



2019
**NORTH AMERICAN
PORTS OUTLOOK**



**CUSHMAN &
WAKEFIELD**



Executive Summary

As U.S.-China trade continues to dominate headlines and uncertainty looms for numerous industries, many eyes stay turned to the ports and intermodal sector. Today, consumers from all over the world want to receive goods faster, no matter where the product comes from, and that expectation is not going away anytime soon. The ports and intermodal industry remains essential to the supply chain process and will continue to evolve to meet the increased demand for goods.

- 2018 was a solid year for both the U.S. and global economies, as well as a record-setting one for U.S. industrial real estate. Real gross domestic product (GDP) rose 2.9% in the U.S. which helped power industrial net absorption to reach an all-time high of 284.9 million square feet (msf) for the year. 2019 will continue this positive trend.
- Trade slowed through the first half of 2019, as did investment and global consumption. However, real GDP is projected to grow by 2.4% in 2019—slower than the 3.2% growth in 2018 but still a solid rate.
- Currently, five shipping companies control 64% of global ocean container shipping capacity and the top 10 manage 83%, which are further “bulked up” by their participation in alliances.
- Shipping lines have responded to containerized trade growth by increasing vessel size. This increase results in fewer calls to move the same number of containers. Larger vessel sizes may also limit which ports can be called due to insufficient access channel depths and air drafts.
- Intermodal traffic in the U.S. increased 5.5% in 2018—a fifth annual record in the past six years—with strong volumes throughout the year. This volume includes both international and domestic freight.
- Approximately 90% of dry, non-bulk manufactured goods in international trade are shipped in containers. Overall, inbound TEU volumes to leading North American container ports were up approximately 6.0% (from 2017) and outbound loaded volumes were up approximately 2.0%.
- Inland ports—multimodal facilities paired with distribution centers located far from the sea—have sprung up around the U.S., particularly over the past decade. Recent growth is tied to the extension of international transport efficiencies generated by containerized cargo shipments to landlocked points.
- Rail-oriented inland ports, typically further from a seaport, are evolving into extended logistics clusters or freight villages with dozens of facilities. The most successful inland intermodal facilities are typically located near major population centers (such as Atlanta) or at crossroads of multiple rail carriers (such as Kansas City or Memphis).
- Port activities linked to other vessel types and marine operations continue to expand, with opportunities for ports and waterfront property developers. Automobile imports, for example, continue to increase.



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MARITIME PORTS

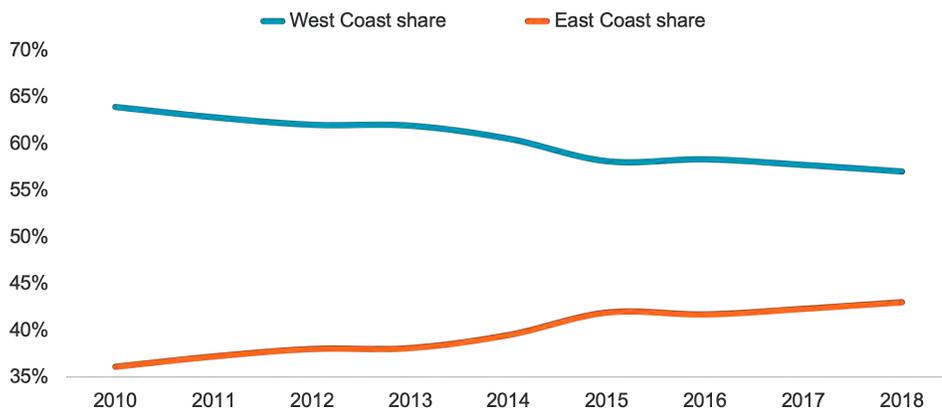
2018 was a solid year for both the U.S. and global economies, as well as a record-setting one for U.S. industrial real estate. Real gross domestic product (GDP) rose 2.9% in the U.S. which helped power industrial net absorption to an all-time high of 284.9 million square feet (msf) for the year. Trade volumes were also strong, with strong GDP growth and private consumption, coupled with existing patterns of global supply chains, continuing to drive large volumes of imports. U.S. exports also rose strongly in 2018, up 4.7% to \$1.7 trillion, the highest on record.

Trade slowed through the first half of 2019, as did investment and global consumption. Nevertheless, real GDP is projected to grow by 3.3% in 2019—slower than the 3.6% growth in 2018 but still a solid rate—and as [Cushman & Wakefield's June 2019 Global Macro Forecast](#) points out, the underlying economic fundamentals that drive demand for real estate remain healthy. Most notably, job growth remains steady with the global economy expected to create close to 29 million net new jobs in 2019. That will translate into another 500 msf+ of industrial net absorption in markets around the world. Similarly, the International Monetary Fund projects global growth will improve in the second half of 2019 and return to 3.6% in 2020.

U.S. East Coast ports gained share in 2018, continuing a 10-year trend. The Atlantic Coast ports accounted for 43% of inbound loaded twenty-foot equivalent units (TEUs) for the nine major containerized ports, up from 42.3% in 2017.

U.S. East Coast Ports Gaining Market Share: Percent of Loaded Import TEUs

Coast by Year (2010-2018)

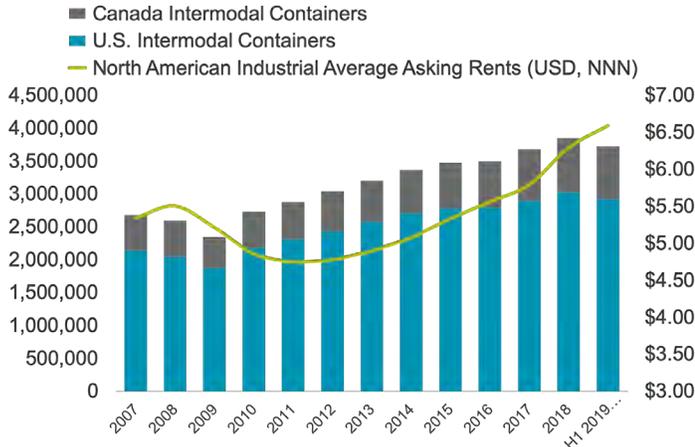


Source: New Harbor Consultants analysis of container data from the ports of Baltimore, Charleston, Long Beach, Los Angeles, New York-New Jersey, Oakland, Savannah, Seattle-Tacoma and Virginia

Intermodal traffic in the U.S. increased 5.5% in 2018—a fifth annual record in the past six years—with strong volumes throughout the year.

10 KEY SUCCESS FACTORS FOR INTERMODAL

North American Intermodal Rail Traffic: Intermodal Containers and Industrial Rent Growth



Source: Association of American Railroads, Cushman & Wakefield Research

This volume includes both international (about two-thirds or the total, including transloading of import/export loads) and domestic freight. The main limitation to greater growth on the domestic side was availability of equipment. Looking forward, the continuing gains by Atlantic and Gulf ports suggest potential weakening in rail intermodal volumes which are strongly tied to the Pacific ports. However, the planned extension of the BNSF Railway network into the East at the CSX Northwest Ohio ramp could partially offset this trend.

Containerized Cargo

Containerized cargo—especially inbound loaded—correlates closely with warehousing demand. Cargo is containerized when it is placed in a standard shipping container that can be handled interchangeably on vessels, in terminals, and via inland transport modes. Standard containers used in international maritime trade come in three main lengths: 20, 40 and 45 feet. Standard containers are typically 8 feet wide and 8.5 feet high (9.5 feet high, for ‘high-cube’ boxes), regardless of length. Almost any commodity can be moved in standard shipping containers, but containerized cargo generally includes the highest value and most time-sensitive maritime commodities. Approximately 90% of dry, non-bulk manufactured goods in international trade are shipped in containers. Container cargo volume and the capacity of container ships are usually measured in TEUs, each nominally equal to one 20-foot container. Container vessel capacities range from barges carrying 100 TEUs or less to

Certain aspects are common to any industrial development, but others are specific to the multimodal transportation role played by a landlocked hub. The investment thesis rests on a combination of projected freight volume, unmet logistics needs, land and labor availability and supporting services. Considering these 10 key success factors during the planning of a new or expanded intermodal logistics hub can help guide an objective analysis of the opportunity.

1 DEMAND

Can volumes reach 10,000-20,000+ lifts per year? Who are the anchor shippers?

Objective assessment of projected traffic volumes to-and-from the service area is a key step in the evaluation process. Specific industries, products, origins and destinations should be identified. Anchor shippers are essential. Analysis must be fact-based and compelling—demonstrating enough volumes to amortize facility costs. Projected demand should reach 20,000 to 50,000 annual intermodal lifts for a greenfield destination facility, although lower volumes of 10,000-30,000 could be viable if the facility is along a route to another location to be served by rail.

2 PORT LINK

Are there close ties with a successful ocean container port 200+ miles away?

A link with a successful ocean container port is important if international container flows are a key part of demand. Distance to the seaport should not be much less than 200 miles to ensure that rail transit can be cost-competitive with truck. High container volumes at the port and on-dock rail are advantages for an inland terminal.

ships capable of carrying over 20,000 TEUs. Domestically, containerized cargo is typically transported by truck or rail, although some is moved by barge on the inland waterway network and along the coasts.

Strong results were booked in 2018 by many of the 12 leading North American container ports. Overall, inbound TEU volumes were up approximately 6% (from 2017) and outbound loaded volumes were up approximately 2%.

- West Coast:** The strongest growth rates for inbound loaded containers were recorded at Prince Rupert (up 8.6%) and Long Beach (up 6.1%). Los Angeles inbound loads were up 3.3% and the Northwest Seaport Alliance experienced inbound growth of 5.2%. Oakland recorded a solid 5% inbound growth, but the port's generally-strong outbound direction declined.
- Gulf Coast:** Houston had a very strong year with inbound volume up 9.6% and outbound up 11.4%. For perspective, Houston's growth rates for both inbound and outbound were higher than the average for either the Atlantic or Pacific Coasts.
- Atlantic Coast:** Each of the largest U.S. East Coast ports did very well in 2018. Savannah had a record year with 10.9% growth on inbound loaded boxes and 5.2% outbound. Charleston and Norfolk were in the 4-6% range on inbound containers. The largest port on the East Coast—New York-New Jersey—recorded an 8.2% gain in inbound.

INBOUND MARKET SHARE

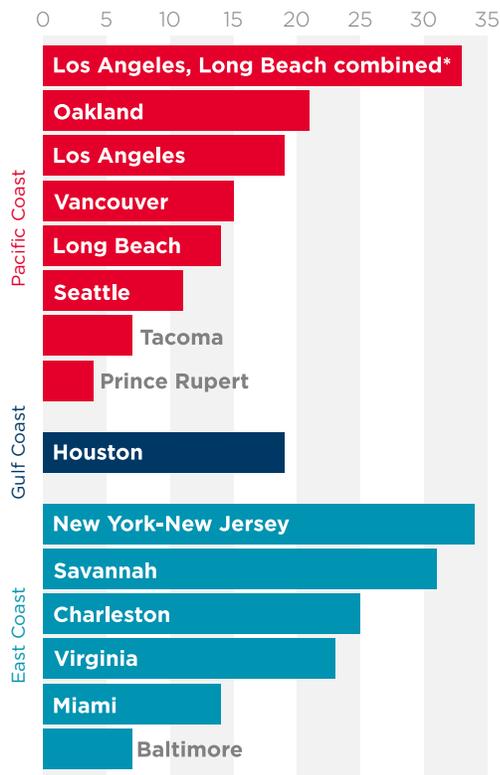


OUTBOUND MARKET SHARE



Port volumes are driven in part by the range of ocean services offered, connecting each gateway to the world. The number of weekly container services calling at each port is a useful indicator of a port's competitiveness in attracting traffic.

