Port Performance Freight Statistics Program

2017

Annual Report to Congress

U.S. Department of Transportation
Bureau of Transportation Statistics

Port Performance Freight Statistics Program:
Annual Report To Congress 2017

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Notice

PREFACE

Pursuant to Section 6018 of the *Fixing America's Surface Transportation (FAST) Act* (Pub. L. 114-94; Dec. 4, 2015; 129 Stat. 1312), the Bureau of Transportation Statistics (BTS) established the Port Performance Freight Statistics Program (PPFSP). The goal of the program is "to provide nationally consistent measures of performance" for the Nation's largest ports, and to report annually to Congress on port capacity and throughput.

The *FAST Act* further required the BTS Director to submit an annual report to Congress, which includes, at a minimum, statistics on capacity and throughput at the top 25 ports by tonnage, twenty-foot equivalent units (TEU), and dry bulk tonnage; nationally consistent port performance metrics; and recommended future measures. The Port Performance Freight Statistics Working Group (Working Group), composed of representatives from Federal, labor, port, private sector associations, and other organizations as specified in *FAST Act* Section 6018, advised BTS during preparation of the first report and transmitted final recommendations to the BTS Director on December 4, 2016.

This is the second *Annual Report* under the PPSFP. It presents publicly available, nationally consistent throughput, capacity, and performance statistics for the top 25 tonnage, container, and dry bulk ports. In doing so it reflects the discussions and recommendations of the Working Group, and the practicalities of a new program. The report also includes background information on U.S. ports and discussions of throughput and capacity concepts to provide a more complete picture of port activity and place the statistics in context.

This *Annual Report* meets *FAST Act* requirements by including recommendations on standards for consistent port performance measures and statistics for port throughput and capacity.

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1 INTRODUCTION

Reflecting the importance of ports to the Nation's multi-modal freight transportation system, Section 6018 of the *Fixing America's Surface Transportation (FAST) Act* requires the Bureau of Transportation Statistics (BTS) of the U.S. Department of Transportation (USDOT) to establish "a port performance statistics program to provide nationally consistent measures of performance of, at a minimum, the Nation's top 25 ports by tonnage; the Nation's top 25 ports by 20-foot equivalent unit; and the Nation's top 25 ports by dry bulk… [and] submit an annual report to Congress that includes statistics on capacity and throughput at the ports."[1] The status of BTS as a principal Federal statistical agency requires these measures to be objective, the methods of measurement to be transparent and published statistics to meet reasonable quality standards.[2] *FAST Act* Section 6018 requires BTS to measure port throughput (defined in this report as the amount of cargo a port handles annually) and capacity (defined in this report as a port's maximum annual throughput, defined by tonnage, TEU, or other unit).

Port throughput statistics measure the volume of cargo or trade that ports handle, and the number of vessels that call at ports. Specifically, throughput metrics pertain to the weight, volume, and value of cargo handled, and the number and size of vessels that call:

- Cargo weight measured in short tons
- Containerized cargo volume measured in twenty-foot equivalent units (TEU)
- Cargo value measured in dollars
- Cargo vessel counts
- Vessel sizes measured in deadweight tons (DWT) for all vessels, and TEU capacity for container ships

This is the second edition of the *Port Performance Freight Statistics Program Annual Report*, which builds on the foundation of the 2016 *Annual Report*. In the inaugural edition, BTS published existing, nationally consistent measures of port capacity and throughput, and explained the criteria used to define ports and the measures used to define the top 25 ports in each category. The report included recommendations of the advisory working group to the Port Performance Freight Statistics Program (2016 Working Group), and was delivered to the BTS Director prior to publication as specified in *FAST Act* Section 6018.

This 2017 *Annual Report* expands upon the first edition in several ways. The throughput and capacity statistics included in the 2016 edition have been updated with the most recently available annual data and, in many

[1] Section 6018 of the *Fixing America's Surface Transportation (FAST) Act* (Pub. L. 114-94; Dec. 4, 2015; 129 Stat. 1312).

[2] *Statistical Policy Directive No. 1: Fundamental Responsibilities of Federal Statistical Agencies and Recognized Statistical Units;* Federal Register / Vol. 79, No. 231 / December 2, 2014. Page 71610.

cases, have been enhanced with additional detail. This edition also expands the number of throughput and capacity measures published and incorporates new and improved methodologies. For example, a new measure of container vessel dwell times uses locational data transmitted continuously from ships, and represents the first application by BTS of automated data collection to port performance measurement.

This edition provides additional descriptions of global and national maritime trends to provide a more robust context for understanding port performance and the emerging issues and topics, including:

1. the increasing size of container vessels calling at U.S ports, due to an industry trend towards larger vessels and the ability of new Panama Canal locks to accommodate larger vessels;

2. the impact of changes in coal, crude oil, and natural gas volumes on U.S. ports

3. the impact of the 2017 hurricane season on the maritime transportation system.

The *Handbook of Methods*,[3] published separately, details the process used to identify the top 25 ports and calculate their capacity and throughput.

BTS plans to continue expanding and improving port throughput and capacity measures as resources permit. Additional discussion of BTS' potential future directions for the Port Performance Freight Statistics Program is included in Section 5: Looking Ahead. Comments on this report are welcomed and should be sent to PortStatistics@dot.gov or to the Port Performance Freight Statistics Program, Bureau of Transportation Statistics, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington, DC, 20590.

[3] Forthcoming in spring 2018.

2 Top 25 Ports

Ports are commonly recognized as places where cargo is transferred between ships and trucks, trains, pipelines, or storage facilities. While ports are usually equated with the port authorities that govern them, ports are difficult to define for statistical purposes due to closely related adjacent land uses (e.g., rail yards), variations in terminal ownership and governance, and proximity to other ports. Continuous waterfront may be divided into separate ports by administrative boundaries, such as the series of Mississippi River terminals in Louisiana between the Ports of New Orleans and Baton Rouge. In contrast, the Port of New York and New Jersey and the Ports of Cincinnati-Northern Kentucky are treated as single entities, even though the former has a river and a State line dividing its facilities and the latter has terminals that stretch along 226 miles through two States. Given the diversity of port ownership arrangements, operating methods, and cargoes handled, developing nationally consistent performance assessments for ports is a challenging task.

Ports are generally located within natural or man-made harbors. San Pedro Bay in California, for example, is a natural harbor where the Ports of Los Angeles and Long Beach are located with other public and private waterfront facilities. When cargo statistics are published for harbors, these data may include terminals that are not part of public port authorities and may thus show higher cargo volumes than what port authority statistics report.

There are many ways to define a "port," such as by legislative enactment of Federal, State, or city government. Port definitions are essential for identifying the top 25 ports. Without a clear port definition, it is impossible to measure port performance in a nationally consistent manner.

2.1 Port Definitions

Among possible definitions considered for use in these *Annual Reports*, Federal definitions offer a nationally consistent approach to determining what a "port" is, therefore providing a starting place from which to measure the port's throughput and capacity. The Federal Government defines ports in several ways, including:

- **U.S. Army Corps of Engineers Ports** – For statistical purposes, the U.S. Army Corps of Engineers (USACE) uses a port's boundaries as defined in the legislation associated with the port.

- **U.S. Customs and Border Protection Districts and Ports** – U.S. Customs and Border Protection (CBP) defines some ports as a single port and others as units comprising multiple ports. The U.S. Census Bureau relies on CBP definitions for reporting on trade.

This report follows the recommendations of the 2016 Working Group to use the USACE statistical definitions of ports, which align with the Federal, State, and city legislative definitions associated with the port. These legislative port definitions are relatively stable over time, although some ports have successfully petitioned USACE to alter their boundaries. Most USACE-defined ports are consistent with the common perception of a facility located within a single harbor, yet some, like the Ports of Cincinnati-Northern Kentucky, cover an extended stretch of river that is not commonly perceived as one entity. In some cases, ports that work together under a common marketing label, such as the Northwest Seaport Alliance (Port of Tacoma and Port of Seattle), are nevertheless defined separately by USACE. The major advantage to using USACE's port definition is that USACE publishes nationally consistent cargo throughput data, including the data used to select the top 25 ports.

2.1.1 Port Governance

Ports are organized and governed in several ways, with implications for port definitions and data availability.

Port Authorities and Public Terminals. A port authority (also sometimes called a harbor district) is a government entity that either owns or administers the land, facilities, and adjacent bodies of water where cargo is transferred between modes. Most ports are governed by port authorities or harbor districts, which are usually part of local or state government. A port authority promotes overall port efficiency and development, maintains port facilities, and interacts with other government bodies. Additional activities include business development and managing infrastructure finances. While the structure, powers, and roles of port authorities vary, the American Association of Port Authorities (AAPA) states that they "share the common purpose of serving the public interest of a state, region or locality." Port authorities may act as:

- **Landlords** – Building and maintaining terminal infrastructure and providing major capital equipment, but not engaged in operations. The Port of Los Angeles, Port of New York and New Jersey, and Port of Oakland are examples of landlord ports. In this capacity, ports may also offer concessions to tenants that make infrastructure improvements. For example, the Maryland Port Administration granted a 50-year concession for the Baltimore Seagirt Marine Terminal that included a commitment by the concessionaire to deepen the Port of Baltimore's channel.

- **Operators** – Directly operating some or all of the terminals in the jurisdiction. For example, the Port of Houston Authority is an operating port.

- **Jurisdictional bodies** – Under which private terminals are responsible for providing and operating their

infrastructure. For example, the Ports of Cincinnati-Northern Kentucky is a jurisdictional body.

A port authority's jurisdiction typically extends over land, where it may include granting concessions, approving construction, and making policy decisions; and over water, where jurisdiction is primarily focused on navigation improvements. A port may own and operate an extensive range of facilities over a large area, many of which may not be water-related. Several port authorities (e.g., Oakland, Portland) also operate airports. The Port Authority of New York and New Jersey operates airports, tunnels, bridges, and transit systems as well as the seaport.

Certain States, such as South Carolina and Georgia, have statewide port authorities that administer some or all of the ports within their jurisdiction. Boards of appointed members typically lead these entities. These port authorities may also directly operate port facilities within the State. A State port authority may be a separate State department or located within that State's Department of Transportation.

Port authority jurisdictions may cross State boundaries. The Port Authority of New York and New Jersey and the Ports of Cincinnati-Northern Kentucky are examples.

Port authorities typically have jurisdiction over public terminals. Port authorities have jurisdiction over most U.S. container terminals, although some container terminals are owned or leased by private interests. Private bulk terminals are normally outside public port authority jurisdiction although they are still subject to U.S. Coast Guard and Federal regulation. Public port authorities may also own or administer bulk and Roll-on/Roll-off (Ro/Ro) terminals.

Public port authorities generally make selected data on their infrastructure and cargo operations available to the public. Data are usually presented on port authority websites, in annual reports, or in special reports or brochures. BTS uses data from these sources to supplement government and trade association sources, and cross-checks the data to assure accuracy and consistency.

Private Port Terminals. Many dry bulk, liquid bulk, and Ro/Ro terminals are owned and operated by private firms, and may or may not fall within public port authority jurisdictions. These terminals tend to be of three types:

- **Terminals owned by vessel or barge operators to serve their own operations.** The primary revenue source for these terminals is the transportation service being offered.

- **Terminals owned by cargo interests**, such as grain terminals owned and operated by grain exporters or petroleum terminals operated by refinery owners. The primary revenue source for these

operations is the cargo and prior/subsequent processing rather than the transportation or terminal services.

- **Terminals owned and operated by marine terminal operators.** These facilities derive their revenue from cargo handling services.

This report presents performance data at the port level, which in many cases include both public and private terminals. When possible, the profiles focus on the public terminals, as ports authorities tend to make capacity and throughput data more readily available through public forums. The wide variety of port ownership, leasing, control, and operations arrangements leads to wide variation in collection, synthesis, and availability of capacity and throughput data. For example, private terminals may or may not publish data on their operations and infrastructure, while a refinery may report total volume of petroleum processed, but not how much was received by vessel versus pipeline. Nationally consistent data are limited for private terminals that are not administrated by a port authority.

As the observations above suggest, this report provides a more detailed picture as well as consistent capacity and throughput measures on public and private terminals governed by port authorities. The ability to measure performance is enhanced when a port authority is actively collecting and reporting data and statistics.

2.1.2 Cargo Types

In general, cargo types handled and geographic location determine the physical characteristics of a port, and the relevance of various capacity and throughput metrics. Specifically, different cargo types require different vessels, terminal configurations, and handling equipment.

Waterborne cargo is generally classified into the following five major types:

- Containerized
- Dry bulk
- Liquid bulk
- Break-bulk
- Ro/Ro

FAST Act Section 6018 specified containerized and dry bulk cargoes as statistical categories; these are addressed in detail below. The other cargo types are discussed more briefly. The total tonnage figures included within this report and the port profiles include all five cargo types.

A large port typically has multiple terminals that together can handle many cargo types; however, individual terminals are usually designed to move a single cargo type. The requirements of loading, unloading, and storing different cargo types lead to major differences in terminal design and overall port infrastructure.

2.1.3 Containerized Cargo

Containerized cargo includes most consumer goods imported into the U.S. and has been the chief focus of concerns over port performance. Cargo is containerized when it is placed in standard shipping containers that can be handled interchangeably on vessels, in terminals, and via inland transport modes. Standardized containers used in international maritime trade come in three lengths: 20 feet, 40 feet, and 45 feet. Standard containers are typically 8 feet wide and 8.5 feet high, regardless of length. Almost any commodity can be moved in standardized shipping containers if packed appropriately, but containerized cargo includes the highest value and most time-sensitive commodities. Approximately 90 percent of dry, non-bulk manufactured goods in international trade are currently shipped in containers.

Container cargo volume and the capacity of container ships are usually measured in twenty-foot equivalent units (TEU), each nominally equal to one 20-foot container. Loaded and empty containers occupy the same space, and are equal in terms of TEU. Forty-foot Equivalent Units (FEU, equal to 2 TEU) are used less frequently when describing throughput and capacity metrics, even though containers that measure 40 feet in length dominate international trade and account for approximately 90 percent of waterborne containers. There are also some 45-foot containers used in international trade (typically equal to 2.25 TEU although sometimes counted as 2.0 TEU). Conversion factors are used to shift between TEU and container counts, thereby allowing the comparison of total container volumes and other metrics. Container vessels range in capacity, from barges that can carry about 100 TEU to ships that are capable of carrying over 20,000 TEU.

2.1.4 Dry Bulk Cargo

Dry bulk cargo includes unpacked and homogenous commodities such as grain, iron ore, or coal. As illustrated in Appendix C, the size of a dry bulk terminal is determined by cargo volume, the number of commodity types, and vessel call frequency. Larger cargo volumes require more space, as do multiple commodities that must be kept separated. Dry bulk terminals usually handle solely imports or exports and are designed accordingly, unlike container terminals that handle both imports and exports.

2.1.5 Other Cargo Types

Other cargo types are not specified in *FAST Act Section 6018*, although other cargo tonnage is included within the total tonnage data reported here and in the 2016 edition of this report. Other cargo types include liquid bulk cargoes, break-bulk cargoes, and Ro/Ro cargoes.

2.2 Port Components

The ports profiled in this report are complex entities, with both physical and institutional components that differ by function, cargo type,

and geographic location, among other factors. The characteristics of these components and their interactions determine a port's overall capacity and annual throughput. Although publicly available measures do not exist for all components, those with nationally consistent measures are reflected in the port profiles in Appendix A. Table 2-1 summarizes these key components and their connection to throughput and capacity.

Figure 2-1 illustrates how changes in vessel size impact port infrastructure. Larger vessels require greater berth lengths, larger loading and unloading equipment, and more cargo/container storage space.

