and overreliance on a single market for many key inputs and household goods. Many of the provisions in the Inflation Reduction Act and the CHIPS and Science Act are largely motivated by growing concerns over China's technological ascent.

Additionally, China's ambitions to expand its influence through the Belt and Road Initiative (BRI) have led to the development of strategic ports and shipping lanes across Asia, Africa, and Europe. This could shift global trade patterns and create new dependencies on Chinese-controlled infrastructure, leading to a rebalancing of shipping routes.

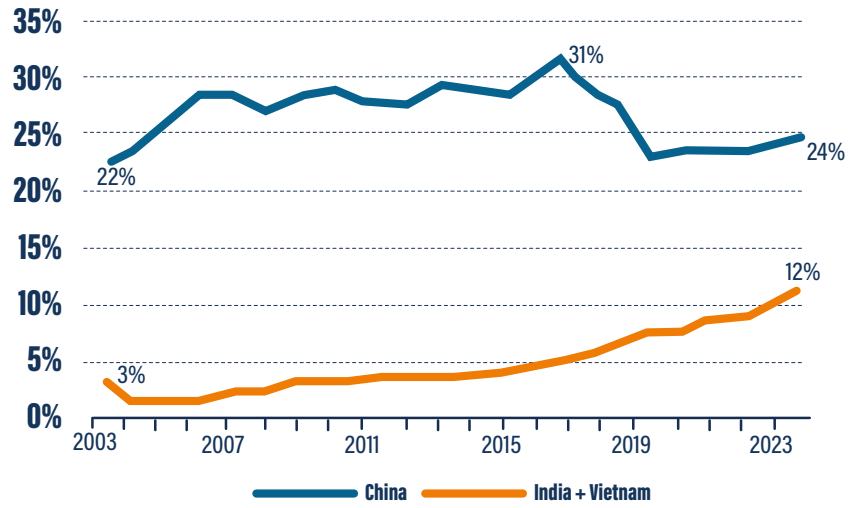
The U.S. has responded by strengthening alliances with key Indo-Pacific countries, promoting alternative supply chains, and increasing military presence in strategic areas such as the South China Sea. Any escalation in military or trade-related tensions could lead to restricted access to key shipping lanes, increased insurance costs, and/or rerouting of vessels – all of which would disrupt global trade flows.

SUPPLY CHAIN DIVERSIFICATION AND IMPACTS TO CARGO FLOWS

One important development born out of the ongoing tensions between the U.S. and China is a new push for firms to diversify supply chains away from China. There is a growing trend among multinational corporations to diversify their supply chains to U.S. neighbors and allies, in what is referred to as "near-shoring" or "friend-shoring."

Despite higher labor and operating costs, many of these firms are doing so in response to U.S. policies, such as the Inflation Reduction Act and Science and CHIPS Act. In 2023, new construction for manufacturing facilities in the U.S. reached $193.2 billion, up from $128.9 billion in 2022 and $90.8 billion in 2021.[8] Between 2017 and 2023, the share of U.S. two-way trade by tonnage to or from India and Vietnam combined rose from 5% to 12%; China's share fell from 31% to 24% over the same period (**Exhibit 10**).

EXHIBIT 10. CHANGES IN SHARES OF U.S. TWO-WAY TRADE (BY TONNAGE) WITH CHINA AND INDIA AND VIETNAM



Port of Kalama

Port of Bellingham

In recent years, Mexico has emerged as major destination for new foreign direct investment, particularly in electric vehicles, industrial machinery, and household goods. According to data from fDi Markets, new announced and/or commenced manufacturing foreign direct investment in Mexico totaled an estimated $130.0 billion between 2022 and October 2024, of which more than half will go to just two border states, Nuevo Leon and Coahuila. Since June 2022, twenty-nine (29) Chinese companies have announced a combined $7.1 billion in investments in Mexico, of which roughly half were from car and auto parts manufacturers. China is now the second largest investor in Mexico's auto industry, just behind Germany; two-thirds of these investments were tier I and II suppliers, including contractors with Tesla and other U.S. automakers. These investments support over 20 projects, representing 18% of the total sector investment.[9]

These existing investments are boosted by announced or planned investments that have not commenced or broken ground yet. In 2024, BYD, the largest electric vehicle (EV) manufacturer in China, announced a $600 million investment in the State of Jalisco,[10] while EV battery manufacturer CATL announced a $5 billion investment (on hold at time of publication) in the State of Chihuahua,[11] and EV and combustion engine vehicle manufacturer Jetour is planning a $3 billion investment in a state yet to be determined.[12] SAIC, China's largest automobile manufacturer, also announced plans to invest $1 billion in an electric vehicle plant in Mexico.[13]

Supply chain diversification will impact future cargo flows. The shift in new manufacturing investments from China to India, Vietnam, Indonesia, Latin America, and elsewhere will result in some goods entering the U.S. through ports outside the Pacific Northwest. For example, shipments from India may instead be routed through the Suez Canal, which is a faster route to the U.S. compared with via the Pacific, while factory shipments from Mexico will either cross overland or use short sea shipping routes in the Gulf of Mexico or to Southern California.

Tensions in the South China Sea

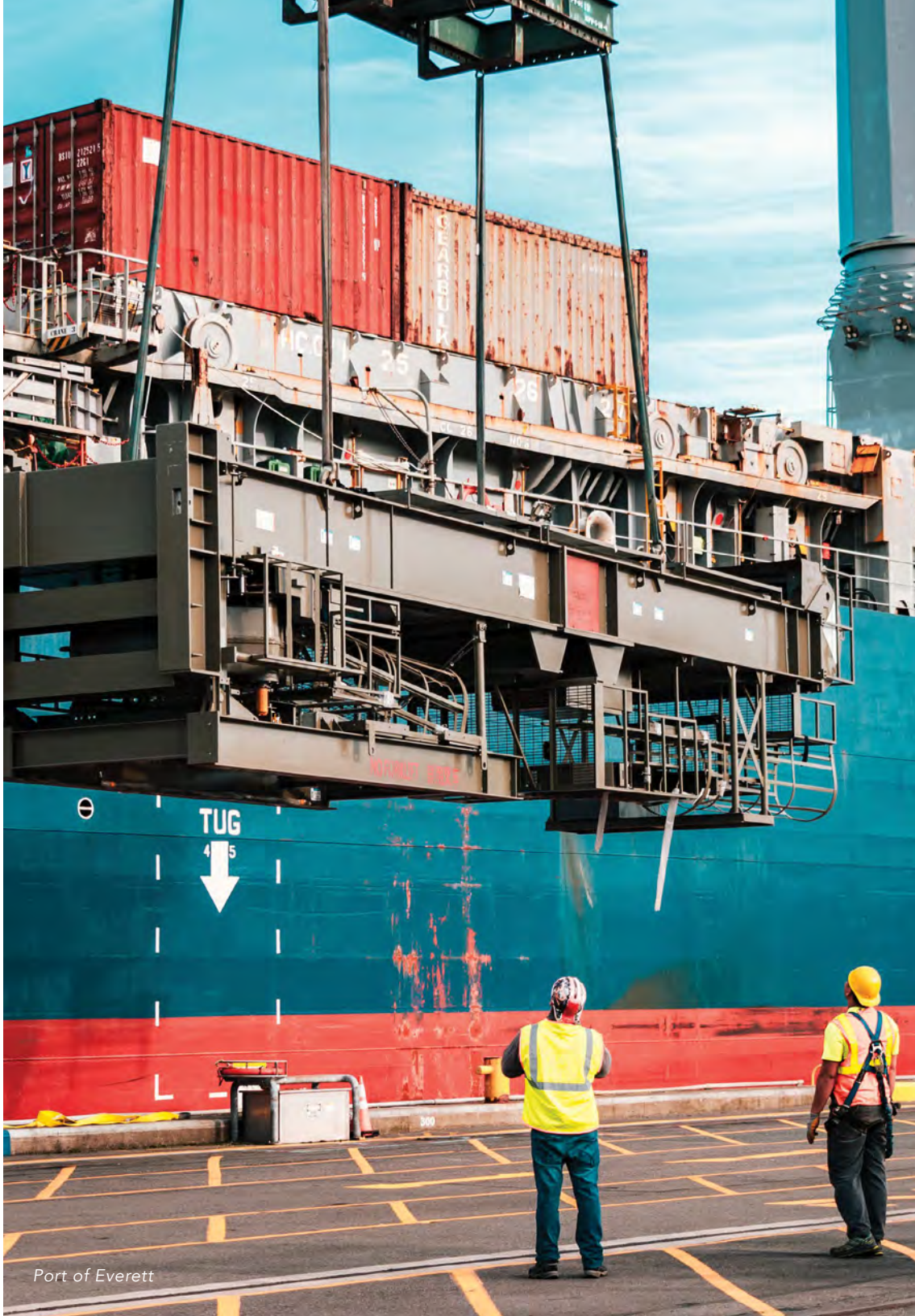
Up to one third of global trade passes through the South China Sea each year, making it one of the most critical maritime trade routes in the world. The Center for Strategic and International Studies has estimated that around $3.4 trillion in goods are transited through the South China Sea annually.[14] The region's importance to global trade is magnified due to its strategic location, connecting the major economies of China, Japan, and South Korea with the rest of the world.

The South China Sea is also a key conduit for energy supplies. Roughly 30% of the world's crude oil and a sizable portion of liquefied natural gas (LNG) pass through the area, highlighting its importance for global energy security. The main route for vessels passing through the South China Sea is the Strait of Malacca, which is the shortest and most economical path between the Indian and Pacific Oceans. Disruptions in this region could force ships to reroute, adding considerable time and costs to global shipping operations.

The South China Sea is also one of the most contested maritime regions. China's expansive territorial claims and military activities, including the construction of artificial islands, have raised concerns among neighboring countries and global powers. Any escalation in territorial disputes or military confrontations could lead to blockades or restricted passage. Shipping companies may need to reroute vessels, leading to increased fuel costs, longer transit times, and higher shipping rates.

Sanctions and Embargoes

Sanctions on Russia, Iran, and North Korea have disrupted energy exports, causing volatility in global oil and gas shipping markets. In response to the war in Ukraine, the European Union and G7 nations have imposed price caps and embargoes on Russian oil and gas. This has led to changes in shipping routes as Russia has shifted its energy exports towards Asia, particularly China and India. For shipping companies, this means adapting to new routes and ensuring compliance with complex and evolving regulatory frameworks. Additionally, there is a risk of secondary sanctions on countries or companies that facilitate trade with sanctioned entities, further complicating the global shipping landscape.



Port of Everett

Port of Pasco

Port of Seattle

Middle East Instability and Red Sea Carrier Diversions

The Middle East, home to several key maritime chokepoints such as the Strait of Hormuz and the Suez Canal, remains a focal point for geopolitical risk. Ongoing conflicts in Yemen and Syria, tensions between Iran and Saudi Arabia, and the resurgence of militant activities pose significant threats to shipping in the region.

The Strait of Hormuz, through which a sizable portion of the world's oil supplies pass, is particularly vulnerable to disruptions. Any conflict or blockade in this area could have immediate and severe impacts on global energy markets, leading to higher shipping costs and rerouting of tankers. While the recent rapprochement between Iran and Saudi Arabia may reduce some tensions, the underlying issues remain unresolved, making this a persistent area of concern.

Since December 2023, Houthi attacks on cargo ships in the Red Sea have disrupted trade along the Asia/Europe trade route. The Red Sea shipping lane is a main artery for Middle East oil exports to Europe, and Russia's oil exports to Asia. The region has seen reduced traffic as ships re-route away from the Red Sea and transit via the Cape of Good Hope, impacting about 15% of global maritime trade volume.[15] Maritime transit around the Cape of Good Hope adds an additional 2,100 nautical miles, and about 8 to 12 days of sailing time, compared with transiting the Suez Canal. As of December 2024, 100% of Red Sea/Suez Canal vessels calling at New York/New Jersey were rerouting around the Cape of Good Hope.

Piracy and Security Threats

Maritime piracy, while on the decline globally, remains a significant risk in certain regions, particularly the Gulf of Guinea and the waters around the Horn of Africa. Pirates often target oil tankers and cargo ships, leading to hijackings, kidnappings, and cargo theft. Increased naval patrols and improved security protocols have reduced incidents, but the threat persists.

Further, the rise of cyber threats presents a new dimension of risk. Shipping companies are increasingly targeted by cyber-attacks that disrupt operations, compromise navigational systems, and lead to data breaches. Cybersecurity has thus become a critical component of risk management for the shipping industry.

Current and Future Tariffs

Since 2018, the U.S. has imposed escalatory tariffs on several countries in addition to China, primarily citing national security, trade disputes, and unfair trade practices. Under Section 232 tariffs, the U.S. applied 25% on steel and 10% on aluminum imports from countries like the EU, Canada, Mexico, Japan, South Korea, India, and Turkey, prompting retaliatory tariffs on U.S. exports.

Other significant tariffs targeted the EU over illegal Airbus subsidies, leading to 25% tariffs on European goods like wine, cheese, and aircraft parts. Disputes with France over its Digital Services Tax led to proposed tariffs on French luxury items, but these were later paused amid global tax reform talks. India faced tariff increases and was removed from the Generalized System of Preferences (GSP) program, prompting retaliation on U.S. agricultural exports.