Inbound Weekly Container Services by Port



Source: New Harbor Consultants analysis, May 2019. | Note: Coastal totals only include listed ports and excludes Ro-Ro (Roll-On Roll-Off), one-way, multi-purpose carrier, and non-weekly services.

It is significant, then, that the number of inbound weekly services calling at Pacific ports declined by 8% in 2018. Inbound services declined most at Oakland and Long Beach, while they rose at the Pacific Northwest ports of Seattle, Vancouver and Prince Rupert. Houston added one weekly service. On the East Coast, most ports lost one service, although Virginia lost five and Miami lost two.

The East Coast picture reflects larger vessel size which can handle the TEU increases with fewer calls. New York-New Jersey and Savannah continue to lead the pack on the East Coast, with Charleston and Norfolk also often included in vessel port rotations. Miami is in a different category, as it has greater orientation to South America and the Caribbean. Baltimore handles significantly fewer weekly containership calls, although it is the nation's leading vehicle roll on/roll off cargo port.

3 SITE

40+ acres for intermodal ramp, more for distribution facilities; near good highway access?

Open acreage, utilities and easy connections to good state or interstate highways are essential. Given noise and air emission concerns, a facility is best situated away from residential uses. About 40 acres would be the minimum size for an intermodal terminal, with adequate space for nearby distribution facilities adding further to the site requirements. Adequate water, sewer, electricity and access roads are required.

4 RAIL

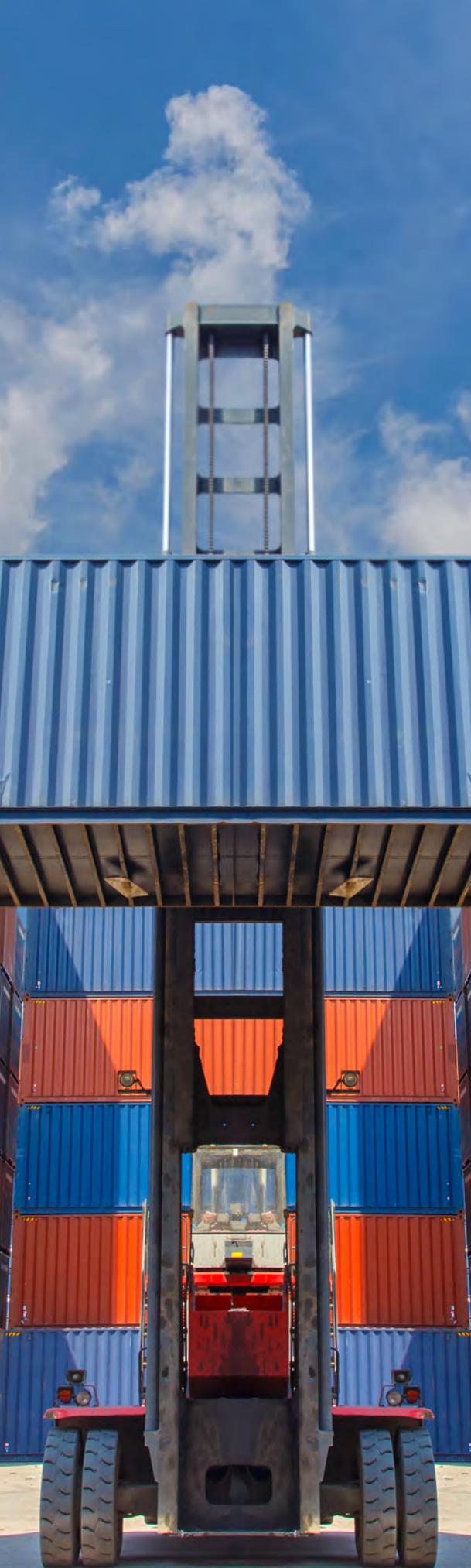
Situated on or near a mainline intermodal rail route; attractive to a Class I railroad?

The proposed site must lie on or near a mainline intermodal rail route. One or even two Class I railroads must be attracted to the project to develop and help champion the intermodal facility that lies at the heart of an inland port. A railroad's interest will be directly linked to current and future intermodal volumes which are the primary source of freight revenue for Class I railroads. Railroads will be most attracted to a location that could allow smooth operations—quick on-and-off the mainline without causing congestion, and easy set-off and pick-ups of blocks of cars if the facility is not the final destination on the route.

5 COST

Competitive land, improvements, road-links, operating costs and taxes?

Cost-effective capital investments and ongoing operations are important. Inland ports operate in a competitive environment and need to keep costs under control. Taxes vary by state and municipality, and figure prominently in a location decision—this can be particularly true for businesses siting facilities after the establishment of the intermodal ramp.



Import Transit Time from Asia to Select West Coast North American Ports

Transit Time in Days, May 2019

	Busan Inbound	Shanghai Inbound	Singapore Inbound
Los Angeles	11	11	22
Long Beach	10	10	25
Oakland	14	18	26
Seattle	10	13	25
Tacoma	10	12	22
Vancouver	10	12	25
Prince Rupert	9	10	23
West Coast Fastest Inbound	10	10	22

Export Transit Time from West Coast North American Ports

Transit Time in Days, May 2019

	Busan Outbound	Shanghai Outbound	Singapore Outbound
Los Angeles	16	18	28
Long Beach	15	20	*
Oakland	12	16	25
Seattle	12	18	*
Tacoma	12	19	23
Vancouver	14	19	20
Prince Rupert	33	23	20
West Coast Fastest Outbound	12	16	20

Import Transit Time to Select East Coast North American Ports

Transit Time in Days, May 2019

	Busan Inbound	Shanghai Inbound	Singapore Inbound
New York - New Jersey	24	26	24
Baltimore	28	30	*
Virginia	28	29	27
Charleston	25	27	28
Savannah	23	24	29
Miami	32	34	33
East Coast Fastest Inbound	23	24	24

Export Transit Time from East Coast to Select European Ports

Transit Time in Days, May 2019

	Algeciras Outbound	Hamburg Outbound	Rotterdam Outbound
New York - New Jersey	10	12	13
Baltimore	17	16	*
Virginia	13	11	11
Charleston	10	18	12
Savannah	12	13	13
Miami	10	*	26
East Coast Fastest Outbound	10	11	11

Rapid transit times to and from a port is another key indicator of competitive service. Prince Rupert, Long Beach, Los Angeles and Tacoma recorded the shortest inbound times from selected major Asian ports.

The number of days is similar for each West Coast port tracked (plus or minus a day or two); the exception is Oakland which lags the other West Coast ports but is very well-positioned for outbound traffic. Of course, ocean transit times are not the whole story when considering an end-to-end supply chain. Arriving in Prince Rupert, for example, is not the equivalent of reaching Los Angeles, although total transit times to an inland destination in the Midwest may be similar. The first port inbound on the West Coast for many services from Asia is Los Angeles or Long Beach.

For outbound transit times to the Asian ports of Busan and Shanghai, Oakland remained the winner, although in 2018 it surrendered its title of “fastest Singapore outbound transit” to the Port of Vancouver. Oakland or Vancouver is generally the last port outbound to these Asian ports, far ahead of other North American Pacific ports.

On the East Coast, New York-New Jersey leads the pack in terms of inbound transit times, whether from select Asian or European ports. The port records the fastest import transit time on half of eight major trade lanes and is generally the first port of call.

Savannah, however, also posts strong transit times—especially from East Asia—and is first port of call almost as often as New York. Miami records the fastest inbound service from the West Coast of South America, due to its favored southernmost location. Charleston and Norfolk have each improved their inbound transit times from Europe but have added a day or two on Asian services.

Outbound from the East Coast ports to Europe, transit times are more mixed. So far in 2019, Norfolk shows the quickest transit time to Rotterdam (supplanting Savannah from the prior year) and the fastest to Hamburg (replacing New York). Three ports—New York, Charleston and Miami—are tied for the shortest transit times to Algeciras (at the entrance to the Mediterranean Sea). Savannah and Charleston are often the last East Coast ports of call to European ports, while Norfolk and Charleston are often the last East Coast ports of call to Asian ports.

6 LABOR

What is the depth and breadth of the labor pool? What is the cost of labor?

The workforce must be capable of staffing the transportation and logistics facilities. Some of the types of jobs created at an intermodal ramp are lift operators, hostler drivers, gate operators, load planners and mechanics. Further development of related distribution centers creates a variety of material handling jobs, with attendant customer service representatives, salespersons, inventory managers, etc. Staffing can be a challenge, since available land may be a long commute from population centers.

7 BUSINESS CASE

Is the value proposition attractive to a developer, railroad and tenants?

A business case should be built for specific high-potential industry, product and origin-destination uses, demonstrating the economics of the proposed logistics site. In addition to transferring containers from rail to truck and vice versa, the core intermodal facility may be designed to act as a storage yard for loaded or empty containers to anchor shippers that would value that service.

8 ENVIRONMENTAL

Can it replace truck with rail traffic, making it attractive in a congested region?

Conversions of truck to rail traffic result in fewer greenhouse gas emissions. If the seaport area and/or seaport-inland route are heavily congested, these benefits are amplified.

Inland Ports

Inland ports—multimodal facilities paired with distribution centers located far from the sea—have sprung up around the United States, particularly over the past decade. Recent growth is tied to the extension of international transport efficiencies generated by containerized cargo shipments to landlocked points. This reflects, most simply, the vast size of the landlocked American interior; two-thirds of the nation's 50 largest cities by population are located away from the sea. These inland ports are at various stages of development. Some have evolved as extensive logistics hubs that combine warehousing (often with a foreign-trade zone designation) and distribution with rail intermodal, truck, barge, and in some cases, air freight operations.

Several types of inland ports have been developed, each with a dominant purpose or transport mode. Some of the earliest examples were in response to the need to repurpose Air Force bases slated for closure during 1989-1995. These tended to be air freight oriented and included locations near San Antonio, Columbus and Kansas City. More recently, inland ports have become an extension of marine terminals in order to alleviate seaside congestion and enhance capacity at ports where expansion can be difficult due to costs, environmental issues, and lack of available land. Rail-oriented inland ports, typically further from a seaport, are evolving into extended logistics clusters or freight villages with dozens of facilities.

The most successful inland intermodal facilities are typically located near major population centers (such as Atlanta) or at crossroads of multiple rail carriers (such as Kansas City or Memphis), with the largest and most active locations having both attributes (Chicago, Dallas). These locations are convenient to interstate highways for trucking access and are often located outside the city center to benefit from lower-priced land (e.g., Joliet, Chicago; Alliance, Fort Worth). The space required from an intermodal ramp varies from as little as 40 acres (e.g., the terminal in Jackson MS is 47 acres; the initial footprint for the Greer SC inland port was 38 acres) to close to 800 acres for each of the Joliet IL intermodal ramps. Logistics activities such as warehousing,



transloading, cross-docking, light assembly and packaging are typically conducted near intermodal ramps; together these transform the areas into true logistics hub.

eCommerce, with its need for same-day and next-day delivery from local market fulfillment centers, has given rise to increased demand for inland port property. For example, the Pennsylvania I-81/I-78 Distribution Corridor has added 86.2 million square feet of distribution space since the end of the Great Recession. This location is ideal for same-day service to the greater New York metropolitan area and stocks can be replenished via intermodal rail or truck. Retailers and third-party logistics providers benefit from the attributes offered by an inland port while volumes related to eCommerce delivery can contribute to the economic viability of a new inland port.

