



DECEMBER 2024

WASHINGTON MARINE CARGO FORECAST

PRELIMINARY FINDINGS, M5 Roundtable

Prepared by:



In association with:



PROJECT SCOPE

INTERNATIONAL TRADE OVERVIEW.

Detailed discussion of leading marine cargo trends at Washington state ports and economic conditions among leading trading partners and blocs; domestic trade trends; geopolitical issues; and other factors shaping current and future cargo volumes.

MARINE CARGO FORECAST.

With breakouts by containerized, bulk, breakbulk, and neo-bulk, and by sub-state regions.

PORT-LEVEL ASSESSMENT.

Discussion of port operations, infrastructure, access, and individual port project lists and transportation system investments.

MODAL SPLIT BY CORRIDOR.

Discussion of landside transportation issues related to the marine cargo forecast, including by truck, rail, and barge.

EMERGING ISSUES AND OPPORTUNITIES.

Trends and industry developments that will shape future marine cargo flows, with a special focus on offshore wind.

PARTICIPATING PORTS



A large container ship is shown from a low angle, sailing on a blue ocean. The ship's deck is covered with numerous colorful shipping containers in shades of red, blue, yellow, and green. In the background, a large, snow-capped mountain rises against a clear blue sky. The foreground is dominated by a dark blue, wavy graphic that resembles water, which transitions into a lighter blue diagonal band across the middle of the image.

TRADE OVERVIEW

TRADE OVERVIEW

**Recent trends
in international
cargo**

**Leading markets
and macro growth
projections**

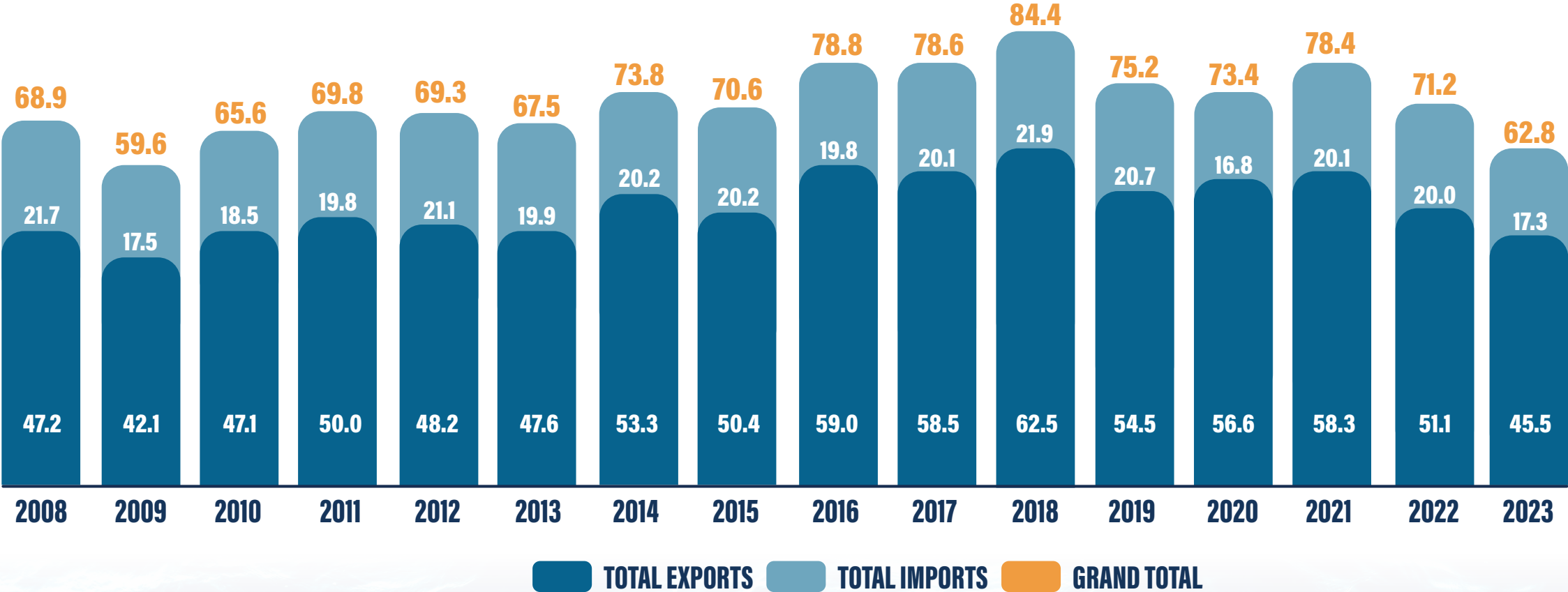
**Washington's
international
cargo overall
market share**

**Domestic cargo
flows and drivers**

**U.S. economic and
trade policy and
impacts to future
cargo volumes**

WATERBORNE IMPORTS AND EXPORTS

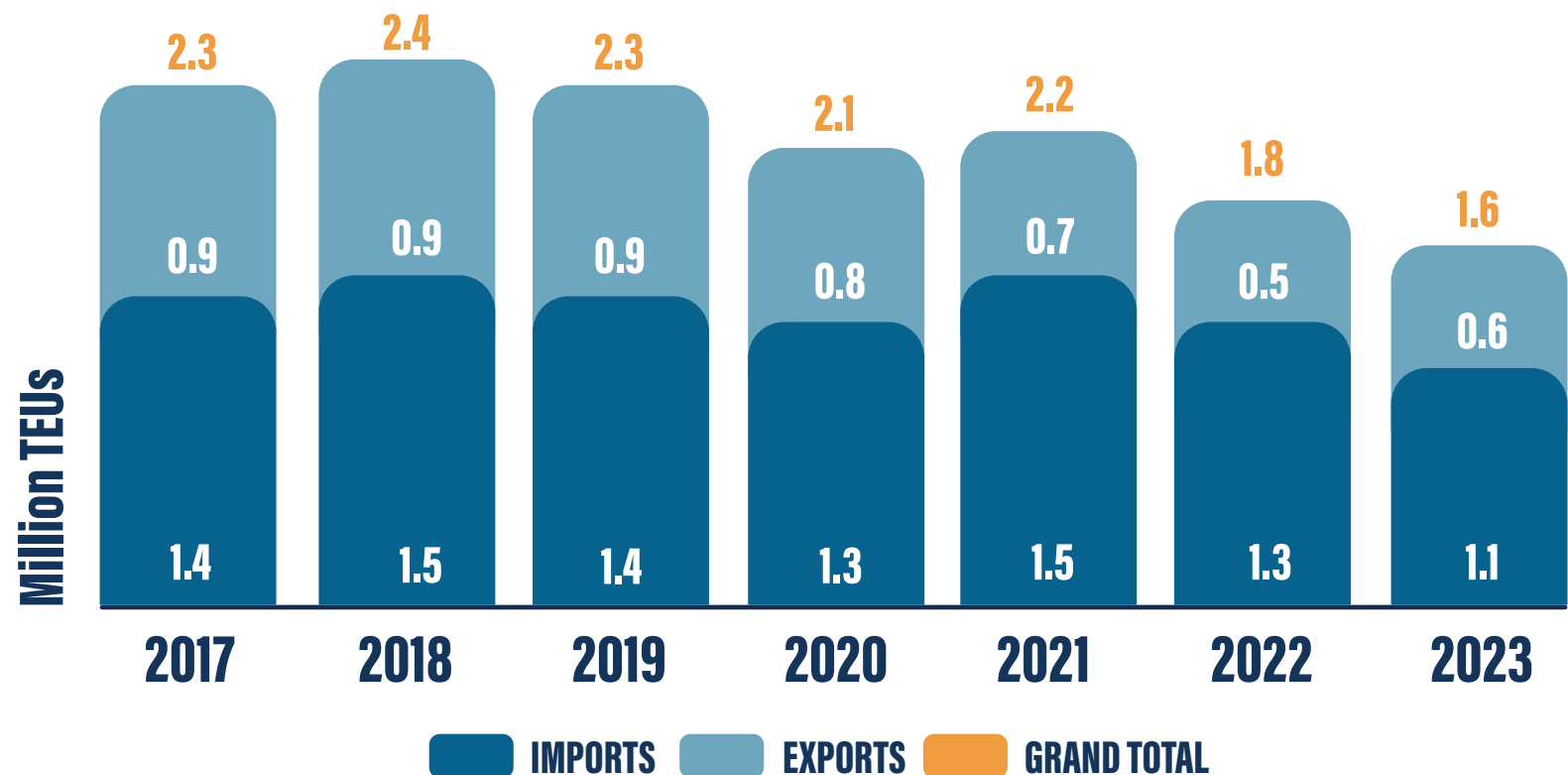
THROUGH WASHINGTON STATE PORTS, MILLIONS OF METRIC TONS, 2008-2023



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

CONTAINERIZED INTERNATIONAL TRADE

LOADED CONTAINERS, IMPORTS AND EXPORTS, WASHINGTON STATE PORTS, 2017-2023

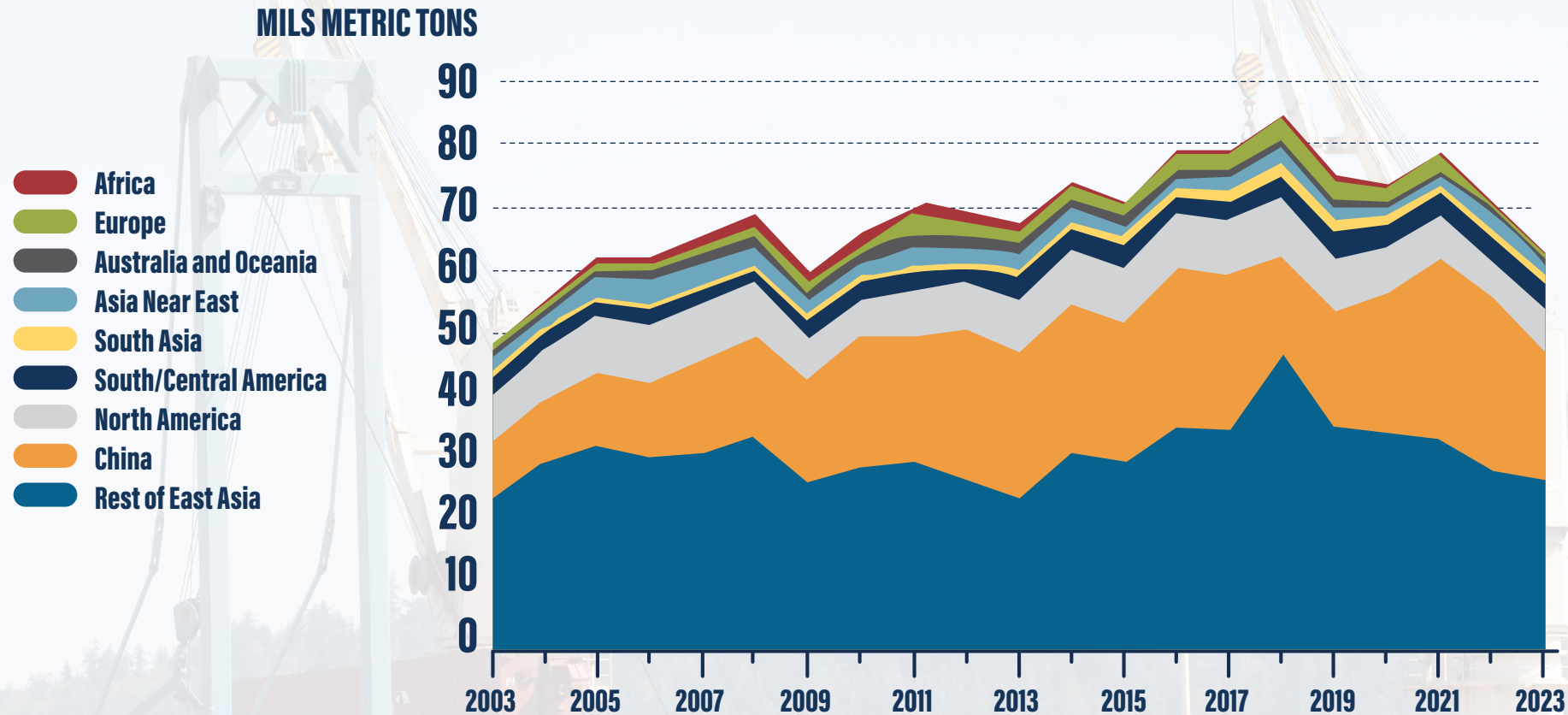


- TEUs from China down 41% between 2018 and 2023.
- Containers from or to Vietnam through The NWSA up 127% between 2017 and 2023.