The U.S. remains critically dependent on imports for most, if not all, manufacturing activity. These higher tariffs will result in retaliation by other countries, which will also slow the growth of U.S. exports, for both bulk and containerized exports. The U.S. dollar is likely to remain at high valuation levels relative to foreign currencies. This will make U.S. exports more expensive and likely result in lower commodity prices. Farmers may need extra subsidies as in 2019 when China retaliated by not increasing its imports of U.S. agriculture.

Escalated tariffs can introduce volatility for ports. In the first two weeks of the second Trump Administration, the U.S. threatened 25% tariffs on Mexico and Canada and increased tariffs on Chinese imports by 10%. Punitive rates could have materially negative consequences on cargo volumes. Washington's ports, as a Pacific Gateway, are disproportionately at risk of a decline in U.S.-China trade. A significant decline in cargo-related revenues could make it more difficult for ports to borrow and invest in necessary infrastructure.

Environmental Regulations

Another driver of change to the marine cargo industry is the transition to green and low-carbon shipping. Environmental regulations can increase capital and operational costs for carriers, in turn increasing shipping rates for the end user. Ships burn heavy bunker fuel for extended periods of time across long distances and as a result, maritime transport is a significant contributor to the transportation industry's greenhouse gas emissions.

Port of Klickitat

Port of Anacortes

Energy Policy

The United Nations International Maritime Organization (IMO) has set a target of reaching net zero emissions by 2050 for the maritime industry. In addition to a sulphur cap for marine fuels, individual ships must measure and submit their carbon intensity index (CII) to the regulatory organization each year; the CII must improve 2% annually through 2030.[16] The consensus across the industry is that many vessels will fall out of compliance and be scrapped from the global fleet. At the core of the EU's climate policy is the Emissions Trading System (ETS). This 2005 directive has been strengthened and now extends carbon pricing to the maritime industry. It will impact trade routes linking the EU and foreign ports. The EU will take a phased approach: shippers affected will only have to pay for a portion of their emissions until 2027, then will pay for 100%. In response, carriers have added surcharges for these routes, impacting Europe/U.S. shipping rates.[17]

INDUSTRY RESPONSE

Carriers have a few options to remain compliant: switch to alternative fuels, change the operational status quo (e.g., less frequent port calls, slower speeds), and retrofitting the mechanical components of existing fleets.[18]

The available alternative fuels all burn cleaner than bunker, a heavy marine fuel oil, but transitioning requires significant capital investment by carriers. Several carriers have placed orders for new biomethanol-, LNG, ammonia-, or hydrogen-powered vessels. In some cases, shippers have contracted with producers to supply these fuels. Maersk entered into a one-year agreement with six energy companies to source several hundred thousand tons of methanol per year through 2025.[19]

LNG is the favored interim option; ships would remain well below IMO targets for a while. Hapag-Lloyd and CMA CGM will transition their fleets to LNG-powered vessels.[20] However, there is some risk attached to this solution: prices are high, the Russian supply is tenuous, and with IMO targets increasing annually, the fuel would eventually need to be mixed with a bio-based LNG.[21]

A major supplier of LNG to the PNW maritime sector, Puget LNG is located at the Port of Tacoma, which serves several Asia trade routes: Yokohama, Shanghai, Singapore, and Jakarta. As of the writing of this report, Puget LNG is the only shoreside marine LNG fueling facility on the West Coast, giving Washington ports a competitive advantage.[22]

Retrofitting existing fleets to burn alternative fuels allows carriers to meet new environmental standards. However, retrofitting is a costly endeavor. There is a lack of yard space to perform multiple retrofits simultaneously, and dry-docking means the ship is missing from the fleet for long periods of time.[23] Shifting operational practices to less frequent stops and traveling at lower speeds to reduce fuel consumption (slow steaming) has implications for the annual volume of cargo hauled.

IMPLICATIONS

In response to the EU ETS, carriers will pass carbon pricing on to customers in the form of increased shipping rates. Though the costs extended to customers are minimal due to economies of scale, ETS could have implications for Washington ports utilizing the North Europe/U.S. trade lanes. Additionally, carriers may choose to call on nearby non-EU ports.

There are close to 180 container ships in the largest TEU size ranges (15,200 to 24,000 TEUS) on order, making up one-quarter of all new-build orders (680). Many of these large ships have been designed to comply with emerging environmental regulations and burn alternative fuels. With sulphur caps and requirements to report carbon intensity, switching fuels and upgrading fleets seems to be a favored response to IMO's policy. The IMO restrictions may encourage greater efficiency through larger vessels and fewer calls.[24] The LNG facility at Port of Tacoma could serve as a model for nearby ports on accommodating LNG-powered ships, in response to these restrictions.

SHIPPING INDUSTRY ECONOMICS

A range of variables impact the economics of the shipping industry. Major themes likely to impact Washington ports are explored in this section.

Carrier Alliances

In the mid-1990s, carriers began forming "carrier alliances" – sharing vessels, container space, and other resources with the goal of enhancing the movement of goods. In 2023, there were three major shipping alliances: 2M, THE Alliance (THE), and the Ocean Alliance. carrier alliances own or charter over 80% of the shipping container capacity (25 million TEUs). Cargo managed by the alliance groups is concentrated in the east/west trade routes and accounts for 90% of global trade volume; however, there remain several carriers who operate independently.

The 2M alliance was established in 2015 and includes Mediterranean Shipping Company (MSC) and Maersk. In 2024, 2M utilized roughly 35% of global TEUs and operated a quarter of the world's fleet.[25] In late 2024, MSC and Maersk announced plans to cease combined operations in 2025, and disband 2M. Maersk and Hapag-Lloyd will join to form the Gemini Corporation; MSC will not join an official alliance but plans to slot-share with THE Alliance once it rebrands as the Premier Alliance.[26] The Gemini Corporation will have a fleet of nearly 300 vessels and a capacity of 3.4 million TEUs. Gemini will cover seven trade routes, including Asia/US West Coast trade.[27]

THE Alliance, formed in 2017, includes Japan's Ocean Network Express (ONE), Germany's Hapag-Lloyd, South Korea's HMM, and Yang Ming (out of Taiwan). In 2024, THE utilized 19% of global TEU capacity (6 million TEUs) and owned or chartered 700 ships. Once Hapag-Lloyd exits THE, the remaining carriers (ONE, HMM, and Yang Ming) will join the Premier Alliance in 2025.[28]

The Ocean Alliance was also established in 2017 and is comprised of CMA GGM (France), Cosco and subsidiary OOCL (China), and Taiwan's Evergreen. The Ocean Alliance owned or chartered close to 9 million TEUs in 2024, 30% of global capacity, and almost 1,400 vessels (about one-fifth of the global fleet).[29] Alliances are likely to continue to shift in the coming years

Port of Everett

The Evolution of Container Ships

The evolution of container ship size is noteworthy—the new wave of mega-ships can have impacts on infrastructure as ports compete to stay relevant in the marine cargo network. In 2023, over 6,000 container ships moved billions of tons of freight around the world with a global capacity of nearly 30 million TEUs. The metal shipping box was a trucking industry concept in the 1950s; standardized in the 1960s, the TEU became the go-to shipping container.

The first container ships carried 1,000 TEUs with cranes on board since many ports did not have them. In the 1980s vessel capacity increased to Panamax size and carried 4,000 TEUs. Container ports emerged in the 1990s as larger, Post-Panamax ships came online, carrying 6,000 to 8,000 TEUs. By the 2000s, vessels were carrying 11,000 - 14,500 TEUs, then 18,000 plus in the 2010s as ultra large container vessels (ULCVs) emerged.

The most recent development in vessel size has been the Megamax (MGX), which can carry up to 24,000 TEUs.[30] MGX fleet capacity stood at around 1 million TEUs in 2017, doubling by 2019 and reaching just over 4 million TEUs in 2024. There are close to 200 MGX ships in service and an additional 43 on order. The new vessels will add another 1.25 million TEUs of capacity to the global fleet by 2028. Carriers use mega-ships to achieve economies of scale, particularly in response to increased environmental regulations.[31]

Port of Whitman County

Port of Port Angeles

CLIMATE AND ENVIRONMENTAL CONSIDERATIONS

Arctic Shipping Lanes

Climate change is opening new shipping lanes in the Arctic as melting ice creates navigable waters. While this allows for shorter shipping distances between Europe and Asia, it also brings new risks. The Arctic region is politically complex, with overlapping territorial claims by Russia, the U.S., Canada, and Nordic countries.

Russia, in particular, has been assertive in its claims and has invested heavily in Arctic infrastructure. Increased shipping through the Northern Sea Route could lead to geopolitical competition and militarization of the region. Environmental risks, such as oil spills or the impact on fragile ecosystems, could lead to stringent regulations that might limit the viability of Arctic shipping.

Lower Water Levels at the Panama Canal

The Panama Canal recently experienced one of the worst droughts in its history, with water levels in Gatún Lake—the main water source for the canal—dropping significantly. This forced the Panama Canal Authority to impose restrictions on vessel transits, reducing the number of daily transits from the typical 36 to as low as 24, and limiting the draft of ships (the depth they can sit in the water) to 44 feet instead of the usual 50 feet. These measures reduced the overall volume of cargo passing through the canal by about 35%.

The resulting delays and higher costs prompted shipping companies to consider alternate routes, such as sailing around the Cape of Good Hope or the Strait of Magellan. These diversions added substantial transit times and fuel costs, which increased ocean transport costs by an estimated 5%, or roughly $1.1 billion, annually.[32]

Since August 2024, the Panama Canal has been gradually recovering from the severe water shortages caused by the prolonged drought. With the onset of the rainy season, water levels in Gatun Lake have risen closer to normal, allowing the Panama Canal Authority (ACP) to increase the number of daily transits to 35 and raise the draft limit to 49 feet, up from the restricted levels earlier this year. This recovery has enabled the canal to handle more vessels, although it is still slightly below pre-drought capacity.

The ACP has also unveiled plans to construct a new $1.6 billion reservoir on the Indio River. This project, which aims to boost water storage capacity and maintain stable operations during future droughts, is expected to take about six years to complete. It could potentially allow the canal to handle an additional 15 vessels daily, ensuring long-term resilience against climate change impacts.[33,34]

Port of Bellingham

Port of Seattle

PORT COMPETITIVENESS

Washington state ports, particularly Seattle and Tacoma under The Northwest Seaport Alliance (NWSA), face significant competitiveness challenges due to policy and funding disparities with both U.S. and Canadian ports. In 2024, the NWSA ranked as the eighth-largest container loading center in North America, behind Los Angeles/Long Beach, New York/New Jersey, Savannah, Houston, Manzanillo (Mexico), Virginia (Hampton Roads), and Vancouver (Canada)—down from fourth-largest in 2019.

Cost is a dominant driver of port competitiveness, including fees, taxes, and inefficiencies in the movement of cargo. The Harbor Maintenance Tax (HMT) disproportionately affects Washington state ports as they receive only a fraction of what they contribute, with naturally deepwater harbors that require minimal dredging. This added ad valorem cost creates an incentive for shippers to divert U.S.-bound cargo through Canadian ports like Vancouver and Prince Rupert, which are exempt from the HMT when goods enter the U.S. via land. These higher costs have contributed to the NWSA losing 18% of its cargo market share to ports in British Columbia in recent years, reducing revenue, job opportunities and export capacity. Canadian ports also receive far greater federal funding than U.S. West Coast ports, allowing them to expand infrastructure and improve operational efficiency.

Congestion is another issue facing Washington ports—it reduces efficiency and raises costs relative to other ports. For example, congestion can impact truck turns and the number of containers moved per day into and out of a gateway, leading to delayed processing, backlogs, and potential demurrage fees.

Meanwhile, ports like Savannah are rapidly expanding, benefitting from significant federal and state investments. In 2024, Savannah's container volume grew 12.5% to nearly 5.6 million TEUs, with plans to increase capacity to 9.0 million TEUs by 2035. Additionally, Canadian ports offer streamlined customs procedures and government policies that favor maritime trade. To counter these threats, Washington ports require HMT reforms to level the playing field, alongside increased federal investment to upgrade infrastructure.

Recent legislative changes have aimed to reform the Harbor Maintenance Tax (HMT) to address long-standing issues affecting U.S. ports, including those under the Northwest Seaport Alliance (NWSA). The Water Resources Development Act (WRDA) of 2020 included provisions to ensure full utilization of the Harbor Maintenance Trust Fund (HMTF). This change is intended to increase funding for maintenance and operations of U.S. ports. The WRDA bill also directs the Army Corps of Engineers to distribute a set percentage of annual HMTF funding to donor ports like the NWSA that have historically received less funding relative to the HMT revenues they generate.