A word of caution is in order: Inland port concepts do not always take off—in any case, not immediately. The numbers must work for both shippers and the railroads, and complementary infrastructure and services take time to evolve. Shippers will only use the service if transit times, reliability and cost are attractive compared to truck. On the carrier side, railroads require enough volume to offset the cost of a facility, personnel and train operations. The level of volume needed to be viable will vary depending on whether the service will be new or leverage other existing flows, and whether the inland facility will be purpose-built or already operates to serve other flows.

9 PUBLIC SUPPORT

Is there active involvement by local officials and support from the public?

Active involvement of local, regional and state officials is crucial to over-coming various constraints (e.g., zoning, infrastructure and training) and obtaining enabling grants and tax incentives. Local public support is also essential, as issues about traffic congestion, emissions, and noise can evolve into concerted opposition if perceived local benefits do not outweigh those concerns.

10 COLLABORATION

Is strong leadership in place, with effective public-private collaboration?

All successful inland ports have involved extensive public-private cooperation, so assembling a strong team to plan and execute an inland port project is critical.

By providing outlets to foreign markets via intermodal rail and port gateways, inland ports facilitate logistics demand while delivering major economic benefits to landlocked regions. The continued growth of eCommerce and the ever-tightening delivery window requiring faster home delivery will continue to foster warehousing demand at new and existing inland hubs. Similarly, temperature-controlled transload and distribution facilities that can maximize the import/export of perishable food will also remain hot properties.



TRENDS TO WATCH

TRENDS LEGEND



WATCH LIST



ONGOING TREND



LONG-TERM RISK



OPPORTUNITY



Trade Policy

U.S.-China trade turmoil dominated the headlines in 2018 and there remains great uncertainty around the issue. Continued escalation of U.S.-China trade tensions could have a negative impact on container volumes, especially significant for West Coast ports. On the other hand, the strong supply base in China and the fact that several alternatives to China sources are also in Asia suggest that Transpacific trade volume is resilient.



Shipping Consolidation

Consolidation continues in the container shipping industry. Currently, five shipping companies control 64% of global ocean container shipping capacity and the top 10 manage 83%.

Shipping Consolidations and Players

Carrier Alliances and Members

Alliance	Members
2M + H	Maersk, MSC, Hyundai
Ocean Alliance	CMA, CGM (APL), COSCO, Evergreen, OOCL
The Alliance	Hapag Lloyd, Yang Ming, Ocean Network Express (ONE)
Major Independent Carriers	Hamburg Sud, ZIM, PIL, Wan Hai and the new SM Line

The acquisition of a majority stake in Orient Overseas Container Lines (OOCL) by COSCO Shipping Holdings (COSCO) in July 2018 and the merger of three Japanese container lines into the Ocean Network Express (ONE) in 2016 are recent examples of this trend. Such M&A activity has been driven by a desire for economies of scale and reduced competition. Large shipping companies are further “bulked up” by their participation in alliances. The three major alliances—the 2M Alliance (Maersk and MSC), the Ocean Alliance (CMA CGM, COSCO and Evergreen) and THE Alliance (ONE, Hapag Lloyd and Yang Ming)—together control 79% of world containership supply.



Ocean Freight Rates

Rates rose during 2018 but have declined sharply during the first half of 2019, and levels so far in 2019 remain far below their 2014 highs, as measured by the Shanghai Containerized Freight Index. The result has been continued stress on shipping company financials. Weaker than anticipated volume growth in 2018 linked to the U.S.-China trade squabble and higher fuel costs have also pinched profits. Even higher costs are on the way: the International Maritime Organization’s rules on low-sulfur fuel go into effect on January 1, 2020. This will require all vessels, including containerships, to switch in the fourth quarter of 2019 from heavy fuel oil to low-sulfur oil or to install scrubbers (converting to LNG is possible but not broadly practicable). Initial concerns about fuel availability have been allayed but the impact on ship operating costs will be substantial. Estimates vary but impacts in the range of \$100-to-\$270 per TEU have been cited by executives at major shipping companies.



Increasing Vessel Size

Shipping lines have responded to containerized trade growth by increasing vessel size. This increase results in fewer calls to move the same number of containers. The greater cargo volumes that these larger ships unload during a single call can challenge terminal throughput and capacity. Larger vessel sizes may also limit which ports can be called due to insufficient access channel depths and air drafts, or due to the lack of container cranes that can meet the reach or height of newer vessels. A useful proxy is the average size of containerships transiting the Panama Canal—which increased by 13.1% during the Canal’s most recent fiscal year (ended September 30, 2018). The Panama Canal Authority reports that its Neopanamax Locks can now handle ships of almost 15,000 TEUs. Large ship visits are now increasingly common at East Coast ports that have the requisite water depths in channels and at berths. How large will vessels get? Orders have been placed for ships as large as 23,000 TEUs.



Non-container Developments

Port activities linked to other vessel types and marine operations continue to expand, with opportunities for ports and waterfront property developers.

- Automobile imports, for example, continue to increase. Volkswagen recently announced it would build a new auto processing and distribution center in Baltimore. The 166,000-square-foot facility at Tradepoint Atlantic (Sparrows Point) will be constructed under a 20-year build-to-suit lease, with completion set for early 2020. Baltimore will handle vehicles for mid-Atlantic dealers, currently received at the Port of Davisville RI (which will still handle the Northeast). Volkswagen will bring in about 120,000 vehicles annually from Europe and Mexico, further buttressing the port’s leadership role among U.S. auto-importing gateways.
- Crude oil and LNG exports from the U.S. Gulf Coast are booming, leading to the construction of new and highly capital-intensive specialized facilities. As production from the Permian Basin expands and additional pipeline capacity is brought on line to reach the Gulf, exports of crude will increase further. Natural gas exports are projected to double in 2019—from approximately 1 trillion cubic feet—and will reach 5 trillion cubic feet within 10 years, according to the U.S. Energy Information Administration. New developments are planned or underway in locations near New Orleans, Houston and Corpus Christi.
- Offshore wind use of waterfront facilities appears to be finally gaining traction. In New Bedford MA, the Marine Commerce Terminal built in 2015 has been little used. But Vineyard Wind, a new 800-megawatt offshore project, signed a \$6 million annual lease for use of the site as a staging area for the nation’s first commercial-scale offshore wind farm. Other sites ranging from the 64-acre South Brooklyn Marine Terminal to the Port of Coeymans (140 miles up the Hudson River near Albany, NY), the former naval base at Quonset Point in Rhode Island and the 90-acre former Bayshore Concrete Products site at Cape Charles VA, are all pursuing offshore wind projects. As wind arrays take off in newly-defined federal waters along the East Coast, a network of multiple ports may emerge to support the industry.

TRENDS LEGEND



WATCH LIST



ONGOING TREND



LONG-TERM RISK



OPPORTUNITY



Extreme weather

Extreme weather conditions pose risks—both actual and potential—to ocean shipping and ports. Of concern to vessel operators is the abnormally low water levels in the Panama Canal. Low rainfall over the winter led to five reductions in allowable ship draft at the Neopanamax Locks that opened in 2016. Designed to accommodate ships with a draft of 50 feet, the Panama Canal Authority reduced allowable drafts to 44 feet in May 2019. This reduces the freight that large containerships can carry, diminishing economies of scale.

The possibility of future extreme events remains as well. Hurricane Sandy in 2012 led to the shutdown of the entire Port of New York-New Jersey for a week and many terminals were out of service much longer. During the hurricane seasons of 2017 and 2018, 31 named storms and 6 hurricanes—Harvey, Irma, Maria, Nate, Florence and Michael—made landfall in the U.S. Each storm had unique damage factors (e.g., inland flooding during Harvey, storm surge during Irma, and high winds during Maria) that affected large geographic regions in a short time, and impacted operations of more than 40 ports throughout the U.S. and Caribbean. While the probability of such events has increased in the era of climate change, the ability of ports to handle sudden, major surges in water level and wind has not advanced in tandem. This is one risk that calls for contingency planning by global supply chain management. It could also encourage, at the margin, some increase in land-served sourcing such as Mexico at the expense of water-based flows from Asia.



Labor unrest

Tight labor markets elevate the risk of dockworker labor unrest (e.g., slowdowns, strikes, lockouts). When jobs are scarce, such actions are less likely. But with U.S. unemployment tracking at the lowest level in 49 years, labor strife is a possibility, and could have major impacts. The 2014-15 longshore labor-management dispute at U.S. West Coast ports cut TEU volumes by 18% during the peak January-February 2015 period.



Technology

Rapidly-evolving technologies—such as blockchain, the Internet of Things (IoT), additive manufacturing and autonomous vehicles—hold the potential to dramatically affect ports and all modes of transportation. Tech disruption creates both opportunities and risks for commercial real estate.



Port Capabilities

These trends have led ports across North America to make significant capital investments in landside infrastructure, berths and channels to increase port capacity and throughput. Notable improvements planned or underway can be found in the following section.



NORTH AMERICAN PORT OVERVIEW

The North American Ports are a vital economic engine for the U.S. and a huge driver of demand for industrial real estate. With the explosive growth occurring in eCommerce, the demand for industrial space in warehouse, distribution, and fulfillment centers has continued to grow. The Ports industry remains essential to the supply chain process and will continue to evolve to meet the increased demand for goods.

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF BALTIMORE

HOWARD STREET CSX RAIL TUNNEL

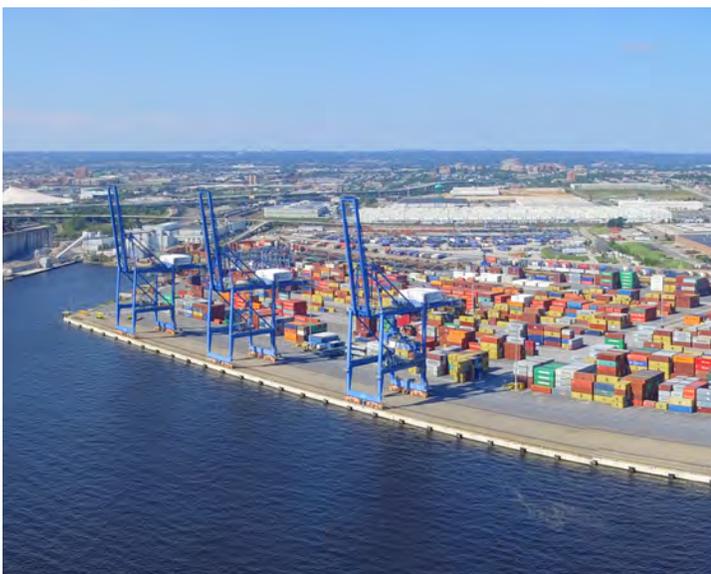
\$466 million project to raise the Howard Street CSX rail tunnel to allow for double-stack trains, helping the port to better compete for containerized rail cargo destined for the Midwest.

SEAGIRT MARINE TERMINAL

\$32.7 million project to deepen a second container berth to 50 feet at the Helen Delich Bentley Port of Baltimore's Seagirt Marine Terminal. A second 50-foot deep berth will allow the Port of Baltimore to handle two supersized container ships simultaneously. Construction is scheduled to begin in the second half of 2019 and should take approximately one year to complete.

FAIRFIELD MARINE TERMINAL

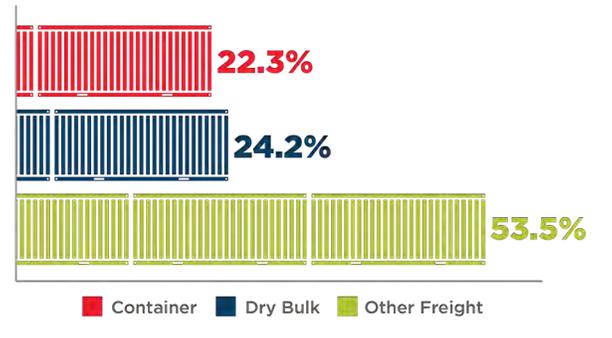
\$6.3 million project that will fill in a wet basin adjacent to the port's Fairfield Marine Terminal. When completed, this will create more land to help handle the Baltimore's surging auto and roll on/roll off (farm and construction machinery) cargo.