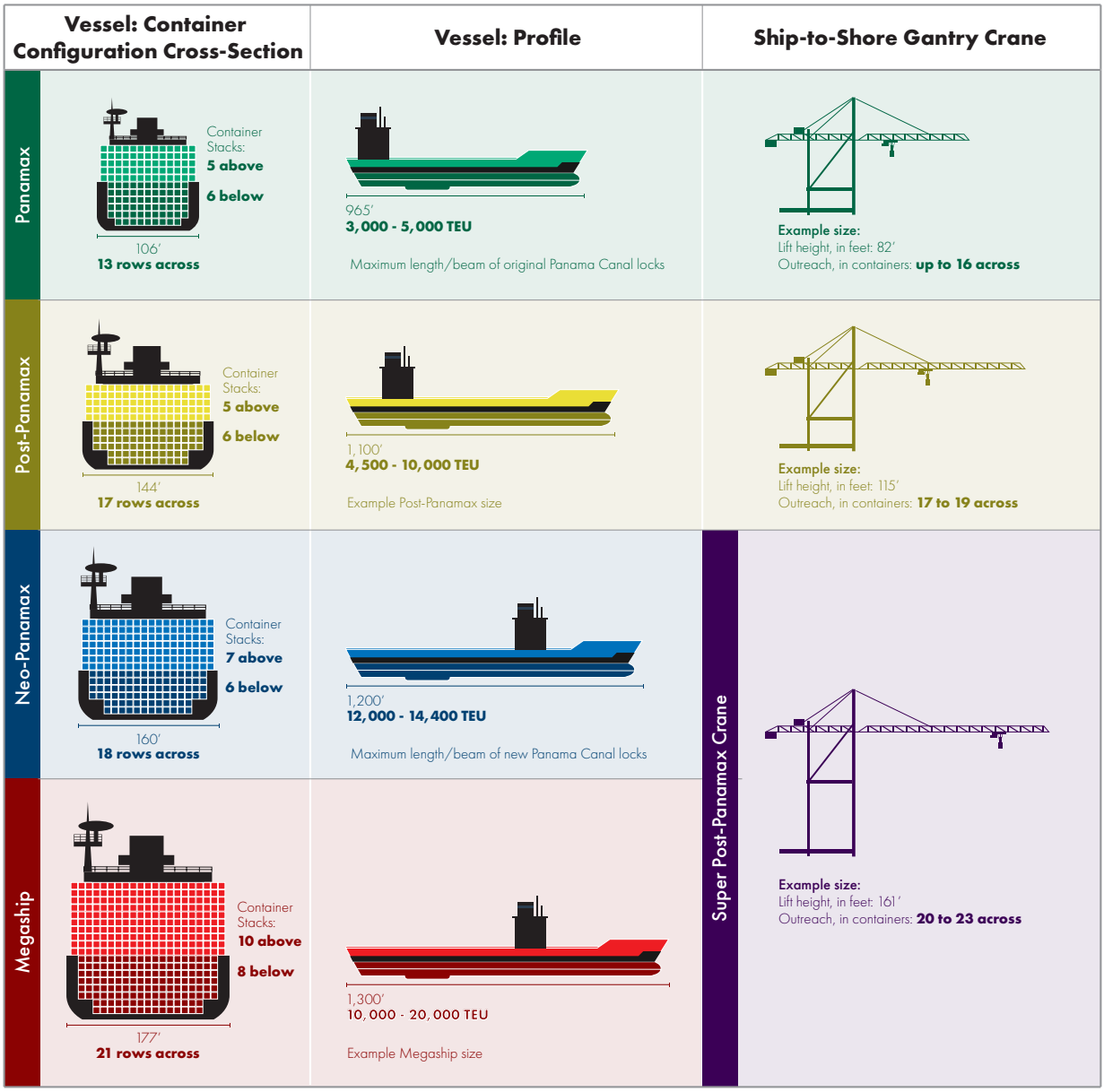
Table 2-1 Key Port Components and Their Impact on Port Infrastructure

Component	Description	Connection to Throughput and Capacity
Berth	A place to stop and secure a vessel for cargo transfer or other purposes. Berth locations are often determined by the availability of securement points on the wharf and may not have fixed sizes or boundaries.	The length of berths is significant for container and break-bulk terminals, where the full length of the vessel must be accessed. Berth length is less significant for bulk and Ro/Ro terminals, where unloading and loading operations use conveyors, ramps, or other means that do not involve the full vessel length. Insufficient berth availability can result in vessels waiting to be unloaded and loaded.
Waterside access	The waterways, channels, reaches, and anchorages that enable vessels to reach a port.	Limited waterside access can constrain the number and size of vessels that can call at a terminal.
Channel	A designated navigable waterway leading from open water to port terminals. Many channels have had sediment and other materials removed from the bottom of the channel (a process known as dredging) to accommodate larger vessels, and require periodic maintenance dredging to keep them clear.	The shallowest point of a channel can be a limiting factor on the size of ships that can access a terminal. Channel access may also be limited by air draft restrictions imposed by bridges.
Terminal	A port facility where vessels are discharged or loaded. Terminals can be defined by their facilities, equipment, the type of cargo handled, physical barriers or boundaries, ownership or operating structure, and other characteristics. Terminals may be operated by a port authority, independent marine terminal operators, vessel operators, or private companies handling their own cargo.	Many ports contain numerous terminals, each with its own berths, equipment, and landside storage space, and which may be adjacent to each other or separated by many miles. Terminals vary widely in configuration and infrastructure, and the number and size are therefore not consistent indicators of port capacity. However, terminal design, size, and infrastructure availability have a significant impact on both throughput and capacity.
Loading and unloading equipment	The fixed or mobile terminal equipment needed to handle different vessel and cargo types.	Cargo and vessel types vary greatly. Most container vessels are loaded and unloaded with shore-side gantry cranes ("container cranes"). Smaller vessels and barges may be handled with on-board equipment ("ship's gear") or with mobile harbor cranes. Ro/Ro vessels and barges are loaded and unloaded via ramps. Bulk and break-bulk terminals use a combination of fixed and mobile equipment that typically allows for faster loading and unloading of a vessel, but operations may still be limited by landside infrastructure and operational efficiency.

Table 2-1 Key Port Components and Their Impact on Port Infrastructure (continued)

Component	Description	Connection to Throughput and Capacity
Modal connections	Connections for moving cargo between vessels and surface transportation modes, including road, rail, and pipeline.	Road access is used for containers, bulk, break-bulk, and Ro/Ro cargo. Highway capacity and congestion can constrain port throughput. For container terminals, the rail intermodal connection is described as on-dock (located within the terminal), near-dock (close to the terminal), or off-dock (farther away from the terminal). Rail is the primary mode of moving dry bulk export commodities, such as coal and grain, to port terminals, and connects coastal container ports to inland import and export markets. Pipelines connect liquid bulk terminals to nearby refineries, storage locations, and distribution facilities.
Cargo/ container/ chassis storage and depots	Places to store cargo, shipping containers, or container chassis outside of port terminals.	Off-terminal storage can include space for cargo before and after it is transferred to or from vessels; parking areas for empty and loaded containers, truck chassis to haul containers, and vehicles being transported in Ro/ Ro ships; trackage to store rail cars; space to pile dry bulk cargo; tank farms for liquid bulk cargo; and warehouses for indoor cargo storage. A lack of storage space may constrain the overall capacity of a terminal as cargo cannot be stored prior to loading or awaiting pickup. The availability of space may also facilitate throughput as separation of activities can alleviate terminal congestion.

Figure 2-1 Vessel Size and Corresponding Port Infrastructure



All cranes or vessels in a column are to scale with each other, but scale differs between columns

2.3 Port Geography

Ports are generally classified as coastal, Great Lakes/St. Lawrence Seaway, or river ports. U.S. coastal ports include those on the East (Atlantic), West (Pacific), and Gulf coasts, as well as those in Alaska, Hawaii, and Puerto Rico. The Great Lakes and Seaway ports include public and private facilities in the eight Great Lakes States (Illinois, Michigan, Ohio, Indiana, Wisconsin, Pennsylvania, New York, and Minnesota). River ports primarily include those on the Mississippi, Columbia-Snake, and Ohio inland waterway systems.

- **Coastal ports** – typically handle larger ships than Great Lakes or river ports as they can meet the deeper draft requirements and greater cargo handling needs of vessels on major international trade routes. Coastal ports tend to have terminals in a compact geographic area. All container ports profiled in this report are coastal ports, due to economies of scale in container terminals and the lack of high-volume container services on U.S. inland waterways.

- **Great Lakes and Seaway ports** – serve ocean-going vessels during their primary season, but close during winter months. Lake terminals can resemble coastal and river facilities, with cargo type and vessel size the primary factors influencing terminal design.

- **River ports** – can be classified into 3 broad categories. The first group includes general purpose facilities that accommodate a wide range of commodities and vessels. The second group includes public facilities designed to handle a single commodity. The third group includes industrial terminals, which are typically privately owned and operated for a manufacturing, agricultural, refining, or mining facility. River and inland waterway ports are more likely than coastal ports to consist of privately owned and operated terminals, given historical patterns of development. River ports may also have terminals that stretch over a distance of many miles. These ports also typically handle smaller vessels than coastal ports, including barges.

2.4 Lists of the Top 25 Ports

The *FAST Act* requires the *Port Performance Freight Statistics Program Annual Report* to include the top 25 ports as measured by overall cargo tonnage, by twenty-foot equivalent units (TEU) of container cargo, and by dry bulk cargo tonnage.

To identify the top 25 ports by overall tonnage, BTS utilized the total weight of cargo (domestic and international) entering and leaving the port in short tons as reported by USACE. For the identification of the top 25 ports by TEU, BTS includes foreign loaded and all domestic containers as reported by USACE. This approach is unchanged from last year's *Annual Report*.

Tonnage statistics are not categorized as dry bulk, so BTS worked with USACE and the Maritime Administration (MARAD) to develop a method for identifying the top 25 dry bulk ports. This methodology is unchanged from last year's *Annual Report*. The *Handbook of Methods* describes these approaches for defining dry bulk cargo in additional detail. This documentation will be made available online.

Figures/Tables 2-2 through 2-4 list the top 25 ports in overall cargo tonnage, total TEU, and dry bulk cargo tonnage, respectively. Maps follow each table to provide port locations. The top 25 ports within each category remained relatively consistent between this report and those reported in the 2016 *Annual Report*. For the top 25 list by total tonnage, Tacoma, WA, took the place of Richmond, CA. For the TEU category, Ketchikan, AK, and Kahului, HI, supplant Camden-Gloucester, NJ, and Juneau, AK. The 25 ports on the dry bulk list are unchanged from last year.

Table 2-5 combines the top 25 ports for each category (total tonnage, TEU, and dry bulk tonnage) into a single list. As indicated in Table 2-5, many ports rank in the top 25 in more than one category. Appendix A profiles each port listed in Table 2-5. A total of 49 ports were identified, of which 46 are located within the continental United States, two in Hawaii, and one in Puerto Rico. The ports were assigned to regions based on four USACE categories: Great Lakes, Atlantic Coast, Gulf Coast and Mississippi River, and Pacific Coast, to clarify the regional distribution of U.S. port capacity and cargo throughput.

Table 2-2 List of Top 25 Ports by Total Tonnage
(Alphabetical Order)

Port	
Baltimore, MD	New Orleans, LA
Baton Rouge, LA	New York and New Jersey, NY and NJ
Beaumont, TX	Pascagoula, MS
Ports of Cincinnati-Northern KY, OH and KY	Plaquemines, LA
Corpus Christi, TX	Port Arthur, TX
Duluth-Superior, MN and WI	Savannah, GA
Houston, TX	South Louisiana, LA,
Huntington – Tristate	St. Louis, MO and IL
Lake Charles, LA	Tacoma, WA
Long Beach, CA	Tampa, FL
Los Angeles, CA	Texas City, TX
Mobile, AL	Valdez, AK
	Port of Virginia, VA

Figure 2-2 Location of Top 25 Ports by Total Tonnage

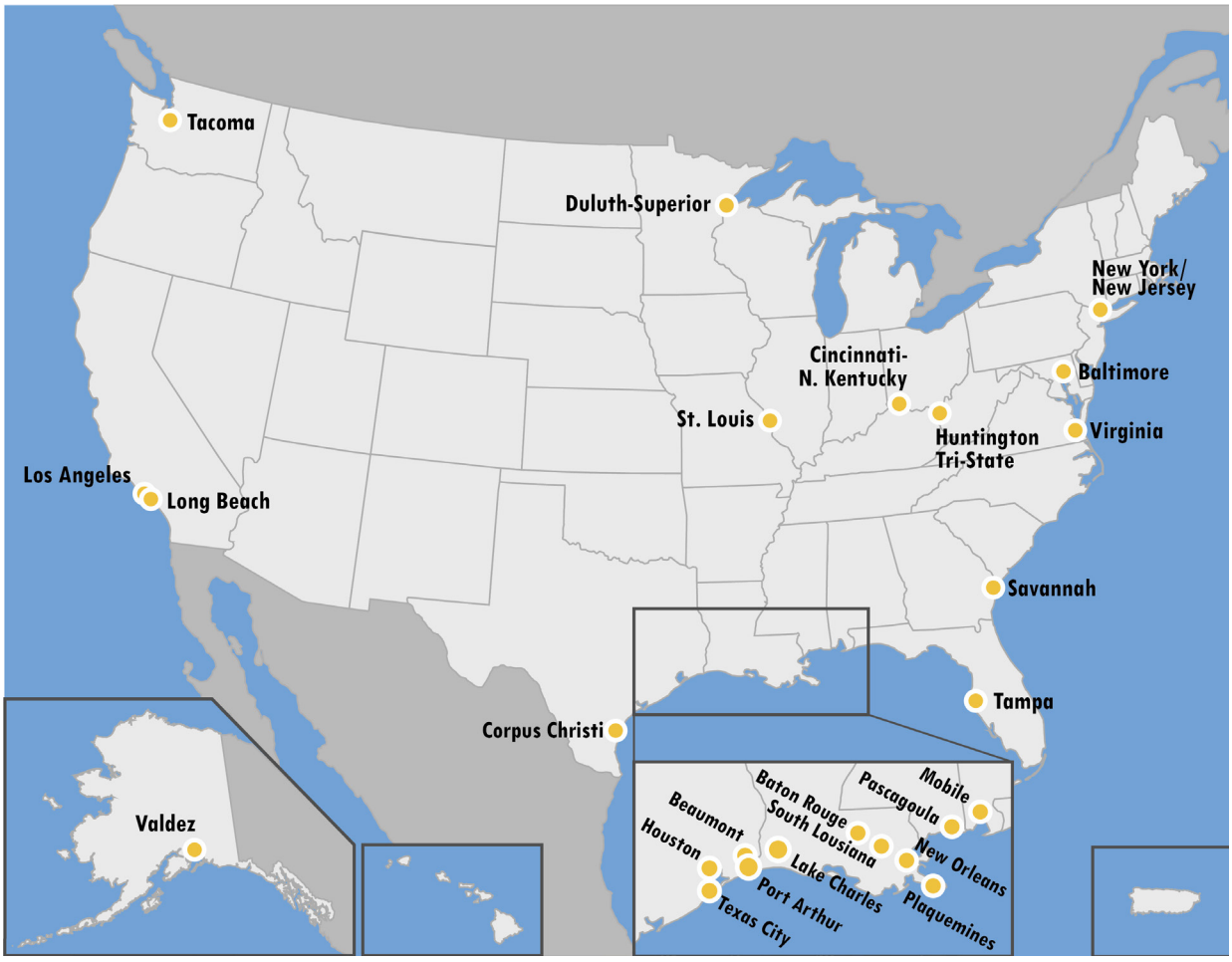


Table 2-3 List of Top 25 Container Ports by TEU
(Alphabetical Order)

Port	
Anchorage, AK	Mobile, AL
Baltimore, MD	New Orleans, LA
Boston, MA	New York and New Jersey, NY and NJ
Charleston, SC	Oakland, CA
Honolulu, HI	Philadelphia, PA
Houston, TX	Port Everglades, FL
Jacksonville, FL	San Juan, PR
Kahului, HI	Savannah, GA
Ketchikan, AK	Seattle, WA
Long Beach, CA	Tacoma, WA
Los Angeles, CA	Port of Virginia, VA
Miami, FL	Wilmington, DE
	Wilmington, NC

Figure 2-3 Location of Top 25 Ports by TEU

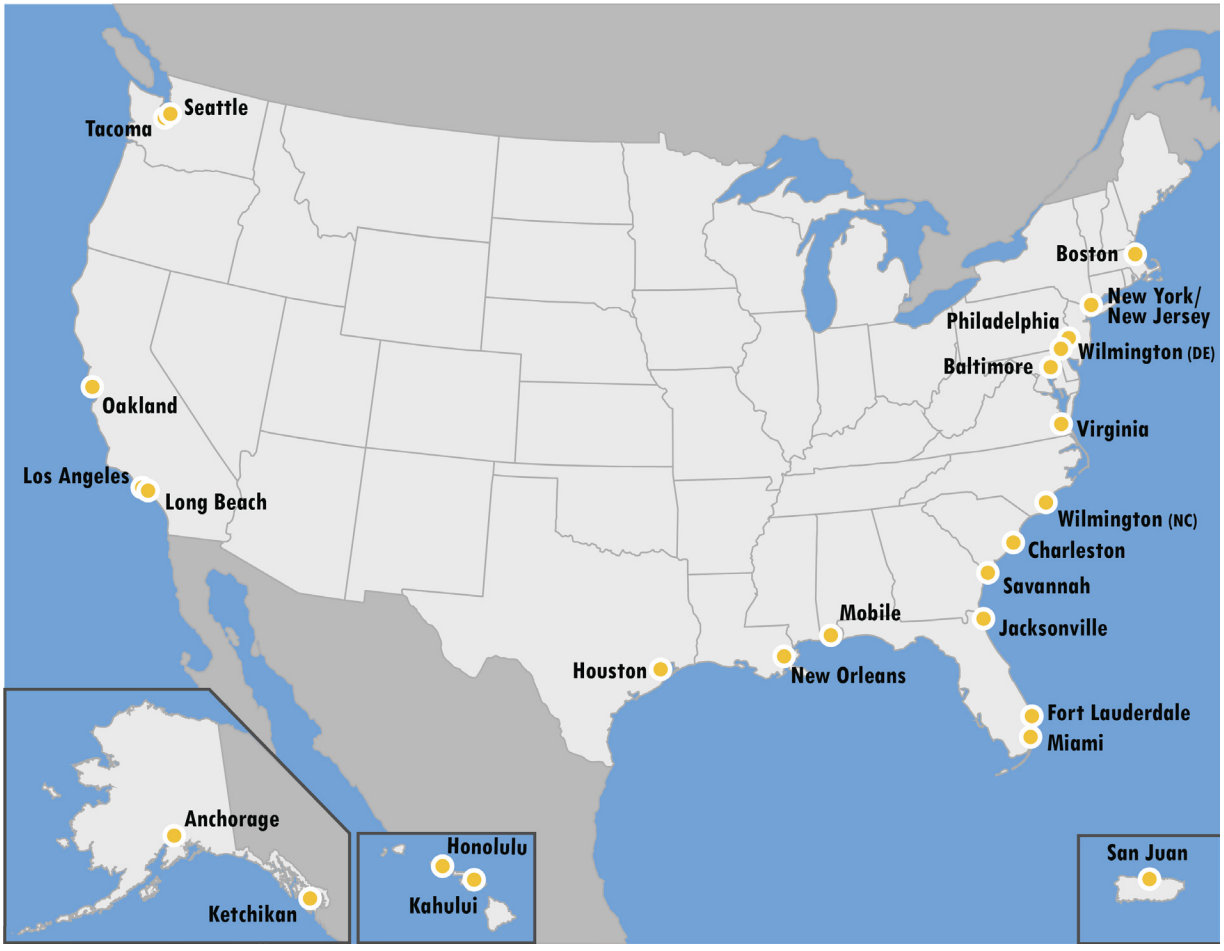


Table 2-4 List of Top 25 Ports by Dry Bulk Tonnage
(Alphabetical Order)