DATA SOURCE: THE NORTHWEST SEAPORT ALLIANCE, 2024; PIERS, 2024.
FIGURES MAY NOT SUM TO TOTALS DUE TO ROUNDING.

TOP TWO-WAY WATERBORNE TRADING PARTNERS

COUNTRY AND REGIONAL TRADING PARTNER WITH WASHINGTON STATE PORTS, 2003-2023, MILLIONS OF METRIC TONS

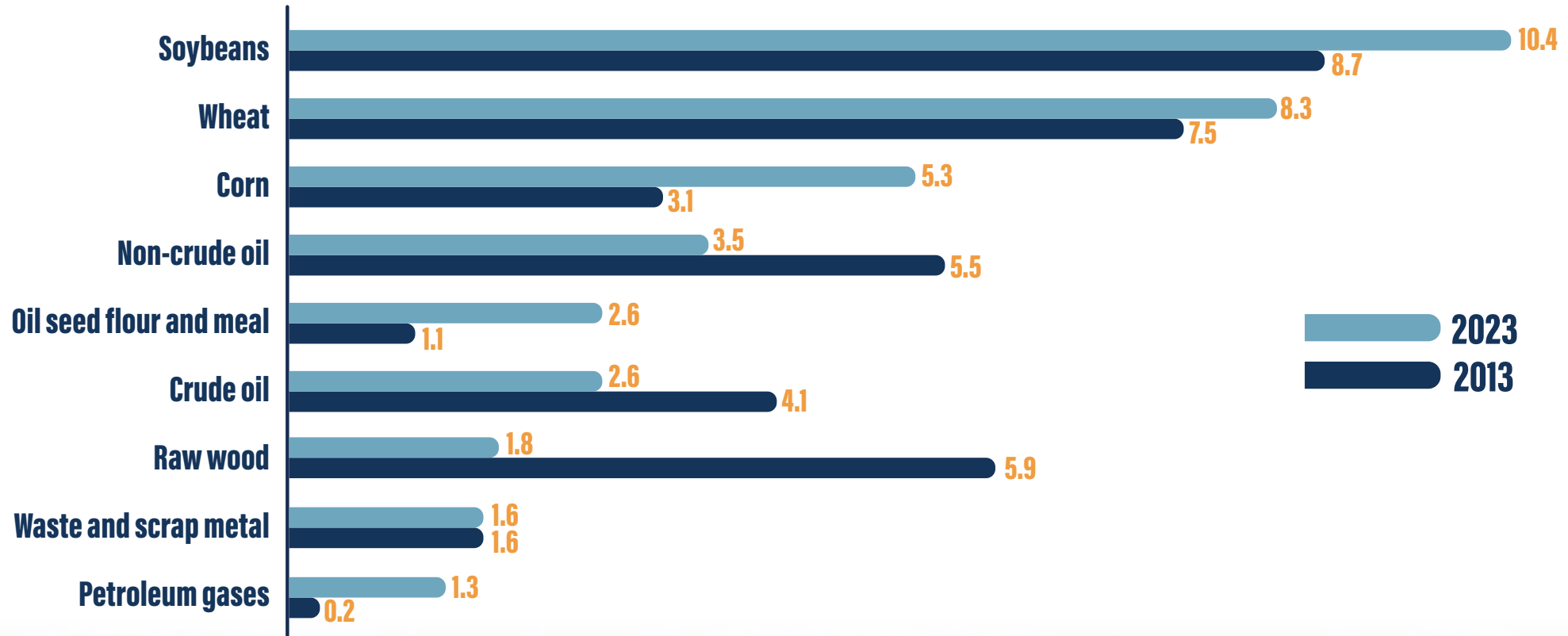


- Washington state ports' trade with China declined 30% in volume between 2021 and 2023.

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

LEADING INTERNATIONAL BULK, BREAK BULK, AND NEO-BULK CARGO

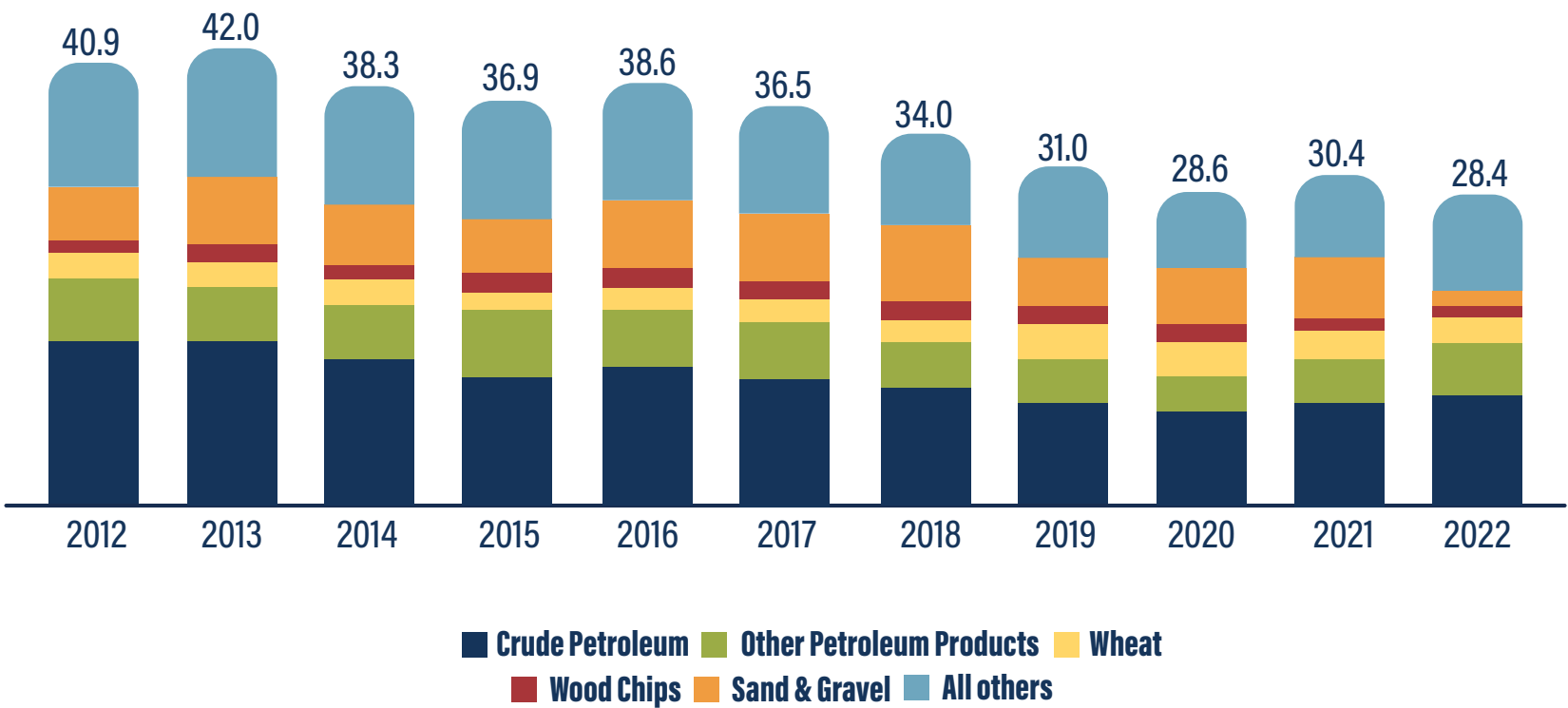
THROUGH WASHINGTON STATE PORTS, BY MILLIONS OF METRIC TONS, TWO-WAY (IMPORTS AND EXPORTS), 2023



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

DOMESTIC TRADE

TONNAGE HANDLED AT WASHINGTON STATE PORTS (MILLIONS OF SHORT TONS)



- Petroleum products comprised 70% of the total domestic cargo tonnage between 2013 and 2022.
- Washington ports have handled an average of 5 million tons of crude oil each year, largely inbound from Alaska.
- In 2017, domestic TEUs were at a low of 700,000 and peaked in 2022 with 990,000 TEUs moved.

DATA SOURCE: U.S. ARMY CORPS OF ENGINEERS, WATERBORNE COMMERCE STATISTICS, 2024.

GEOPOLITICS AND ECONOMICS

CONSIDERATIONS FOR LONG-TERM CARGO VOLUMES THROUGH THE PNW

**Trade
agreements
and tariffs.**

**U.S.-China rift,
trade war, etc.
Impact on
volumes.**

**Limited
connections
with other
markets.**

**Disruptions
and Houthis.**

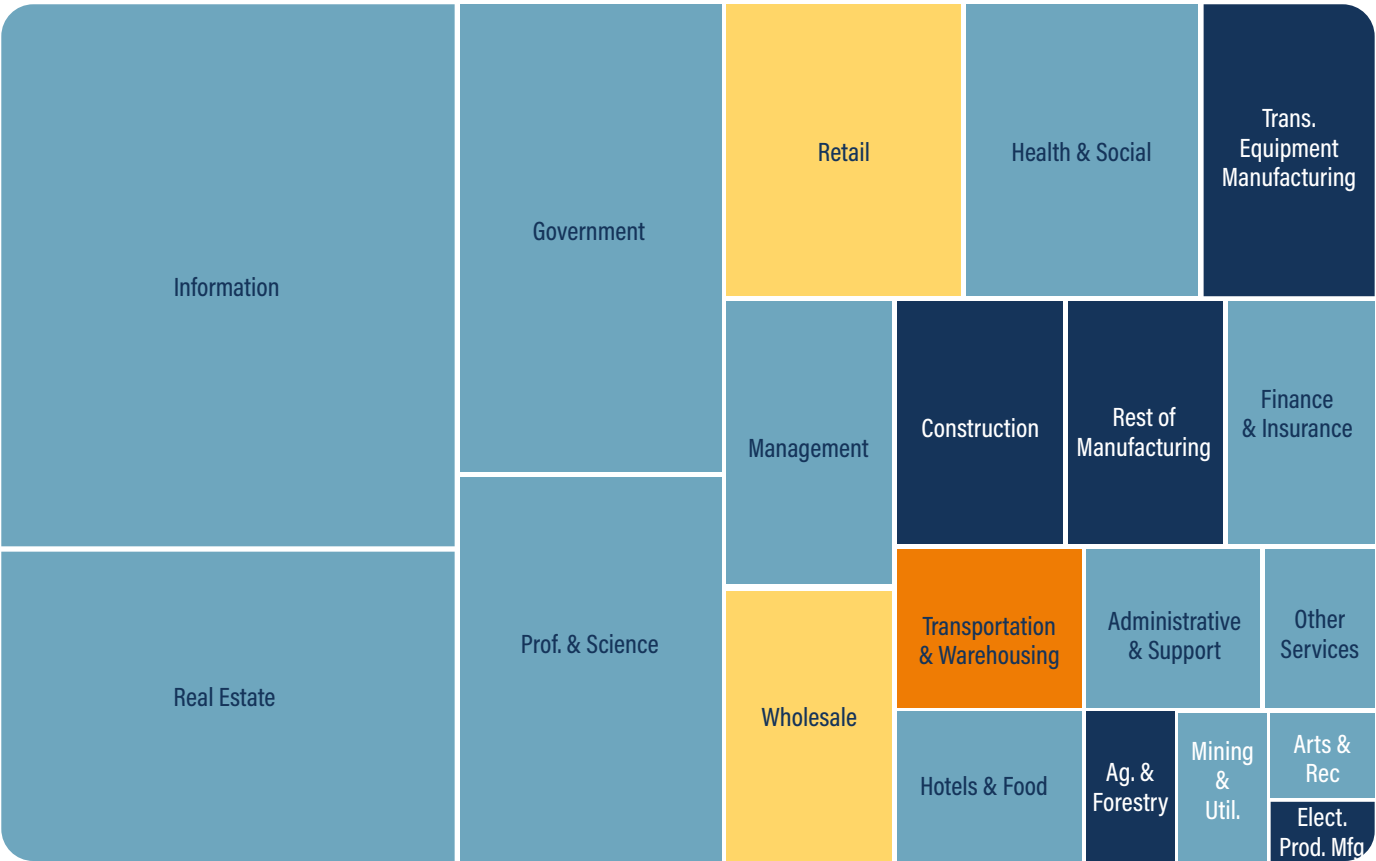
**Supply chain
diversification
and
re-shoring.**