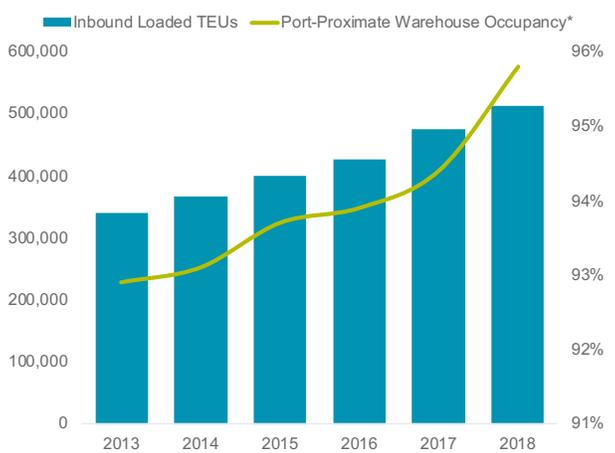
PORT SNAPSHOT

PORT OF BALTIMORE	
THROUGHPUT	
2018	
Container volume (TEUs, 000)	1,023.2
Inbound loaded	512.0
Outbound loaded	228.4
Major trading partners	China, Netherlands, Japan, Brazil, South Korea and Canada
CAPACITY	
Container terminals	2
Average TEU per vessel	2,350
Rail operators	CSX, Norfolk Southern
CONTAINER TERMINALS	
	Acres Berth Length
Dundalk Marine Terminal	570 2,874
Seagirt Marine Terminal	284 4,352

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Baltimore, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF CHARLESTON

CHARLESTON HARBOR

The President's Fiscal Year 2020 Budget includes \$138 million for the 52-foot Charleston Harbor Deepening Project, a milestone that provides an opportunity for the project to receive Congressional funding for construction. Construction work began on the Charleston Harbor Entrance Channel in February 2018. Deepening the harbor up to the port's busiest container terminal, the Wando Welch, is expected by early 2021 and will allow the port to handle 14,000 to 18,000 TEU vessels drawing 50 feet or more without significant depth and other navigational restrictions.

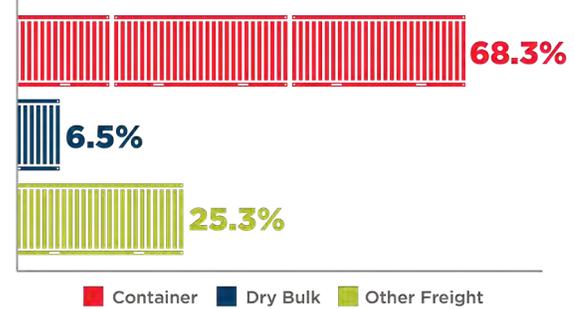
INLAND PORT DILLON

Inland Port Dillon—South Carolina Ports' second inland facility—opened in 2018. It utilizes an existing CSX intermodal train service to handle container movement to and from the Port of Charleston's seaport facilities. It is expected to convert an estimated 45,000 container movements from truck to rail in the first year of operation.

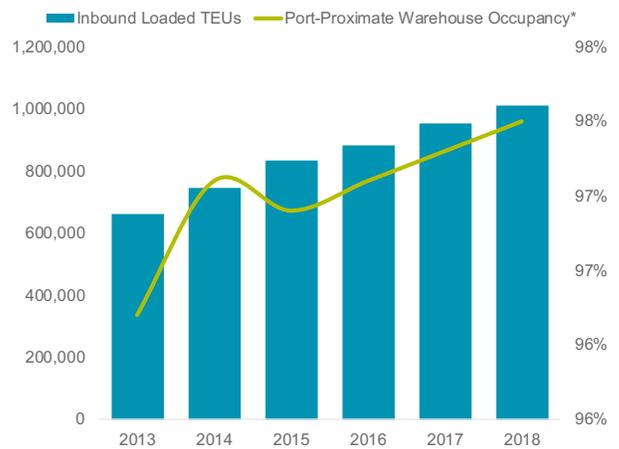
PORT SNAPSHOT

PORT OF CHARLESTON	
THROUGHPUT	
2018	
Container volume (TEUs, 000)	2,316.3
Inbound loaded	1,010.5
Outbound loaded	809.9
Major trading partners	Germany, China, United Kingdom Japan, India, South Korea, France
CAPACITY	
Container terminals	2
Average TEU per vessel	1,689
Rail operators	CSX, Norfolk Southern
CONTAINER TERMINALS	
	Acres Berth Length
North Charleston Terminal	198 2,500
Wando Welch Terminal	399 3,800

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Charleston, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



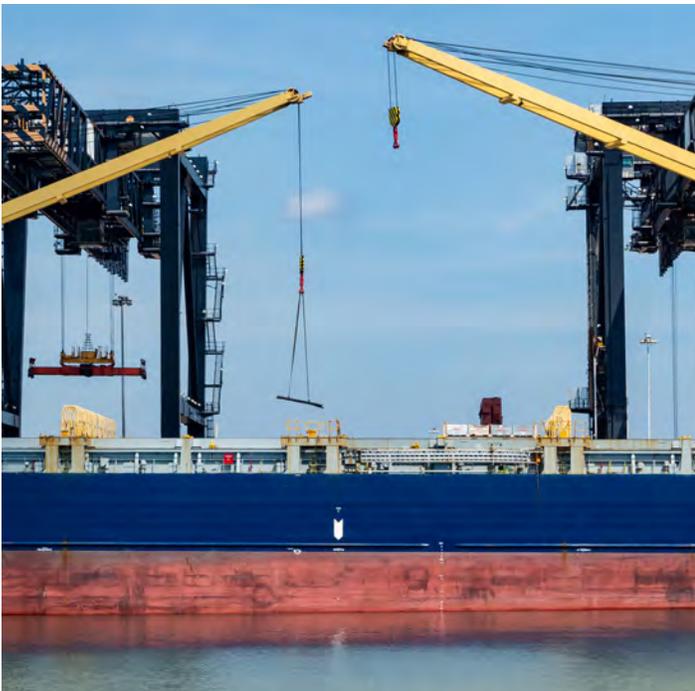
PORT EVERGLADES

SOUTHPORT CONTAINER COMPLEX

New cargo berths and Super Post-Panamax gantry cranes are planned for the Southport Container Complex. The \$437.5 million expansion, the largest infrastructure project in the Port's history, will allow for up to five new cargo berths by lengthening the existing Southport Turning Notch for cargo ships from 900 feet to 2,400 feet. The project is expected to be completed and operational by 2021.

NAVIGATION CHANNELS

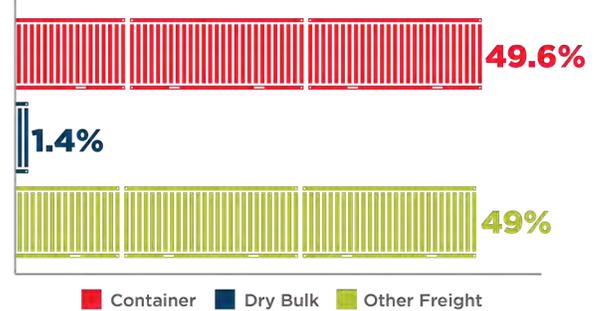
The U.S. Army Corp of Engineers is moving forward with a plan to deepen the Port's navigation channels from 42 feet to 48-50 feet and widen narrower sections of the channel for safe vessel passage. Construction will take place in multiple phases and is expected to be completed between 2021-2025, an estimated 3-5 years after construction begins.



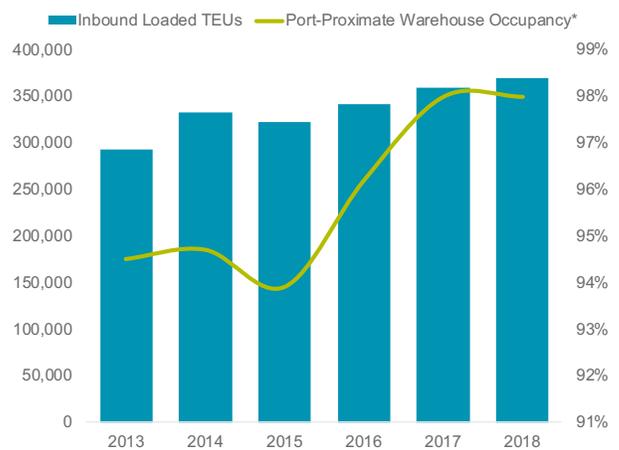
PORT SNAPSHOT

PORT EVERGLADES	
THROUGHPUT	
2018	
Container volume (TEUs, 000)	966.7
Inbound loaded	369.5
Outbound loaded	457.4
Major trading partners	Honduras, Guatemala, Dominican Republic, Brazil, Bahamas
CAPACITY	
Container terminals	2
Average TEU per vessel	714
Rail operators	Florida East Coast Railway
CONTAINER TERMINALS	
	Acres Berth Length
Midport Terminal	40 800
Southport Terminal	300 2,900

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port Everglades, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF HALIFAX

SOUTH END CONTAINER TERMINAL

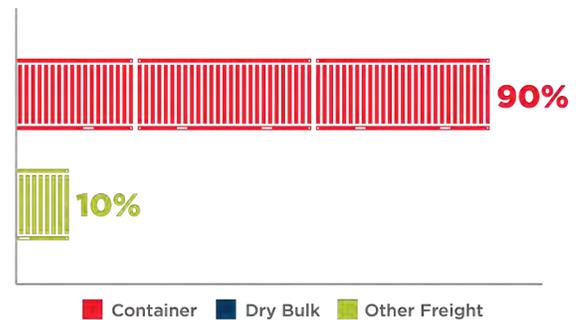
The first phase of work on the South End Container Terminal extension is underway. The next phase, construction of concrete caissons, will begin in Q2 2019. The purpose of the extension is to ensure the Port of Halifax can berth and service larger vessels now serving trade routes along the East Coast of North America. Future cargo growth through the Port of Halifax will be rail-based, connecting inland markets to Europe and Southeast Asia through the new vessel gateway.



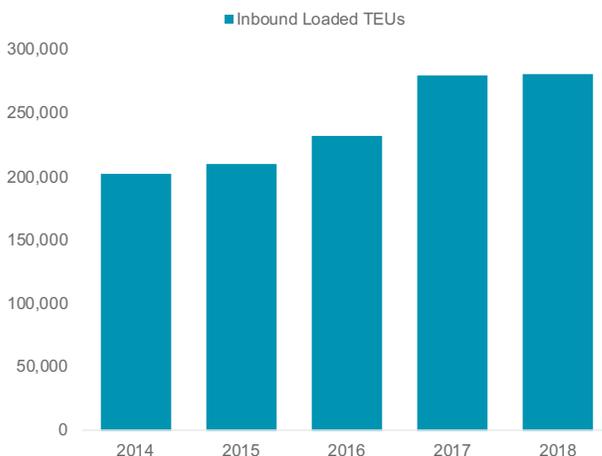
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	547.4
Inbound loaded	280.7
Outbound loaded	266.8
Major trading partners	USA, China, Mediterranean Latin America, Caribbean
CAPACITY	
Container terminals	4
Average TEU per vessel	800
Rail operators	Canadian National
CONTAINER TERMINALS	Acres Berth Length
South End Terminal	75 925-1,093
Fairview Cove Terminal	70 1,083-1,214

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME



Source: Port of Halifax, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF HOUSTON

BAYPORT TERMINAL RAIL

Construction is underway of approximately 6,500 track feet of rail at the Bayport Terminal, connecting the existing rail from Strang Rail line to within 900 feet of the Container Freight Station Road in the Bayport Intermodal Facility.