Port
Baltimore, MD
Baton Rouge, LA
Chicago, IL
Ports of Cincinnati-Northern KY, OH and KY
Cleveland, OH
Corpus Christi, TX
Detroit, MI
Duluth-Superior, MN and WI
Houston, TX
Huntington – Tristate, KY, OH, and WV
Indiana Harbor, IN
Kalama, WA
Longview, WA
Mobile, AL
New Orleans, LA
New York and New Jersey, NY and NJ
Pittsburgh, PA
Plaquemines, LA
Portland, OR
Seattle, WA
South Louisiana, LA
St. Louis, MO and IL
Tampa, FL
Two Harbors, MN
Port of Virginia, VA

Figure 2-4 Location of Top 25 Ports by Dry Bulk Tonnage

Table 2-5 List of Top 25 Tonnage, Container, and Dry Bulk Ports
(Alphabetical Order)

Port	Tonnage	Container	Dry Bulk
Anchorage, AK		●	
Baltimore, MD	●	●	●
Baton Rouge, LA	●		●
Beaumont, TX	●		
Boston, MA		●	
Charleston, SC		●	
Chicago, IL			●
Cincinnati-Northern KY, Ports of	●		●
Cleveland, OH			●
Corpus Christi, TX	●		●
Detroit, MI			●
Duluth-Superior, MN and WI	●		●
Honolulu, HI		●	
Houston, TX	●	●	●
Huntington – Tristate	●		●
Indiana Harbor, IN			●
Jacksonville, FL		●	
Kahului, HI		●	
Kalama, WA			●
Ketchikan, AK		●	
Lake Charles, LA	●		
Long Beach, CA	●	●	
Longview, WA			●
Los Angeles, CA	●	●	
Miami, FL		●	
Mobile, AL	●	●	●
New Orleans, LA	●	●	●
New York, NY and NJ	●	●	●
Oakland, CA		●	
Pascagoula, MS	●		
Philadelphia, PA		●	
Pittsburgh, PA			●
Plaquemines, LA, Port of	●		●
Port Arthur, TX	●		
Port Everglades, FL		●	
Portland, OR			●
San Juan, PR		●	
Savannah, GA	●	●	
Seattle, WA		●	●
South Louisiana, LA, Port of	●		●
St. Louis, MO and IL	●		●
Tacoma, WA	●	●	
Tampa, FL	●		●
Texas City, TX	●		
Two Harbors, MN			●
Valdez, AK	●		
Port of Virginia, VA	●	●	●
Wilmington, DE		●	
Wilmington, NC		●	

3 THROUGHPUT AND CAPACITY MEASURES

The statistics in this report measure total port capacity and throughput for 2016, and the change in throughput from 2015 to indicate the extent of trade growth or decline and the increasing challenges facing ports. BTS used the following criteria to select throughout and capacity indicators for this report:

- **Availability** – The chosen measures must be readily available for at least the top 25 ports to which they apply (e.g. tonnage for all ports, TEU for container ports, vessel calls and sizes for all ports).
- **National consistency** – The measures must be based on a nationally consistent definition and collection methodology. Ideally, the measure should be available from a single, authoritative source. If not, multiple sources were documented and reconciled to ensure consistency.
- **Timeliness** – The measures should be final and available for the preceding year (e.g., for 2016 data to be included in this 2017 report).
- **Relevance and clarity** – The measures should be closely connected to the throughput and capacity of ports, terminals, and port infrastructure, and understandable to readers unfamiliar with ports or shipping terminology.
- **Accuracy and transparency** – The measures should be accurate within acceptable data quality standards, and should come from authoritative sources, as outlined in the *Handbook of Methods.*

This section provides an overview of the methodologies used to develop the throughput and capacity measures included in the *Annual Report*. The *Handbook of Methods* provides a more complete description. This documentation will be made available online.

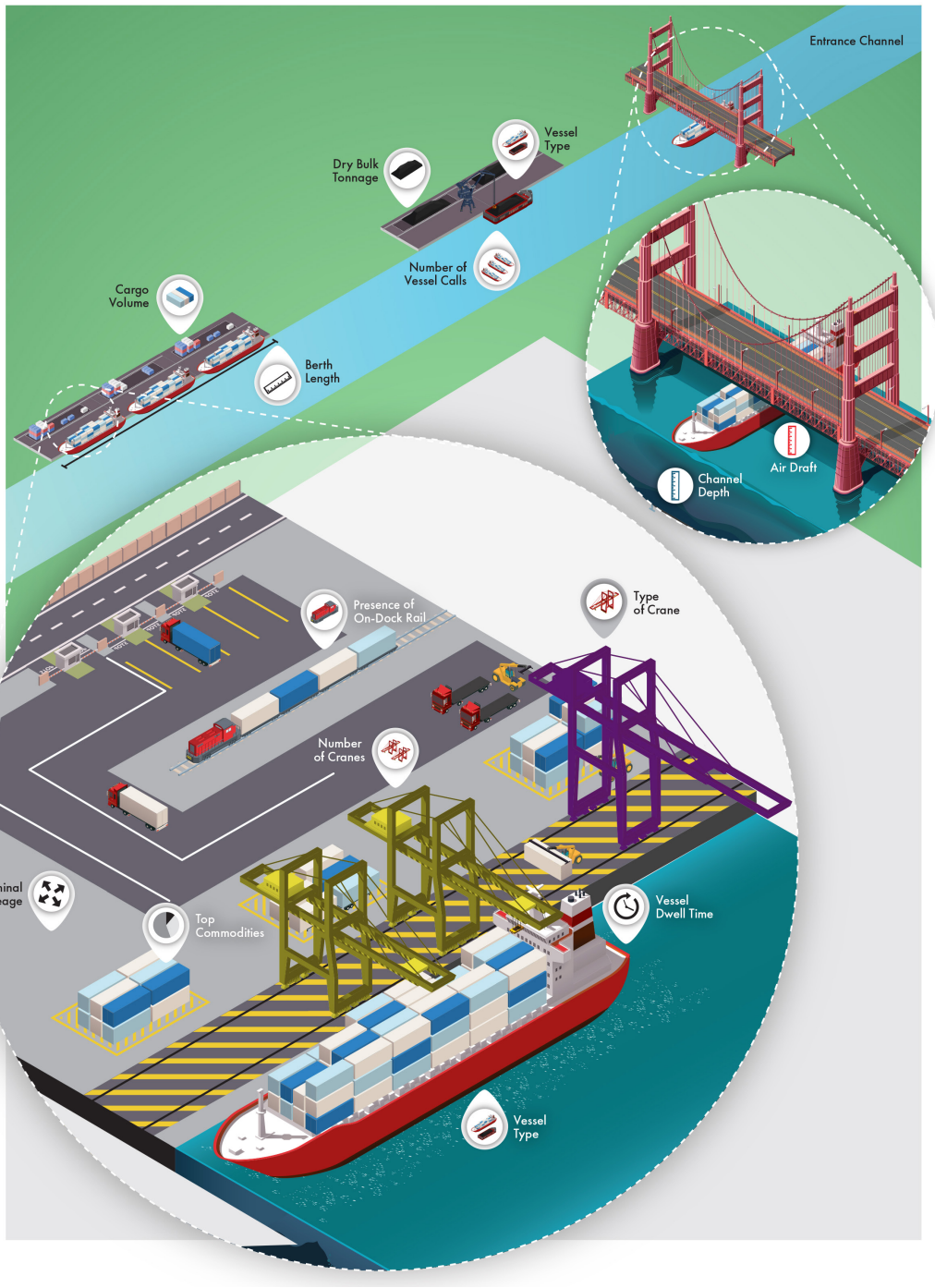
3.1 Summary of Selected Throughput and Capacity Measures

BTS selected multiple throughput and capacity metrics for the top 25 ports by total tonnage, TEU, and dry bulk tonnage. The Port Profiles in Appendix A contain these throughput and capacity metrics for each port included in top 25 ports lists, as well as descriptions of port type and other port characteristics (Table 3-1). Figure 3-1 illustrates, approximately, where each of the selected throughput and capacity metrics are located within the terminal, port, or port vicinity.

Table 3-1 Summary of Elements/Metrics in Port Profiles and Data Sources

Element/ Metric Type	Element/ Metric	Details/Notes	Source (more details in Notes/ Sources in profiles)
Port Description	Port type	Designation using 2016 data as top 25 tonnage, container, or dry bulk port (as specified by FAST Act Section 6018)	USACE, special tabulation, as of October 2017
	Port overview	High-level description of the port	Port websites
Throughput	Annual total tonnage	Domestic, foreign, import, export, and total short tons, 2016 and percentage change from 2015	USACE, special tabulation, as of October 2017
	Annual container throughput	Inbound, outbound, loaded, empty, and total TEU, 2016 and percentage change from 2015	AAPA, Port Industry Statistics, NAFTA Region Container Traffic, October 2017[1]
	Annual dry bulk tonnage	Domestic, foreign, import, export, and total short tons, 2016 and percentage change from 2015	USACE, special tabulation, as of November 2017
	Annual vessel calls by vessel type	2016 and percentage change from 2015	USACE, special tabulation, as of October 2017
	Top 5 commodities	Total short tons 2016 and percentage share of total	USACE, special tabulation, as of October 2017
	Average container vessel dwell time	Port terminal boundaries limited to terminals servicing container vessels	U.S. Coast Guard Nationwide Automatic Identification System
Capacity	Channel depth	Measured in feet Authorized Channel Depth Minimum Project Dimension Depth Mean Lower Low Water (MLLW) for each container terminal	USACE Deep Draft and Shallow Draft Navigation Project listing, special tabulation, as of December 2017
	Air draft restrictions	Measured in feet Located within the vicinity of the port	NOAA USACE charts
	Berth length for container ships	Measured in feet Presented for the top 25 container ports	Port and terminal websites
	Container terminal size	Measured in acres	Port and terminal websites
	Number and type of container cranes	Number of cranes capable of serving (1) Panamax, (2) Post-Panamax, and (3) Super Post-Panamax vessels Presented at terminal level for top 25 container ports	Port and terminal websites
	Presence of on-dock rail transfer facilities	Presented for top 25 container ports	Port and terminal websites

Figure 3-1 Location of Metrics within Port



3.2 Port Throughput

Throughput measures reflect the amount of cargo or number of vessels ports handle over time. These measures are affected by many variables beyond physical capacity, such as international and domestic cargo demand, competition between ports, contractual arrangements with carriers, and changes in distant facilities such as expansion of the Panama Canal.

This *Annual Report* builds upon the basic measures of tonnage, TEU, vessel calls, and top commodities that were used to characterize port throughput for 2015 and provides additional data. For example, barges are separated from the non-container vessel categories in the vessel call analysis, and the top commodities are specified at the 4-digit level rather than the 1-digit level. New measures were developed, including the use of Automatic Identification System (AIS) signals from container vessels to examine container ship dwell time.

The throughput statistics included in this report are (1) total cargo tonnage, (2) container TEU, (3) dry bulk tonnage, (4) vessel calls by type, (5) top commodities handled, and (6) average container vessel dwell time. It is important to note that all throughput statistics presented in this report are annual totals, which can mask seasonal variations in cargo flows that place recurring stress on available port capacity. Each metric is examined in more detail below, along with an analysis for the relevant top 25 ports.

3.2.1 Cargo Tonnage

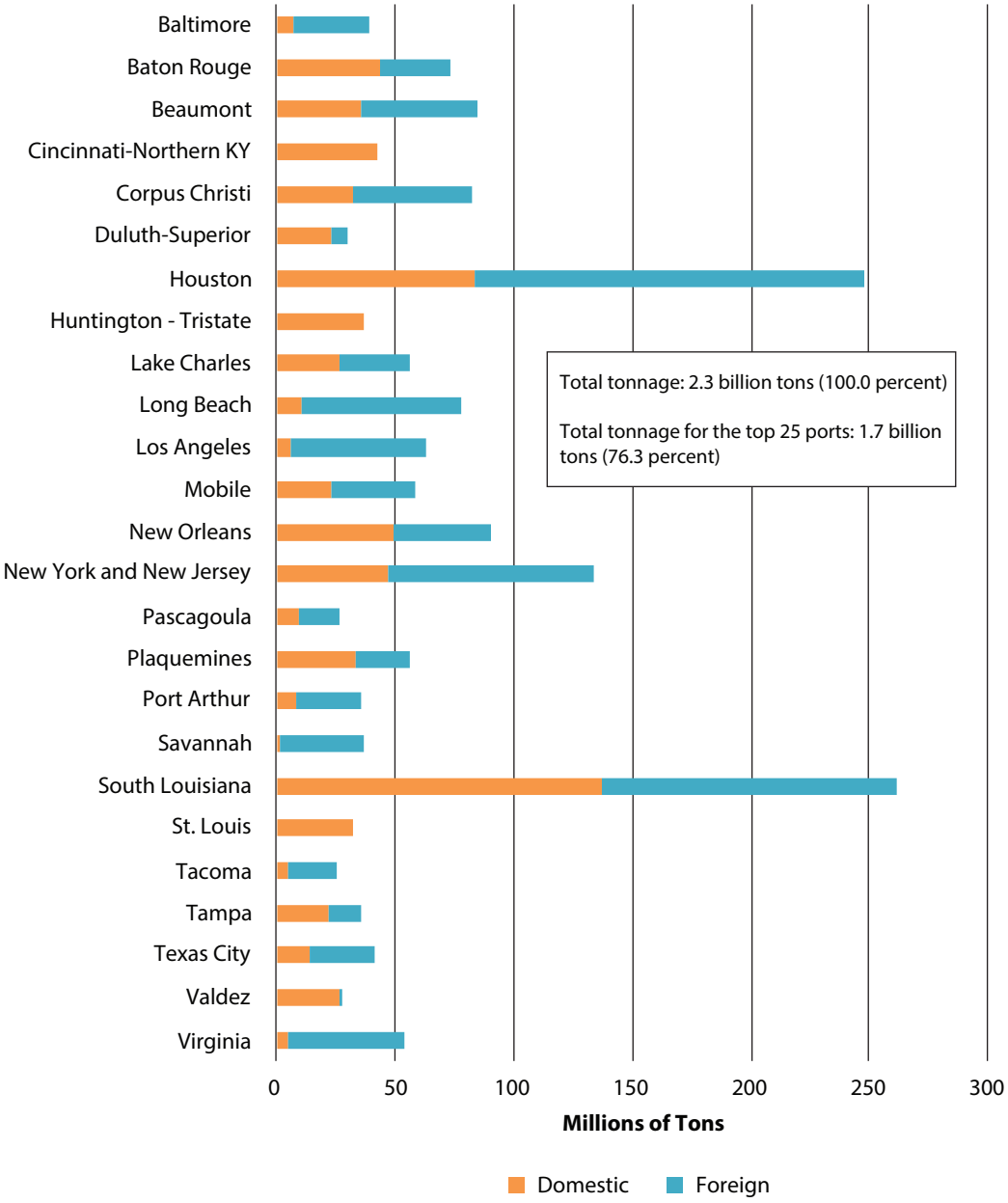
Cargo tonnage is the most fundamental measure of port and terminal throughput. Total cargo tonnage includes the weight of dry bulk and liquid bulk cargo, break-bulk cargo, Ro/Ro vehicles and industrial equipment, and the contents of shipping containers. Total cargo tonnage does not include the weight of shipping containers themselves, even though movement of empty containers may be a significant portion of a port's activity.

Figure 3-2 displays the total short tons moved in 2016 for the 25 top tonnage ports, which includes the weight of all cargo. Figure 3-3 depicts the dry bulk tonnage in 2016 for the top 25 dry bulk ports. Dry bulk tonnage is determined by the type of vessel that carried the cargo, as described in Section 2.1.4. The highest tonnage figures are associated with ports that handle large quantities of both liquid bulk cargo (e.g., petroleum or chemicals) and dry bulk cargo (e.g., grain or coal), such as the Ports of South Louisiana and Houston.

3.2.2 Container TEU

The top 25 container ports by TEU count were identified using USACE data for loaded and empty domestic containers and loaded foreign containers; USACE does not include foreign empty containers in its published statistics. This approach is consistent with last year's *Annual Report* and allows for a nationally consistent methodological approach. Since empty containers can have a significant impact

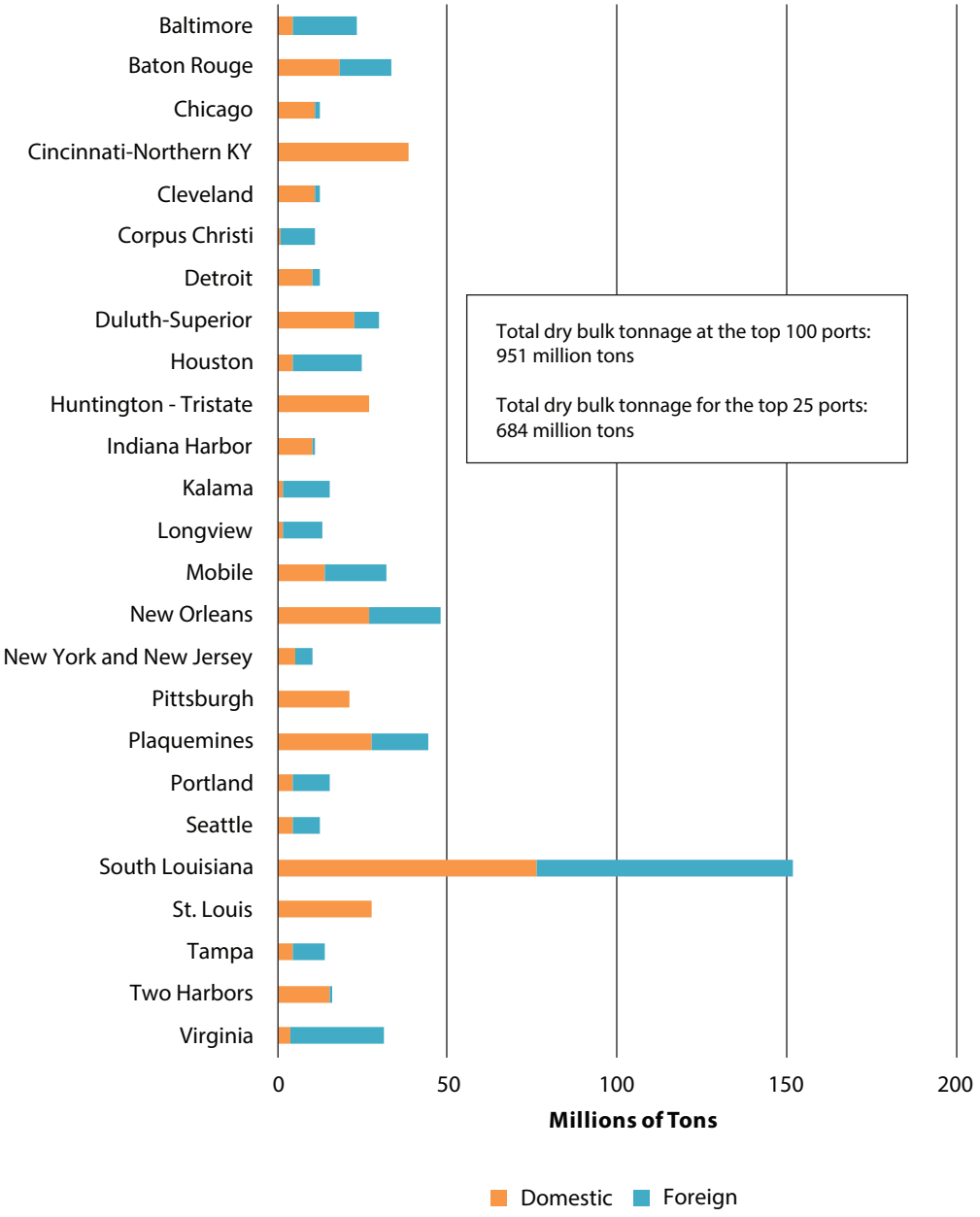
Figure 3-2 Annual Total Tons of the Top 25 Ports by Tonnage, 2016
(Alphabetical Order)



NOTES: *Domestic* is cargo moving from a U.S. dock to a U.S. dock. *Foreign* is waterborne import, export, and in-transit cargo between the United States and any foreign country.