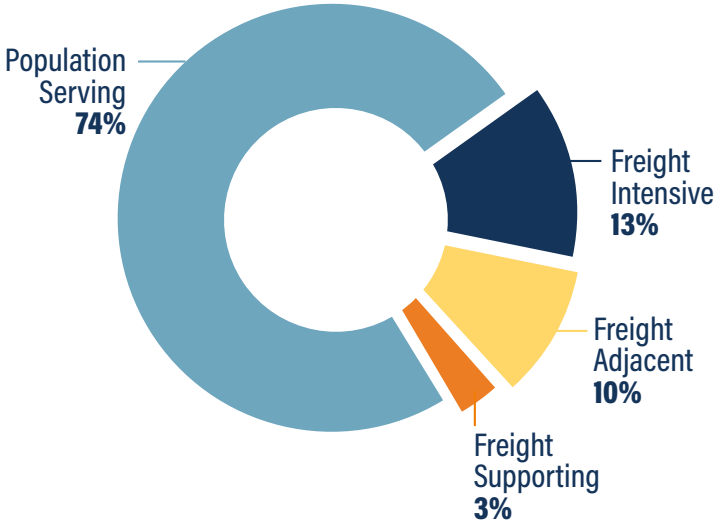
CARGO FORECAST

WASHINGTON STATE ECONOMY

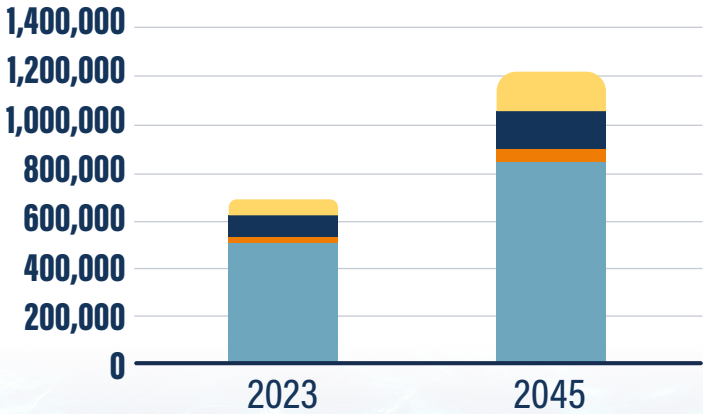
2023, REAL GDP



Population Serving
Freight Intensive
Freight Adjacent
Freight Supporting



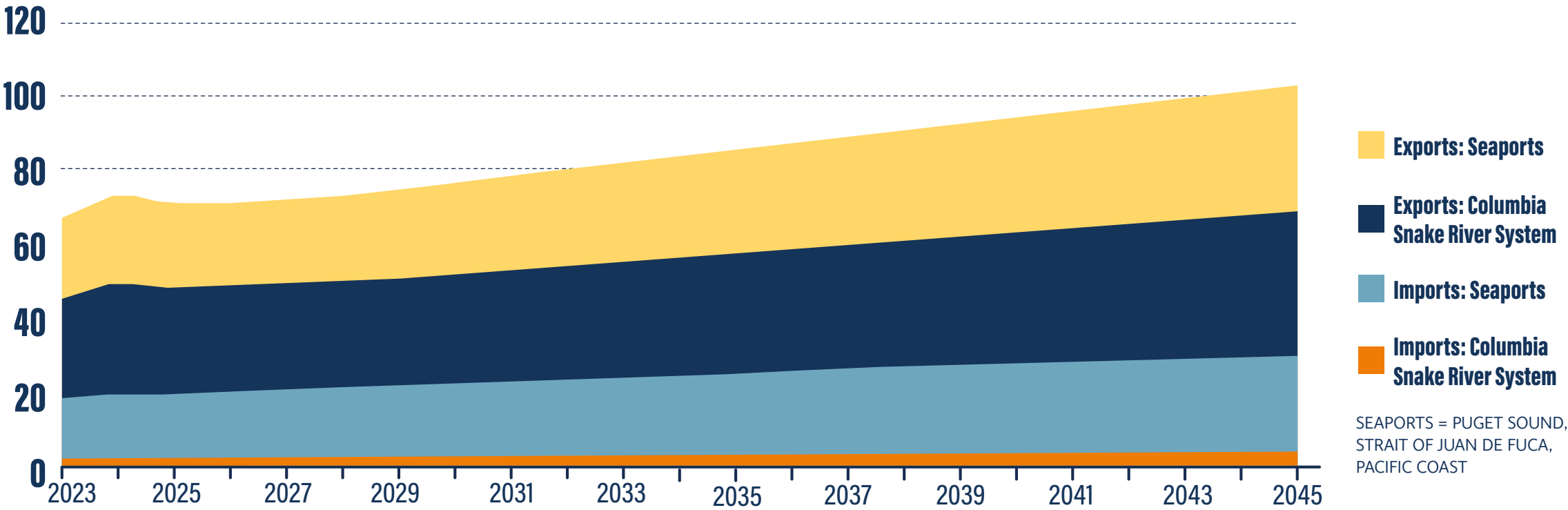
WA REAL GDP GROWTH (\$M)



DATA SOURCE: MOODY'S ECONOMY.COM

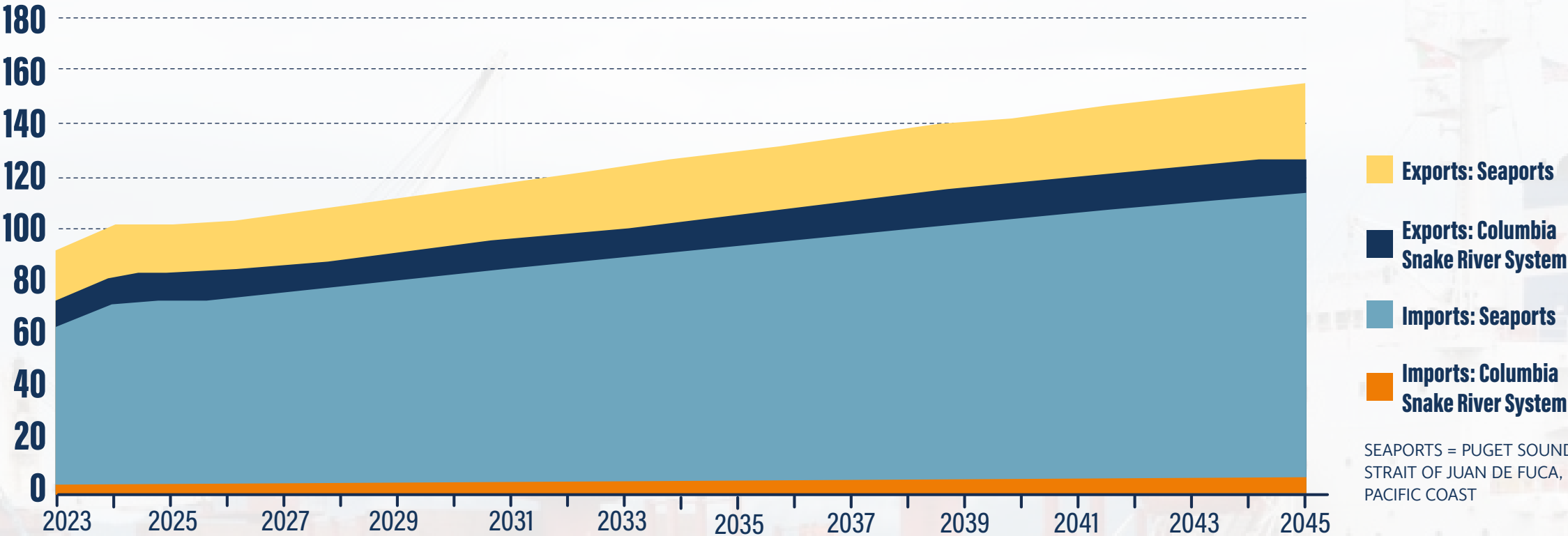
FORECASTS BY SUB STATE REGION

GROWTH IN TONNAGE | TONS OF CARGO (MILLIONS)