BAYPORT TERMINAL CONTAINER YARD

Development is underway of approximately 50 acres of reinforced and roller compacted container yard storage and what will become Container Yard 7.

FUTURE GATE UPGRADES

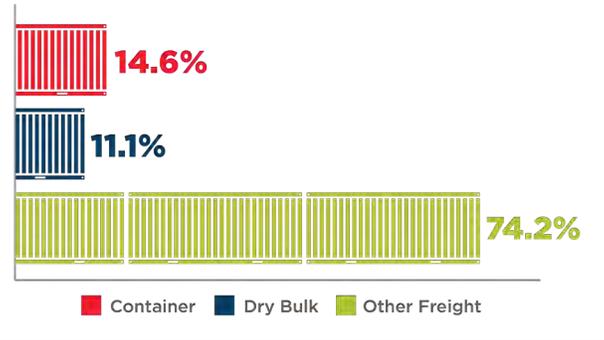
Plans call for design upgrades to increase the gate capacity at Barbours Cut to handle anticipated growth, and the remodel of the existing Gate Services Building at the Bayport Container Terminal to be utilized by the USDA as an inspection laboratory. The project includes creating a larger tenant space, and installing labor equipment, office space, and a communications equipment room.



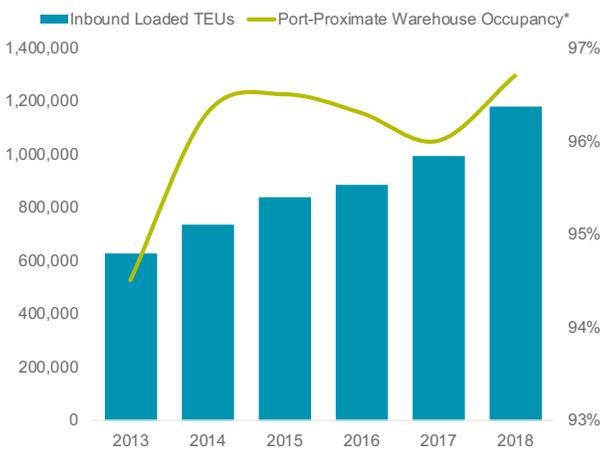
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	2,699.9
Inbound loaded	1,178.4
Outbound loaded	1,036.1
Major trading partners	Mexico, China, Brazil, Germany, Netherlands, Japan, South Korea
CAPACITY	
Channel depth (feet)	45
Container terminals	2
Average TEU per vessel	2,752
Rail operators	Union Pacific, BNSF, Kansas City Southern
CONTAINER TERMINALS	Acres Berth Length
Barbours Cut Container Terminal	435 6,000
Bayport Container Terminal	376 3,500

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Houston, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF JACKSONVILLE

The Port of Jacksonville, known as JAXPort, has three separate port facilities that make up port operations. All of them farther upstream than any of the other major East Coast ports.

HARBOR DEEPENING

Construction of the first phase of the Jacksonville Harbor Deepening project to take the shipping channel to a depth of 47 feet began in Q1 2018 and is expected to conclude in 2020. The project consists of deepening the existing 40-foot channel to 47 feet; widening at Mile Point, the Training Wall Reach and St. Johns Bluff Reach plus construction of two new turning basins at Blount Island and Brills Cut. The entire project is anticipated to be completed in 2023/2024.

NEW AUTO PROCESSING TERMINAL

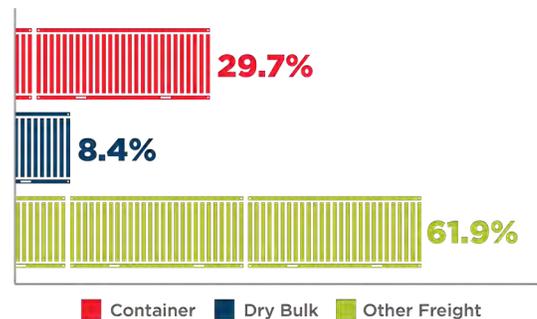
Construction is underway on a new auto processing terminal that will increase the port's vehicle-handling capacity by 25 percent. Once completed, the facility will add more than 100 acres of processing and storage space on Dames Point Marine Terminal and offer vessels direct waterside access for loading/unloading with major interstates less than one mile away plus the potential for rail capabilities.



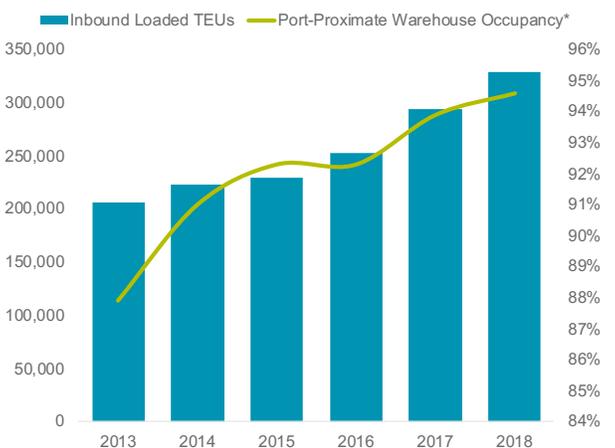
PORT SNAPSHOT

THROUGHPUT		2018
Container volume (TEUs, 000)		1,288.1
Inbound loaded		328.7
Outbound loaded		487.1
Major trading partners	Puerto Rico, China, Japan, Finland, Brazil, Saudia Arabia	
CAPACITY		
Container terminals		3
Average TEU per vessel		2,646
Rail operators	CSX, Norfolk Southern	
CONTAINER TERMINALS		Acres Berth Length
Blount Island Marine Terminal		754 7,094
Dames Point Marine Terminal		158 5,002
Talleyrand Marine Terminal		173 4,780

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Jacksonville Port Authority; U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF LONG BEACH

GERALD DESMOND BRIDGE REPLACEMENT

When completed, the Gerald Desmond Bridge Replacement Project will span the Port of Long Beach's Back Channel with a deck rising 205 feet above the water. The new cable-stayed bridge will include additional traffic lanes and a higher clearance to accommodate larger cargo ships. The new bridge is expected to open to traffic in late 2019 and be completed by 2020.

PIER E MIDDLE HARBOR TERMINAL REDEVELOPMENT

The Middle Harbor terminal will be 311 acres, with an annual capacity of 3.3 million TEUs—which alone would rank it as the fourth-busiest port in the U.S. Construction began in 2011 and is expected to conclude in 2020. Once completed, it will include a new 4,200-foot-long concrete wharf with three deepwater berths with 14 modern gantry cranes capable of accommodating 21,000 TEU ships. An on-dock rail yard designed to handle 1.1 million TEUs a year, or about 24 trains a week, will facilitate throughput and minimize traffic.

PIER B ON-DOCK RAIL SUPPORT FACILITY

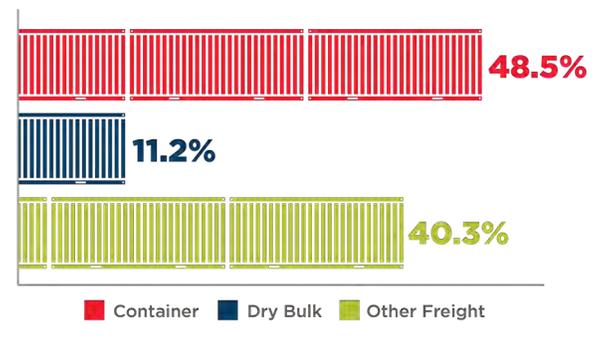
The Port of Long Beach is proposing to enhance and expand the existing Pier B rail facility located along Anaheim Street and the 710 Freeway. The project will include reconfiguring existing tracks and adding additional tracks to allow trains up to 10,000 feet long to directly connect to the on-dock rail facilities and the Alameda Corridor railway.



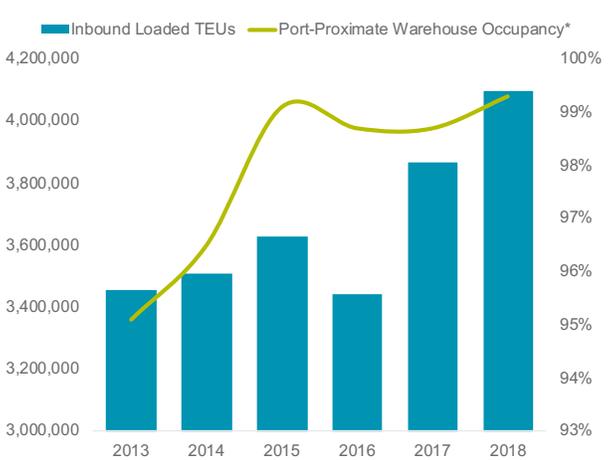
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	8,091.0
Inbound loaded	4,097.4
Outbound loaded	1,523.0
Major trading partners	China, Japan, South Korea, Taiwan, Hong Kong
CAPACITY	
Container terminals	7
Average TEU per vessel	7,575
Rail operators	Union Pacific, BNSF
CONTAINER TERMINALS	Acres Berth Length
Total Terminals International Pier T	385 5,000
SSA Terminals Pier A	160 3,600
SSA Terminals Pier C	70 1,800
Long Beach Container Terminal Pier E	154 2,750
Long Beach Container Terminal Pier F	88 2,750
Int'l. Transportation Service Pier G	246 6,379
Pacific Container Terminal Pier J	256 5,900

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Long Beach, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF LOS ANGELES

EVERPORT CONTAINER TERMINAL

In October 2018, the Board certified the Final Environmental Impact Report for Everport's adopted \$67.0 million improvement project for Berths 226-236. Design work is in progress on proposed improvements to ready the terminal for 14,000 TEU vessels. Improvements include wharf upgrades at Berths 226-229 and Berths 230-232, and new berth depth increases to -53 feet and -47 feet respectively. The project will also involve constructing an additional 1.5 acres of backland and electrical improvements for additional cranes and five new AMP connections. Construction is expected to start in summer 2019.

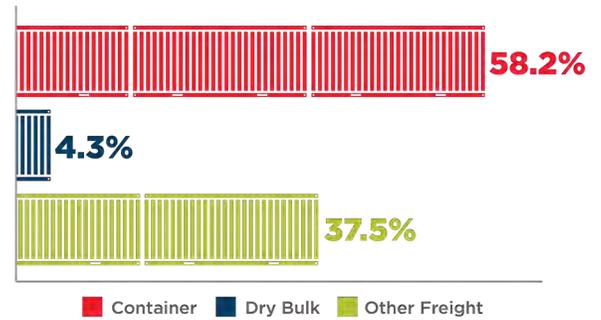
YANG MING CONTAINER TERMINAL

Yang Ming, a Taiwanese marine transport company that operates at the West Basin Container Terminal at Berths 121-131, plans to enhance its terminal facilities and deepen its berths to accommodate 14,000 TEU vessels and increase cargo volume. The environmental review process concluded in November 2018. As part of the project, the Port plans improvements at the terminal that will include construction of a new 1,250 linear-foot wharf at Berths 126-129, dredging to a depth of -53 feet at the newly constructed wharf, and expansion of the existing on-dock rail yard.

PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	9,458.7
Inbound loaded	4,870.6
Outbound loaded	1,904.0
Major trading partners	China, Japan, South Korea, Taiwan, Vietnam, Thailand
CAPACITY	
Container terminals	7
Average TEU per vessel	8,406
Rail operators	Union Pacific, BNSF
CONTAINER TERMINALS	Acres Berth Length
West Basin Container Terminal 1	132 2,500
West Basin Container Terminal 2	186 2,500
TraPac	220 4,630
Yusen Terminals	185 5,800
Everport Terminal Services	205 5,800
Eagle Marine Services	292 4,000
APM Terminals Pacific	484 7,300

TOTAL VESSEL CALLS BY TYPE



Source: Port of Los Angeles, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



CUSHMAN & WAKEFIELD

PORT OF LOS ANGELES (CONT'D)

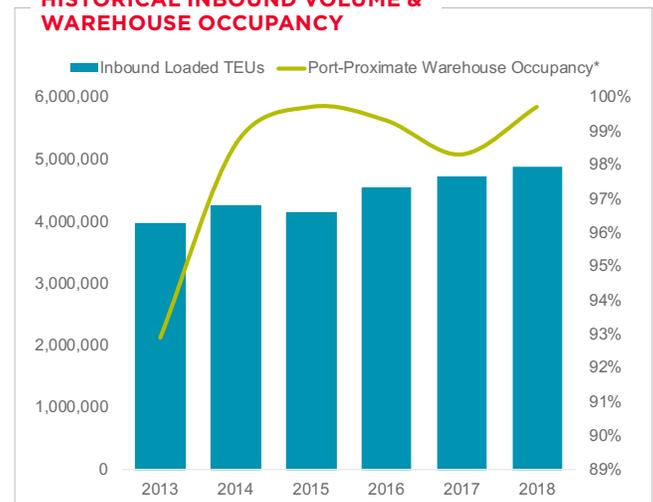
TECHNOLOGY ADVANCEMENTS

Also continuing into the new fiscal year will be technology advancements, including the port optimizer tool that is being developed by the port authority and GE Transportation. The optimizer and port information portal provide a single window to support enhanced supply chain performance as vessel sizes and cargo volumes continue to grow.

SAN PEDRO PUBLIC MARKET REDEVELOPMENT

The 40-acre redevelopment project will include restaurants, entertainment venues, shopping, fresh markets, office space, and a waterfront promenade with ample outdoor space and an open-air amphitheater. Demolition of the existing structure on the former Ports O'Call site continues with the demolition of all structures between the San Pedro Fish Market and the Ports O'Call restaurant. Port improvements will include a 30-ft wide promenade along the water's edge, town square improvements, and 600 linear feet of floating dock for public/visiting vessels. The San Pedro Public Market is expected to open in 2021.

HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF MIAMI

The Port of Miami, known as PortMiami, is a dense and highly efficient (250+ acres) man-made island in the middle of Biscayne. Half the island shares operations with the cruise industry which has a larger economic impact than trade.

CHANNEL DEPTH

The port recently completed one billion dollars of infrastructure improvements that increased the channel depth to -50/-52 feet, added a new fast access tunnel with direct access to the interstate, modernized its on-dock freight rail system creating a connection to the national rail system, and included the installation of new Super Post-Panamax cranes that have an outreach of 22 containers wide.

DENSIFICATION & GATE IMPROVEMENTS

SFCT broke ground on a densification project to boost its terminal's operational capacity while converting from use of top-lift loaders to eco-friendly electrified rubber-tired gantries. RTGs are scheduled for delivery in 2020. Gate improvements that will replace two cargo terminal gates with new automated truck gates.

FEASIBILITY STUDY

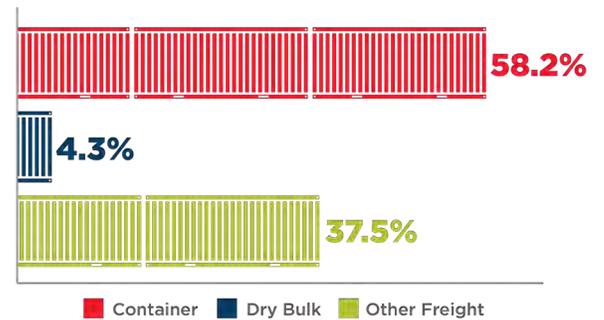
In Q2 2018, the US Army Corps of Engineers began a feasibility study for future channel improvements and navigational enhancements that will enable the Port to accommodate 14,000 TEU cargo vessels once completed.



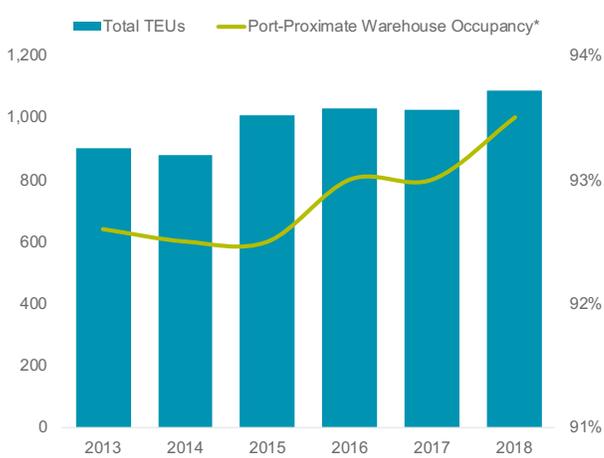
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	1,085.0
Inbound loaded	418.2
Outbound loaded	395.5
Major trading partners	China, Dominican Republic, Honduras, Guatemala, Costa Rica
CAPACITY	
Container terminals	3
Average TEU per vessel	1,161
Rail operators	Florida East Coast Railway
CONTAINER TERMINALS	Acres Berth Length
South Florida Container Terminal	80 4,950
POMTOC	120 5,000
Seaboard Marine	80 3,919

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Miami, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port

NORTH AMERICAN PORT OVERVIEW

September 2019



CUSHMAN & WAKEFIELD

PORT OF NEW YORK-NEW JERSEY

EXPRESS RAIL INTERMODAL CONTAINER TRANSFER FACILITY (ICTF) AT GREENVILLE YARD

Construct a new intermodal rail facility for Global Container Terminal—Bayonne. The project will improve the flow of goods to and from the Port of New York and New Jersey and in accordance with the lease agreement with Global Container Terminals Bayonne LP. The project also includes full redevelopment of Greenville Yard A, which supports both the ICTF and New York New Jersey Rail (NYNJR) operations. Completion of first lead track to the ICTF occurred in 2018 with the full project completion by 2020.

UPGRADES AT HOWLAND HOOK MARINE TERMINAL

Excavation and replacement of approximately 6 acres of pavement subgrade that will restore the port container operation for full utilization of the tenant's leased area.

INSTALLATION OF SUPPORT TRACKS

Provides for construction of tracks in Greenville Yard to support NYNJ carfloat. Eight of the thirteen tracks are currently in service with full project completion by 2020.

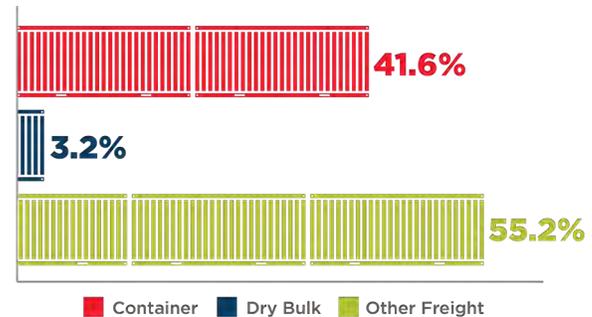
BAYONNE BRIDGE

Raised the existing air draft clearance and included replacement of the existing main span deck, the NY and NJ approach structures and access ramps. Navigational clearance that allows larger and more efficient ships to access the Port of New York and New Jersey was achieved in 2017 and the remaining traffic lanes, bike path and pedestrian walkway will open in 2019.

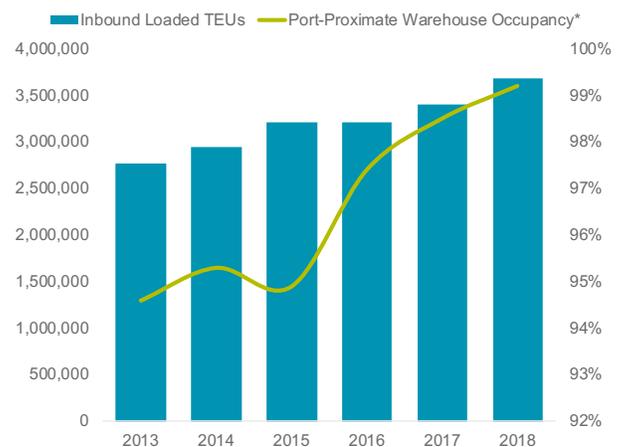
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	7,179.8
Inbound loaded	3,676.1
Outbound loaded	1,476.8
Major trading partners	China, India, Italy, Germany, Brazil
CAPACITY	
Container terminals	6
Average TEU per vessel	3,394
Rail operators	CSX, Norfolk Southern, Canadian Pacific
CONTAINER TERMINALS	Acres Berth Length
Red Hook Container Terminal	80 5,490
Port Newark Container Terminal	267 4,800
Global Container Terminal Bayonne	167 2,700
Maher Terminal	445 10,128
APM Terminal	350 6,001
Global Container Terminal New York	187 3,012

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of New York-New Jersey, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019

PORT OF OAKLAND

COOL PORT

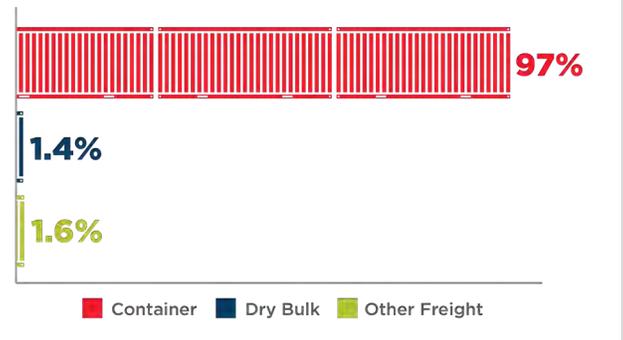
In November 2018, Lineage Logistics and Dreisbach Enterprises opened Cool Port Oakland, a \$90 million refrigerated distribution center. Set on 25 acres at the Port of Oakland's waterfront, Cool Port will serve as the newest hub for temperature-controlled cargo transiting through Northern California. The 280,000-square-foot depot with 90 truck doors can send up to 1,000,000 tons of perishable product through the Port of Oakland annually. A secure, fully cold-chain compliant facility, Cool Port offers 20,000 pallet positions, has three blast cells and includes a 100,000-square-foot, high-cube, multi-temperature storage environment. The new facility also supports a full range of services including rail transload and truck cross-dock operations, frozen and refrigerated storage, import-export services, onsite USDA inspection and labeling capabilities. Cool Port's strategic proximity to the Port's marine terminal entrance will expedite the transition process between ship and warehouse, thereby reducing transportation costs and energy expenditures. Oakland is the last call for transpacific cargo—ensuring faster transit times for shipping perishable food products to Asian markets.