Port of Everett

TWO

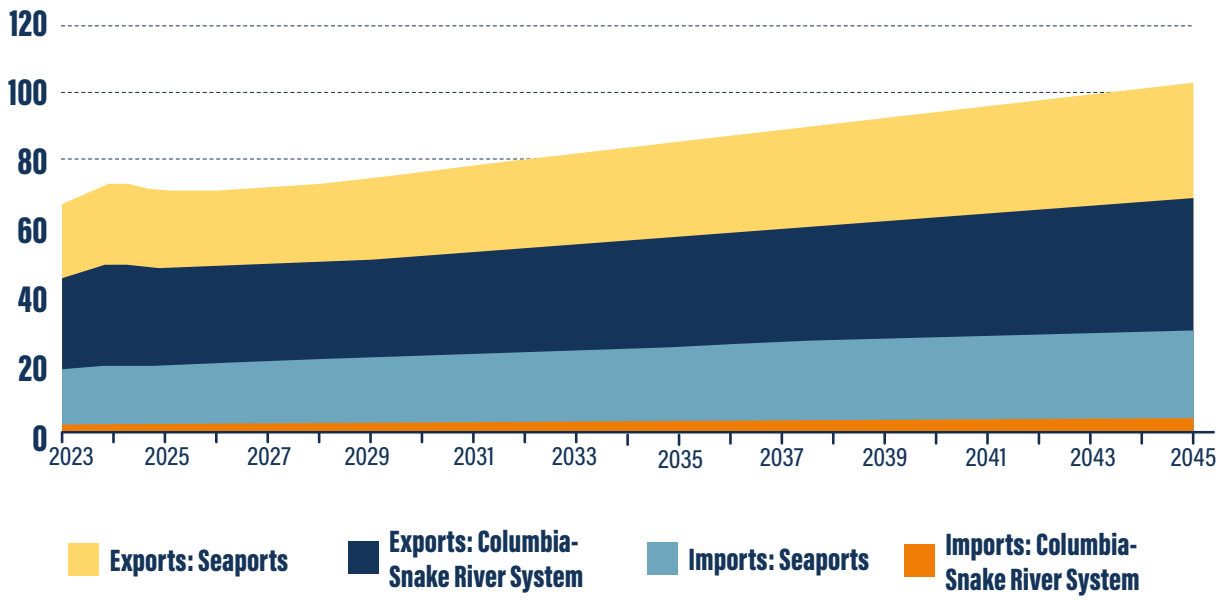
MARINE CARGO FORECAST

This section presents a series of forecasts for marine cargo movements to and from Washington state ports over the next 20 years. These long-term forecasts are broken out by geography (statewide and substate regions), direction (imports, exports), cargo segment (containers, bulk, breakbulk, neo-bulk), domestic versus international, and commodities.

FORECASTS STATEWIDE AND BY REGION

Between 2023 and 2045, statewide marine cargo tonnage is projected to increase 1.9% annually. Exports through the Columbia-Snake River System are projected to grow slightly faster, at 2.0% per year, maintaining its role as the largest segment by tonnage for marine cargo flows (**Exhibit 11**). Much of this tonnage is dry bulk, primarily soybeans, soymeal, and wheat exports.

EXHIBIT 11. INTERNATIONAL MARINE CARGO FORECAST BY SUBSTATE REGION,
GROWTH IN TONNAGE, TONS OF CARGO (MILLIONS)

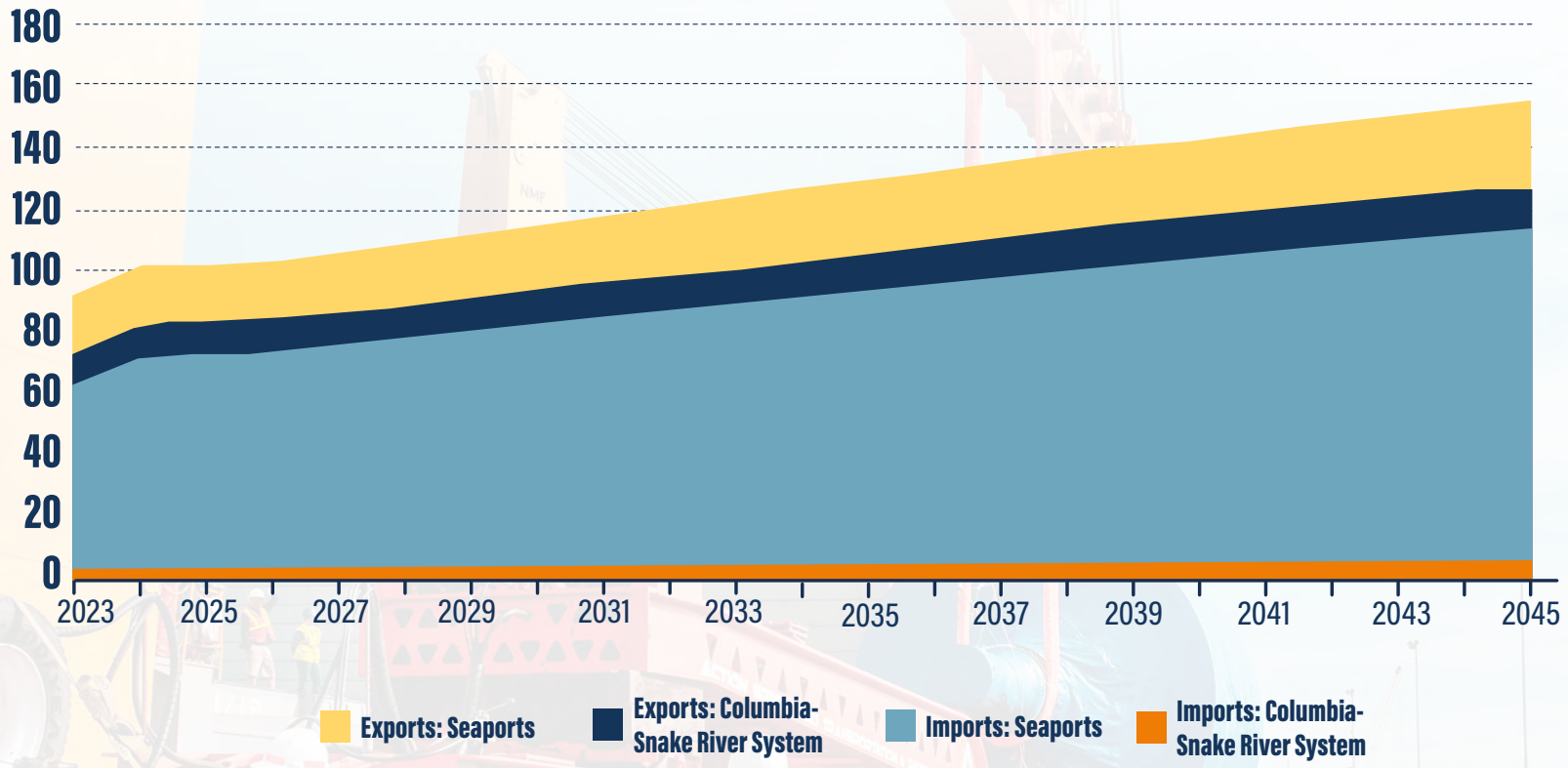


SEAPORTS = PUGET SOUND, STRAIT OF JUAN DE FUCA, PACIFIC COAST

Port of Vancouver

However, on a valuation basis, imports through the seaports are the dominant segment. This owes largely to the concentration of containerized cargo through The Northwest Seaport Alliance, along with project cargo handled among seaports. Imports by value handled at Washington state seaports, in constant inflation-adjusted dollars, are projected to grow 2.6% annually between 2023 and 2045 (**Exhibit 12**). Approximately 87% of imported and exported statewide marine cargo by value will be handled at Washington's seaports, primarily through high-value containerized cargo and neo-bulk cargo, such as automobiles and project cargo.

EXHIBIT 12. INTERNATIONAL MARINE CARGO FORECAST BY SUBSTATE REGION, GROWTH IN VALUE ($BILLIONS)



SEAPORTS = PUGET SOUND, STRAIT OF JUAN DE FUCA, PACIFIC COAST

FORECASTS BY CARGO TYPE AND COMMODITY

Total international cargo tonnage handled at Washington state ports, imports and exports combined, is projected to grow 1.9% annually between 2023 and 2045. Exports tonnage from Columbia and Snake River ports are projected to grow 1.7% per year over this same period. By segment, containerized cargo represents 59% of total cargo by value through Washington state ports, followed by neo-bulk and dry bulk (15% each). By tonnage, dry bulk represents 58% of total volume, followed by containerized tonnage at 22%. International containerized cargo tonnage and liquid bulk (imports and exports combined) are both projected to increase 2.1% per year between 2023 and 2045. Dry bulk shipments, comprised primarily of grain exports, is projected to increase 1.9% per year over this period. (**Exhibit 13 and Exhibit 14**).

EXHIBIT 13. INTERNATIONAL MARINE CARGO FORECAST BY CARGO SEGMENT,
PROJECTED GROWTH IN CARGO (BY TYPE, VALUE IN $BILLIONS)

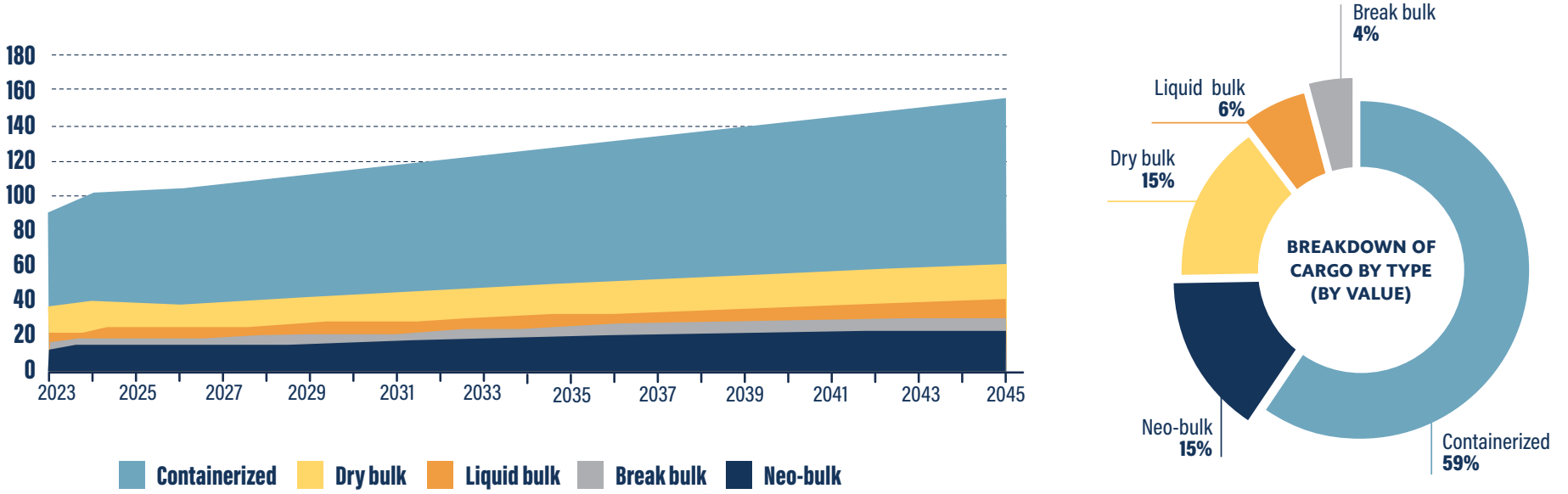
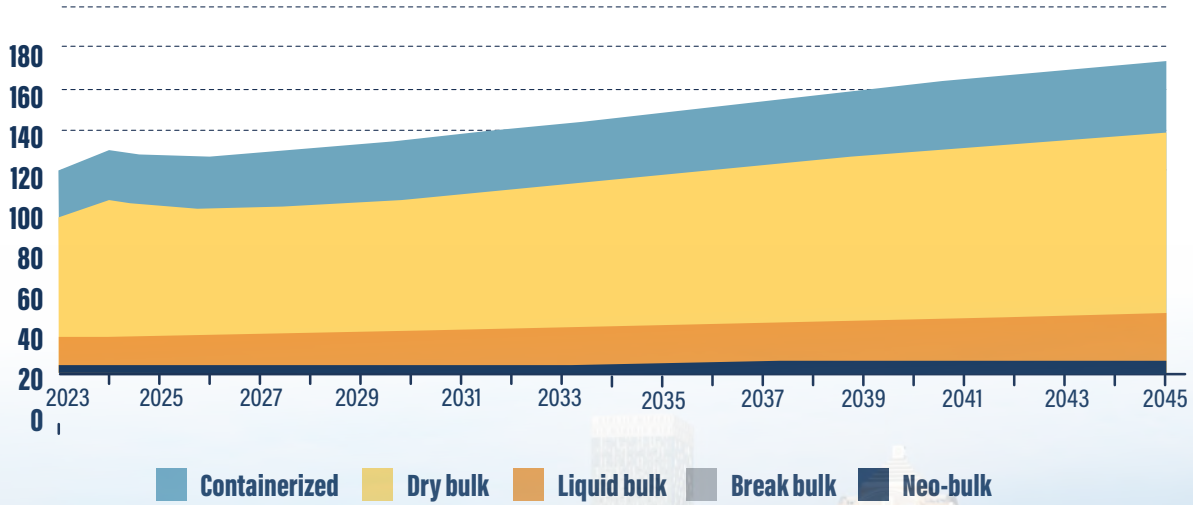
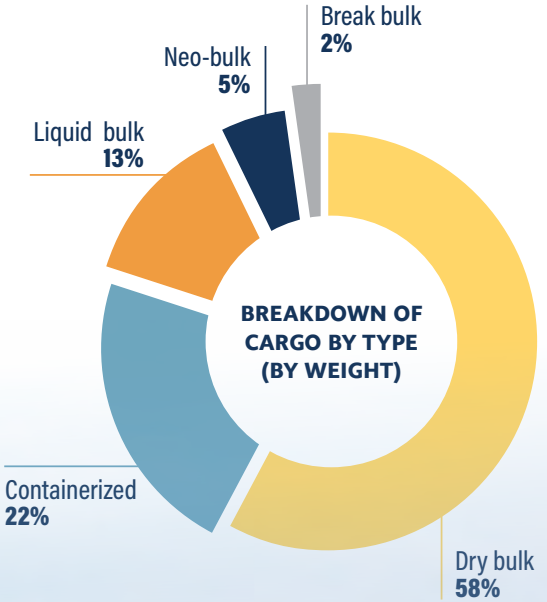