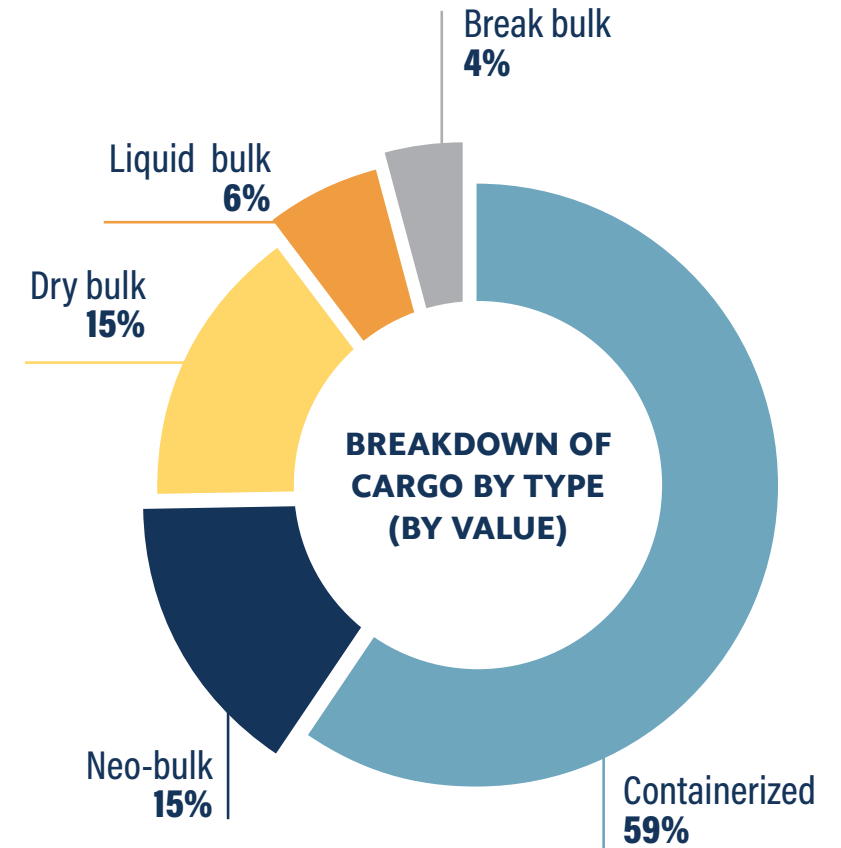
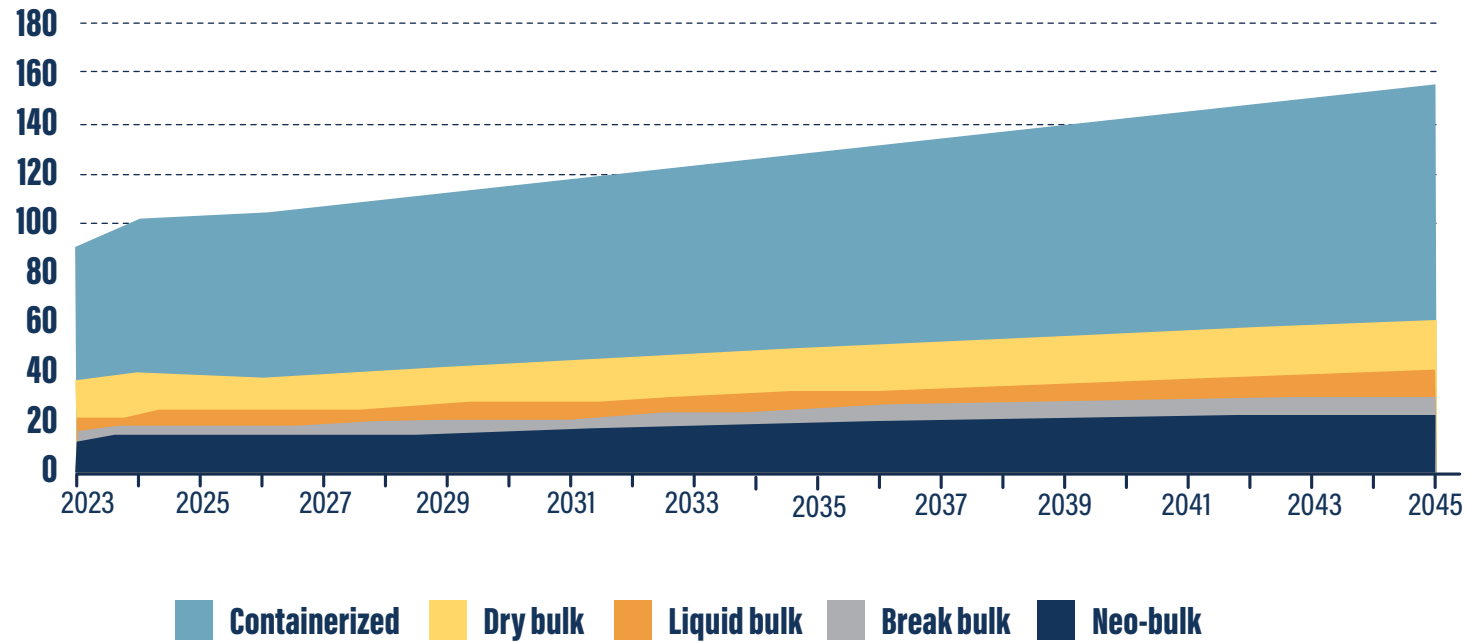
FORECASTS BY SUB STATE REGION

GROWTH IN VALUE | \$BILLIONS



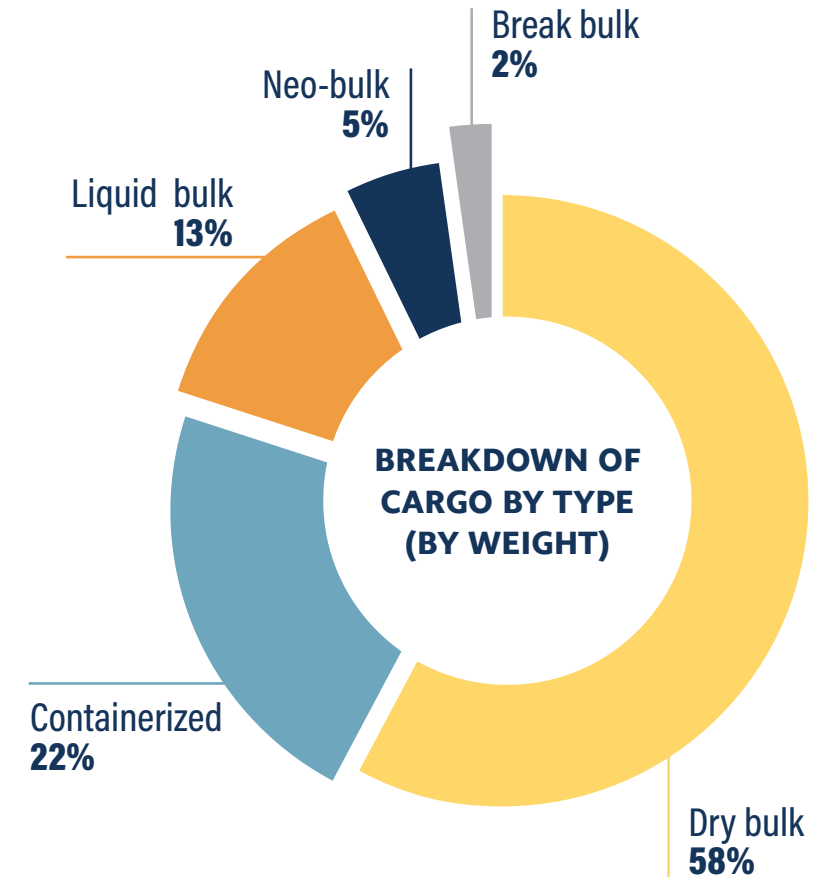
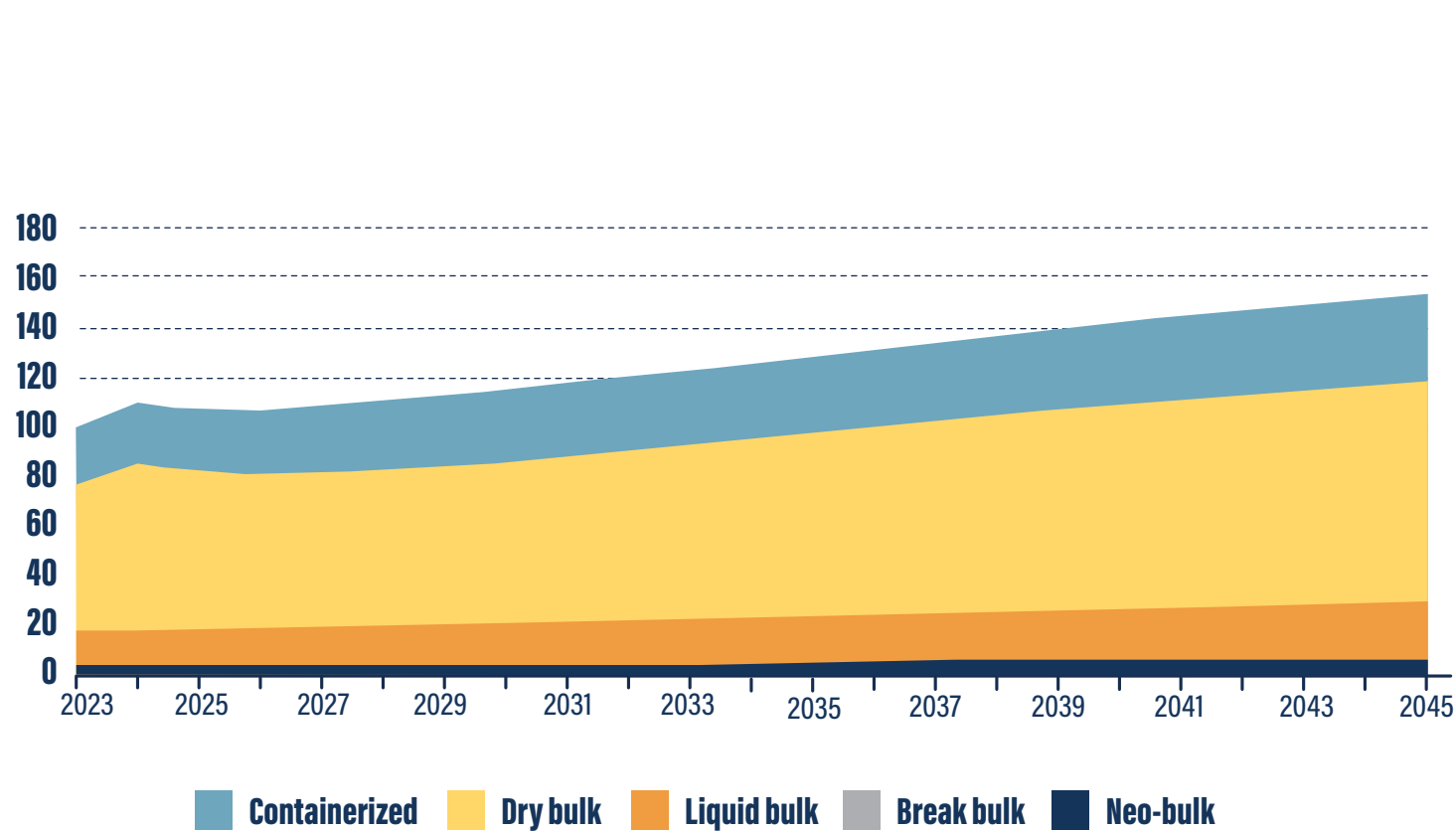
CARGO SEGMENTS

PROJECTED GROWTH IN CARGO (BY TYPE, VALUE IN \$BILLIONS)