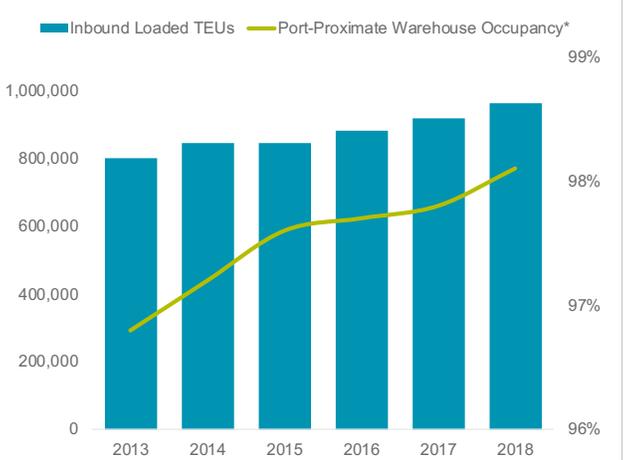
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	2,546.4
Inbound loaded	965.6
Outbound loaded	897.8
Major trading partners	China, Japan, Taiwan, Australia, Hong Kong
CAPACITY	
Container terminals	4
Average TEU per vessel	1,445
Rail operators	Union Pacific, BNSF
CONTAINER TERMINALS	Acres Berth Length
TraPac Terminal	123 4,263
Ben E. Nutter Terminal	74 2,157
Oakland International Container Terminal	270 6,000
Matson Terminal	80 2,743

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Oakland, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port

NORTH AMERICAN PORT OVERVIEW

September 2019



CUSHMAN & WAKEFIELD

PORT OF OAKLAND (CONT'D)

SEAPORT LOGISTICS COMPLEX

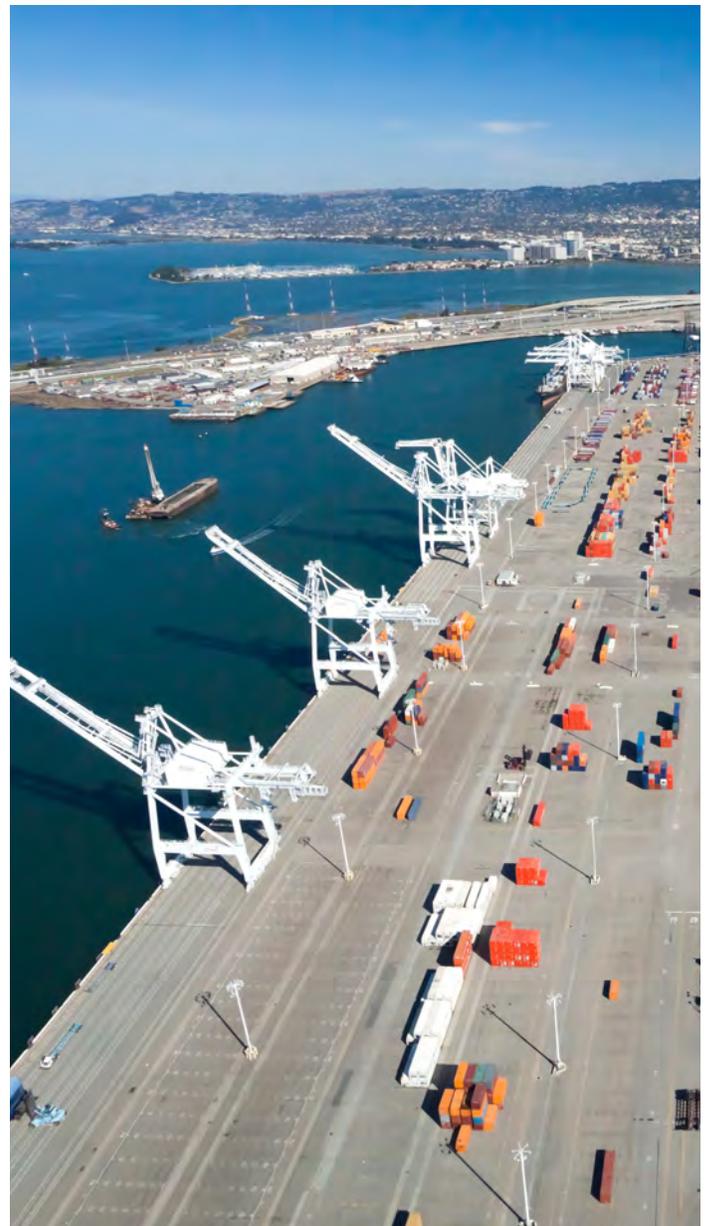
CenterPoint Properties is building CenterPoint Landing, the first 440,000-square-foot facility at the complex. Site preparation began in October 2018 with the building expected to open by summer 2020. The facility will be constructed at Maritime and 14th streets in the heart of the Port. The property once served as an Army supply depot. The Army decommissioned its Oakland base in the late 1990s. The Port received about 240 acres of the property between 2003 and 2007. Since then, planners have imagined a logistics campus that could further strengthen Oakland's role as a global trade gateway. The plan eventually calls for a complex with multiple buildings for warehousing and distribution. The Seaport Logistics Complex is envisioned as a transload center where shippers can ready cargo for transfer from ships to trucks or rail. Transloading has become increasingly popular with supply chain managers pursuing cost-effective transport alternatives. The Port opened a \$100 million rail yard at the Seaport Logistics Complex in 2016. CenterPoint's development will be the first building at the campus.

TRAPAC MARINE TERMINAL

In January 2019 TraPac marine terminal opened its newest vessel berth to arriving container ships. The milestone signals completion of a 2-year project that nearly doubled TraPac's footprint from 66 to 123 acres, boosted its fleet of ship-to-shore cranes from four to seven, added a third, 1,400-foot-long dock for berthing mega container ships, increased plug-in space for storing refrigerated containers from 388 to 860, and opened a new gate complex for harbor truck drivers.

OAKLAND INTERNATIONAL CONTAINER TERMINAL

Three 300-foot-tall gantry cranes will be installed late in 2020 at the Oakland International Container Terminal on Oakland Estuary. Among the tallest cranes on the West Coast.



NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF PRINCE RUPERT

RIDLEY ISLAND PROPANE EXPORT TERMINAL

The Ridley Island Export Terminal is the first propane export facility in Canada, located on the Ridley Island Industrial site. The AltaGas facility shipped its first load to Asia in May 2019 and can handle up to 1.2 million tons of propane per year. The \$450-\$500-million project includes rail car unloading facilities, refrigeration equipment, power generation, connection to BC Hydro's grid, propane storage tanks, new piping and the addition of new loading arms to RTI's existing berth.

PRINCE RUPERT MARINE FUELS PROJECT

Wolverine Terminals marine fueling service project is a marine fuel delivery service for the Port of Prince Rupert that will enable cargo vessels anchored or berthed in the Port to fuel locally. Currently, the Port of Prince Rupert does not offer marine fueling services for cargo vessels, and ships that call on the Port must carry enough fuel to make a round trip or detour to an alternative West Coast port for fuel. The marine berth will be located at a site adjacent to Westview Terminal in the inner harbor, providing direct access to the existing Aquatrain Terminal. Delivery and commissioning of the barges is slated for mid-2020.

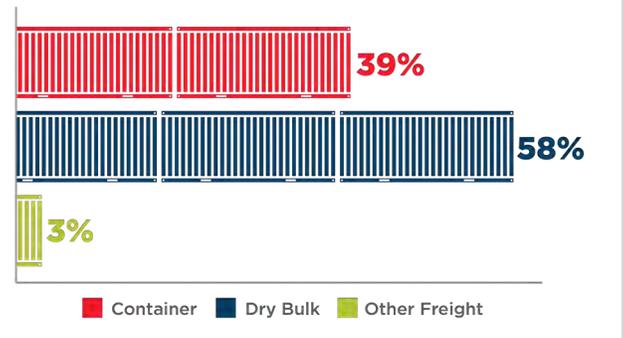
RIDLEY ISLAND BULK TERMINAL

An environmental assessment commenced in September 2018 for construction of a new bulk liquids tank storage and marine berthing and loading facility on Ridley Island. The proposed terminal would store and ship liquid products such as liquefied petroleum gas, refined products such as diesel and/or gasoline, and methanol. All products would be transported from various locations across Western Canada to the terminal via the existing CN rail line. Should the project proceed, construction will commence in 2020 with the facility estimated to be operationally in-service by 2022.

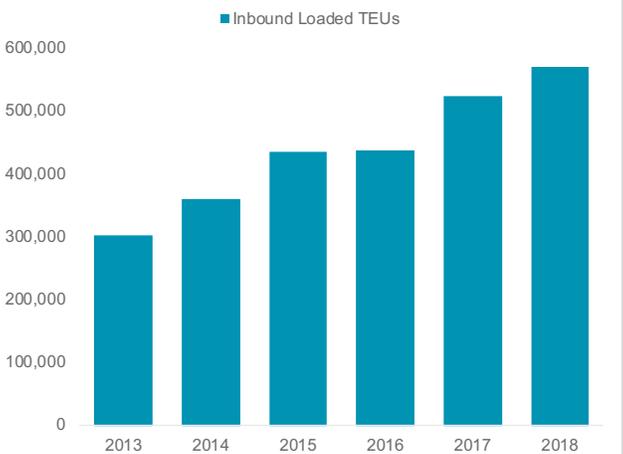
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	1,036.0
Inbound loaded	569.0
Outbound loaded	207.1
Major trading partners	Asia Pacific, USA
CAPACITY	
Container terminals	1
Rail operators	Canadian National
CONTAINER TERMINALS	Acres Berth Length
Fairview Container Terminal	74 2,624

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Prince Rupert, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

September 2019



PORT OF SAVANNAH

HARBOR DEEPENING

In 2016 the Georgia Ports Authority began deepening Savannah Harbor and its shipping channel from an authorized depth of 44 feet to 47 feet. Outer harbor deepening was completed in 2018 while deepening of the inner harbor is slated for completion by late 2021 or early 2022. The port is also planning to expand the Garden City Terminal's rail capacity over a two-year period between 2018 and 2022.

MASON MEGA RAIL PROJECT

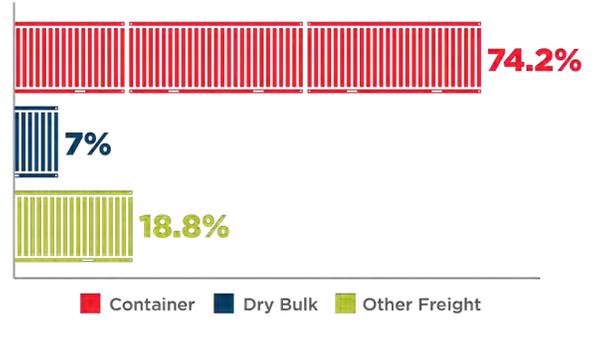
The Port of Savannah's Garden City Terminal is already the South Atlantic region's busiest intermodal gateway, handling 38 trains per week of import and export cargo. The Mason Mega Rail project will deliver the largest on-dock intermodal rail facility to a port authority in North America. The project will add 97,000 feet of new rail at Garden City Terminal, for a total of 179,000 feet. It will increase the number of working tracks to 18 and it will combine the current on-dock CSX Transportation and Norfolk Southern rail terminals into one facility, providing each railroad with at least nine 2,700-foot working tracks. The expanded rail yard will be served by eight rail-mounted gantry cranes, each spanning nine tracks. The added track will better accommodate 10,000-foot long unit trains at the Port. Longer, more cost-effective trains incentivize Norfolk Southern and CSX to provide direct, expedited rail service to the Mid-American Arc.

The project will double the Port of Savannah's annual rail capacity to 1 million containers and deliver the largest on-terminal rail facility in North America by 2020. The project includes 124,000 feet of new track, 88 automated switches and rail control devices, as well as the rail and power infrastructure to support the operation of rail-mounted gantry cranes. This will extend the territory best served by the Port of Savannah along an arc of cities ranging from Memphis to St. Louis, Chicago and Cincinnati.