EXHIBIT 14. INTERNATIONAL MARINE CARGO FORECAST BY CARGO SEGMENT,
PROJECTED GROWTH IN CARGO (BY TYPE, BILLION KILOGRAMS)

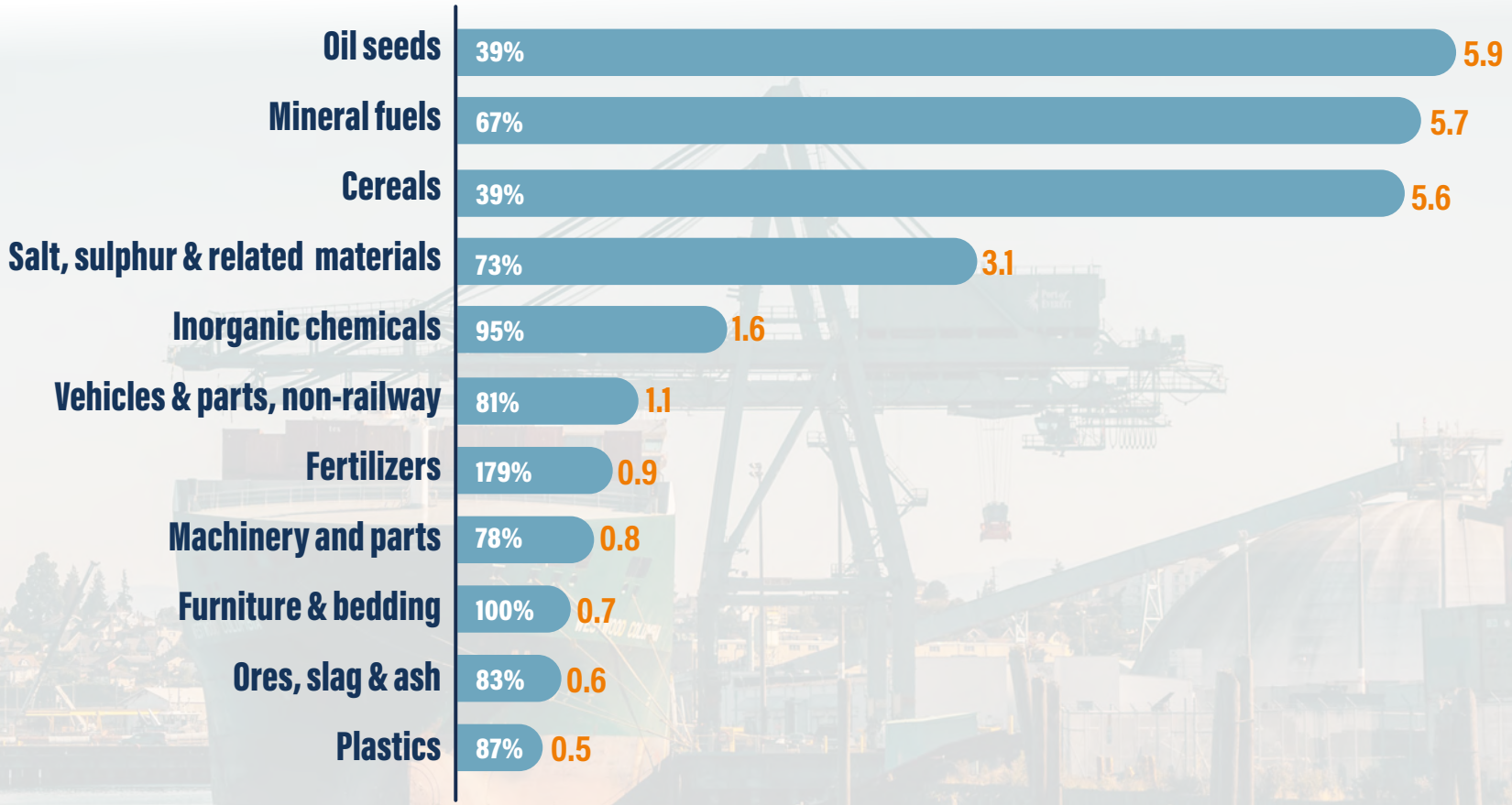


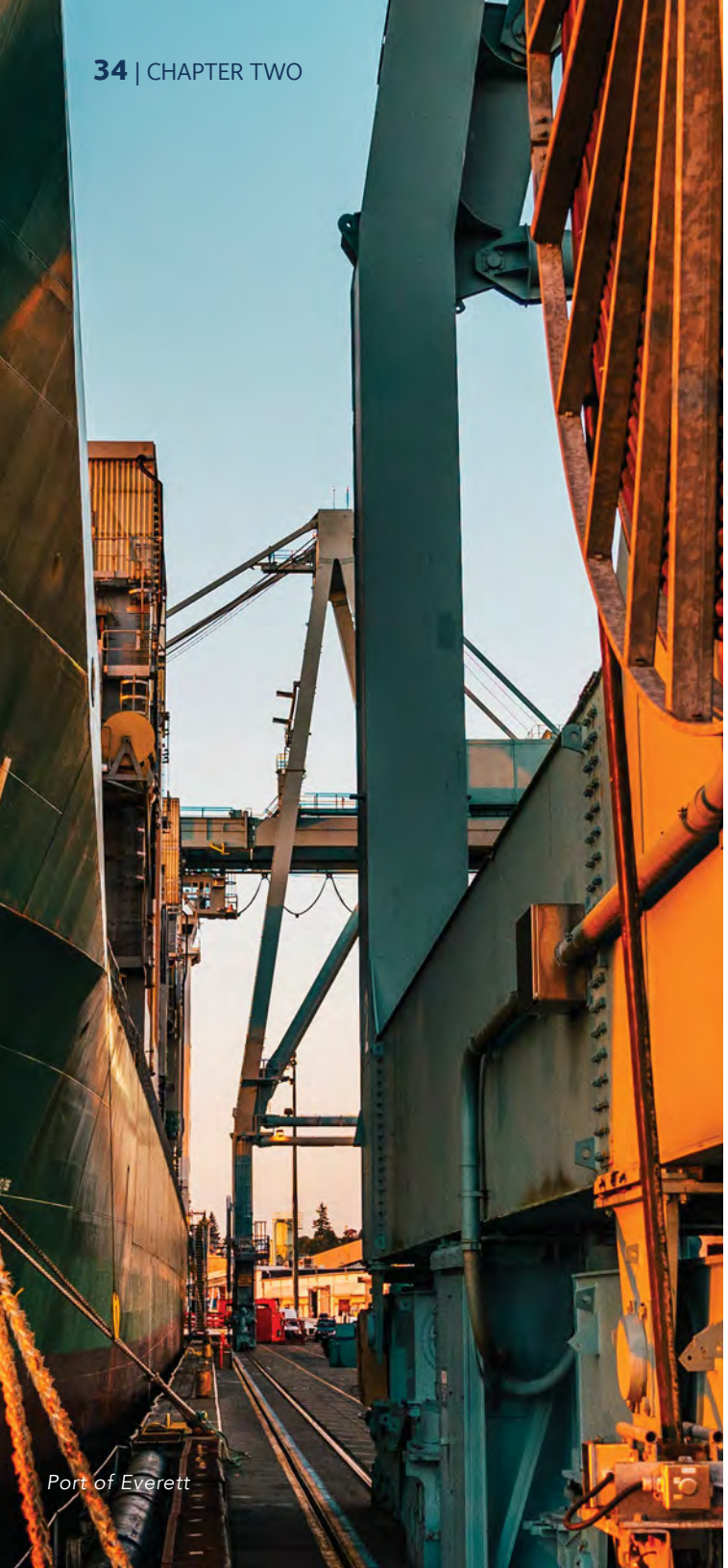


Port of Seattle

In terms of commodities, oil seeds are projected to see the greatest net increase in tonnage between now and 2045, with volumes increasing 5.9 million metric tons, or 39% over 2023 levels. Potential future growth drivers include demand from emerging markets in Southeast Asia, such as the Philippines, where a shift to higher protein diets will result in increased demand for soymeal animal feed. Mineral fuels are expected to see a 5.7 million metric ton increase by 2045, followed by cereals (primarily wheat) with a 5.6 million metric ton increase. Fertilizers are expected to increase by 179% through 2045, reaching 900 million metric tons (**Exhibit 15 and Exhibit 16**).

EXHIBIT 15. TOP GROWING INTERNATIONAL COMMODITIES, NET CHANGE IN BILLIONS KG AND % GROWTH, 2023-2045





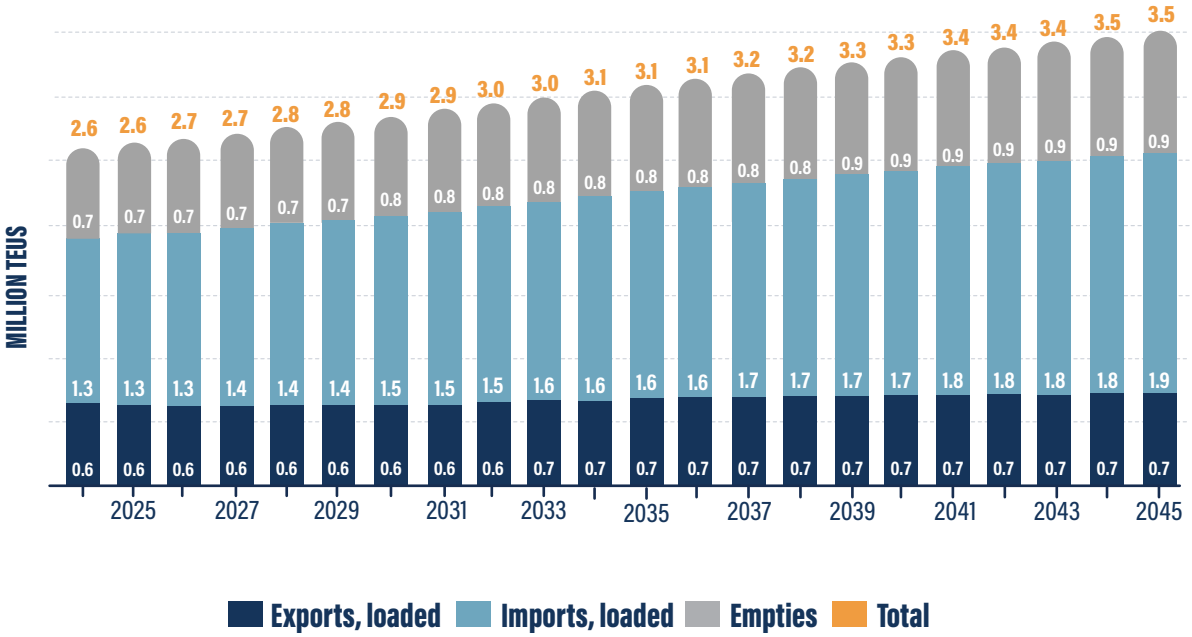
Port of Everett

CONTAINER FORECAST

Between 2024 and 2045, total international containers (loaded and empties) are projected to grow 1.4% per year. Imports will continue to be the dominant segment for international containerized cargo, representing between 68% and 72% of loaded containers, measured in twenty-foot equivalent units (TEUs), growing at a rate of 1.8% per year (compared with 0.6% for loaded export containers).