SOURCE: USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017.

Figure 3-3 Annual Dry Bulk Tons of the Top 25 Ports by Dry Bulk Tonnage, 2016
(Alphabetical Order)



NOTES: *Domestic* is cargo moving from a U.S. dock to a U.S. dock. Foreign is waterborne import, export, and in-transit cargo between the United States and any foreign country.

SOURCE: USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of November 2017.

on port operations, the throughput statistics presented in this report draw on AAPA data to include both foreign empty and loaded containers and thus reflect the full volume of activity.

USACE TEU tabulations are derived from cargo manifest data collected by the Federal government and compiled through the Port Import Export Reporting Service (PIERS). AAPA publishes container statistics from data released by the ports, which BTS checked through comparisons with data available on port authority websites.

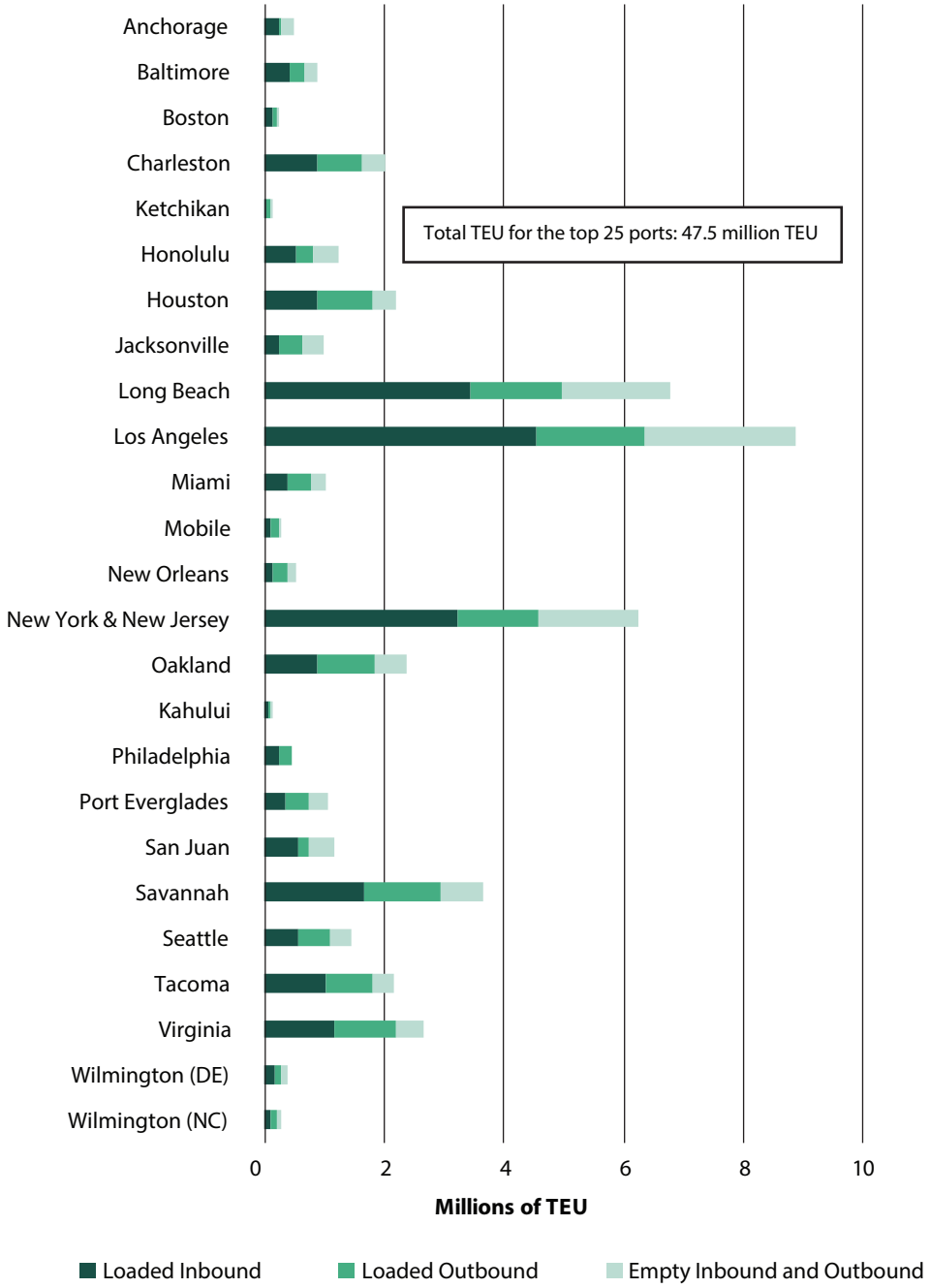
Container flows are characterized as "inbound" (including imports received from foreign origins and domestic cargo from U.S. origins, as well as inbound empty containers) and "outbound" (including exports to foreign destinations and domestic cargo shipped to other U.S. destinations, as well as outbound empty containers). Figure 3-4 displays the 2016 TEU volumes for the top 25 U.S. container ports. The highest container volumes pass through ports that serve large coastal and inland markets, such as the Port of Long Beach, the Port of Los Angeles, and the Port of New York and New Jersey.

While TEU is the standard measure of container movement, it does not fully represent the work accomplished by container terminals, or by the motor carriers and railroads that connect port terminals to the marketplace. The total work accomplished is a function of the number of containers handled rather than the total TEU volume. The mix of container sizes at most U.S. ports yields an average TEU per container ratio of 1.5–1.8, because 40' containers (equal in capacity to two 20' containers or 2.0 TEU) are most common. The Port Profiles in Appendix A report the number of containers handled for each port. 48' and 53' domestic containers are also used in North America and sometimes move in domestic barge service through coastal ports. These larger containers are reflected in USACE domestic trade data, but rarely move in foreign oceanborne trade.

3.2.3 Vessel Calls

The individual port profiles in this *Annual Report* include the total number of cargo vessel calls that each port handled in 2016, and the change from 2015. Vessel calls are divided into five categories based on International Classification of Ships by Type (ICST) codes, and exclude two broad categories: ferries, cruise, and other passenger vessels; and support vessels. In a change from the 2016 *Annual Report*, dry bulk and other freight vessels are both divided into barge and non-barge groups. This separation allows for a more meaningful description of the activity at each port. The full list of vessel call categories is as follows:

Figure 3-4 Annual TEU of the Top 25 Ports by TEU, 2016
(Alphabetical Order)



NOTES: Data provided by USACE Waterborne Commerce Statistics Center was used to identify the top 25 ports. Data provided by AAPA and port authorities was used to provide detailed TEU counts. BTS assigned the Northwest Seaport Alliance TEU counts to the Port of Seattle and the Port of Tacoma based on the distribution reported by USACE.

SOURCES: AAPA, *NAFTA Region Container Traffic* available http://www.aapa-ports.org/, as of October 2017, port authorities, and USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017.

- **Container** – Vessels identified as carrying containers. A container vessel is usually a cellular container ship loaded and unloaded using shoreside container cranes, or a "geared" vessel that can also handle containers with its own on-board cranes. Some ports handle containers on Ro /Ro vessels and/or barges. These types are not included in the container vessel counts unless specifically classified as container vessels, as it is not feasible to separate out which Ro/Ro or barge calls carry containers.

- **Dry bulk** – Non-barge vessels identified as carrying dry bulk cargo. The method for selecting vessel types most commonly used in shipping dry bulk, described in the *Handbook of Methods*, was developed to quantify dry bulk port cargo volumes and select the top 25 dry bulk ports. Six of the 13 vessel types selected to measure dry bulk cargo tonnage and dry bulk vessel calls are self-propelled or otherwise classified as non-barge vessels, and are included in this category.

- **Dry bulk barge** – The remaining seven vessel types that were identified both as carrying dry bulk cargo and as barges.

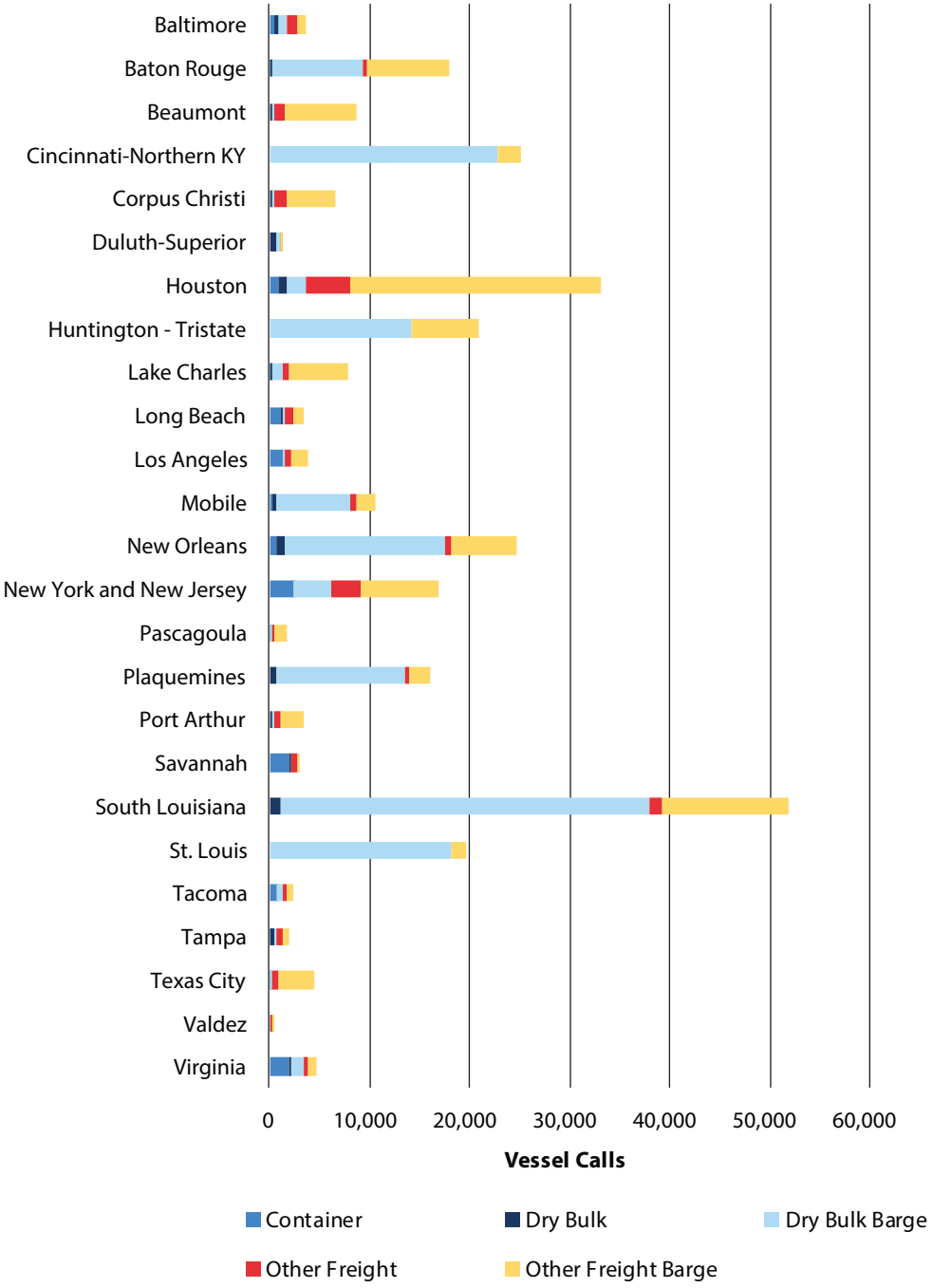
- **Other cargo** – All other vessels that predominantly handle cargo and are not designated as container vessels, dry bulk vessels, or barges. These include crude oil tankers, liquefied natural gas (LNG) tankers, chemical tankers, general cargo vessels, and vehicle or Ro/Ro carriers. The combination of "Other freight vessel" calls and "Other freight barge" calls represent overall cargo tonnage minus container and dry bulk cargo tonnage.

- **Other cargo barges** – Vessels that were identified both as barges and as carrying non-containerized, non-dry bulk cargo.

Figure 3-5 shows 2016 vessel calls by category of vessel for the top 25 ports by tonnage. Figure 3-6 and Figure 3-7 show 2016 dry bulk and container vessel calls for the top 25 ports by dry bulk tonnage, and top 25 container ports by TEU, respectively.

There were 346,468 calls at the 49 ports that make up the three port lists in 2016, which is a 0.2 percent increase over the 345,629 calls made at the same ports in 2015. Container vessel calls at the top 25 ports by TEU increased by 2.7 percent between 2015 and 2016 with 18,459 calls. There were 178,365 total dry bulk vessel calls at the top 25 dry bulk tonnage ports, which is a 1.4 percent increase between 2015 and 2016. Dry bulk barges comprised the majority of these vessels, with 95.6 percent of the total in 2016. Dry bulk barge calls at the 25 ports increased by 1.8 percent between 2015 and 2016, while non-barge dry bulk vessel calls decreased by 5.3 percent.

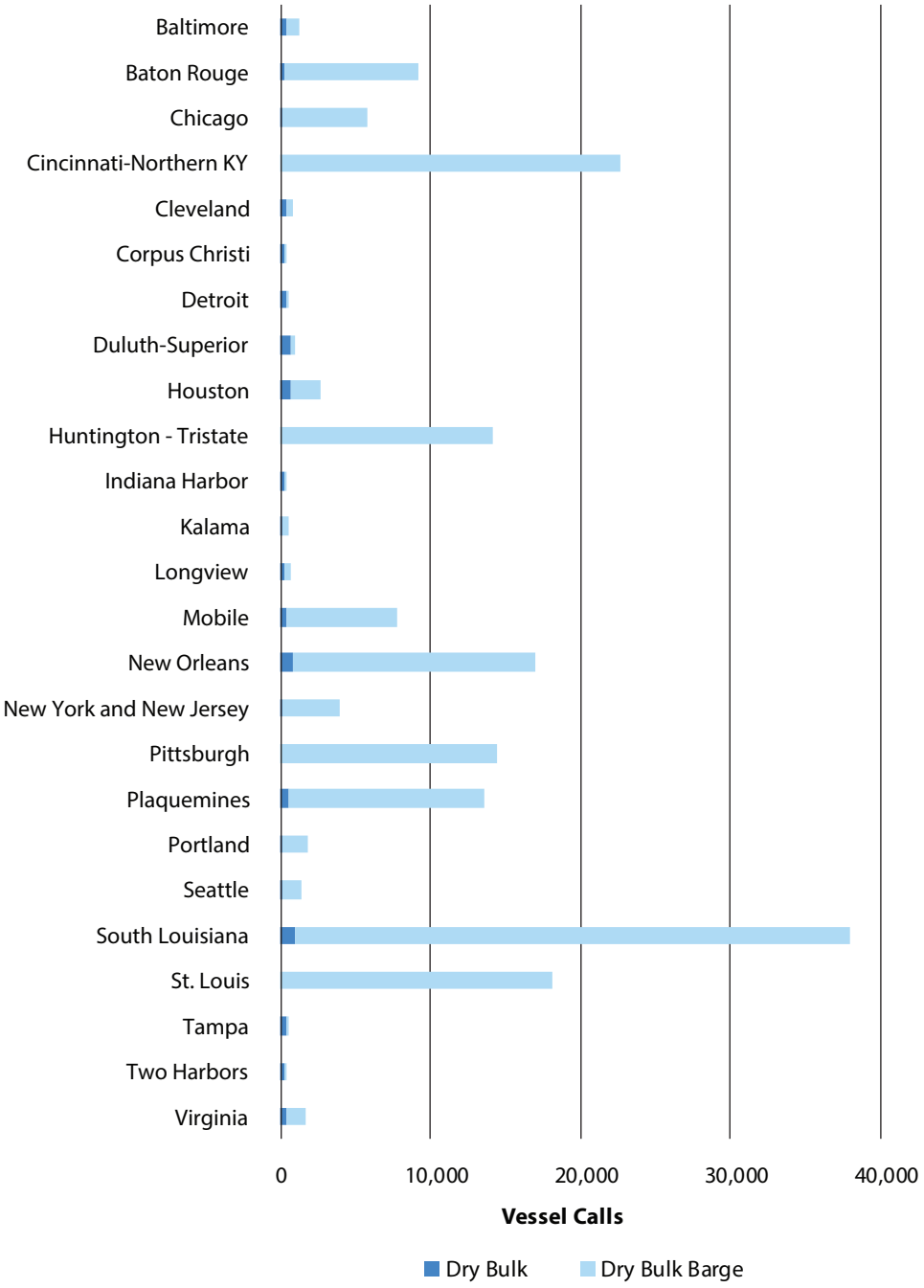
Figure 3-5 Cargo Vessel Calls for Top 25 Ports by Tonnage, 2016
(Alphabetical Order)



NOTE: The ports in this figure include the top 25 ports by tonnage.