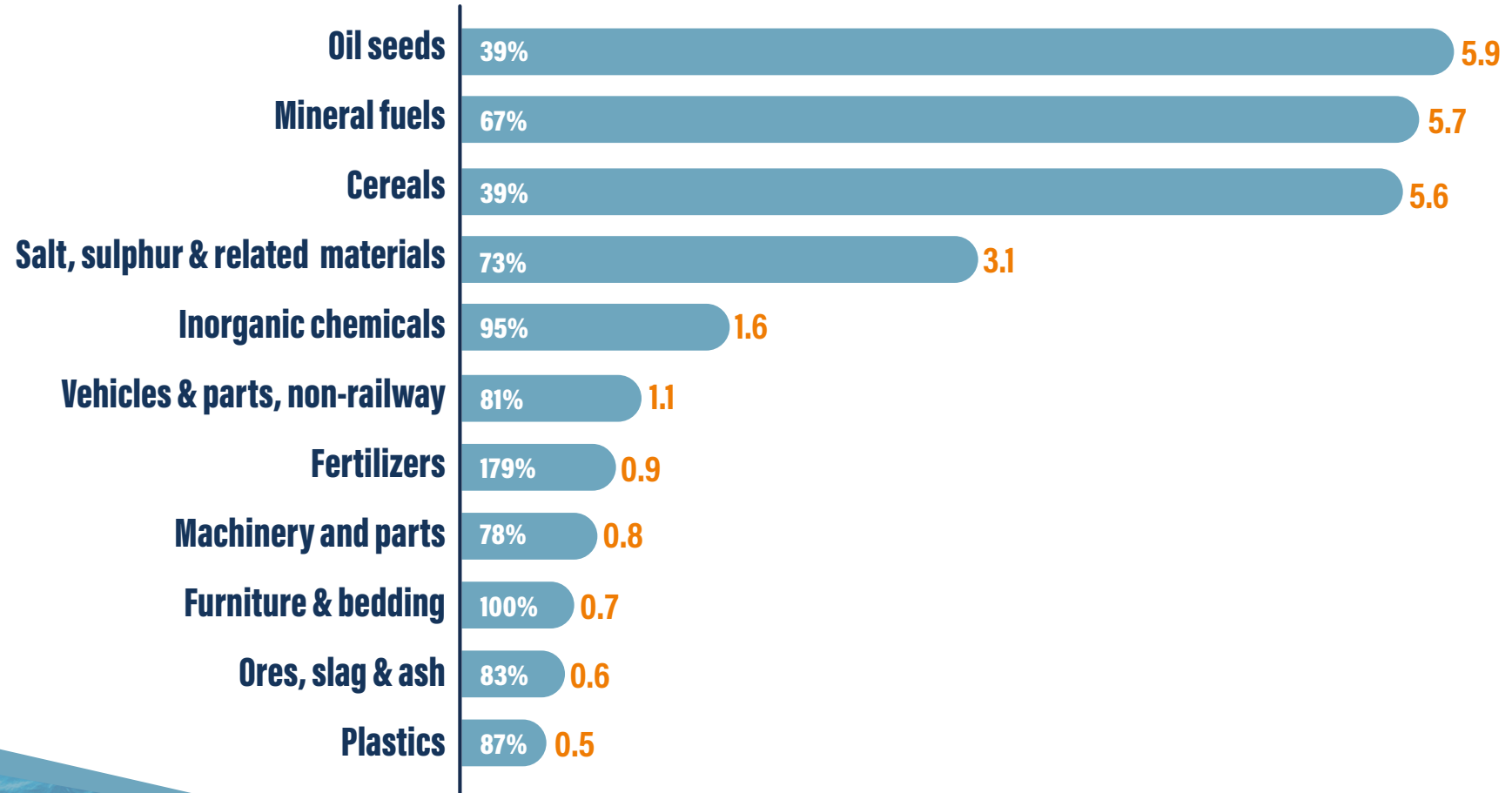
CARGO SEGMENTS

PROJECTED GROWTH IN CARGO (BY TYPE, BILLION KILOGRAMS)



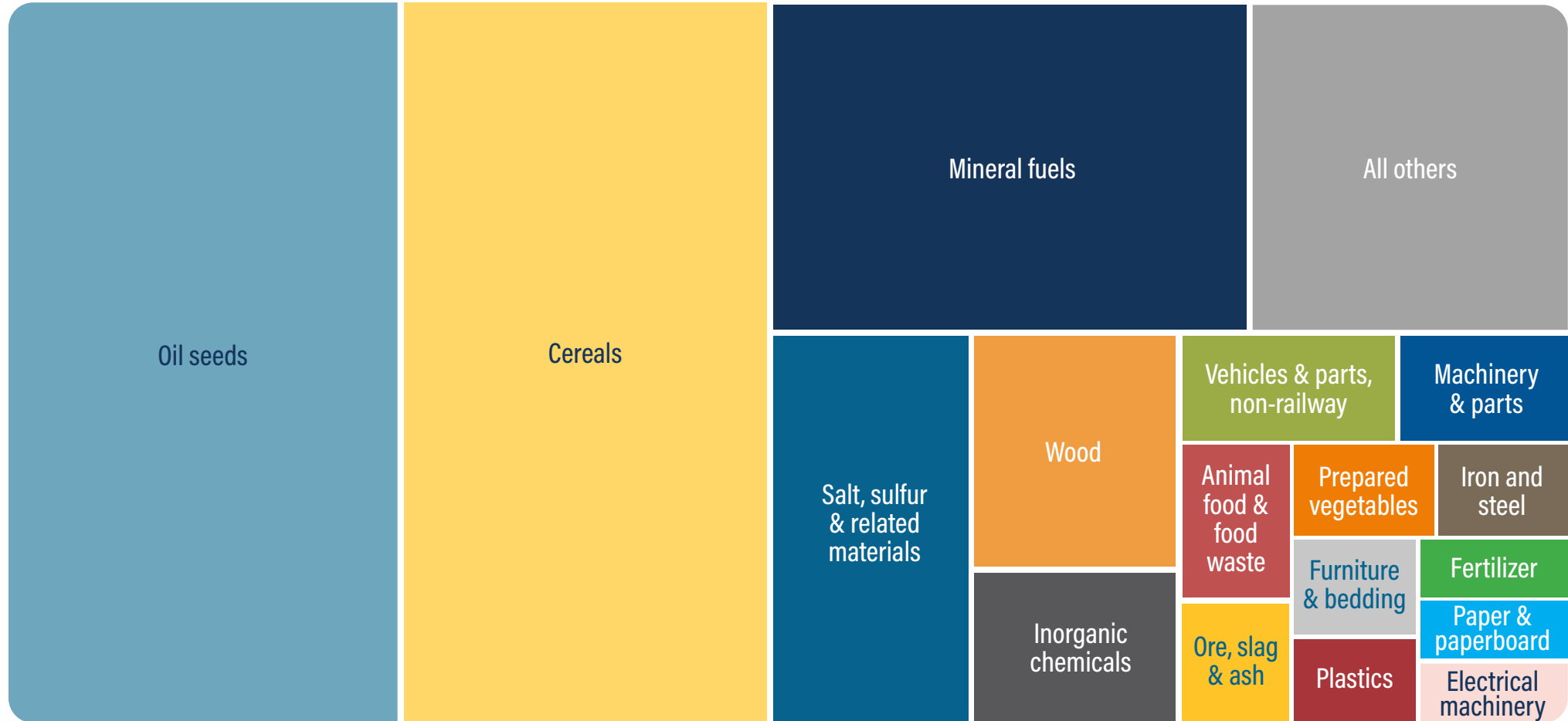
TOP GROWING COMMODITIES

NET CHANGE IN BILLIONS KG AND % GROWTH, 2023-2045



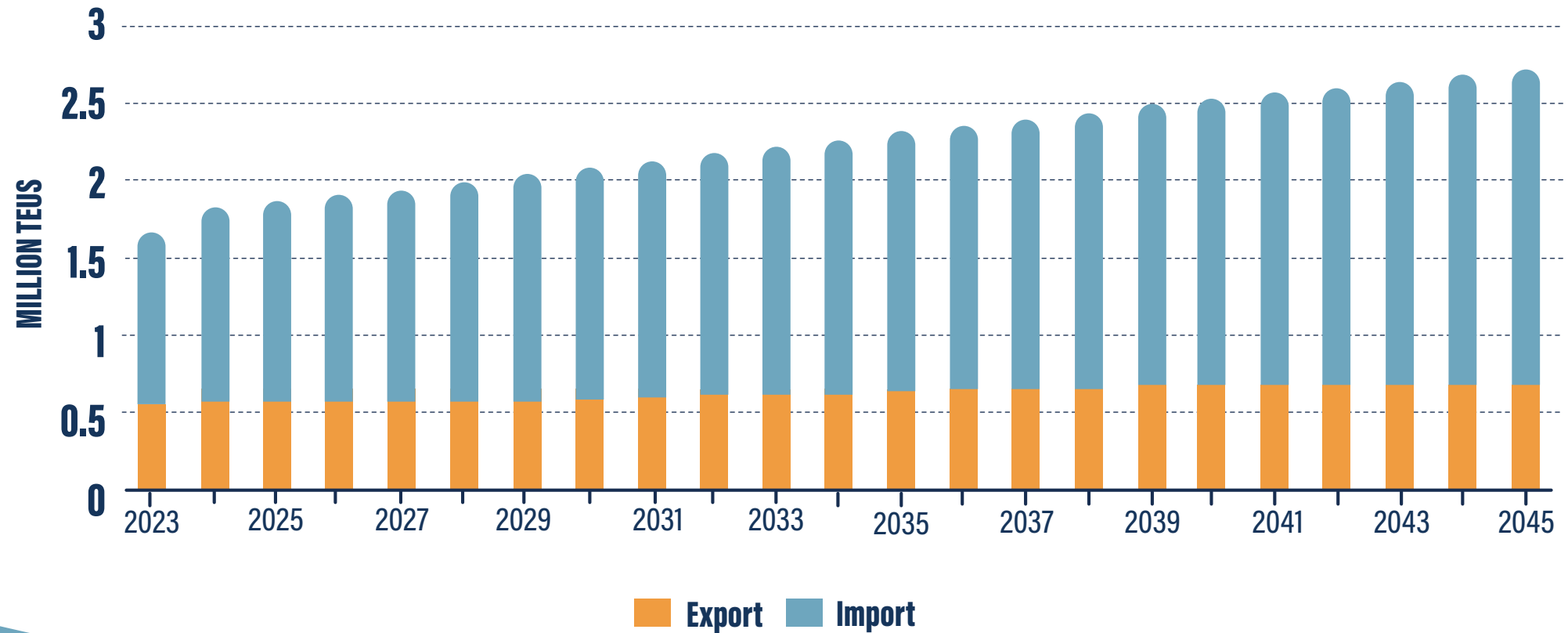
COMMODITY GROWTH BY WEIGHT

TOP TRADED COMMODITIES BY WEIGHT KG, 2023



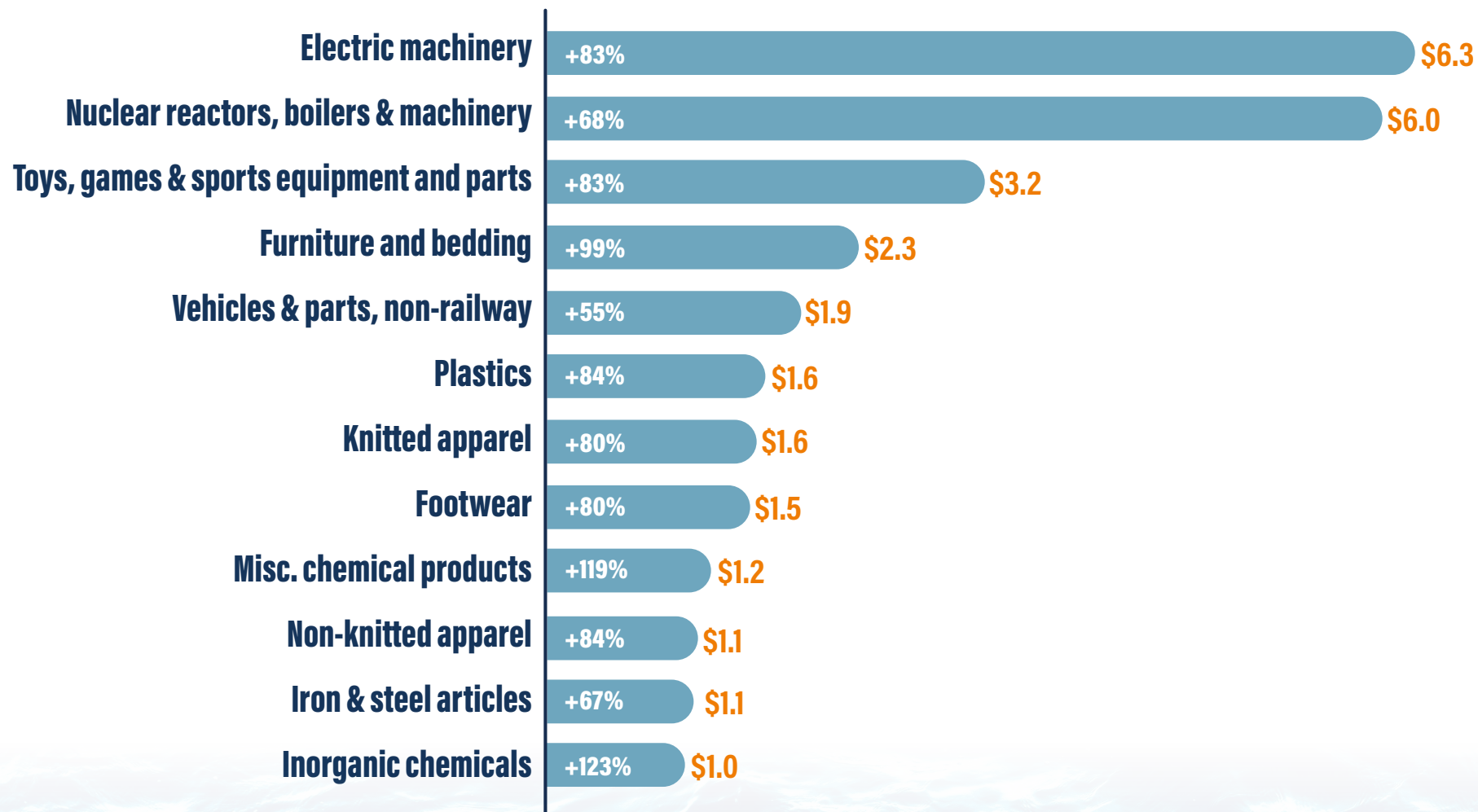
CONTAINER FORECAST

CONTAINER FORECAST WASHINGTON PORTS (LOADED FOREIGN TEUS)