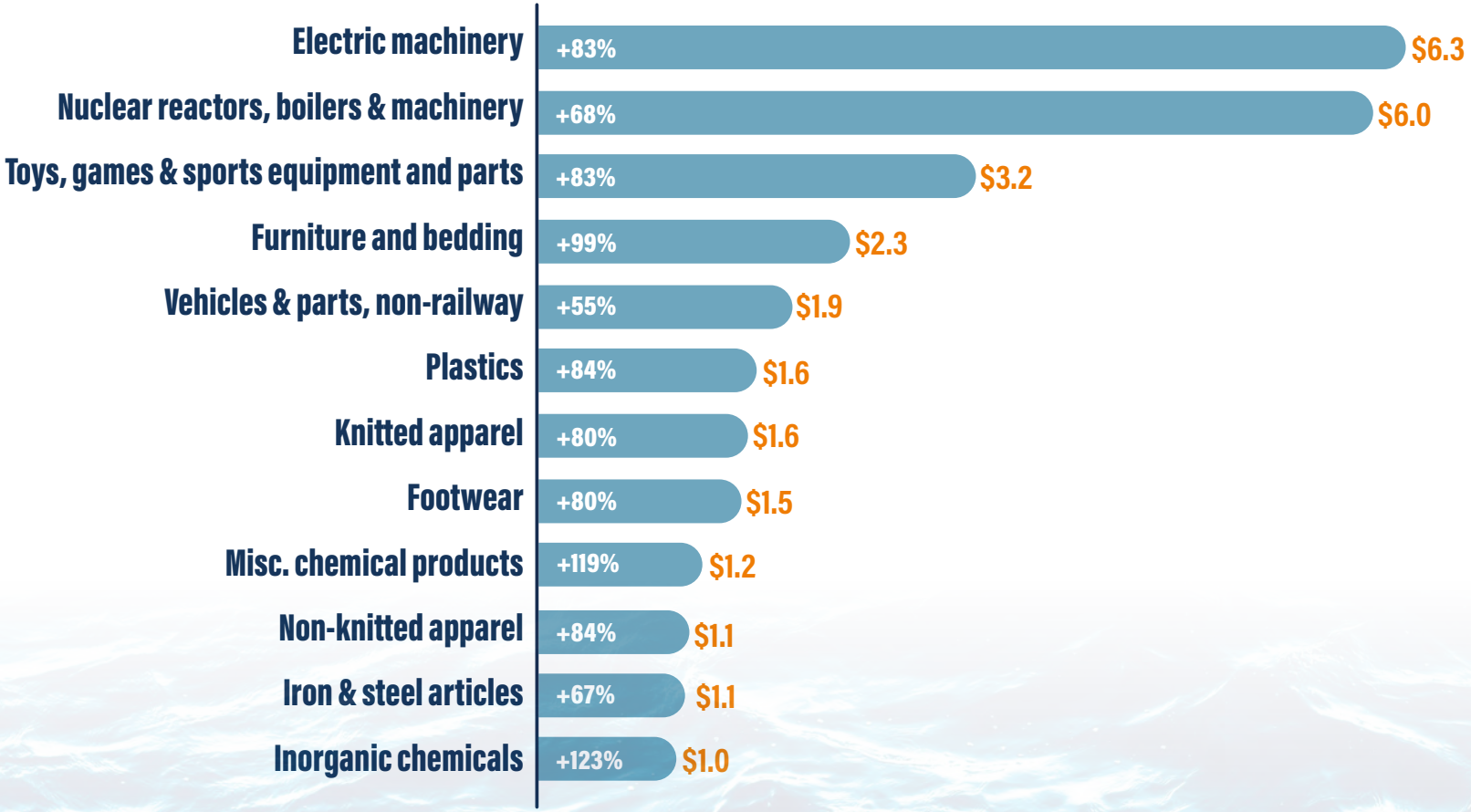
In recent years, empty international containers (primarily outbound) have represented between 16% and 32% of all international containers handled at The Northwest Seaport Alliance. Total international container traffic handled at Washington state ports, including loaded and empty containers, is projected to reach 3.5 million TEUs by 2045 (**Exhibit 16**).

EXHIBIT 16. INTERNATIONAL CONTAINER FORECAST, LOADED AND EMPTY, WASHINGTON PORTS (MILLIONS OF TEUs)



By value, the largest net increase in value by commodity will be electrical machinery ($6.3 billion, +83% over 2023 levels), followed by nuclear reactors, boilers & machinery ($6.0 billion, +68%) and toys, games & sports equipment and parts ($3.2 billion, +83%) (**Exhibit 17**). Other major commodities include furniture and bedding ($2.3 billion, +99%), auto parts ($1.9 billion, +55%), and plastics ($1.6 billion, +84%). Nearly all of these containerized shipments enter or exit via The Northwest Seaport Alliance, though other ports such as Everett also handle a small share of statewide containerized cargo.

EXHIBIT 17. INTERNATIONAL CONTAINER FORECAST, TOP GROWING CONTAINERIZED COMMODITIES BY NET CHANGE, $BILLIONS AND % GROWTH, 2023-2045

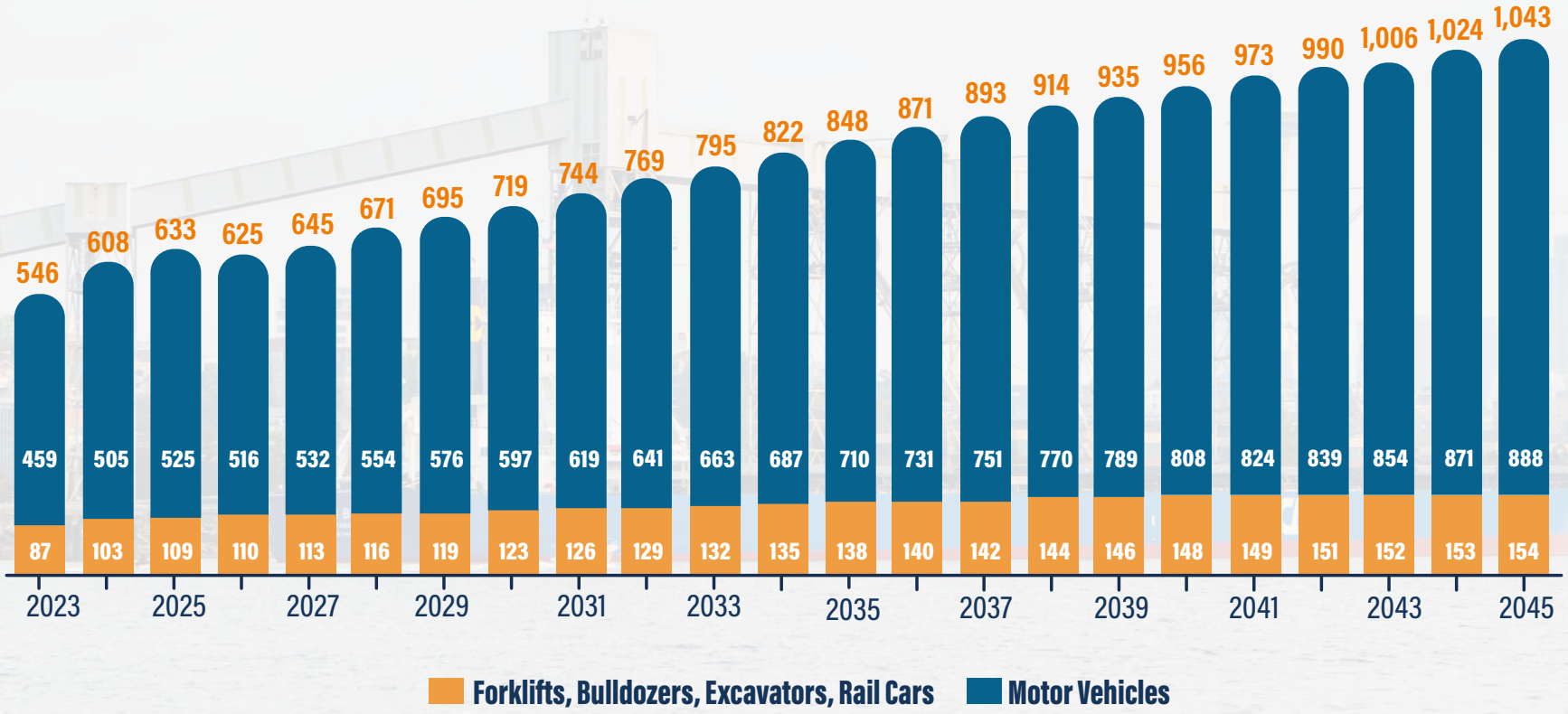


NEO-BULK CARGO

Two-way cargo flows for neo-bulk, such as logs, project cargo, steel rolls, passenger automobiles, and construction equipment, are projected to increase by tonnage 1.1% per year, growing from 2.4 million metric tons in 2023 to 3.0 million metric tons in 2045. In 2023, neo-bulk exports represented 78% of all neo-bulk international cargo flows through Washington state ports. However, export levels are projected to remain relatively flat in the coming years (0.2% per year), while imports by tonnage are projected to grow 3.2% per year, driving the import share up from 22% to 35% by 2045.

Roll-on/roll-off refers to wheeled cargo that can be driven or towed onto an ocean-going vessel. Motor vehicles, mostly passenger cars and trucks, are forecast to increase from 459,000 units in 2023 to nearly 900,000 units by 2045. Industrial machinery, such forklifts, bulldozers, excavators, and rail cars, are projected to increase from 87,000 units in 2023 to 154,000 units by 2045 (**Exhibit 18**). This growth will require new or expanded port infrastructure for staging and laydown areas and the loading and offloading of vehicles. Nearly all roll-on/roll-off vehicles arrive as imports (98%); this pattern will hold through 2045.

EXHIBIT 18. INTERNATIONAL RO-RO FORECAST, CHANGE IN ROLL-IN/ROLL-OFF VEHICLES,
THOUSANDS OF VEHICLES, 2023-2045



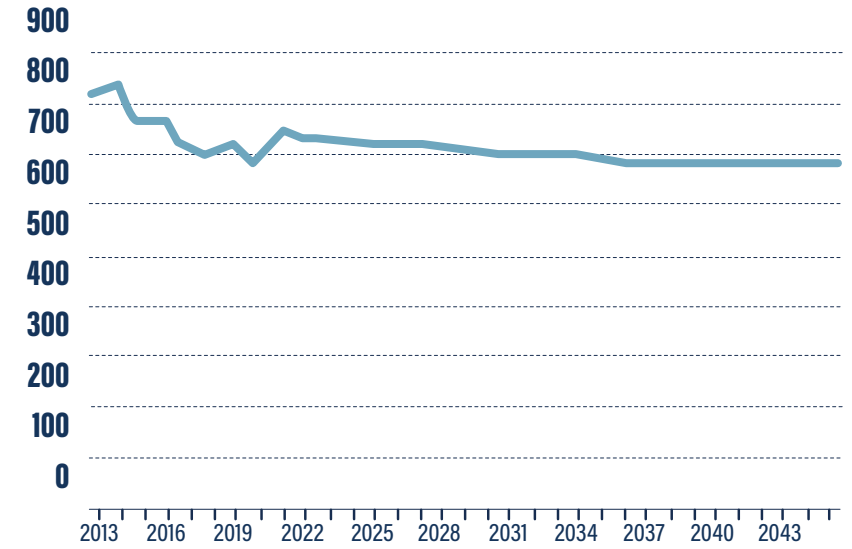
DOMESTIC CARGO

Washington is a key gateway for domestic cargo shipments to and from Alaska and Hawaii. In 2024, The Northwest Seaport Alliance handled 730,488 domestic loaded and empty TEUs of containerized cargo. Between 2017 and 2024, domestic containers represented between 18% and 25% of all containers handled at the NWSA. Over the same period, containers to and from Alaska (loaded and empty) represented 83% of all domestic containers handled at the NWSA.

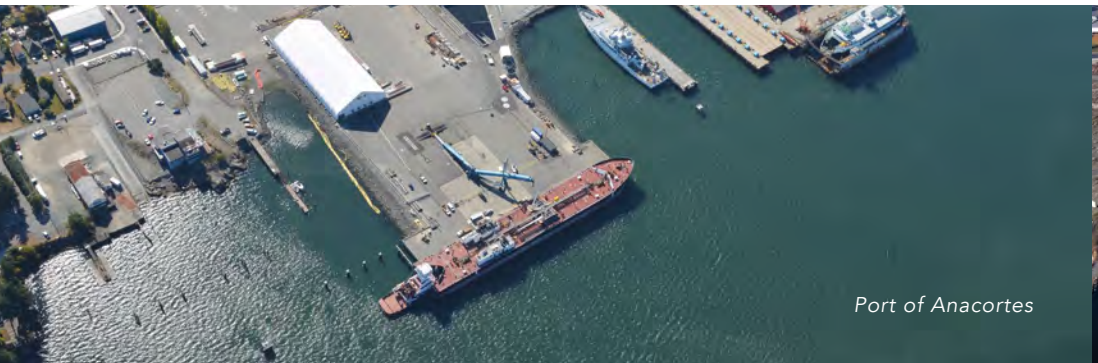
The long-term projection for Washington state domestic containerized trade is relatively flat, with a slight downward trend. Domestic containerized TEUs (loaded and empty combined) is projected to fall to below 700,000 TEUs through 2045. Total domestic cargo tonnage, measured in short tons, is projected to reach 27.0 million short tons by 2030, significantly up from a low of 20.1 million short tons in 2020. However, most of this tonnage is non-containerized cargo, largely petroleum products. The projected decline in containerized cargo is attributable to machinery, vehicle parts, and other manufactured goods (**Exhibit 19**). Due to negative net migration and ageing, Alaska's population is projected to decline over the next two decades. These demographic challenges adversely affect demand for various consumer goods shipped via container from Washington state to Alaska.

Several developments could alter this forecast. Notably, the Trump Administration's pursuit of rapid expansion of oil and gas exploration may spur new demand for shipments of related equipment to Alaska. Most of this equipment, such as drilling rigs, mud pumps, winterized cranes, and bulldozers, would be primarily shipped as project cargo, but a small percentage (such as replacement parts) could be delivered via containers. Maersk's recent announced cancellation of direct ocean carrier service between Dutch Harbor and Kodiak and Asia will also help boost container shipments of seafood products via Seattle for transshipment to Asia; however, remaining carrier services in Dutch Harbor will also pick up much of this demand.

EXHIBIT 19. PROJECTED DOMESTIC CONTAINER CARGO (TEUs), LOADED AND EMPTY (THOUSANDS OF TEUs)



SOURCES: THE NORTHWEST SEAPORT ALLIANCE, 2024; U.S. ARMY CORP OF ENGINEERS COMMERCIAL WATERBORNE DATA, 2024. MOODY'S, 2025.



Port of Anacortes

Port of Benton

FACTORS AFFECTING FORECAST

Tariff and non-tariff barriers, supply chain diversification, future global insecurity, and port competitiveness are critical factors that could adversely affect the cargo forecast.

Tariff and Non-Tariff Barriers

As of this report publication, the Trump Administration has announced an additional 10% tariff on Chinese imports and 25% tariffs on Canadian and Mexican imports; all affected parties have announced retaliatory rates. Current and future tariffs are taxes borne by U.S. importers and households. These costs may lower demand for some imports, adversely impacting trade volumes. Companies may also seek to avoid tariffs by shifting production to less affected countries, imports from which could enter the U.S. via non-Washington ports.