SOURCE: USACE, Waterborne Commerce Statistics Center, 2017 data, special tabulation, as of October 2017.

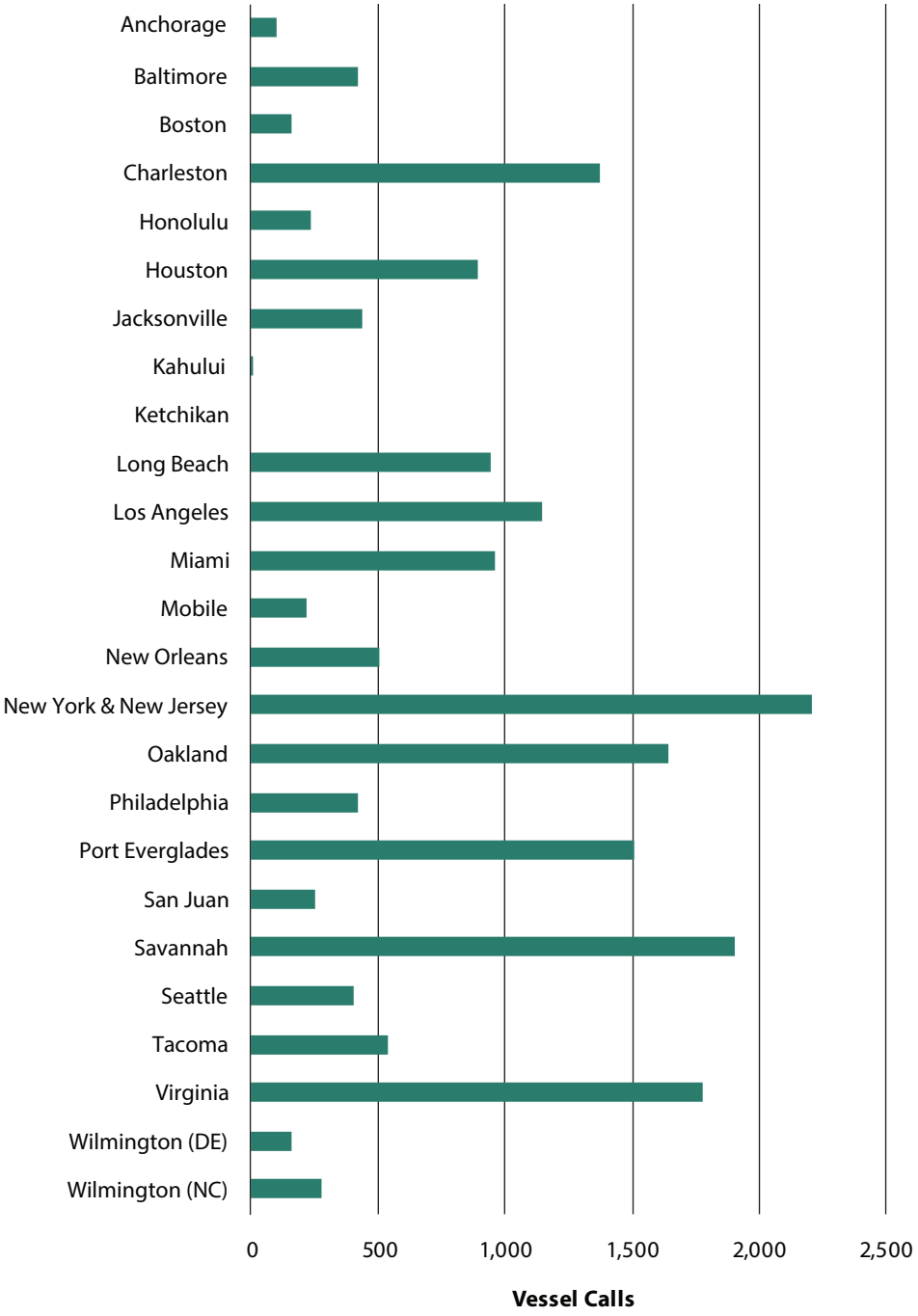
Figure 3-6 Dry Bulk Vessel Calls for Top 25 Ports by Dry Bulk Tonnage, 2016
(Alphabetical Order)



NOTE: The ports in this figure include the top 25 ports by dry bulk tonnage.

SOURCE: USACE, Waterborne Commerce Statistics Center, 2017 data, special tabulation, as of October 2017.

Figure 3-7 Container Vessel Calls for Top 25 Container Ports, 2016
(Alphabetical Order)



NOTE: The ports in this figure include most of the top 25 ports by TEU. The ports of Kahului and Ketchikan primarily handle containers on Ro/Ro vessels and barges, which are not included in the container vessel counts.

SOURCE: USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017.

3.2.4 Top Five Commodities Measured by Tonnage

USACE tabulates cargo tonnage by commodity, including dry bulk cargo and container cargo (excluding the weight of containers). USACE classifies the cargo using a series of numeric codes that correspond with the Lock Performance Monitoring System, which are standardized to reflect the hierarchical structure of the Standard International Trade Classification system. The profiles provide the tonnage of the top five commodities at the four-digit classification level using simplified names to describe the categories rather than the complex regulatory categories. The profiles in Appendix A also provide the percentage share of total tonnage for each of the top five commodities.

3.2.5 Container Vessel Dwell Time

Container vessels operate on schedules, and the ability to control the amount of time they spend in port – known as dwell time – is a major factor in a port terminal's ability to unload and load vessels ("turning" the ship), annual port throughput, and vessel service reliability. Shorter dwell times are desirable because vessel and marine terminal operating costs typically rise with dwell time.

Dwell times for non-containerized break-bulk, Ro/Ro, and tank vessels and barges are governed by different factors. Such vessels do not always operate on a schedule, and their time in port depends on cargo volume, cargo type, and cargo handling methods. Future reports in this program may be able to provide insights into non-containerized vessel dwell times.

In collaboration with USACE, BTS developed a method to estimate vessel dwell times at U.S. ports using U.S. Coast Guard (USCG) AIS data. AIS is a ship-to-ship and ship-to-shore maritime navigation safety communications system that monitors and tracks ship movements, primarily for collision avoidance (47 CFR §80.5). USCG regulates the use of AIS in U.S. waters, and has deployed a Nationwide AIS (NAIS) system of towers and transceivers to receive and transmit AIS messages. NAIS consists of an integrated system of AIS, data storage, processing, and networking infrastructure. In addition, NAIS integrates with other systems for purposes of sharing infrastructure, quicker implementation, and improved performance. The U.S. Army Engineer Research and Development Center (ERDC) has also deployed AIS transceivers at inland navigation locks to support the Lock Operations Management Application (LOMA). The NAIS and LOMA vessel position reports are stored in a multi-year NAIS archive accessible to authorized parties.

From 2016 AIS data, 18,500 records of container vessel calls at U.S. ports were inferred. In 2016, the average container vessel dwell time at U.S. ports was 24.8 hours. Figure 3-8 provides a perspective on overall U.S. container vessel dwell times

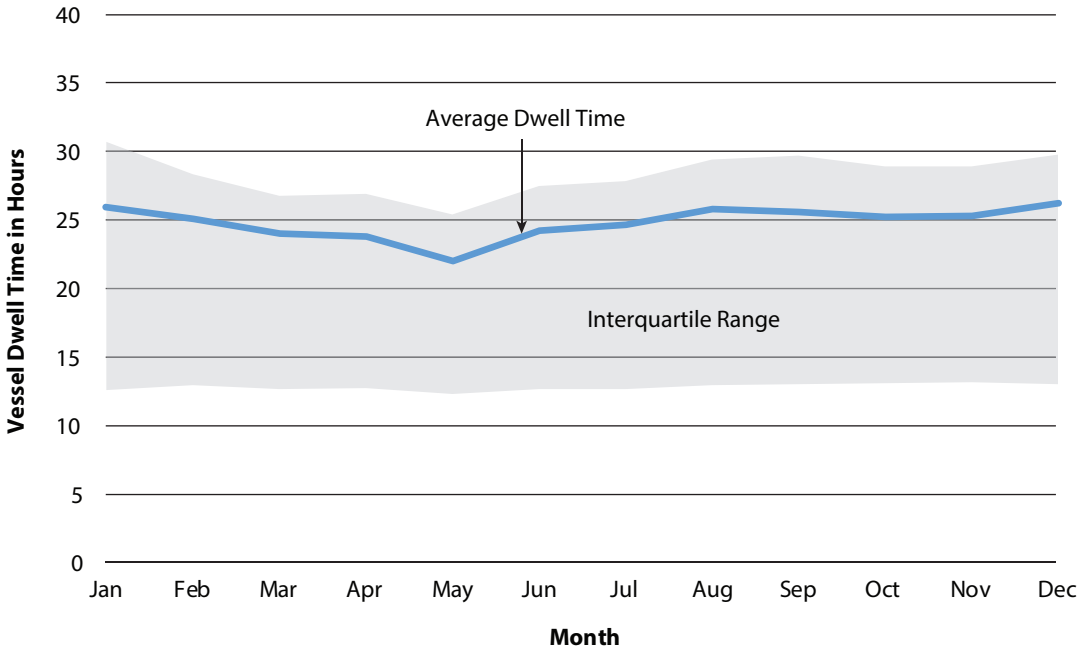
(details on the dwell time data and analysis are provided in the *Handbook of Methods*).[4] As Figure 38 shows, the month-to-month U.S. average dwell time is fairly consistent. Except in winter, the average remains within five percent of the annual mean (the May average is missing data from Southern California ports, which typically have longer dwell times). The higher averages in December through February may be due to winter weather impacts at some ports. It can be illustrative to compare the overall U.S. seasonal pattern below with the port-by-port patterns shown in the port profiles in Appendix A. The shaded area in Figure 3-8 highlights the interquartile range, which is the 50 percent of vessel calls between the 1st and 3rd quartiles. For example, 50 percent of vessels had dwell times between 12.6 and 30.7 hours (a difference of 18.1 hours) in January 2016, which is the month with the most variability. May had the least variability.

[4] Forthcoming in spring 2018.

Dwell Time Variability and Scheduled Vessel Calls

Despite the stability of the U.S. average dwell time in Figure 3-8, review of the AIS data reveals that dwell times vary widely between vessels, ports, and even different calls by the same vessel at the same port. Figure 3-9 shows the distribution of the dwell times in Figure 3-8. The long "tail" of the Figure 3-9 histogram illustrates dwell time variability.

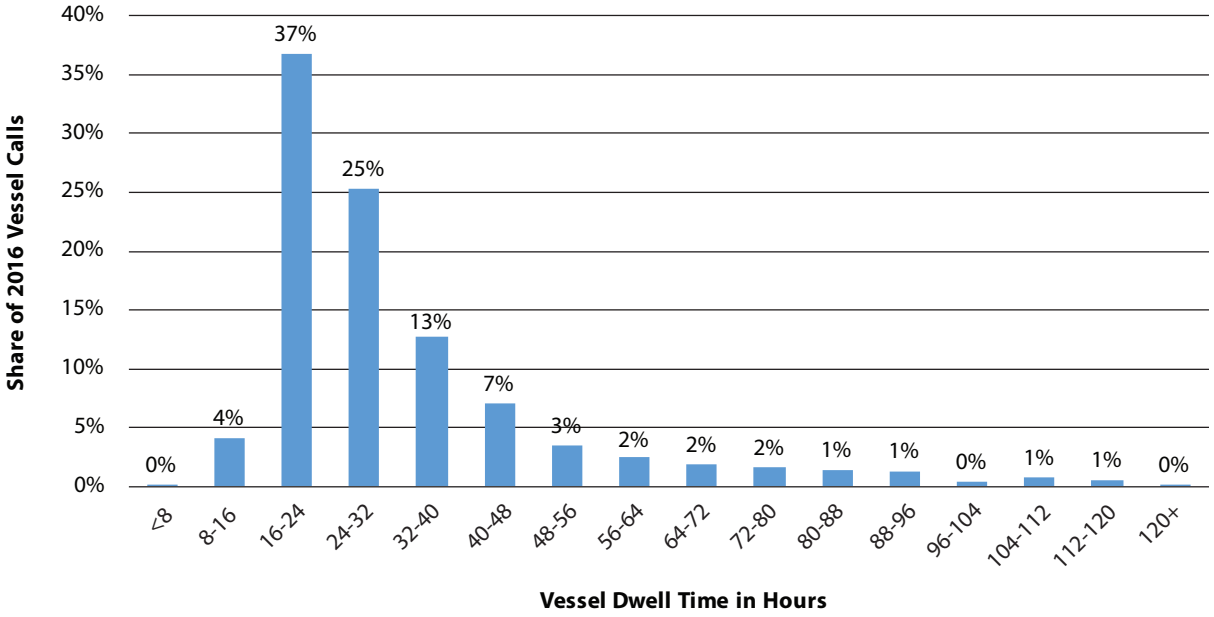
Figure 3-8 Average U.S. Container Vessel Dwell Times, 2016



NOTE: Based on 18,500 observations. May is missing data for ports in Southern California.

SOURCE: USDOT, BTS, and Volpe Center, calculated using AIS data provided by ERDC.

Figure 3-9 Distribution of Container Vessel Dwell Times, 2016



NOTE: Based on 18,500 observations.

SOURCE: USDOT, BTS, and Volpe Center, calculated using AIS data provided by ERDC.

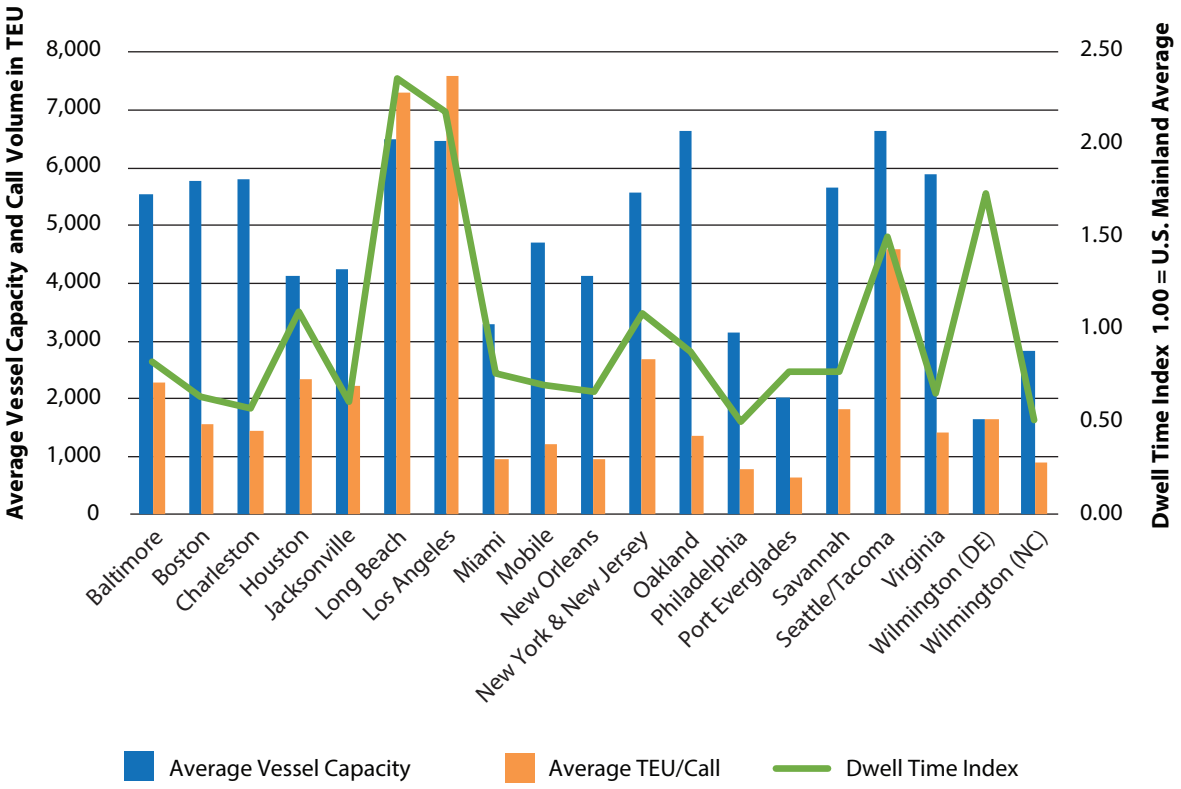
Adherence to vessel schedules is critical in managing port capacity, equipment, and labor to maximize throughput. The published schedule governs the time span over which the vessel is expected to be available for discharge and loading. Container vessels are typically scheduled for one to two days in port. Vessels rarely begin discharging before their scheduled arrival, even if the vessel itself arrives early. Vessels likewise rarely leave before scheduled departure. Although AIS data are not yet linked to vessel schedules, preliminary analysis of the available dwell time data suggests that dwell times generally correspond to scheduled vessel calls. As Figure 3-9 shows, 86 percent of container vessel dwell times are within eight to 48 hours, typical of a one- to two-day scheduled vessel call.

The distribution in Figure 3-9 is skewed because vessels seldom spend less than their scheduled time in port, but may spend much longer in port if delayed.