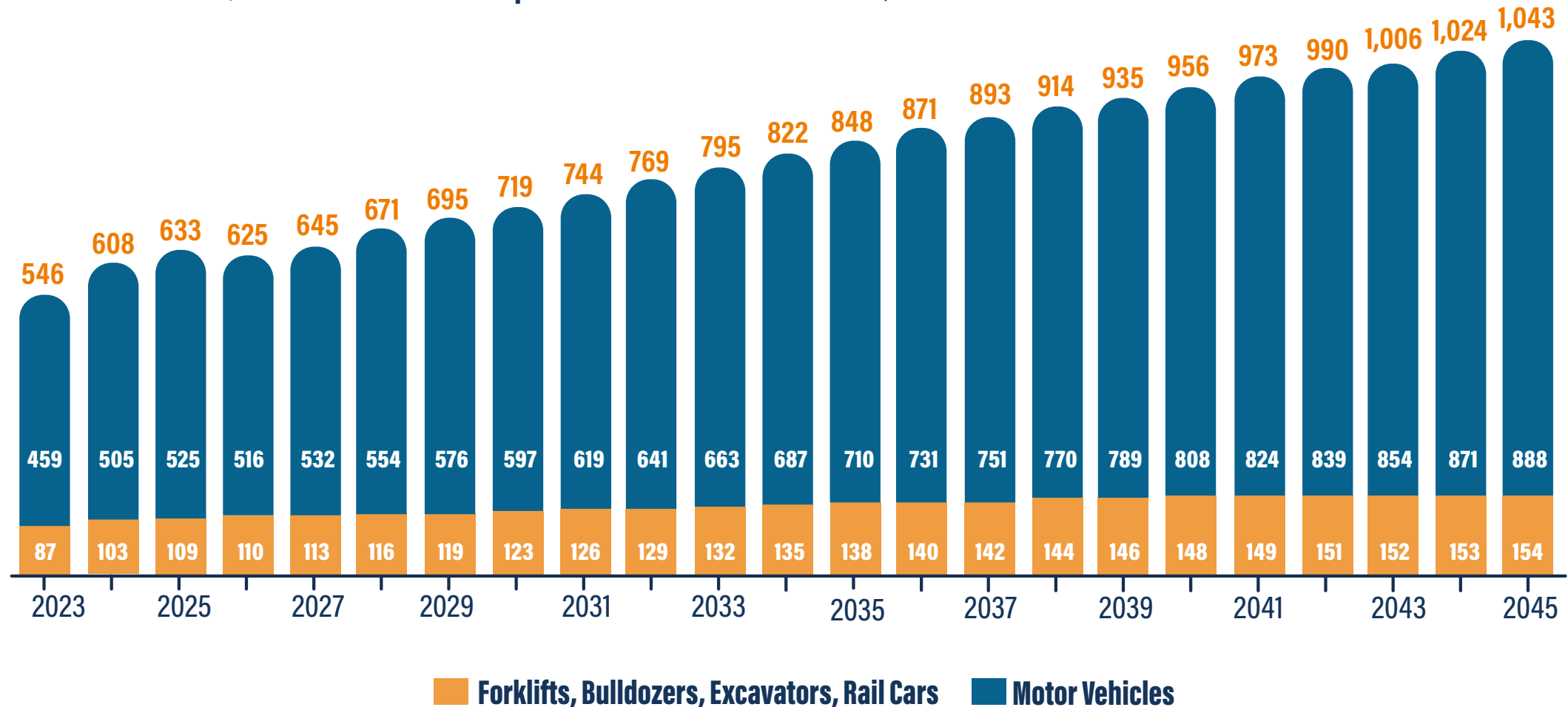
CONTAINER FORECAST

TOP GROWING CONTAINERIZED COMMODITIES BY NET CHANGE, \$BILLIONS AND % GROWTH, 2023-2045



RO-RO FORECAST

CHANGE IN ROLL-ON/ROLL-OFF VEHICLES | THOUSANDS OF VEHICLES, 2023-2045



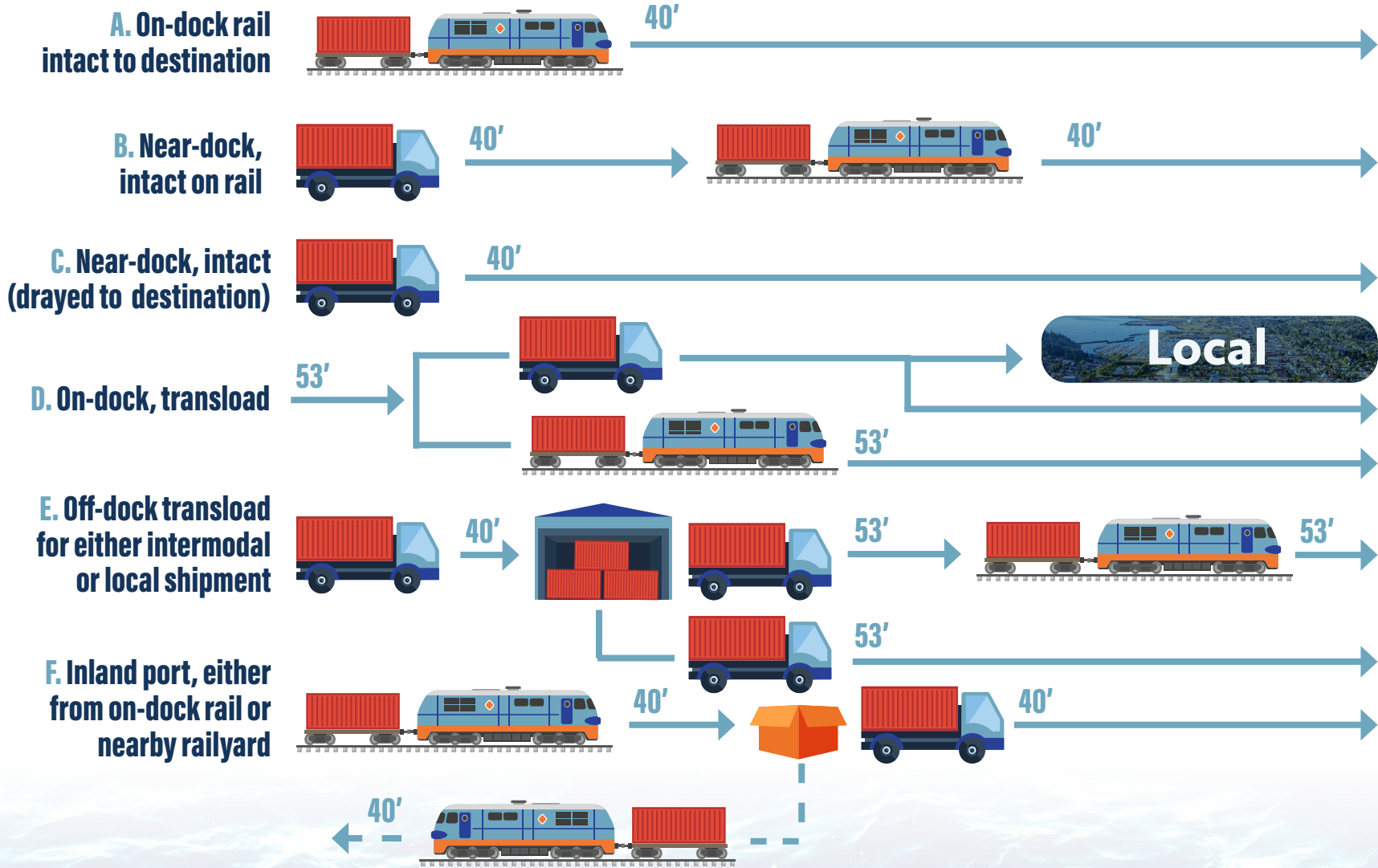
FACTORS AFFECTING FORECAST

- **U.S.-China rivalry**
- **Shifting supply chains**
- **Decline or deceleration in global trade**
- **Slowdown in global economic growth**
- **Geopolitical uncertainties and risks of future conflicts**
- **Growing demand for higher quality foods**
- **Larger container ships ⇒ fewer vessel calls**
- **Increased competition from other ports**
- **Changes in value of U.S. dollar**