The Administration is also considering non-tariff trade barriers, including substantial fees on shipping companies that use Chinese-built vessels or are operated by Chinese entities. The proposed program would charge up to $1 million per U.S. vessel call on carriers with 50% or more of their fleet comprised of Chinese-built vessels, $750,000 for carriers with 25%-49%; and up to $500,000 for those with 0%-24%. The USTR is also targeting new vessel construction and proposes a $1 million per call fee on shipping lines having 50% or greater orders in Chinese shipyards, or vessels expected to be delivered by Chinese shipyards over next 24 months. If implemented, some of the world's largest ocean carriers may need to alter shipping routes to either divert calls to Canadian ports and/or reduce the number of U.S. port calls. In both cases, shipping diversions could result in lower container cargo volumes through Washington state.[35]

Future Global Insecurity, Supply Chains, and Widening U.S.-China Rift

The Pacific Northwest's close commercial ties with East Asia may leave the region exposed to global insecurity and supply chain reconfigurations. A conflict in the Taiwan Strait or South China Sea would wreak havoc on global commerce and seize up some of the world's busiest sea lanes. A growing U.S.-China rift, even short of conflict, may still drive supply chain diversification out of East Asia into Africa, South America, and South Asia, resulting in a large diversion away from shipping lanes that favor the Pacific Northwest.

Port Competitiveness and Loss of Market Share

As discussed in Chapter 1, Washington state ports already face steep and growing competition from other ports in North America. In recent years, some East Coast ports have made sizable increases in port infrastructure and capacity. As the North Harbor of the NWSA, the Port of Seattle already faces congestion and pressures to repurpose urban industrial land for non-industrial uses such as housing. Canadian ports have unique cost-saving advantages over U.S. ports, most notably the lack of harbor maintenance tax. Prince Rupert in Northern British Columbia is 1-2 days transit time closer to Northeast Asia and has extensive land for development. West Coast Canadian and East Coast ports could continue to gain North American container market share, reducing or dampening container volume growth through Washington state.

Port of Tacoma

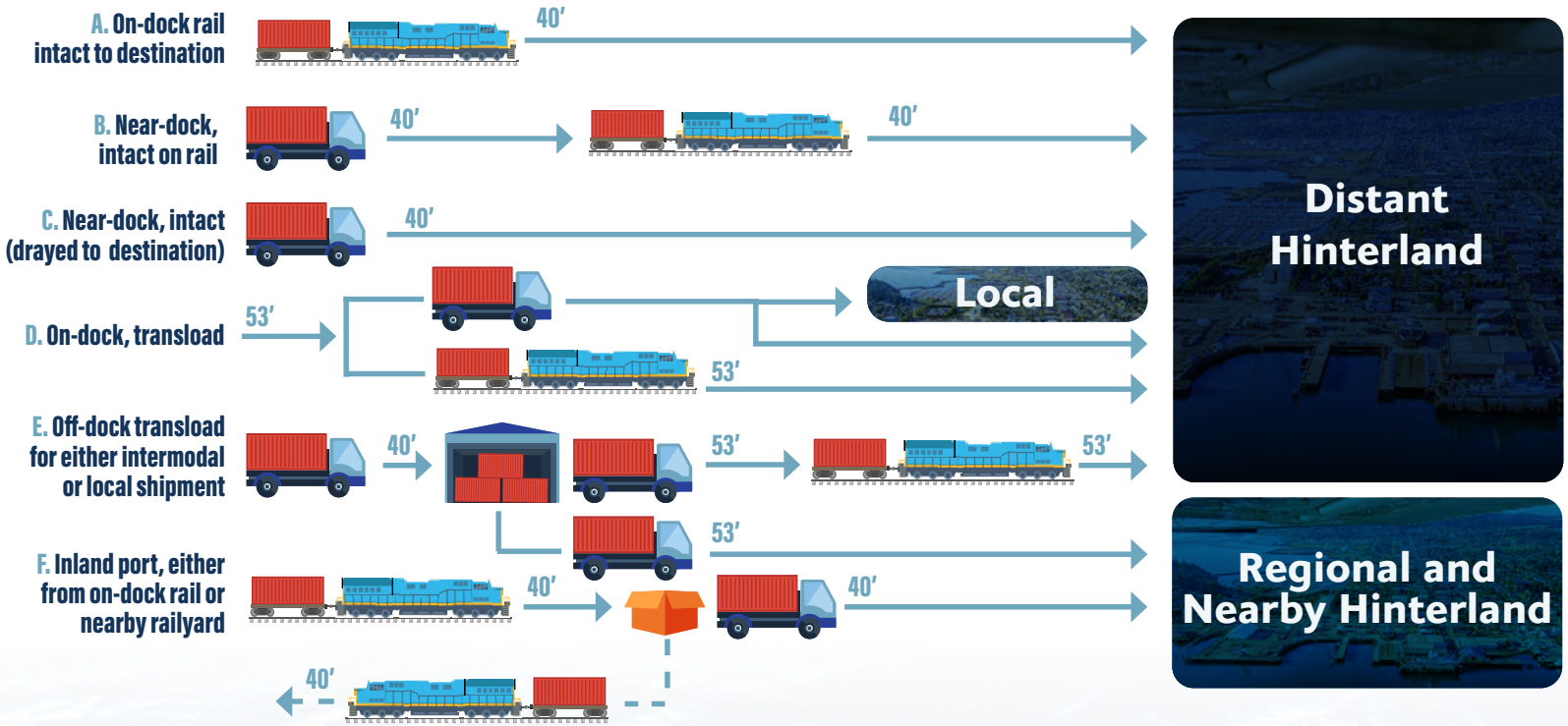
THREE
MODAL SPLIT

There are a number of modes by which cargo moves from or to Washington state ports, either for export or further transit to local, regional, and hinterland destinations. These include by rail, truck, barge, or a combination of rail and truck that often involves the unpacking, sorting, and reformatting of cargo between 40-foot ISO ocean containers and 53-foot U.S. domestic containers. For regional exports, such as agriculture products from Eastern Washington, the primary modes are either via truck to a seaport or via barge using a combination of truck and/or short-haul rail line to transit grains (primarily wheat) to the barge terminal, then transit downriver to one of Washington's riverports.

Container imports involve a more complex system of modal options, depending on the ultimate destination for the goods. **Exhibit 20** illustrates the most common modal options for imported containers.

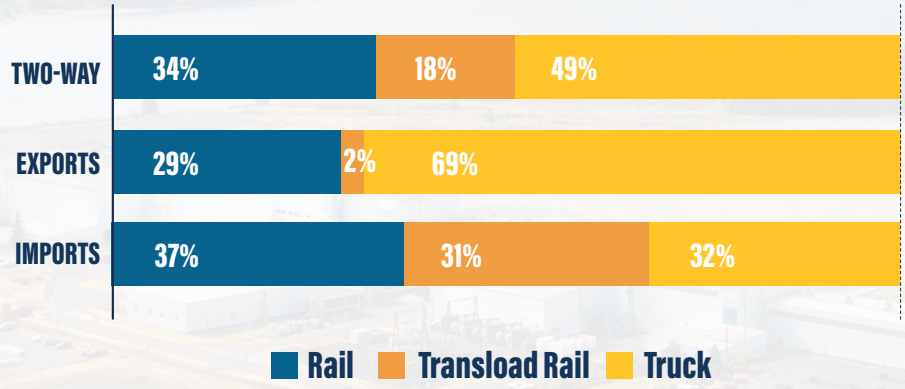
For example, the simplest (i.e., least touches) mode is direct movement of containers from the container yard to on-dock rail for transit to distant destinations east. In a more complex scenario, a 40-foot ISO ocean container is first drayed by truck from the container yard to an offsite transloading facility, such as in the Kent Valley. The cargo is then unpacked, sorted, and reloaded into 53-foot domestic containers (for example from three 40-foot containers to two 53-foot containers). The container is then reloaded on a truck and either delivered directly to the beneficial cargo owner or other local destination or brought to an intermodal railyard to be loaded onto a rail car (such as a well car, for double stacking) for domestic shipment east. Six distinct types of import container modal splits are presented.

EXHIBIT 20. IMPORTED CONTAINER MODAL SPLITS



Statewide, an estimated 69% of containerized exports were transited to Washington state ports by truck in 2023. This is largely due to the higher share of containerized exports originating in Washington state, where shipping economics strongly favors trucking over rail for modal choice. However, for containerized imports entering Washington state ports, 37% are shipped via rail intact (i.e., with no formatting of cargo from 40-foot containers to 53-foot containers), while 31% are first transloaded and then loaded onto rail and shipped eastbound. The remainder, 32%, are loaded onto trucks from the port and either transloaded and then further trucked to local and regional destinations or trucked directly to the final cargo destination (**Exhibit 21**).

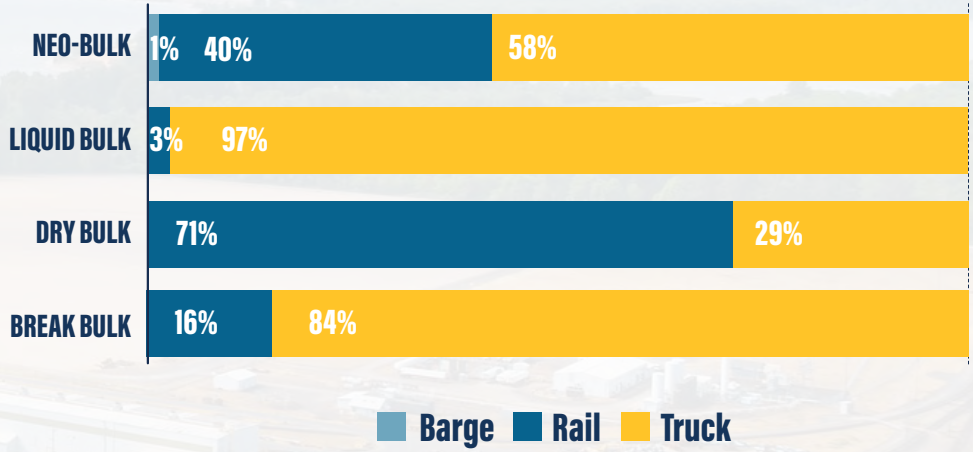
EXHIBIT 21. CONTAINERIZED CARGO BY MODE
TO/FROM WASHINGTON STATE PORTS, 2023 (BASED ON TONNAGE)



SOURCES: U.S. CENSUS BUREAU, 2024; PROJECT TEAM ANALYSIS.
FIGURES MAY NOT SUM TO TOTALS DUE TO ROUNDING.

For non-containerized cargo, among seaports, 58% of neo-bulk imports and exports is transited to or from the port via truck, and 97% of liquid bulk. Rail is the primary mode of transport (71%) for dry bulk, predominately to the port for export, while 84% of break bulk is shipped to or from the port via truck. Barge plays a small role for foreign shipments, primarily logs and wood products moved within the Salish Sea and Strait of Juan de Fuca (**Exhibit 22**).

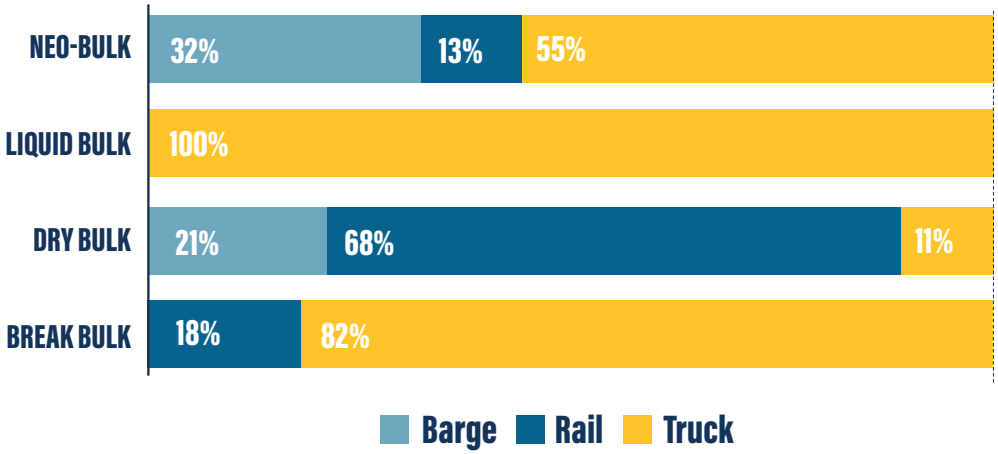
EXHIBIT 22. MODAL SPLIT, TWO-WAY TRADE (BASED ON TONNAGE),
NON-CONTAINERIZED CARGO, PUGET SOUND, STRAIT OF JUAN DE FUCA, AND PACIFIC COAST PORTS, 2023



SOURCES: U.S. CENSUS BUREAU, 2024; PROJECT TEAM ANALYSIS.
FIGURES MAY NOT SUM TO TOTALS DUE TO ROUNDING.

For the Columbia-Snake River System, barging plays a much larger role, owing to the commodity composition of imported and exported products and materials. For example, 32% of neo-bulk cargo by tonnage is transited to or from the riverports (mainly exports) via barge; for dry bulk, primarily wheat, 21% is shipped via barge downriver for export (**Exhibit 23**).