Dwell Time, Vessel Size, and Container Volume

Container vessel dwell time is commonly attributed to the size of the vessel. The container shipping industry and its customers are concerned that the growing size of container vessels will lead to longer dwell times, reduced service reliability, and higher terminal costs. Analysis of the AIS data indicates that container vessel size (measured in TEU capacity) does influence terminal dwell time, but that cargo volume handled per call is the major factor. Figure 3-10 suggests that

Figure 3-10 Average Vessel Capacity, TEU per Call, and Dwell Time Indices for Mainland U.S. Ports, 2016



KEY: TEU = Twenty Foot Equivalent Unit

SOURCES: *Dwell Time*: USDOT, BTS, and Volpe Center, calculated using AIS data provided by ERDC. Vessel Size: USDOT, MARAD, special tabulation, as of November 20, 2017.

average dwell time is more closely associated with volume per call than with vessel size or capacity. For example, in 2016 the Port of Charleston had an average container vessel size (capacity) of 5,791 TEU, an average cargo volume of 1,450 TEU per call, and an average container vessel dwell time of 14.3 hours. The Port of Long Beach had an average container vessel size of 6,498 TEU (12 percent larger than Charleston), but an average cargo volume of 7,309 TEU per call (five times greater than Charleston), leading to an average dwell time of 58.6 hours.

The difference between *vessel size/capacity* and *container volume handled* leads to a disconnect between vessel size and dwell time. Ocean carriers assign vessel sizes and capacities for complete multi-port voyages, not for the cargo volume at each port. The average vessel *capacity* at most U.S. mainland ports ranges from about 4,000-6,000 TEU. (Hawaiian, Alaskan, and Puerto Rican ports have a very different mix, including barges or Ro/Ro vessels in the domestic *Jones Act* trades.) The average *TEU per vessel call*, however, varies widely. On the Atlantic Coast vessels typically

call at multiple ports, spreading the volume over multiple markets. On the Pacific Coast, most vessels just call at one or two ports. At Los Angeles and Long Beach, many vessels unload and load nearly their full capacity at a single call, resulting in longer dwell times. Patterns vary on the Gulf Coast, with Houston handling higher volumes per call than other ports. Data on average TEU per call are provided for each mainland port in the Port Profiles.

Implications for Port Capacity and Throughput

Port terminals must provide sufficient capacity to discharge and load container vessels within scheduled calls. Ocean carriers and terminal operators are concerned with dwell times due to the costs of holding and handling vessels while in port. Port customers are concerned when longer dwell times lengthen schedules and raise costs that are ultimately reflected in shipping rates.

The dwell times estimated from analyzing the AIS data implies there might be cause for concern, but the cause for concern is less the physical size of larger vessels than the greater container volumes they may hold. A trend toward handling the same cargo volume in fewer vessel calls will require increased terminal capacity to avoid longer dwell times and higher costs. As trade volume increases, annual port throughput capacity may not grow fast enough to meet the throughput demands of vessel calls. These implications are consistent with the observed industry practice of assigning cranes to a vessel call based on the number of containers to be handled, rather than on the size of the vessel alone. The need for more and larger cranes to handle larger vessels, as discussed further in section 4.2, is thus as much a function of vessel cargo loads as of vessel size alone. BTS will continue to explore the AIS data and seek ways to improve their use in measuring port performance.

3.3 Port Capacity

In theory, port capacity is a simple measure of the maximum throughput in tons, TEU, or other units that a port and its terminals can handle over a given period. This maximum can be set by physical constraints (where the port is unable to handle any additional cargo) or by economic conditions (where the marginal cost of additional throughput is prohibitive).

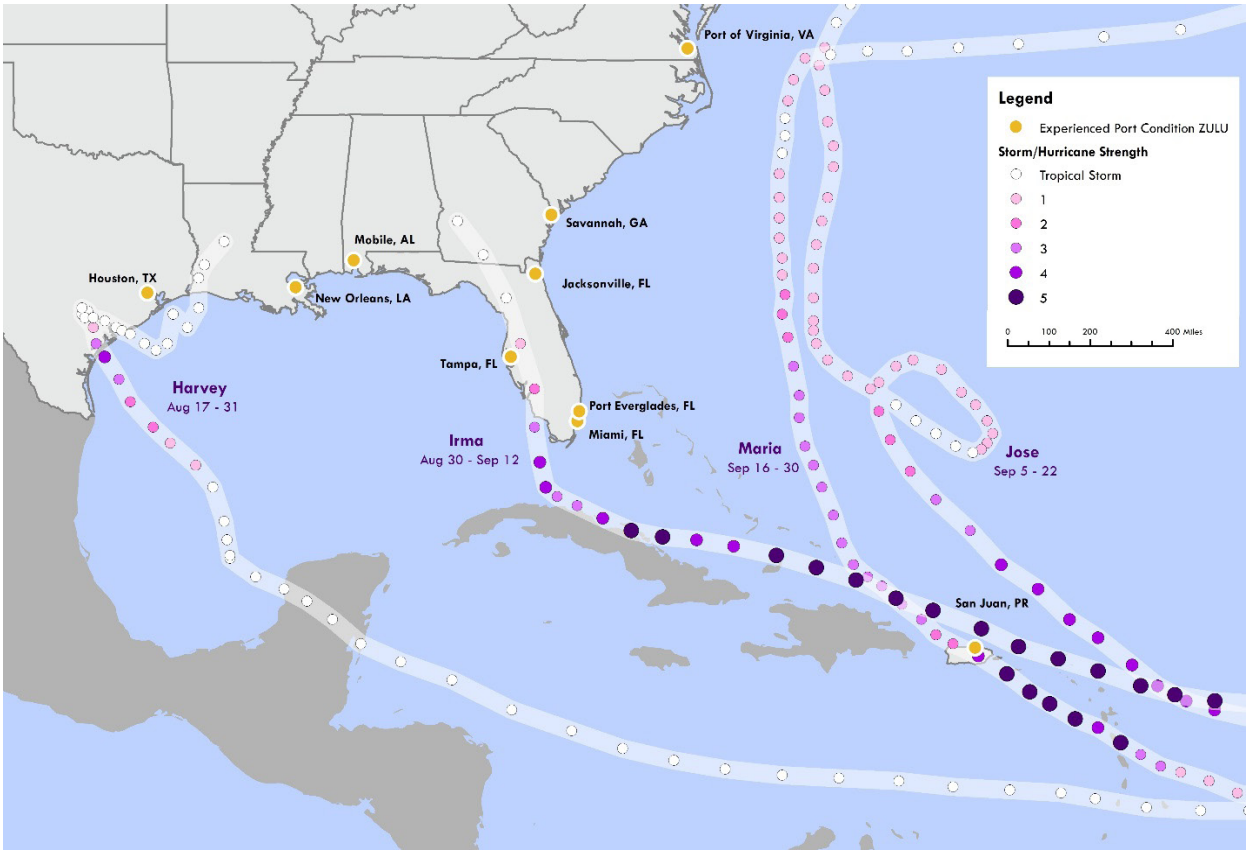
However, many factors influence port capacity. Capacity depends on the type of cargo being handled, and can be affected by short-term adjustments (e.g., extended hours at terminal gates) or long-term changes (e.g., terminal expansion). Port hours of operation and terminal operating methods can also influence short-term capacity. Individual ports monitor their operations, yet specific measures and measurement methods vary among ports and even among terminal operators within the same port.

In addition to internal operations, port capacity is routinely affected by external events such as weather, vessel schedule reliability, and institutional disruptions. Many of these are seasonal in nature, including closures of Great Lakes ports every winter due to ice or harsh weather, or snow storms that hamper operations at some Atlantic Coast ports. Floods and droughts have shut down inland waterways or limited the maximum vessel size on the route. In 2017, hurricanes Harvey, Irma, Jose, and Maria caused major disruptions to port operations (see the *Hurricane Impacts Box* below).

Box 3-A: Hurricane Impacts

Major 2017 hurricanes damaged port infrastructure and disrupted operations in Texas, Florida, and Puerto Rico. In 2017 there were 13 named Atlantic storms, including five major hurricanes: Lee (Category 3), Harvey and Jose (Category 4), and Irma and Maria (Category 5). Of the 2017 storms, Harvey, Irma, Maria (as shown in Figure B-1) and Nate (Category 1) made landfall in the United States. As of late 2017, hurricanes Harvey and Irma alone had caused estimated damages of $150 billion to $200 billion in Texas and Florida (Moody's 2017). The full extent of damage in Puerto Rico remained unknown at the time this report was prepared.

Figure B-1 Impact of Hurricanes on Select Container Ports, 2017



NOTE: Port Condition ZULU is a danger condition in which gale force winds are possible within 12 hours. In Port Condition ZULU the port is closed and all port operations are suspended except for vessel movements and activities specifically authorized by the U.S. Coast Guard.

SOURCE: *Hurricane paths*: based on preliminary best track data from the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Hurricane Center (NHC), *NHC Data in GIS Formats*, available http://www.nhc.noaa.gov/gis/ on November 30, 2017. ZULU conditions: based upon data from the U.S. Coast Guard's Homeport and individual port websites as of November 30, 2017.

Box 3-A: Hurricane Impacts (continued)

Hurricane Harvey made landfall between Brownsville and Houston, Texas in August. The wind, rain, and storm surge from Harvey closed 23 maritime ports.

In September, Hurricane Irma made landfall near Cudjoe Key, Florida. The Port of Miami, Miami River, Port Everglades, Port of Palm Beach, Port of Fort Pierce, and all other South Florida terminals and facilities suspended operations. While the full impact of the closure remains unknown, these maritime ports collectively handle several thousand TEU each day.

Later in September, Hurricane Maria made landfall just south of Yabucoa, Puerto Rico. All ports in the region were closed and operations were suspended for the second time in one month, delaying recovery from the earlier closure for Hurricane Irma. As of November 2017, port operations remain limited. Critically, as of late September 2017, inland infrastructure problems limited inland delivery of cargo that did reach the Port of San Juan.

SOURCE: Moody's, *Plan for Public Finance Issuers Impacted by Hurricanes Harvey and Irma* (September 15, 2017), accessed https://www.moodys.com/ on November 14, 2017.

Other disruptions can include institutional events, such as the 2016 Hanjin Container Lines bankruptcy that delayed shipments and impacted container port operations, or cyber-attacks such as the one that caused delays and temporary closures at APM Terminals in June 2017. More common external factors include the variability of ship arrivals and surges in cargo volumes associated with the peak back-to-school and holiday seasons.

Measuring port capacity is complex and the number of available, nationally consistent capacity measures remains limited. This report focuses on indicators of port capacity that are both available and nationally consistent. It should be noted, however, that these indicators suggest relative capacities rather than absolute capacities, and do not provide the complete picture that can come from focused capacity studies. A container port with longer berths and more cranes, for example, can be expected to have higher annual container throughput capacity than a port with shorter berths and fewer cranes, but these metrics do not support calculation of absolute port capacities.

Acreage dedicated to terminals may be another useable indicator for capacity. However, the number of individual terminals into which that acreage is divided is not an indicator of capacity because terminals vary in governance and service type, and a nationally consistent, standard definition of a "terminal" as a statistical unit does not exist. Although port acreage is a useful capacity indicator, it tells only a part of the story, as containers can be stacked higher and dry bulk cargo piled higher when needed. Also, storage within a port's boundaries may be only part of the storage capacity accessible nearby. Acreage is most relevant for container terminals, which are less variable in their configuration than bulk terminals.

BTS has built upon the indicators of port capacity in last year's *Annual Report* by increasing the level of detail for several measures. A terminal-level analysis of channel

depths expands the description of port-level authorized depths; air drafts in the vicinity of ports are identified; and container crane counts are presented at the terminal level in addition to the port level. BTS continues to research new approaches to improving port capacity measurement.

The capacity metrics included in this year's *Annual Report* are (1) channel depth, (2) air draft, (3) length of berth for container ships, (4) container terminal size (acreage), (5) number and type of container cranes, and (6) rail connectivity. Each is examined in more detail below.

3.3.1 Channel Depths

Channel depth limits the sailing draft (the vertical distance between the waterline and keel) of vessels that can call at the port. Table 3-2 details the components of channel depth and their impact on port capacity.

To the extent that the work is cost-effective and given inherent budget limitations, USACE conducts regular maintenance dredging to remove accumulated sediment. Channel conditions relative to this depth are monitored via channel surveys conducted on a regular, sub-annual basis by USACE

This edition of the *Annual Report* lists the authorized channel depths for each port and the operational depths of approach channels for each container terminal; both are measured in feet. The starting point for the authorized channel depths was a dataset compiled by USACE; port authorities were subsequently contacted to confirm the depths. The minimum project dimension depth MLLW values were determined by BTS staff from NOAA maps and USACE surveys; a representative of USACE subsequently confirmed the depths. Additional detail is provided in the *Handbook of Method*s, which is to be made available online.

3.3.2 Air Draft

Bridges located over shipping channels can impose air draft restrictions on vessel sizes. The numerous bridges over the rivers and lakes that comprise the inland waterway system do not typically restrict the vessels that utilize those channels, although temporary conditions, such as a storm surge or water runoff, may reduce air drafts and lead to short-term limits. Bridges over access channels are not common at the largest container terminals located in coastal regions, but there are some instances in which bridges limit access for the largest ships now in service. The profiles included in this report (see Appendix A) indicate what, if any, air draft restrictions exist within the port vicinity.

3.3.3 Length of Container Berths

Along with depth, the length of berths determines the number and size of vessels the port can handle. The number of berths, their length, and the total berth length are interrelated. A small terminal may have

Table 3-2 Measures of Channel Depth

Measure	Description	Notes
Authorized Depth	The depth specified in the congressional legislation authorizing USACE to construct and maintain a Federal navigation project.	The authorized depth applies to specific port channels or approaches, not necessarily to the entire port or harbor area. Not all authorized navigation channels are constructed or maintained to their exact authorized dimensions. The profiles in this Annual Report list the maximum authorized depth for each port, as based on port-provided data (or USACE data when port-provided data were unavailable). Both authorized and maintained minimum depths are nine feet on the inland river system. Deep-draft coastal navigation projects typically range anywhere from 35-50 feet, with most high-use ports coming in between 40-50 ft.
Maintained Depth	The level to which USACE maintains the channel through regular dredging due to accumulation of sediment via tidal currents, watershed runoff, and storm events.	Maintained depths may be less than authorized or constructed depths due to a number of factors. In some cases, limited annual budget allocations may have precluded maintaining the entire navigation project to full authorized dimensions; this is particularly true when the initial deepening results in significantly higher-than-expected sediment loads accumulating in the channel. In other cases, the difference is only temporary, pending completion of ongoing channel deepening activities, which can require several years depending on the scope of the required dredging. The Great Lakes system has maintained depths between 26-28 feet for most projects.
Controlling (or limiting) Depth	Governs the maximum sailing draft of a vessel that can enter a channel, and represents the least depth that might be encountered due to other factors such as tide or localized shoaling from sediment accumulation.	A channel is typically divided into four quartiles for the purposes of determining the controlling depth, with each quartile detailing the absolute shallowest spot within the associated footprint area. For the channel side slopes (the outer edges of the two outer quarters), the shallowest spot will be the periphery of the area that a vessel travels through, and the channel may therefore remain sufficient to safely handle traffic. The controlling depth may also be updated several times per year, especially in an area prone to shoaling. For these reasons the controlling depth is not included in the port profiles.
MLLW Depth	The average of the lower low water height of each tidal day observed over a specified period (typically 19 years, but in some regions like Alaska or the Gulf of Mexico a five-year period is used).	The profiles in this report list the minimum project dimension MLLW depth for each container terminal, using the current minimum MLLW for reaches and ranges encountered between a port's entrance channel and the container terminal.

a single berth with a fixed length. Large container terminals can have 2,000-6,000 feet of continuous berth, and vessels of different lengths can often be handled with flexible berth arrangements. For example, ports and terminals can decide whether a 6,000-foot face is counted as four 1,500-foot berths or five 1,200-foot berths. In multi-berth container terminals, cranes can usually be moved up and down the wharf face, further complicating the definition of "berth." Since a given length of berth space can be divided into different numbers of berths without affecting total capacity, only total length is included in this report.

As described in Table 2-1, the length of berths is most relevant to container terminals. Since most container vessels in service are less than 1,000 feet long and 1,000-foot berths are common, berth length has seldom been a limiting factor in handling vessels. However, berth length has started to affect vessel calls as megaships over 1,000 feet long call more often at U.S. container ports. As Figure 3-11 depicts, the largest and busiest (i.e., highest annual TEU) container ports also have greater total berth length.