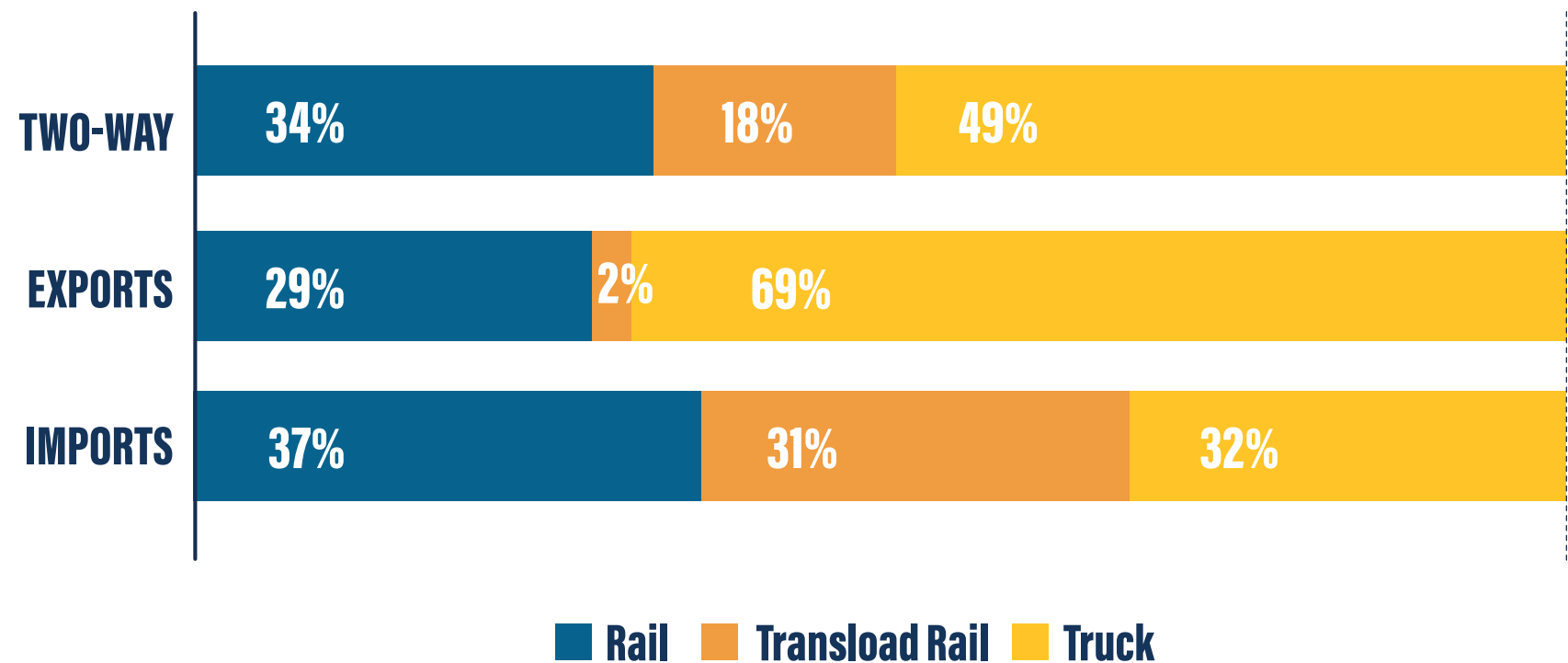
TRANSPORTATION MODAL SPLIT

IMPORTED CONTAINER MODAL SPLITS



CONTAINERIZED CARGO BY MODE TO/FROM WASHINGTON STATE PORTS, 2023

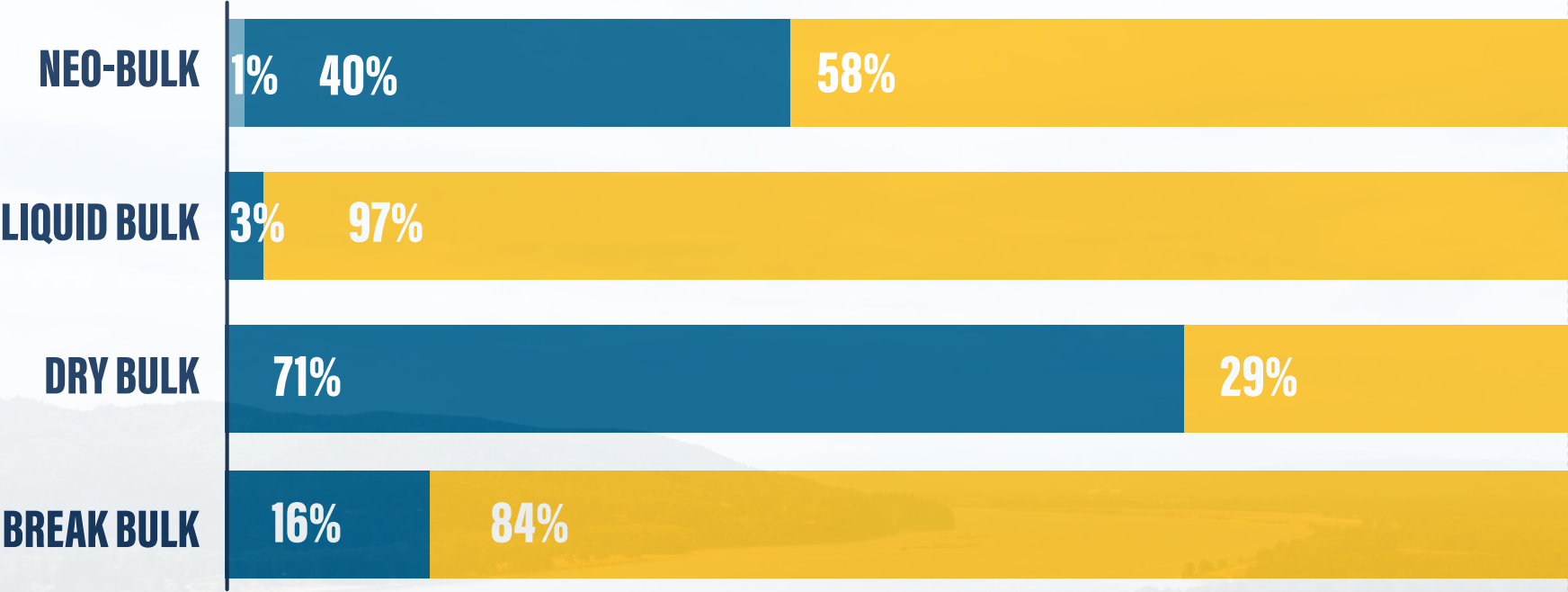
BASED ON TONNAGE



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

NON-CONTAINERIZED CARGO BY MODE TO/FROM PUGET SOUND, STRAIT OF JUAN DE FUCA, AND PACIFIC COAST PORTS, 2023

BASED ON TONNAGE

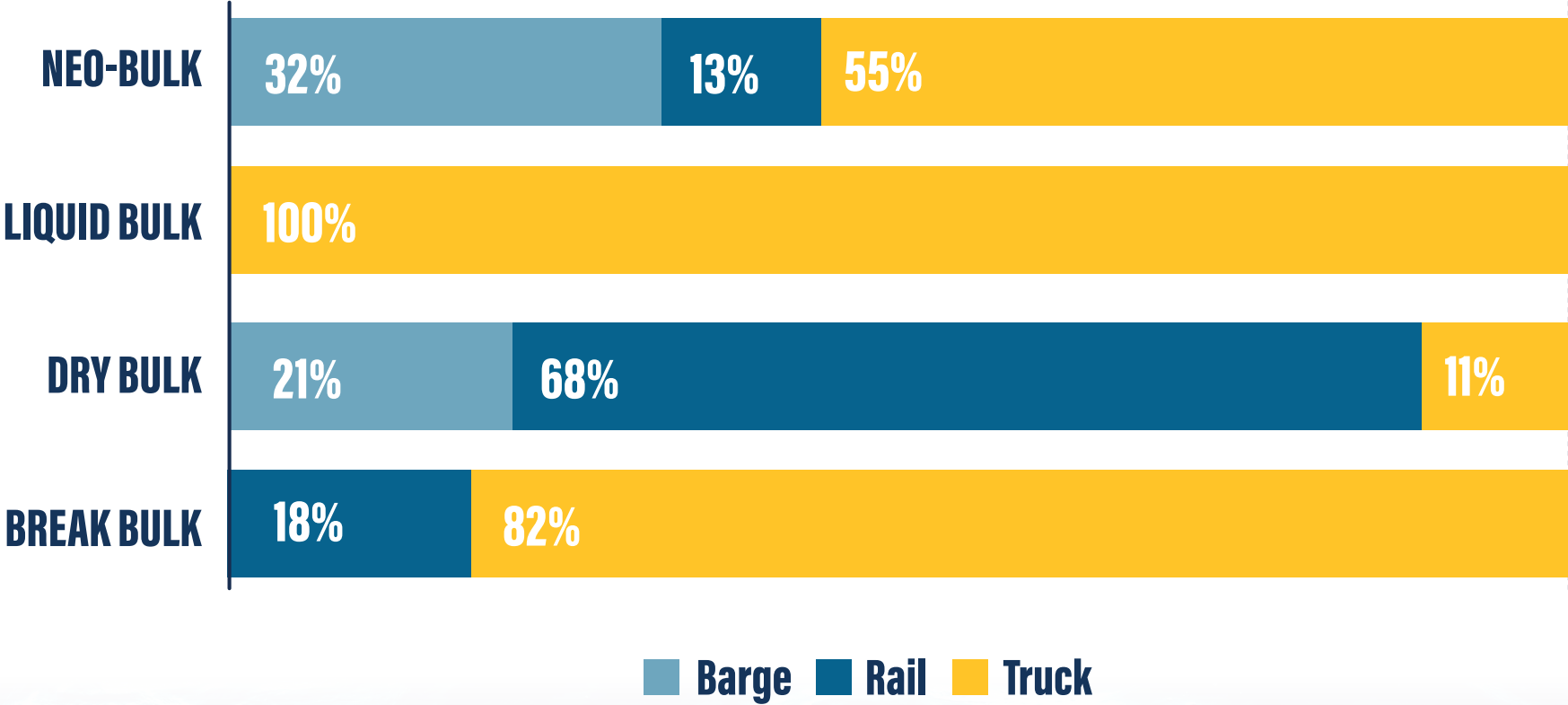


■ Barge ■ Rail ■ Truck

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

NON-CONTAINERIZED CARGO BY MODE TO/FROM COLUMBIA SNAKE RIVER SYSTEM PORTS, 2023

BASED ON TONNAGE



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

FINDINGS FROM BARGE FEASIBILITY ANALYSIS, 2024

| | ROUTE | | | | | |
|----------------------------------|---------------------------------|----------------------------|------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| | Neah Bay <i>Port Angeles</i> | Neah Bay <i>Everett</i> | Neah Bay <i>San Diego</i> | Port Angeles <i>San Diego</i> | Bellingham <i>Port Angeles</i> | Everett <i>San Diego</i> |
| TYPE OF CARGO | Green timber | Green timber | Cant logs | Finished dimensional lumber | Finished dimensional lumber | Finished dimensional lumber |
| ONSHORE LOADING/OFFLOADING COSTS | \$120,000 | \$120,000 | \$120,000 | \$90,000 | \$30,000 | \$120,000 |
| BARGING COSTS | \$15,000 | \$23,000 | \$233,000 | \$248,000 | \$3,000 | \$255,434 |
| SUBTOTAL | \$135,000 | \$143,000 | \$353,000 | \$338,000 | \$33,000 | \$375,434 |
| TRUCKING COSTS COMPARATOR | \$191,000 | \$420,000 | \$1,199,000 | \$804,000 | \$49,800 | \$786,000 |
| DIFFERENCE WITH BARGING | \$56,000 | \$277,000 | \$846,000 | \$466,000 | \$16,800 | \$410,566 |
| RATIO TRUCKING-TO-BARGING | 4.1 | 2.9 | 3.4 | 2.4 | 1.5 | 2.1 |
| COST PER TON | | | | | | |
| BARGING | \$22.50 | \$23.83 | \$58.83 | \$56.33 | \$5.50 | \$62.57 |
| TRUCKING | \$31.83 | \$70.00 | \$199.83 | \$134.00 | \$8.30 | \$131 |

NEXT STEPS

TAC #3, December 10

Incorporate feedback

Port profiles

Technical appendix

Data files

TAC #4 (TBD)