EXHIBIT 23. MODAL SPLIT, TWO-WAY TRADE (BASED ON TONNAGE), NON-CONTAINERIZED CARGO, COLUMBIA-SNAKE RIVER SYSTEM, 2023



SOURCES: U.S. CENSUS BUREAU, 2024; PROJECT TEAM ANALYSIS.
FIGURES MAY NOT SUM TO TOTALS DUE TO ROUNDING.

Several factors could affect modal split in the future. Congestion at container ports globally during the pandemic resulted in some shippers seeking workarounds for goods that typically used containers by using bulk or neo-bulk. Delays for trucks accessing marine terminals could also result in more use of rail transport to reach inland destinations. This could include using intermodal for fairly short distances, such as intermodal terminals at the Port of Benton, Port of Walla Walla, or others in Eastern Washington. Similarly, short sea shipping, connecting ports in the Salish Sea or Puget Sound with the terminals of the Northwest Seaport Alliance, could create resiliency for moving goods along the I-5 Corridor or to parts of the Olympic Peninsula.

Port of Longview

Port of Seattle

FOUR
PORT ASSESSMENT

This section provides essential port-level information and context for the marine cargo forecast.

The following Port Matrix gives a summary overview of Washington's marine cargo ports:

- **PORT TYPE (SEAPORT, RIVERPORT)**
- **ACCESS (RAIL, HIGHWAYS, ETC.)**
- **CARGO TYPE (LIQUID BULK, DRY BULK, CONTAINER, ETC.)**
- **MAJOR COMMODITIES**
- **MAJOR MARKETS**
- **CARGO INFRASTRUCTURE**
- **PLANNED CARGO PROJECTS**

Readers are referred to the supplemental Port Profiles for more detailed information on each of these elements, plus information on port budgets and recent cargo trends.

The second section, Port Opportunities and Challenges, addresses a variety of regional and port-specific factors that could potentially influence Washington's cargo flows in the coming years – for example, specific transportation bottlenecks, the growth of short sea shipping, and the trend toward port electrification.

Port of Whitman County

Port of Vancouver

WASHINGTON MARINE CARGO PORT MATRIX

PORT	TYPE	SURFACE ACCESS		CARGO TYPE (✔) = PLANNED					MAJOR COMMODITIES	MAJOR MARKETS	CARGO INFRASTRUCTURE	PLANNED CARGO PROJECTS
		Rail	*Highway*	*Liquid bulk*	*Dry bulk*	*Break bulk*	*Neo-bulk*	*Container*				
Anacortes	**Seaport**	None	SR20		✔	✔	✔		Petcoke, sulfur	Mexico, India, East Asia	• Deepwater dock • Barge dock • Laydown space	• Pump-out • Electrification • Improved road access • Warehouse
Bellingham	**Seaport**	Class I: BNSF (planned)	I-5		(✔)	(✔)	(✔)	(✔)	none currently	n/a	• Cargo dock • Barge dock • Warehousing • Laydown space	• Marine Terminal • Modernization • Dredging • Connection to BNSF Electrification
Benton	**Riverport**	Shortline: Southern Connection	I-82 I-182 SR240 SR224			✔			Decommissioned nuclear materials	U.S. Navy	• Barge terminal • Container crane	• Rail extension • Intermodal facility/Inland port
Chehalis	**No water access**	Class I: BNSF, UP	I-5 SR6 SR12		(✔)				none currently	n/a	6 industrial inland properties	• Southwest Washington Grain Project • Public grain storage and transloading facility
Everett	**Seaport**	Class I: BNSF	I-5 US2 SR529		✔	✔	✔	✔	Cement, project cargo, aerospace components	Japan, South Korea,China	• 2 marine terminals with 8 berths • Barge terminal • Satellite intermodal facility	• Hewitt Terminal pier 3 electrification • South Terminal clean up • Pacific Terminal improvements
Grays Harbor	**Seaport**	Class I: BNSF, UP via PSAP	I-5, US 101 US 12	✔	✔	✔	✔		Seafood, forest products, autos, liquid bulk	Southeast Asia, South Korea	• 4 deep water terminals with 5 berths • Warehousing • Rail loops • Paved cargo yard	• Terminal 4 Expansion & Redevelopment • Wood Pellet Manufacturing & Export Facility
Kalama	**Riverport**	Class I: BNSF, UP, Northern Pacific	I-5	✔	✔	✔			Grain, wheat, soybeans, corn, sorghum, steel, logs, chemicals	China, Japan, South Korea, rest of East Asia	• 5 marine terminals • 2 grain elevators • Cargo dock • Barge dock • Liquid bulk facility • Warehousing	Expansion of grain terminal rail infrastructure

WASHINGTON MARINE CARGO PORT MATRIX (CONT'D)

PORT	TYPE	SURFACE ACCESS		CARGO TYPE (✔) = PLANNED					MAJOR COMMODITIES	MAJOR MARKETS	CARGO INFRASTRUCTURE	PLANNED CARGO PROJECTS
		Rail	*Highway*	*Liquid bulk*	*Dry bulk*	*Break bulk*	*Neo-bulk*	*Container*				
Klickitat	**Riverport**	Class I: BNSF, UP	I-84				✔		Logs	Domestic	• Barge marine terminal • Log yard	Paving for additional storage capacity, stormwater management investments
Longview	**Riverport**	Class I: BNSF, UP	I-5	✔	✔	✔	✔		Grain, petcoke, potash, project cargo (oversized industrial), steel	China, Japan, Korea, Philippines	• Three marine terminals with 9 berths • Ro-Ro • Portable conveyor • Cranes, stackers, lifts • Industrial Rail • Corridor	• Berth 4 Revitalization • Industrial Rail Corridor Expansion • Rail overpass
NWSA, Seattle, Tacoma	**Seaport**	Class I: BNSF, UP Shortline: Tacoma Rail	I-5 I-90 SR18 SR167	✔	✔	✔	✔	✔	Furniture, machinery, hay, frozen potato products, grains, autos, various containerized consumer goods	China, Japan, Vietnam, South Korea, Taiwan, Alaska, Hawaii	• 10 container terminals and 47 cranes • 5 non-container terminals for breakbulk cargo and automobiles • Bulk terminals • On-dock rail and nearby intermodal yards	• T91 cold storage facilities • Rail and intermodal facility expansion • Waterfront electrification program • Industrial stormwater and air quality mitigation
Olympia	**Seaport**	Shortline to BNSF; UP Class 1	I-5		(✔)	✔			Logs, Paper Pulp	China, Japan, South Korea	• 70k sqft Warehouse on berth • 3 berths • Logyard • Cargo Yard • Rail Access	Second Warehouse 70,000 sq. ft. on Berth 1
Pasco	**Riverport**	Class I: BNSF	I-182 US12 US395		✔			✔	Wood chips, grains, frozen foods	Domestic	• Barge terminal • Rail served industrial center • Large scale food processing facility • Dairy processing facility	• Warehousing and industrial park • Waterfront expansion area for open storage and industrial use • Darigold Processing Facility • Barge terminal improvements

WASHINGTON MARINE CARGO PORT MATRIX (CONT'D)

PORT	TYPE	SURFACE ACCESS		CARGO TYPE (✔) = PLANNED					MAJOR COMMODITIES	MAJOR MARKETS	CARGO INFRASTRUCTURE	PLANNED CARGO PROJECTS
		Rail	*Highway*	*Liquid bulk*	*Dry bulk*	*Break bulk*	*Neo-bulk*	*Container*				
Port Angeles	**Seaport**	None	US101 SR117		✔	✔	✔		Logs, wood chips	China, Japan, Domestic	• 6 marine cargo terminals • Logyard • IHTF • Cargo surge area • Warehousing	• Marine Terminal (T1/T3) rehabilitation • Industrial property acquisition • Marine Terminal 1 • Warehouse rehabilitation
Vancouver	**Riverport**	Class I: BNSF, UP	US101 SR117	✔	✔	✔	✔		Soy, wheat, mineral & liquid bulk, vehicles, soda ash, project cargo	Southeast Asia, China	• 5 marine terminals with 17 berths • Grain elevator • On-dock rail • Auto processing facility • Heavy-lift dock • Laydown storage	Terminal 5 development (early stages)
Walla Walla	**Riverport**	Class I: BNSF, UP	US12	✔	✔	✔	✔	✔	Grain, liquid animal feed, apples, onions, hay, potatoes, alfalfa seed	Domestic, Asia	• 2 grain storage complexes • 3 barge slips • 2 cargo docks • Stackyard • Warehousing	• Industrial water system upgrades • Expansion of intermodal rail
Whitman County	**Riverport**	Short lines: PCC Railroad Camas Prairie Raiload	SR194 SR193 SR127	✔	✔		✔		Grain, logs, wood chips, fertilizer	Domestic	• 3 barge facilities with grain elevators • Log yard • Industrial Rail	None
Woodland	**Riverport**	Class I: BNSF, UP	I-5		(✔)				None currently	n/a	n/a	Barge facility

PORT OPPORTUNITIES AND CHALLENGES

Inland Ports & Logistics Cluster Strategy

Inland Ports generally function as an extension of nearby major ports. They are characterized by adjacent rail or barge access and availability of real estate and services to support freight activities. Inland ports can reduce shipping costs, create new business opportunities, increase volume in cases of capacity constraints, and reduce the impacts of trucking, which include congestion, energy consumption, and the high cost of transiting freight overland. As real estate becomes scarce at existing ports, inland ports also represent a good opportunity to spread out operations—land for storage helps attract and retain cargo and supports the Logistics Cluster Strategy.

In Washington state, there are inland port facilities at the ports of Walla Walla, Pasco, and Whitman County. These operations serve as key inland logistics hubs, providing intermodal connections to The Northwest Seaport Alliance, the Columbia-Snake River system, and major U.S.-Canada trade routes.

Port Electrification and Shore Power

Shore power is increasingly used at major ports worldwide, especially in areas with strict environmental regulations, such as California. The benefits

REDUCED EMISSIONS:

Shore power allows ships to turn off their diesel engines while docked, significantly reducing emissions of greenhouse gases, particulate matter, and nitrogen oxides. This supports cleaner air for port workers and nearby communities.

IMPROVED AIR QUALITY AND PUBLIC HEALTH:

Shore power reduces air pollution, benefiting the health of local communities, especially in port-adjacent neighborhoods.

LOWER NOISE POLLUTION:

Ships using shore power do not need to run auxiliary engines, reducing noise pollution in and around the port area.

FUEL COST SAVINGS FOR SHIP OPERATORS:

Instead of burning costly marine fuel while docked, vessels can use cheaper and often cleaner electricity from the grid, reducing operational costs.

COMPLIANCE WITH ENVIRONMENTAL REGULATIONS:

Ports in areas with strict emissions regulations (like California's Air Resources Board standards) can avoid fines and meet environmental targets by using shore power.

ENHANCED PORT COMPETITIVENESS:

Ports that offer shore power are more attractive to environmentally conscious shipping companies and can attract more business from "green" logistics providers.

SUPPORT FOR CLEAN ENERGY TRANSITION:

If shore power is supplied from renewable energy sources, it supports broader decarbonization goals for the shipping and logistics industry.

Port of Everett

In 2024, $26.5 million was awarded to 11 Washington state ports to electrify their operations, funded by the WSDOT Port Electrification Competitive Grant Program through the Climate Commitment Act. These projects collectively plan to reduce their greenhouse gas emissions by more than 140,000 metric tons over the next 10 years (**Exhibit 24**).[36] In addition to shore power, these projects fund the acquisition of electric cargo handling equipment, medium and heavy duty yard and drayage trucks, and other port fleet electrification. Supplemental to the grant program, three additional projects received a total of $31 million dedicated for shorepower projects in Anacortes, Bremerton, and Tacoma.

EXHIBIT 24. WASHINGTON STATE DEPARTMENT OF TRANSPORTATION SHORE POWER INVESTMENTS, 2024

PORT	PROJECT
THE NORTHWEST SEAPORT ALLIANCE	$2.6 million for shore power planning
PORT OF ANACORTES	$1.0 million for shore power and zero emission equipment
PORT OF BELLINGHAM	$2.8 million for shore power
PORT OF BENTON	$2.7 million for shore power
PORT OF EDMONDS	$1.5 million for shore power
PORT OF EVERETT	$4.3 million for shore power, electric trucks, and cleaner generators
PORT OF FRIDAY HARBOR	$7.0 million for shore power and electric trucks
PORT OF KALAMA	$1.4 million for an electric boat dock
PORT OF PORT ANGELES	$0.5 million for shore power and electric cargo equipment
PORT OF RIDGEFIELD	$1.2 million for electric vehicle chargers
PORT OF SEATTLE	$1.0 million for shore power

Offshore Wind

The development of Offshore Wind (OSW) near the California and Oregon coastline represents a significant opportunity for Washington ports, particularly Everett, Longview, Tacoma, and Kalama, to participate as supply chain partners to those distant deployment sites. OSW activity can be categorized into three categories.

STAGING AND INTEGRATION

Ports like Long Beach, Humboldt (CA), and potentially Columbia River Basin ports (Kalama, Longview, Vancouver) could play roles in staging offshore wind components. These ports would handle the final supply chain stage before installation, assembling massive components (e.g., 100-meter blades, 100-meter tower sections) and requiring large upland and wet storage areas.

MANUFACTURING AND FABRICATION

OSW requires bespoke manufacturing for platforms, turbines, and blades. While domestic production is uncertain, components will need transportation (via rail or barge) to staging ports.

OPERATIONS AND MAINTENANCE

These ports must be as close to wind farms as possible. Washington ports have potential roles once OSW projects expand locally.