3.3.4 Container Terminal Size

Measuring the physical size of a port and its terminals can be problematic, as terminal components and configurations differ widely. Container terminals consist of three major elements:

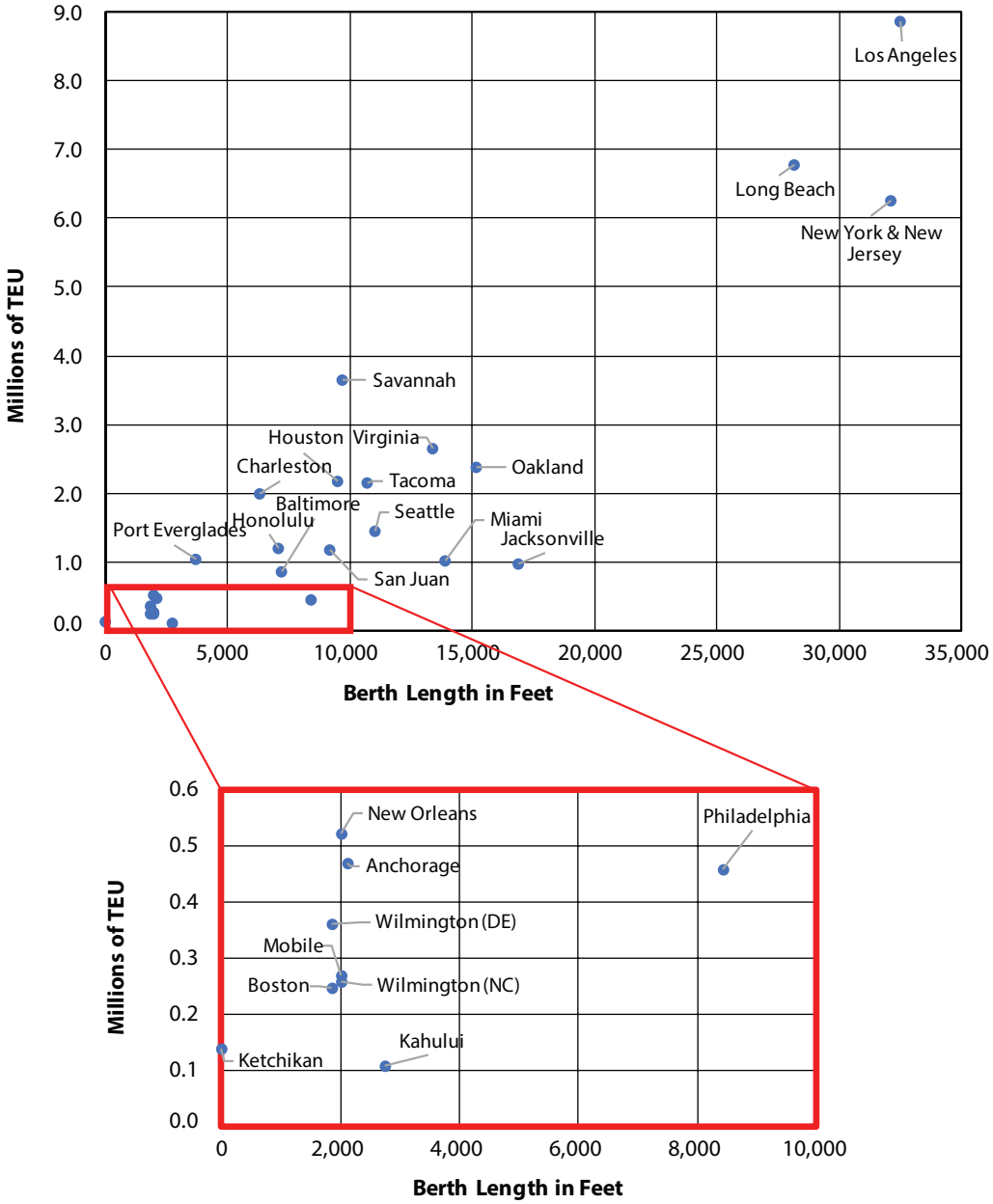
- The berth, wharf, and container cranes, which together provide the capability to receive vessels and transfer containers between the vessel and the terminal.
- The container yard, where loaded and empty containers are stored for transfer between vessels and truck or rail modes.
- The gates, through which inbound and outbound trucks and containers are processed.

Many container terminals also have rail transfer facilities within the terminal gates ("on-dock rail") that can transfer containers to and from trains without over-the-road trucking moves. At terminals without on-dock rail, containers may be trucked to and from external (off-dock or near-dock) rail terminals.

Container terminals may also have chassis storage areas, container or chassis maintenance and repair facilities, or container freight stations. Some marine container terminals are combination facilities that also handle break-bulk, project, or Ro/Ro cargo. In other cases, terminals may have established satellite operations to store or stage containers or chassis.

Figure 3-12 below shows reported total container terminal acres (or estimated acres where not reported) for the top 25 container ports by TEU. In general, container ports with the highest annual TEU have the largest total container terminal acreage.

Figure 3-11 Container Berth Length in Feet versus Annual TEU at Top 25 Container Ports by TEU, 2016

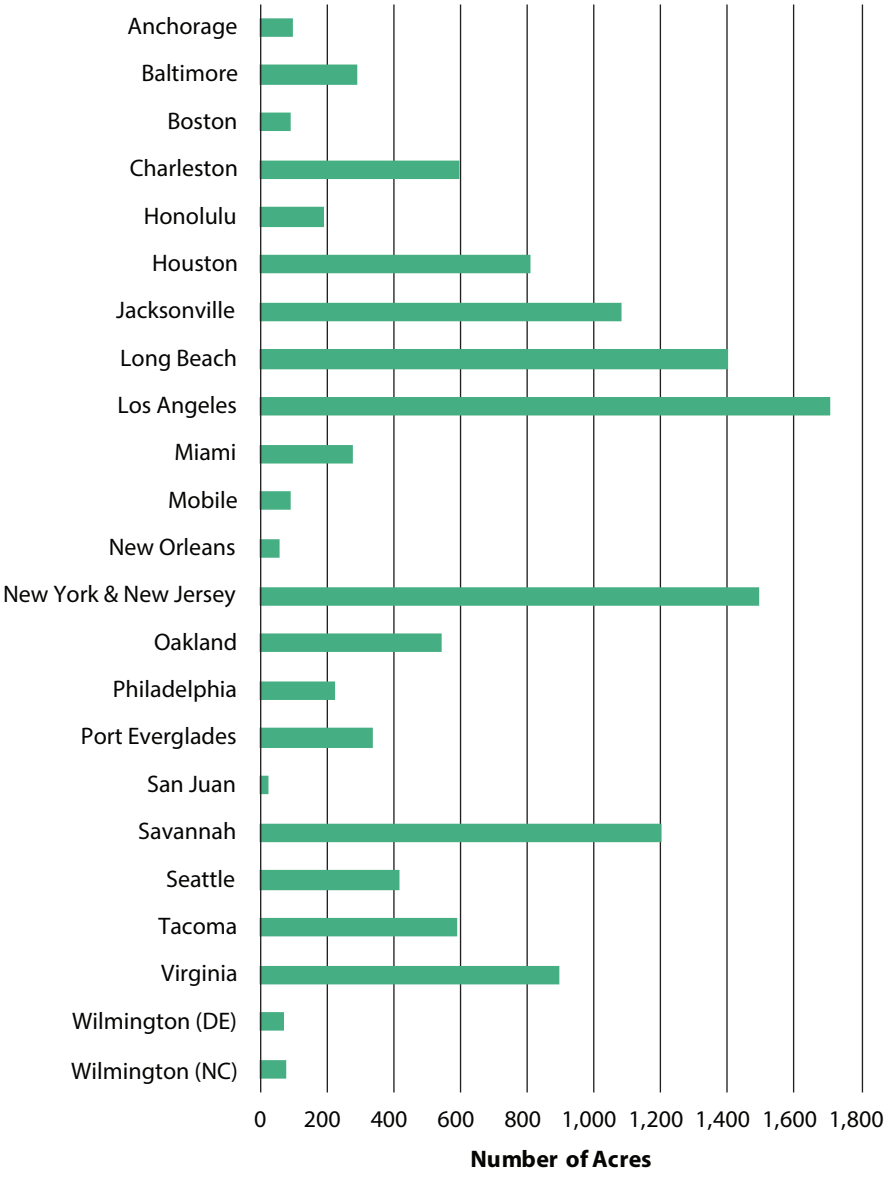


KEY: TEU = Twenty Foot Equivalent Unit

NOTE: Berth length data not available for the Port of Ketchikan.

SOURCES: *Annual TEU*: AAPA, NAFTA Container Traffic: 1997-2016, available http://www.aapa-ports.org/ as of November 30, 2017, port authorities, and USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017. *Berth length*: port websites including linked terminal-specific websites (see port profiles in Appendix A for more details),

Figure 3-12 Container Terminal Acres of Top 25 Container Ports by TEU, 2016
(Alphabetical Order)



KEY: TEU = Twenty Foot Equivalent Unit

NOTES: The container terminal sizes reflect gross container terminal acres, including on-dock rail transfer facilities (raising the acreage totals) and non-container operations at mixed-use terminals. Some terminals may be only partly in use as capital upgrade projects are completed or due to temporary closures, leading to an overestimate of acres that are actively used for container operations. Data not available for the Ports of Kahului or Ketchikan.

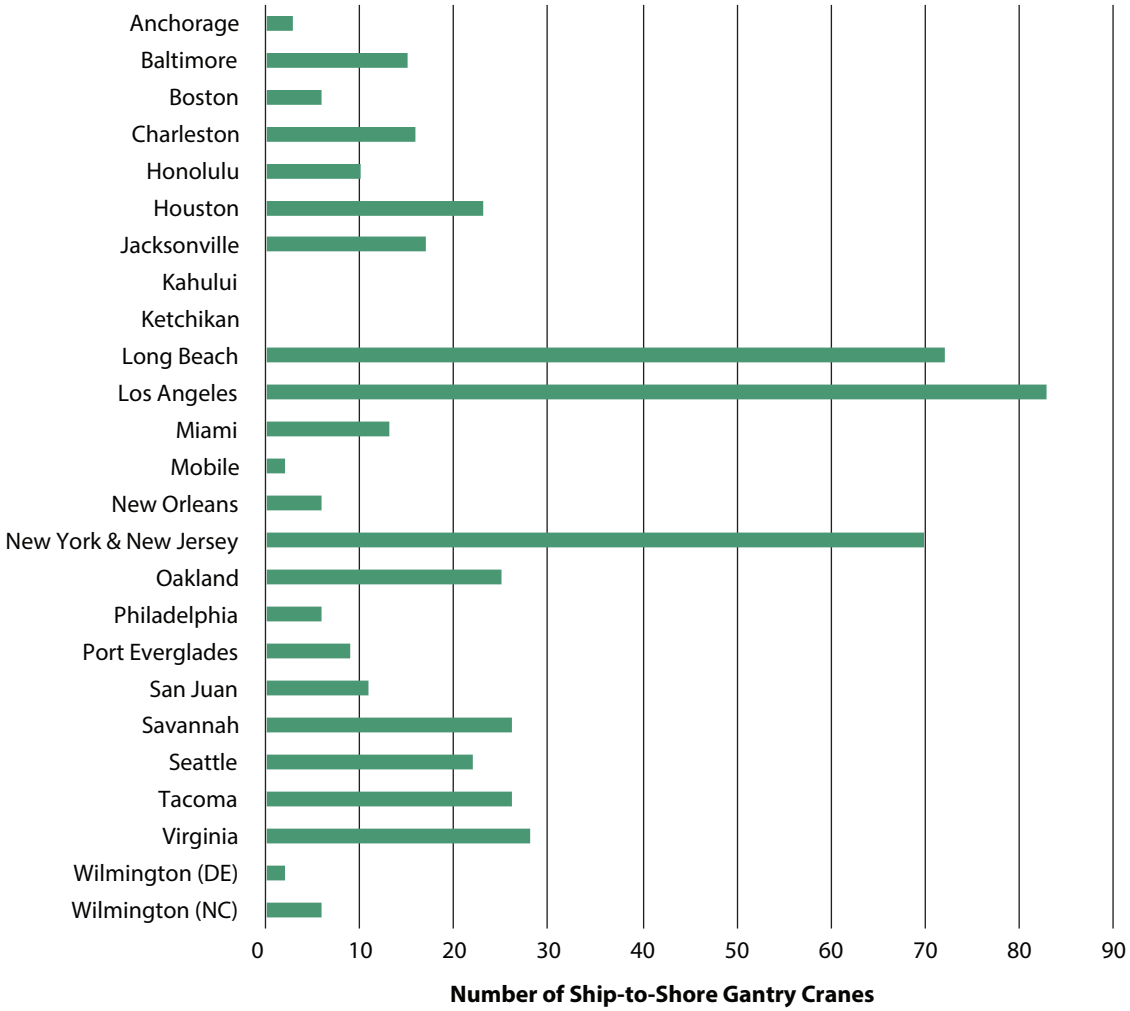
SOURCES: Port websites including linked terminal-specific websites (see port profiles in Appendix A for more details).

3.3.5 *Number of Container Cranes*

Most container terminals use ship-to-shore gantry cranes mounted on rails that run alongside the wharf to unload and load berthed container vessels. Smaller terminals may instead rely on mobile cranes, equipment on the container vessel itself (known as ship's gear), or Ro/Ro operations.

The number and size of cranes affects the number and size of ships a terminal can service simultaneously. Most port and terminal websites provide information about the number and types of shore-side container cranes (Figure 3-13), making that information a useful indicator for terminal capacity. The busiest container ports also have the most

Figure 3-13 Number of Container Cranes at the Top 25 Container Ports by TEU, 2016
(Alphabetical Order)



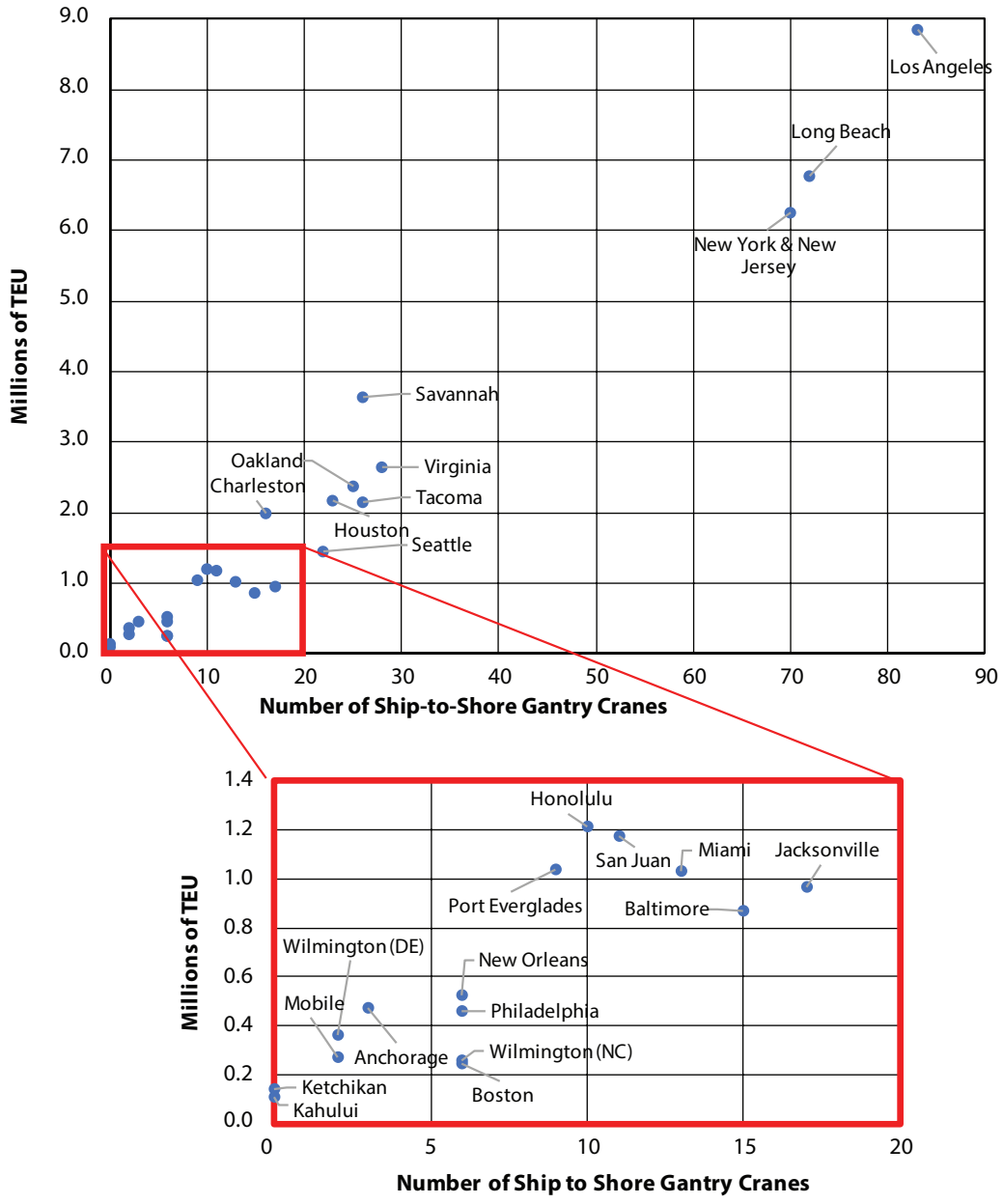
KEY: TEU = Twenty Foot Equivalent Unit

NOTE: Ketchikan and Kahului do not have container cranes.

SOURCE: Port websites including linked terminal-specific websites (see port profiles in Appendix A for more details).

container cranes, as Figure 3-14 highlights. This relationship is expected, because cranes can provide increments of capacity at lower cost (in the tens of millions of dollars) as compared to new terminals or major dredging projects (which are typically in the hundreds of millions of dollars).

Figure 3-14 Container Cranes versus Annual TEU at Top 25 Container Ports, 2016



KEY: TEU = Twenty Foot Equivalent Unit

SOURCES: *Annual TEU: AAPA, NAFTA Container Traffic: 1997-2016*, available http://www.aapa-ports.org/ as of November 30, 2017, port authorities, and USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017. *Number of cranes*: port websites including linked terminal-specific websites (see port profiles in Appendix A for more details).

The inclusion of Ro/Ro barge operations or container operations using ship's gear can distort the crane-related metrics, and are omitted from this analysis. The Port of San Juan, for example, handles many of the containers included in port totals at Ro/Ro barge terminals.

The profiles included in Appendix A provide the number and types of ship-to-shore gantry container cranes located at each container terminal, and are grouped into three size classes: Panamax, Post-Panamax, and Super Post-Panamax. While cranes can typically handle loading and unloading operations of vessels in an equivalent size class or smaller, the three classes overlap in physical dimensions. The two primary measures that determine which vessels a crane can serve are lift height and outreach length, with newer vessels having both wider beams (to allow more containers to be stacked across the width) and greater height (as containers are stacked higher). Container terminals purchase new cranes or retrofit older cranes to increase capacity and accommodate larger vessels. The outreach measured in container equivalents is used to classify cranes into three size classes: up to 16 container rows for Panamax, between 17 and 19 container rows for Post-Panamax, and 20 container rows and up for Super Post-Panamax.