Final report due late February 2025



APPENDIX



McKINLEY RESEARCH
GROUP, LLC

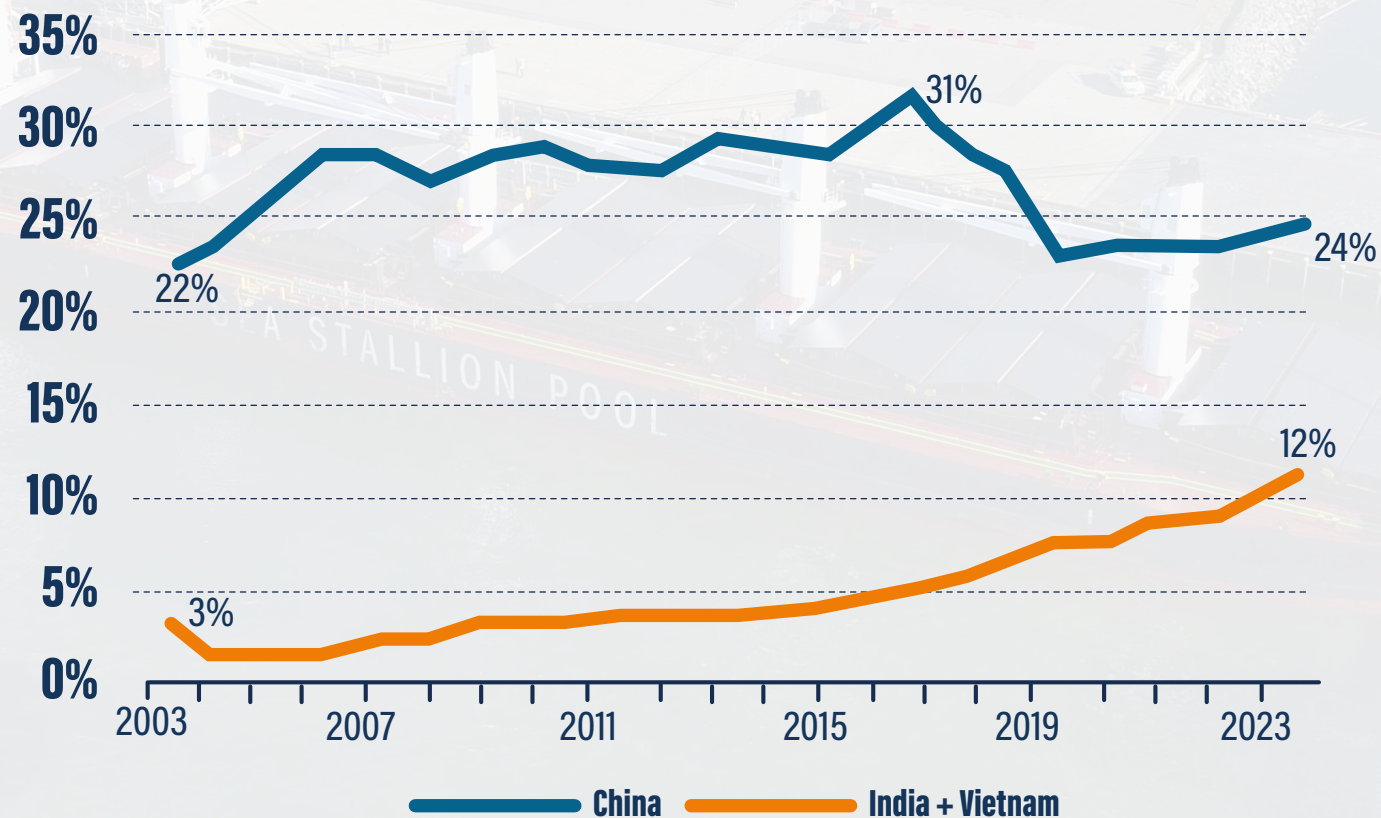


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SHIFTING SHIPPING LANES

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



SOURCES AND METHODS

DATA INPUTS

FREIGHT DATA

- WiserTrade
- USA Trade Online
- USACE Data
- Merchandise Trade Statistics

MODAL BEHAVIOR

- FAF 5.1

INTERVIEWS

FORECASTING

FREIGHT ECONOMY MODEL

- US BEA Benchmark IO
- OECD ICIO

ECONOMIC GROWTH

- Moody's
- BLS Employment Data
- CENSUS County Business Patterns

OUTPUTS

DETAILED ORIGIN/ DESTINATION IMPORTS/ EXPORTS

- Trading Partner
- Container/Bulk/
Breakbulk/Neo-bulk
(project cargo)
- Port of Entry/Exit
- Domestic Mode
- Commodity

ECONOMIC OUTLOOK FOR LEADING TRADE PARTNERS

REAL GDP GROWTH, GLOBAL AND MAJOR REGION, 2008-2023 (ACTUAL) AND 2024-2029 (FORECAST)

| REGION | COMPOUND ANNUAL GROWTH RATES | |
|--|------------------------------|-----------|
| | 2020-2023 | 2024-2029 |
| Advanced economies | 3.3% | 1.7% |
| Major advanced economies (G7) | 3.1% | 1.6% |
| European Union | 3.4% | 1.6% |
| ASEAN-5 | 4.5% | 4.6% |
| Emerging market and developing economies | 5.1% | 4.1% |
| Emerging and developing Asia | 5.9% | 4.7% |
| Latin America and the Caribbean | 4.6% | 2.5% |
| Middle East and Central Asia | 3.9% | 3.7% |
| Sub-Saharan Africa | 4.0% | 4.1% |
| World | 4.4% | 3.1% |
| <i>Select Countries/Regions</i> | | |
| China | 5.5% | 3.8% |
| Japan | 1.8% | 0.7% |
| Taiwan | 3.5% | 2.5% |
| Vietnam | 5.2% | 6.4% |
| South Korea | 2.8% | 2.2% |

- Growth projected to slow down among most major trade markets.
- Slower growth among Asian economies could be a drag on trade volumes through PNW ports.
- China will slow from 5.5% per annum growth from 2020 to 2023 to 3.8% between 2024 and 2029.
- Vietnam projected to see an increase in growth over this period, from 5.2% per year to 6.4%, in part due to a rise in new manufacturing investments in the country and supply chain diversification.

DATA SOURCE: INTERNATIONAL MONETARY FUND, WORLD ECONOMIC OUTLOOK, 2024.

 SLOWER GROWTH FORECASTED  MORE RAPID GROWTH FORECASTED



PORT ASSESSMENT: PRELIMINARY FINDINGS

PORT MARINE CARGO CAPABILITIES AND ASSETS

| 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 | <ul style="list-style-type: none"> • Deepwater dock • Barge dock • Laydown space | <ul style="list-style-type: none"> • Pump-out • Electrification • Improved road access • Warehouse |
| Bellingham | Seaport | Class I: BNSF (planned) | I-5 | | (✓) | (✓) | (✓) | (✓) | none currently | n/a | <ul style="list-style-type: none"> • Cargo dock • Barge dock • Warehousing • Laydown space | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Barge terminal • Container crane | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Southwest Washington Grain Project • Public grain storage and transloading facility |

| 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 | | | | |
| Everett | Seaport | Class I: BNSF | I-5 US2 SR529 | | ✓ | ✓ | ✓ | ✓ | Cement, project cargo, aerospace components | Japan, South Korea, China | <ul style="list-style-type: none"> • 2 marine terminals with 8 berths • Barge terminal • Satellite intermodal facility | <ul style="list-style-type: none"> • 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 | ✓ | ✓ | ✓ | ✓ | | Soybeans, seafood, forest products, autos, biodiesel | China, South Korea | <ul style="list-style-type: none"> • 4 deep water terminals with 5 berths • Warehousing • Rail loops • Paved cargo yard | Terminal 4 Expansion & Redevelopment |
| 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 | <ul style="list-style-type: none"> • 5 marine terminals • 2 grain elevators • Cargo dock • Barge dock • Liquid bulk facility • Warehousing | <ul style="list-style-type: none"> • Expansion of grain elevator • Expansion of rail |
| Klickitat | Riverport | Class I: BNSF, UP | I-84 | | | | ✓ | | Logs | Domestic | <ul style="list-style-type: none"> • Barge marine terminal • Log yard | Paving for additional storage capacity, stormwater management investments |

| 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 | | | | |
| Longview | Riverport | Class I: BNSF, UP | I-5 | ✓ | ✓ | ✓ | ✓ | | Grain, petcoke, potash, project cargo (oversized industrial), steel | China, Japan, Korea, Philippines | <ul style="list-style-type: none"> • Three marine terminals with 9 berths • Ro-Ro • Portable conveyor • Cranes, stackers, lifts • Industrial Rail Corridor | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 10 container terminals and 47 cranes • 5 non-container terminals for breakbulk cargo and automobiles • Bulk terminals • On-dock rail and nearby intermodal yards | <ul style="list-style-type: none"> • T91 cold storage facilities • Rail and intermodal facility expansion • Waterfront electrification program • Industrial stormwater and air quality mitigation |
| Pasco | Riverport | Class I: BNSF | I-182 US12 US395 | | ✓ | | | ✓ | Wood chips, grains, frozen foods | Domestic | <ul style="list-style-type: none"> • Barge terminal • Rail served industrial center • Large scale food processing facility • Dairy processing facility | <ul style="list-style-type: none"> • Warehousing and industrial park • Waterfront expansion area for open storage and industrial use • Darigold Processing Facility • Barge terminal improvements |

| 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 | <ul style="list-style-type: none"> • 6 marine cargo terminals • Logyard • IHTF • Cargo surge area • Warehousing | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 2 grain storage complexes • 3 barge slips • 2 cargo docks • Stackyard • Warehousing | <ul style="list-style-type: none"> • Industrial water system upgrades • Expansion of intermodal rail |

| PORT | TYPE | SURFACE ACCESS | | CARGO TYPE (✓) = PLANNED | | | | | MAJOR COMMODITIES | MAJOR MARKETS | CARGO INFRASTRUCTURE | PLANNED CARGO PROJECTS |
|----------------|-----------|--|-------------------------|--------------------------|-----------------|-------------------|-----------------|------------------|-------------------------------------|---------------|---|------------------------|
| | | <i>Rail</i> | <i>Highway</i> | <i>Liquid bulk</i> | <i>Dry bulk</i> | <i>Break bulk</i> | <i>Neo-bulk</i> | <i>Container</i> | | | | |
| Whitman County | Riverport | Short lines: PCC Railroad Camas Prairie Railroad | SR194 SR193 SR127 | | ✓ | | ✓ | | Grain, logs, wood chips, fertilizer | Domestic | • 3 barge facilities with grain elevators | None |
| Woodland | Riverport | Class I: BNSF, UP | I-5 | | (✓) | | | | None currently | n/a | n/a | Barge facility |

EMERGING ISSUES AND OPPORTUNITIES

**Dam removal
reducing navigable
distances along
the Columbia Snake
River System**

Inland ports

**Electrification
of ports**

**Planned
transportation
projects**

**M5 Marine
Corridor and
shortsea barging**

**PNW
population
growth and
freight demand**

Offshore wind

KEY TAKEAWAYS

RECENT DECLINE IN OVERALL TRADE VOLUMES

- Total volumes down 26% since 2018
- Container volumes down 33% since 2018
- Driven by declines in trade with China
 - 41% decrease in TEUs since 2018 (onset of the Trade War).

EAST ASIA: DOMINANT MARKET FOR WASHINGTON STATE PORTS

- Downturn in trade with East Asia can have profound impact on overall trade volumes.

DOMESTIC TRADE VOLUMES DOWN SINCE 2013

- Much of decline due to crude oil
- Containerized trade (two-way): up from 700,000 TEUs in 2017 to 990,000 TEUs in 2022

KEY TAKEAWAYS (CONT'D)

BARGE PLAYS SIGNIFICANT ROLE ON COLUMBIA SNAKE RIVER SYSTEM

- 21% of two-way international dry bulk shipments in CSRS
- 32% of neo-bulk shipments in CSRS

TRADE VOLUMES PROJECTED TO GROW BETWEEN 2023 AND 2045, DEPENDING ON MODE/COMMODITY

- Annual oil seed exports: projected to grow by 5.9 million metric tons by 2045 (39%)
- Mineral fuels: projected to grow by 5.7 million metric tons
- Cereals (primarily wheat): projected to grow by 5.6 million metric tons
- Container volumes: projected to grow more than 2% annually
- RoRo trade: projected to grow 3% annually

A VARIETY OF FACTORS COULD IMPACT LONG-TERM PROJECTIONS:

- Shifting supply chains affecting shipping lanes
- Global downturns in trade and economic growth
- Structural changes in the shipping industry
- Increased competition from other ports