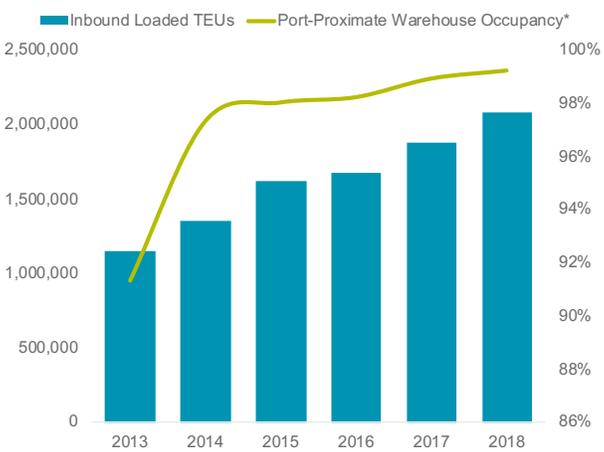
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	4,352.0
Inbound loaded	2,081.4
Outbound loaded	1,444.4
Major trading partners	Asia, Mediterranean, Northern Europe
CAPACITY	
Container terminals	1
Average TEU per vessel	2,169
Rail operators	CSX, Norfolk Southern
CONTAINER TERMINALS	Acres Berth Length
Garden City Terminal	1,200 9,693

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Savannah, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

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PORT OF VANCOUVER

ROAD AND RAIL INFRASTRUCTURE IMPROVEMENTS

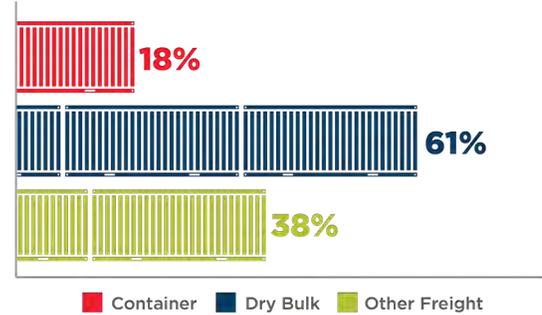
Three projects will make improvements to port infrastructure by increasing the capacity of the rail infrastructure that serves the south shore port area, ensuring goods move efficiently to market. The first two projects are led by the Vancouver Fraser Port Authority, with investment from Canadian National Railway and Canadian Pacific Railway and include: improving the rail corridor by building 5.5 kilometers of track adjacent to the existing double-tracked corridor; designing and raising Douglas Road so it crosses over the existing Canadian National Railway I corridor; building the Centennial Road overpass, a 600 meter-long, two-lane elevated viaduct structure; extending the existing two-lane Waterfront Road by 600 meters; realigning 350 meters of Commissioner Street; and building 9.4 kilometers of new siding track and reconfiguring train switching operations within the Canadian Pacific Railway corridor, along the south shore of Burrard Inlet in Vancouver and Burnaby. The third project, led by Canadian National, with investment from the Vancouver Fraser Port Authority, involves designing and building a 4.2-kilometer-long secondary track, parallel to the existing Burrard Inlet line in Vancouver. The increased rail capacity will support the flow of goods through the South Shore Trade Area, as trade volumes continue to grow.



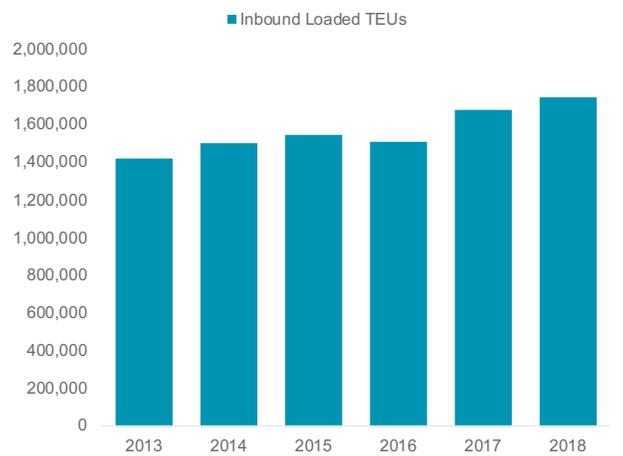
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	3,396.4
Inbound loaded	1,743.4
Outbound loaded	1,119.6
Major trading partners	China, Hong Kong, Japan, Korea, Singapore, Taiwan, USA
CAPACITY	
Container terminals	4
Rail operators	Canadian National, Canadian Pacific, BNSF
CONTAINER TERMINALS	Acres Berth Length
Deltaport	210 3,609
Vanterm	76 2,030
Frazer Surrey Docks	154 2,297

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Vancouver, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

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CUSHMAN & WAKEFIELD

PORT OF VIRGINIA

CAPACITY EXPANSION PROJECT

Expanding overall container capacity by 40 percent, or one million container units. Adding four ship-to-shore cranes at Virginia International Gateway. Developing more docking space for ultra-large container vessels. Adding 86 rail-mounted gantry cranes to expanded container yards at Virginia International Gateway and Norfolk International Terminals. Infrastructure improvements to accommodate more refrigerated containers.

VIRGINIA INTERNATIONAL GATEWAY EXPANSION

In November 2018, the 800-foot-long wharf extension was completed providing berth space for three ultra-large container vessels. In January 2019, 13 new container stacks became operational. In July 2019, the expansion of the rail yard was completed.

NORFOLK INTERNATIONAL TERMINALS

In January 2018, thirty-three acres of the terminal's container yard was taken out of service as construction began. By July 2018, the first rail-mounted gantry cranes arrived and by October 2018 those units went into service. In August 2018, dredging to improve the approach to the terminal's south berth for ultra-large container vessels began. By late 2020, sixty new rail-mounted gantries are expected to be in place with the terminal fully operational.

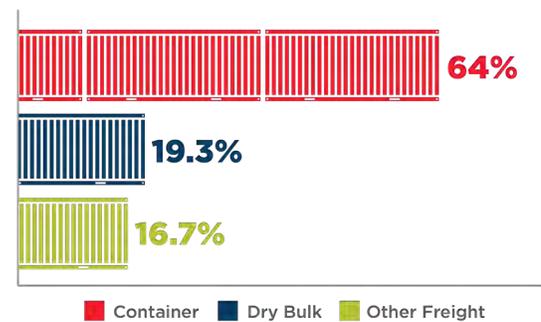
NORFOLK CHANNEL DEEPENING

The project includes increasing the channel depth at several key locations: 59 feet in the Atlantic Ocean Channel; 56 feet at Thimble Shoals; and 55 feet in the Norfolk Harbor and Newport News Channels. It also includes widening the channel in select areas to include Thimble Shoals over the Chesapeake Bay Bridge Tunnel.

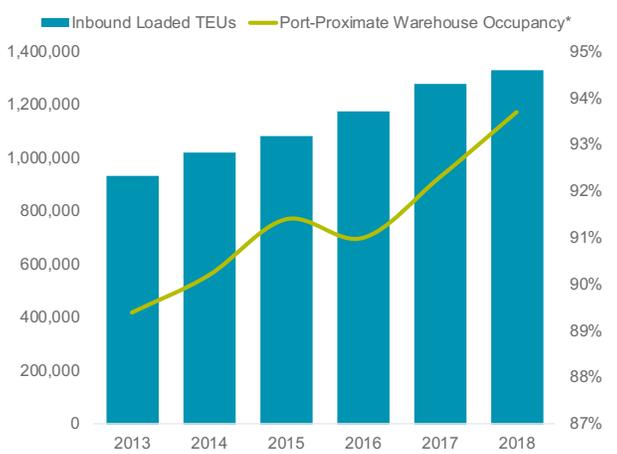
PORT SNAPSHOT

THROUGHPUT	2018
Container volume (TEUs, 000)	2,855.9
Inbound loaded	1,327.4
Outbound loaded	977.8
Major trading partners	Northern Europe, Asia, South America, Mediterranean
CAPACITY	
Container terminals	3
Average TEU per vessel	1,791
Rail operators	CSX, Norfolk Southern
CONTAINER TERMINALS	Acres Berth Length
Norfolk International Terminals	378 6,630
Virginia International Gateway	231 3,200
Portsmouth Marine Terminal	287 3,540

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



Source: Port of Virginia, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex

NORTH AMERICAN PORT OVERVIEW

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CUSHMAN & WAKEFIELD

THE NORTHWEST SEAPORT ALLIANCE

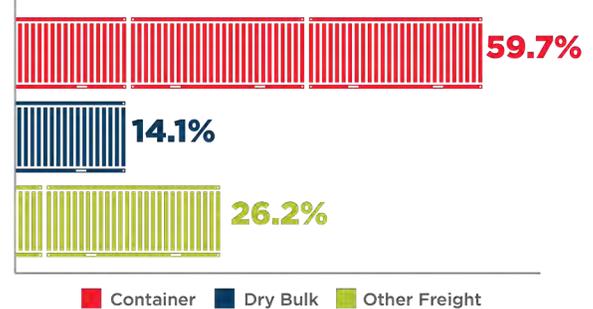
NORTH HARBOR CONTAINER TERMINAL DEVELOPMENT

T-5 wharf redevelopment, including a rail quiet zone and electrical upgrades to the substation. T-46 wharf repair and paving, stormwater improvements, and removal of obsolete cranes at several terminals.

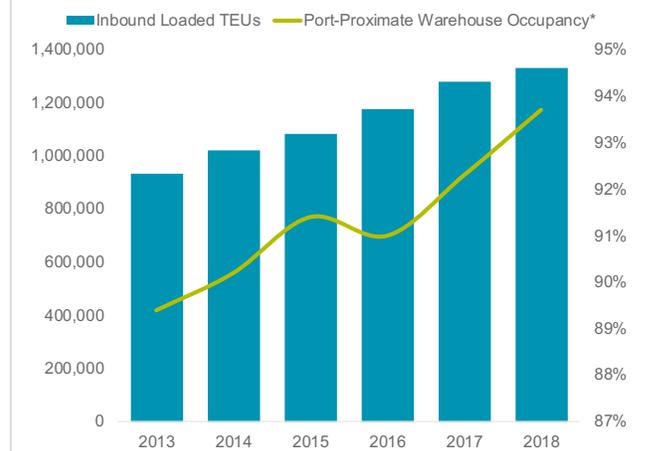
SOUTH HARBOR CONTAINER TERMINAL DEVELOPMENT

Purchase of four additional post-Panamax cranes for Husky Terminal, gate improvements for the General Central Peninsula (Husky and East Sitcum Terminals and the North Intermodal Yard), and development of facilities for Customs and Border Patrol staff.

TOTAL VESSEL CALLS BY TYPE



HISTORICAL INBOUND VOLUME & WAREHOUSE OCCUPANCY



PORT SNAPSHOT

THROUGHPUT

	2018
Container volume (TEUs, 000)	3,797.6
Inbound loaded	1,452.6
Outbound loaded	953.5

Major trading partners: China, Japan, Korea, Taiwan, Vietnam, Canada

CAPACITY

Container terminals	10
Average TEU per vessel	3,992
Rail operators	BNSF, Union Pacific

CONTAINER TERMINALS

	Acres	Berth Length
Seattle – Terminal 18	196	4,440
Seattle – Terminal 25/30	70	2,700
Seattle – Terminal 46	82	2,300
Seattle – Terminal 115	70	1,600
Tacoma – TOTE Maritime Alaska Terminal	48	1,100
Tacoma – Husky Terminal	93	2,700
Tacoma – East Sitcum Terminal	54	1,100
Tacoma – West Sitcum Terminal	135	2,200
Tacoma – Washington United Terminals	123	2,600
Tacoma – Pierce County Terminal	140	2,087



Source: The Northwest Seaport Alliance, U.S. Department of Transportation, Cushman & Wakefield Research | Vessel calls by type excludes barge traffic | *Warehouse and distribution product sited along main corridors within 15 miles of port complex



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