The platforms for offshore wind farms are at such a scale—platforms as wide as Lumen Field in Seattle—that no single port along the West Coast has the capacity to receive and stage all necessary components, requiring instead a network approach involving multiple ports. Offshore wind will also require terminals for ferrying construction and maintenance crew to and from the offshore site, which may be hundreds of miles from the port.

OSW could drive substantial economic benefits, including new construction jobs, long-term operations and maintenance roles, and increased activity for local suppliers and contractors. However, ports face challenges related to space constraints, multi-port coordination, regulatory compliance, and labor development. Addressing these issues through infrastructure investments, workforce development, and port collaboration will be essential for success.

STAGING AND FABRICATION OF OFFSHORE WIND COMPONENTS

The Port of Everett has plans for the Norton Facility, with 40 acres of laydown space, to be used as a fabrication and staging site for offshore wind components. The potential for "wet storage" of large floating wind components at the port presents a unique opportunity. The Port of Longview has potential space available for use as a staging area and assembly location for OSW projects. The port has experience with high and heavy loads and has been a destination for wind turbines for landside wind farms.

INFRASTRUCTURE, SPACE CONSTRAINTS, AND PERMITTING AND REGULATORY CHALLENGES

The Port of Everett's Norton Facility offers significant laydown space. However, OSW components like floating platforms are massive, requiring additional space and infrastructure for storage and assembly. Handling large components like blades and turbines will require enhanced capacity at berths and additional laydown space. Current berths at the Port of Longview, particularly Berth 6 (steel) and Berth 8 (wood pellets), already face congestion from existing operations. Other ports, such as Kalama, have space limitations that may limit their ability to participate in OSW projects, as much of the available land is already allocated for other bulk cargo activities. Port authorities will also need to secure permits for OSW assembly and storage, particularly if "wet storage" is required. Regulatory timelines could delay project implementation.

SUPPLY CHAIN AND COMPONENT SOURCING AND LABOR CHALLENGES

OSW projects depend on global supply chains, which may be impacted by international trade dynamics and fluctuations in raw material availability. Ports must be prepared to handle fluctuations in delivery schedules for OSW components, which could impact berthing schedules and resource allocation.

Offshore wind development also requires a skilled labor force capable of handling large-scale assembly and specialized equipment. Workforce development initiatives may be necessary to ensure a pipeline of skilled workers.

Port of Seattle

Port of Chechalis

M5 and M84 Marine Corridors and Short Sea Shipping

Short sea shipping is strictly a maritime service and, like inland ports, involves the movement of goods from a major hub to a smaller, strategically positioned transshipment facility. Incentives for implementing short sea shipping include increased port revenues (from wharfage/dockage fees); fewer trucks on the road; reduced costs; greater shipping flexibility; and increased competitiveness.[37]

The M5 Coastal Corridor is an example of a designated project, connecting Port Angeles, Anacortes, and Bellingham with California ports. The corridor helps alleviate congestion on highways and rail networks by offering a sustainable, cost-effective alternative for freight transport. It plays a critical role in supporting regional economies, promoting trade, and reducing environmental impacts by lowering greenhouse gas emissions.

In Washington state, the corridor offers opportunities to remove trucks from the road, instead using barging to transit heavy commodities such as green timber and finished dimensional lumber. For example, future barging services can help connect tree farm owners on the west coast of the Olympic Peninsula to sawmills and processors in Port Angeles and Everett (which would otherwise require trucking services along Highway 101, at much greater cost). Finished dimensional lumber can then be barged down the West Coast to furniture manufacturers as distant as Southern California. In 2022, MARAD announced additions to the Marine Highway Program including *Northwest Connect: Critical Lifelines between Alaska, Hawaii, and Washington*. This new designation on the M5 will further support the transport of freight to and from Alaska, Hawaii, and Washington.

The M84 Marine Highway is another vital waterway in the Pacific Northwest, encompassing the Columbia, Snake, and Willamette rivers. It spans approximately 440 miles from Astoria, Oregon, to Lewiston, Idaho, facilitating the efficient movement of goods and reducing reliance on overland transportation routes. The M84 facilitated the movement of 49.7 million metric tons of international cargo valued at over $31.2 B in 2022.[38] An example of a designated project associated with M84 is the $4.2 million *Tidewater M84 Barge Service Expansion* to support the purchase of an electric dock crane at the Port of Vancouver.

Power Capacity

Access to power, also known as resource adequacy, is a growing concern at some ports, with capacity limits posing significant challenges to industrial expansion and new projects. Ports are actively working to secure additional power through negotiations with Bonneville Power Administration (BPA) and exploring options in the open market. For instance, the $1.5 billion Atlas Agro project is facing hurdles due to power limitations and requires finalized agreements before proceeding with full construction. At the Port of Klickitat, power constraints limit the port's ability to expand industrial operations. The Port of Vancouver is working with Clark Public Utilities to prepare a site for a proposed electrical substation to meet future energy demands.

Ports are also anticipating large-scale renewable projects, such as the 125-megawatt Ruby Flats solar project proposed by Energy Northwest and an additional 8,000 acres of solar developments recently approved by the Department of Energy. Energy Northwest has also signed an agreement to develop small modular nuclear reactors in partnership with X Energy and Amazon. These initiatives are seen as crucial steps in supporting green trade corridors and promoting sustainable industrial growth.

The Tri-Cities region already benefits from a high percentage of clean energy, with the City of Richland providing 90% non-emitting power and the broader region at 87%. Efforts are underway to further enhance clean energy capabilities, including an advanced nuclear reactor project that, once operational, will make Richland's power supply fully non-emitting. Despite these efforts, several ports stressed the importance of securing reliable and competitively priced baseload power to sustain existing industries and attract new businesses. They are also keeping a close watch on the decommissioning of the last remaining coal facility in the region and are considering potential partnerships to mitigate any resulting power shortages. Overall, ports are working proactively to address power availability challenges while aligning with sustainability goals to ensure long-term operational success.

Environmental Compliance

The region's commitment to clean energy is evident in the push for green trade corridors and the electrification of port facilities, but challenges remain in securing adequate and affordable non-emitting power to meet demand. The introduction of offshore wind projects and other clean energy initiatives brings regulatory complexities, requiring careful planning and compliance with evolving environmental standards. Ports are also addressing concerns related to land use planning, ensuring adequate industrial space while balancing environmental conservation efforts. They emphasized the need for stable, long-term policies that support sustainable growth without creating additional barriers for businesses operating within the region.

Additionally, ports are facing increasing regulatory pressures related to emissions reductions and sustainability mandates. They are actively working to comply with new federal trucking regulations, which create operational bottlenecks and require significant adjustments to logistics.

STORMWATER REGULATIONS

An ongoing challenge to the maritime industry is stormwater regulations. Washington state's Industrial Stormwater General Permit (ISGP) mandates that ports manage stormwater discharges across their entire operational footprint. This broader scope, overseen by the Washington State Department of Ecology and implemented on January 1, 2025, necessitates extensive infrastructure and monitoring to ensure compliance, which represents an additional cost for ports.

Industrial Lands Preservation & Preventing Incompatible Uses

The City of Seattle's approval of conditional use placing housing within SODO's industrial zones has ignited concerns, primarily revolving around the conflict between residential living and established industrial operations that are adjacent to the port. The introduction of housing in the area will present several challenges for port operations, including increased traffic congestion—particularly impacting freight movement—and potential safety hazards for residents due to proximity of new housing to heavy industrial activity and freight transportation corridors. There are also concerns regarding the vulnerability of new residents to negative health outcomes associated with living near truck routes and intense industrial activity.

Port of Everett

Transportation Bottlenecks

Interviews with port representatives revealed several important concerns related to transportation bottlenecks, either current or anticipated.

GRADE SEPARATIONS

Ports recognize that freight traffic generated by the state's trade-driven economy can have impacts across the state. Recently completed highway rail grade separation projects, like the Lander Street Crossing in Seattle or the Barker Road grade separation in Spokane Valley, demonstrate that these needs can be immediately adjacent to port activity or hundreds of miles away from it. The Port of Grays Harbor's rail traffic is expected to double in the next 18 to 24 months. The City of Aberdeen's US12 Highway-Rail Separation Project will be critical to mitigate future congestion and improve safety and emergency access for local residents as well as visitors. These projects improve safety and reduce congestion, and are essential to the continued growth and competitiveness of ports.

HIGHWAY CONGESTION

Highway congestion and bottlenecks can be major impediments to the movement of freight and result in a less competitive environment for ports to do business. The American Transportation Research Institute identifies the Top 100 Truck Bottlenecks each year, six of which are located in Washington State. The Interstate Bridge linking Vancouver and Portland continues to be the worst bottleneck in Washington, followed by major interchanges in Seattle (I-5/I-90), Federal Way (I-5/SR18), Auburn (SR18/SR167)
and Bellevue (I-90/I-405).
The SR 18 Tiger Mountain Summit, currently experiencing construction-related closures and delays, is also on the list. During closures, trucks often detour through adjacent towns, upsetting local residents. Delays can also directly impact Eastern Washington agriculture commodity shippers who rely on trucking to export products through the Northwest Seaport Alliance. Extended delays and closures to redeck the I-90 Vantage Bridge, slated to continue during the summer of 2025, will exacerbate these type of delays.

I-5 NISQUALLY RIVER VIADUCT

Replacing the Nisqually River Viaduct should improve connectivity between the Port of Tacoma to Centralia and other southern industrial regions. The project is currently in the planning phase, with funds not yet allocated for construction.

LEGACY PROJECTS

Washington has several long-term highway projects with just one or two phases remaining. These include the Interstate Bridge Replacement Project, the Puget Sound Gateway Program, US 12 – Wallula to Nine Mile Hill (Phase 8), and Hood River Bridge replacement. These projects are essential to freight mobility and need to be prioritized.

EXTENDING TACOMA RAIL ARRIVAL AND DEPARTURE TRACKS AT THE PORT OF TACOMA

The current arrival and departure staging tracks are each over 1.5 miles in length (approximately 7,920 feet)—generally sufficient for most train operations. However, as cargo volumes and train lengths continue to grow, further extensions or additional tracks may be necessary to maintain operational efficiency and prevent congestion, enhancing the port's competitiveness.

PORTS OF BENTON AND WALLA WALLA: TRUCK TURN TIMES

Federal regulations mandating driver rest periods for long-haul truck drivers have created the demand for truck parking in locations near or adjacent to load pickup or final delivery. Exporters of hay and other value-added agricultural products face delays accessing the seaport gateways, reducing the number of truck turns from two or more per day to just one. Ports are working to find more efficient ways to facilitate competitive transport of goods for export.

PORT OF LONGVIEW: BERTHS FOR BULK COMMODITIES

The Port of Longview has direct access to BNSF and UP rail networks, but capacity issues exist. Rail congestion is a critical constraint, particularly for bulk commodities like grain and calcine coke. Train arrival and departure timing conflicts with passenger rail service, affecting operational efficiency.

RAIL AND INTERMODAL BOTTLENECKS

The Port of Benton intermodal facility is not yet fully operational. While the loop track exists, it still requires a yard, fencing, and essential infrastructure, with full operations expected by 2025. The lack of fully operational intermodal capacity limits efficient movement of goods.

At the Port of Kalama, capacity limitations with BNSF and Union Pacific (UP) restrict the port's ability to support unit trains. The port's goal to add 21,000 linear feet of track to increase the capacity for unit trains remains a work in progress, with an emphasis on relieving congestion caused by overlapping freight and passenger rail schedules.

Port of Woodland

HIGH, WIDE, AND HEAVY CARGO

The Columbia River High, Wide and Heavy (HWH) Corridor Coalition is working to develop a federally authorized multimodal freight corridor. This corridor enables cost-effective and reliable cargo transport between North America, Canada, and Asia through Columbia River ports, including Vancouver and Longview, and Oregon's interstate highways. Key goals include establishing a designated HWH network across multiple states and Canada, protecting route capacity, engaging stakeholders, improving safety by removing obstacles, and encouraging manufacturing along the routes to boost the regional economy. Shipping via Columbia River ports offers time and cost savings, with reduced handling and stress on cargo.

LOWER COLUMBIA MAINTENANCE DREDGING

The Lower Columbia River Channel Maintenance Plan is an ongoing effort to ensure the navigability of the Columbia River's shipping channel. This involves the periodic removal of accumulated sediment, such as sand and silt, from the riverbed to maintain the authorized depth of 43 feet deep and width necessary for safe and efficient vessel traffic. Dredging operations are crucial for supporting regional and national economies by facilitating the movement of goods through ports like Kalama, Longview, Woodland, and Vancouver. Ports will be responsible for securing upland sites designed for dredged placement. The project aims to minimize impacts on aquatic ecosystems while ensuring that the river remains a vital transportation artery.

Climate and Environmental Factors

Shorter winters, elevated temperatures, and drier conditions could all contribute in the coming years to reduced agricultural output, translating into lower cargo volumes through Washington state ports. Similarly, wildfires could devastate tree farms, resulting in lower timber volumes for domestic and international export. Fires can also cause road closures and disrupt trucking.

Dam Removal

The loss of the Snake River and Columbia River dams would impact the region's ability to maintain efficient freight movement and provide reliable, competitively priced energy essential for industrial activities. As of the writing of this report, dam removal is reported to be unlikely to occur in the near future.

Port of Longview

ENDNOTES

1 Data provided by The Northwest Seaport Alliance, based on the PIERS dataset.

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