3.3.6 Rail Connectivity

All high-volume ports are either directly connected to the rail system or have nearby rail facilities. Bulk terminals have a variety of rail service connections suited to the type and volume of commodities they handle. Most container terminals have either on-dock transfer facilities within the terminal boundaries or off-dock facilities nearby. Table 33 indicates the number of container terminals with on-dock rail at the nine of the top 25 container ports by TEU that have at least one terminal with on-dock connectivity.

Table 3-3 Number of Container Terminals with On-Dock Rail Facilities at 10 of the Top 25 Container Ports by TEU, 2016

Port	Number of Container Terminals	Number of Container Terminals with Rail Access
Jacksonville	3	1
Long Beach	7	6
Los Angeles	7	7
Miami	3	3
New York & New Jersey	6	4
Savannah	1	1
Seattle	4	1
Tacoma	6	4
Virginia	3	2
Wilmington (NC)	1	1

SOURCE: Port websites including linked terminal-specific websites (see port profiles in Appendix A for more details).

4 Port Performance Context

The Port Performance Freight Statistics Program defines port *performance* in terms of throughput and capacity. This report defines port *throughput* as the volume of cargo and number of vessel calls that ports handle each year, and port *capacity* as the infrastructure elements that support cargo handling and vessel calls. This report focuses on a subset of U.S. ports, yet port performance should be understood in the context of relevant global, national, and regional trends. This chapter describes relevant maritime trends, emerging issues, and their implications for throughput and capacity. The emerging and topical issues include:

1. the increasing size of container vessels calling at U.S ports, due to an industry trend toward larger vessels and the ability of new Panama Canal locks to accommodate larger vessels; and

2. the impact of changes in coal, crude oil, and natural gas volumes on U.S. ports.

4.1 Global and National Maritime Trends

Global seaborne trade grew faster in 2016 than in 2015, reversing the 2014-2015 slowdown, although the growth was slower than in recent years.[5] In comparison, the United Nations (UN) estimated that world gross domestic product increased by 2.6 percent in 2015 and 2.2 percent in 2016.[6] Maritime trade has grown at a compound annual rate of 2.8 percent over the past decade, including a 4.5 percent decrease in 2009 and a 7.0 percent post-recession rebound in 2010.[7] The United Nations Conference on Trade and Development (UNCTAD) notes that one major factor in slower trade growth in recent years is a reduction in imports of dry bulk commodities to China.

The World Bank ranked the U.S. economy as the world's largest in 2016, accounting for 24.6 percent of the total global gross domestic product (GDP).[8] International trade played a large role in the U.S. economy, accounting for $3.6 trillion in 2016.[9] While almost one-third of U.S. trade is with Canada and Mexico, the majority requires maritime shipping or air cargo service to reach foreign countries (see Figure 4-1).[10]

[5] UNCTAD, *Review of Maritime Transport: 2017*, p. 4, available http://unctad.org/ on November 30, 2017.

[6] Ibid.

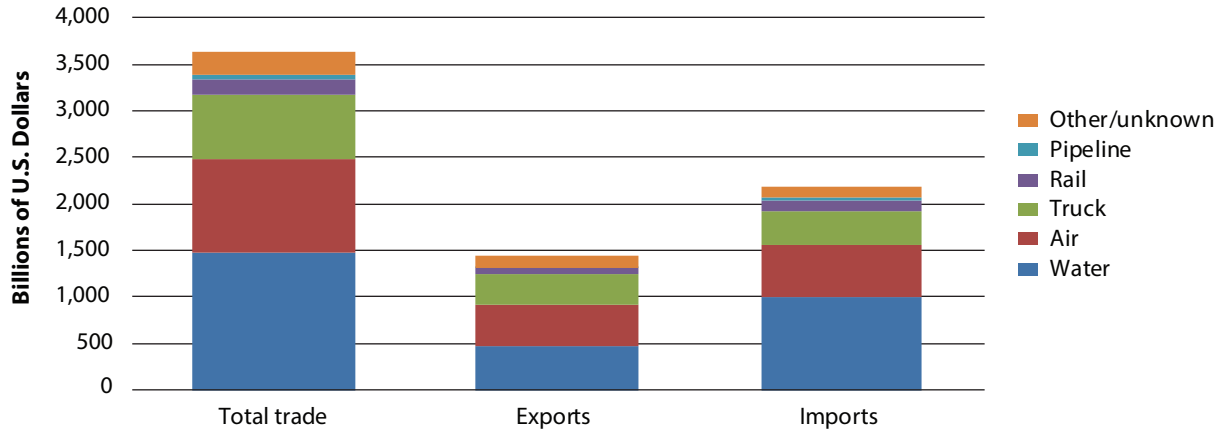
[7] Calculation using data from United Nations Conference on Trade and Development (UNCTAD) STAT, *World seaborne trade by types of cargo and by group of economies: 1970-2016*, available http://unctadstat.unctad.org/ on November 9, 2017.

[8] The World Bank, *Data Bank*, available http://databank.worldbank.org/data/ on November 16, 2017.

[9] Seasonally Adjusted. U.S. Census Bureau, *U.S. International Trade in Goods and* Services, available https://www.census.gov/ on December 27, 2017.

[10] Not seasonally adjusted. U.S. Census Bureau, *U.S. Trade in Goods by Country and Area: 2016*, available https://www.census.gov/ on December 27, 2017.

Figure 4-1 U.S. International Merchandise Trade Value by Mode, 2016



SOURCES: Total, water and air data: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, USA Trade Online, available https://usatrade.census.gov/ on May 2017. Truck, rail, pipeline, and other and unknown data: USDOT, BTS, North American TransBorder Freight Data, available www.bts.gov as of May 2017.

According to UNCTAD, total seaborne trade has grown nearly four-fold since 1970.[11] Global trade has expanded the market for U.S. manufactured and natural resource exports, while imports supply consumer goods and inputs to U.S. industries. The growth in international maritime trade has resulted in the construction of new ports in developing nations, and port expansion in the United States and other developed economies.

Global seaborne trade has increased in nine of the last 10 years, with the sole downturn occurring during the recession in 2009 (see Figure 4-2). In 2016, UNCTAD estimated that 11.3 billion tons of cargo were transported over water, with year-on-year growth estimated at 2.6 percent.[12]

UNCTAD classifies seaborne trade into five categories (see Figure 4-3), with main bulk (iron ore, coal, bauxite and alumina, grain, and phosphate rock) and other dry cargo combined accounting for 53.6 percent of the total tonnage in 2016, and crude oil and petroleum products combined accounting for 29.7 percent. Together, these main bulk commodities were the largest class of waterborne cargo shipped in 2016, with 3.5 billion tons or 30.8 percent of the total (see Figure 4-3 and Figure 4-4), up from 2.3 billion tons in 2007.[13]

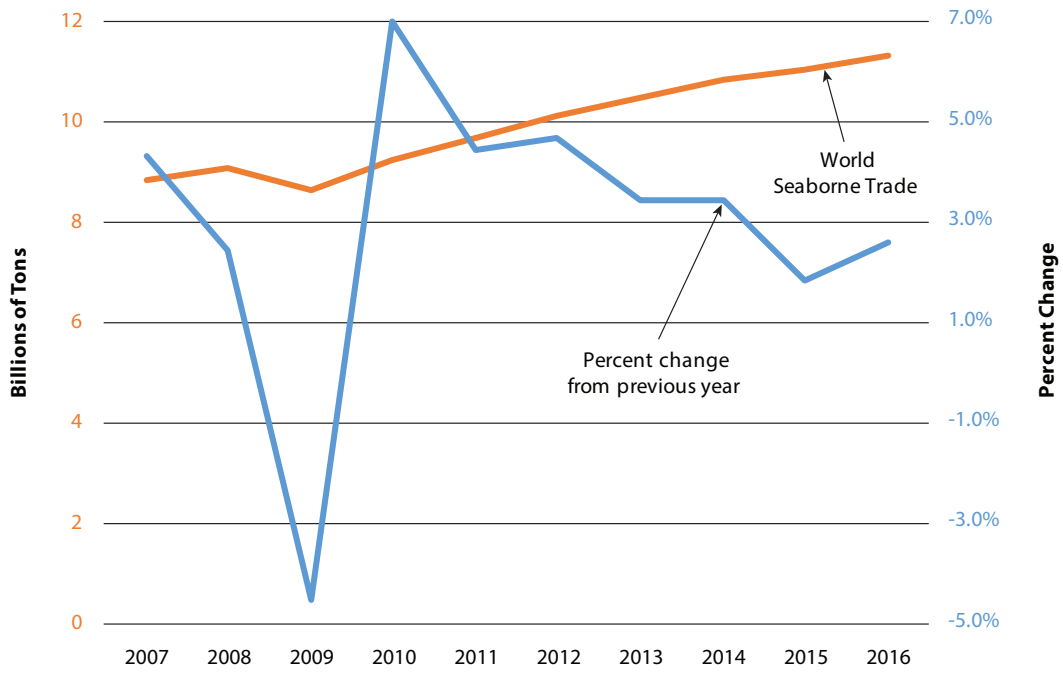
Global crude oil, petroleum products, and natural gas trades have together increased by 4.2 percent from 2015 to 2016, reaching 3.4 billion tons, and rose by 11.2 percent

[11] United Nations Conference on Trade and Development (UNCTAD) STAT, *World seaborne trade by types of cargo and by group of economies: 1970-2016*, available http://unctadstat.unctad.org/ on November 9, 2017.

[12] UNCTAD, *Review of Maritime Transport: 2017*, available http://unctad.org/ on November 30, 2017.

[13] United Nations Conference on Trade and Development, UNCTAD STAT, *World seaborne trade by types of cargo and by group of economies: 1970-2016*, available http://unctadstat.unctad.org/ on September 8, 2017.

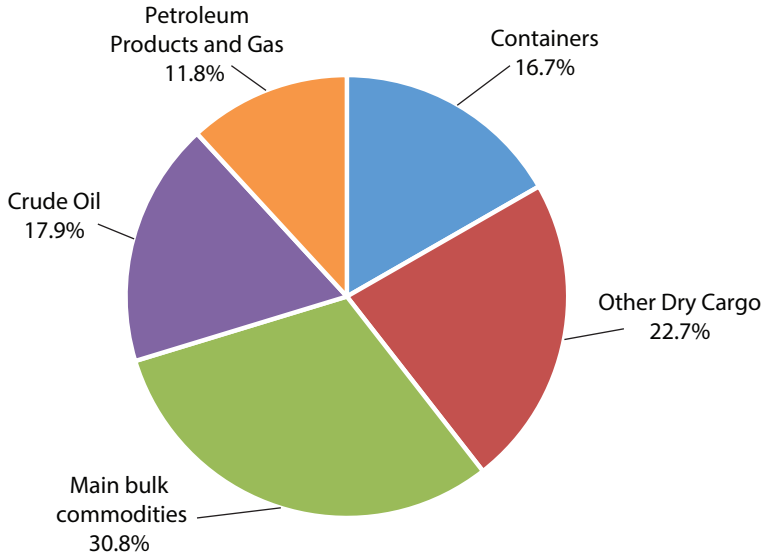
Figure 4-2 World Seaborne Trade in Tons, 2007-2016



NOTE: *World seaborne trade* measures the total tonnage of goods loaded.

SOURCE: UNCTAD, *Review of Maritime Transport: 2017*, available http://unctad.org/ as of November 30, 2017.

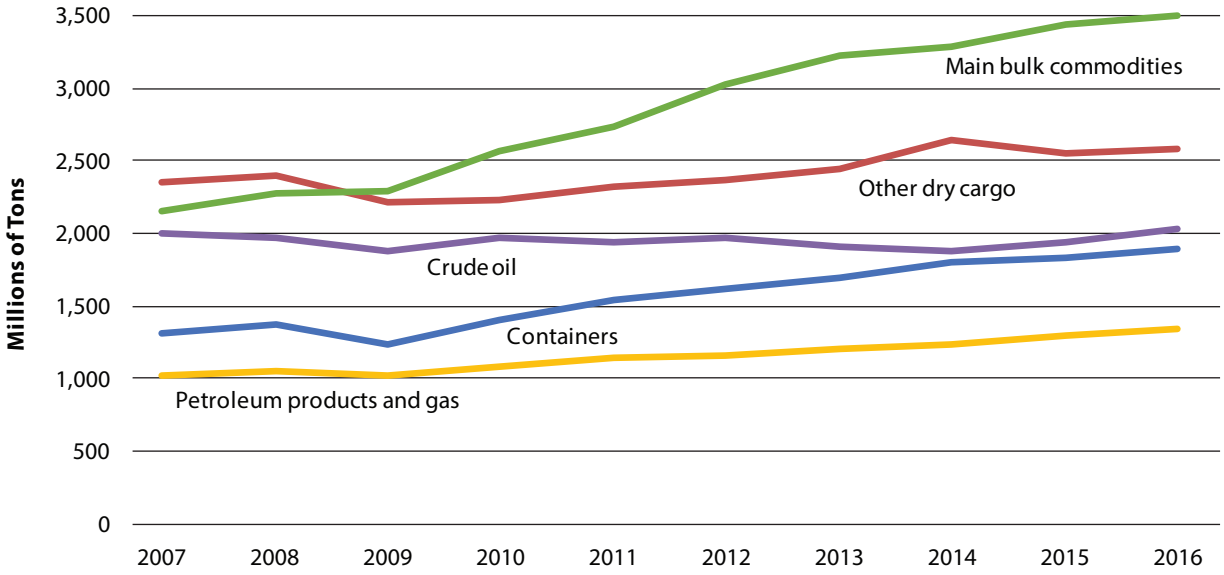
Figure 4-3 Share of World Seaborne Trade Tonnage by Category, 2016



NOTE: *Main bulk commodities* include iron ore, coal, bauxite and alumina, grain, and phosphate rock. *Other dry bulks* include forestry and steel products, cement, etc.

SOURCE: United Nations Conference on Trade and Development, *Review of Maritime Transport: 2017*, available http://unctad.org/ as of November 30, 2017.

Figure 4-4 World Seaborne Trade in Tons by Category, 2007-2016



NOTE: *Main bulk commodities* include iron ore, coal, bauxite and alumina, grain, and phosphate rock. *Other dry bulks* include forestry and steel products, cement, etc.

SOURCE: United Nations Conference on Trade and Development, *Review of Maritime Transport: 2017* available http://unctad.org/ as of November 30, 2017.

over the past 10 years.[14] The oil and natural gas share of maritime trade decreased from 34.2 percent in 2007 to 29.7 percent in 2016. While petroleum products and natural gas trades experienced similar rates of growth between 2015 and 2016, their growth over the past 10 years (30.5 percent) has outpaced that of crude oil (1.3 percent). This growth in petroleum products and natural gas trades has led to the development of new LNG terminals and petrochemical facilities. (See Emerging Issue on Energy Products, Section 4.3)

U.S. ports have been affected by changing global demand for the nation's natural resources. The decrease in global coal trade (down 0.2 percent between 2015 and 2016) is reflected in decreased export volumes at the national level, while the increase in global LNG trade (up 7.2 percent between 2015 and 2016) is mirrored by increased U.S. export volumes.[15] These changes in throughput may not be experienced equally by all ports, but capacity must remain ahead of throughput requirements for efficient operation.

UNCTAD reported that global containerized trade reached 140 million TEU in 2016, a 3.1 percent increase over 2015.[16] The weight of containerized cargo reached 1.9 billion tons in 2016, a 3.6 percent increase over 2015.[17] Containerized trade accounted for 16.7

[14] Ibid.

[15] Ibid. p. 10-11

[16] Ibid. p. 11

[17] Ibid. p. 6

percent of total cargo by weight in 2016, an increase from 14.8 percent in 2007, but only slightly higher than the 16.6 percent share recorded in 2015.

In response to growth in containerized trade, one approach taken by shipping lines has been to increase the size of the vessels used. This increase results in fewer calls required to move the same number of containers. The greater volumes of cargo that these larger ships unload during a single call can challenge terminal throughput and capacity (see Emerging Issue on Megaships, Section 4.2).

4.2 Emerging Issue: The Impact of Container Megaships on Port Capacity and Throughput

The size of ships serving a port affects the port's capacity and throughput. Dry bulk, liquid bulk, and Ro/Ro vessels have all increased in size. Yet the largest recent increases have been in container ships, due in part to the intense competition within the containerized trades and the corresponding need for the ship owners (known as carriers) to minimize their costs. The largest containerships are commonly called megaships. There is no single definition of what constitutes a megaship, but these vessels are significantly longer, taller, and wider and have double or triple the capacity of other container vessels commonly seen at U.S. ports. For purposes of this report, a megaship is defined as a vessel that is too large to fit within the newly expanded Panama Canal locks.

Table 4-1 shows typical vessel dimensions for the following:

- Panamax container vessels (sized to fit through the original Panama Canal locks);
- Post-Panamax vessels (too large for the original locks, but commonly used in U.S. container trade);
- Super Post-Panamax vessels (longer and wider than the typical Post-Panamax vessels);

Table 4-1 Representative Containership Size by Generation

Vessel Class	Capacity (TEU)	Containers Across	Draft (feet)	Beam (feet)	Length Overall (feet)	Air Draft (feet)
Panamax	4,000	15	40	106	965	117
Post-Panamax	7,000	17	49	144	1,100	138
Super Post-Panamax	9,000	19	50	158	1,200	159
Neo Panamax	13,000	20	50	160	1,200	164
Megaship	18,000	23	52	193	1,300	187

KEY: TEU =Twenty-foot equivalent unit

SOURCE: USDOT, BTS research based upon industry publication.

- Neo-Panamax vessels (the maximum for the new Panama Canal locks); and
- Megaships (too large for even the new Panama Canal locks).

These vessel classes are not precisely defined and classes overlap, so the dimensions in Table 4-1 should be considered representative rather than definitive. Figure 2-1 illustrates the relative size of these container vessels.

Channel depths are critical constraints for large vessels. Vessel designers have effectively capped containership design draft at 52 feet, and increased length, height, and beam instead to achieve higher capacities. This draft limit is good news for ports that would otherwise face escalating dredging costs, but overall increases in other vessel dimensions can be problematic if existing cranes cannot meet the outreach or height requirements of the new vessels.

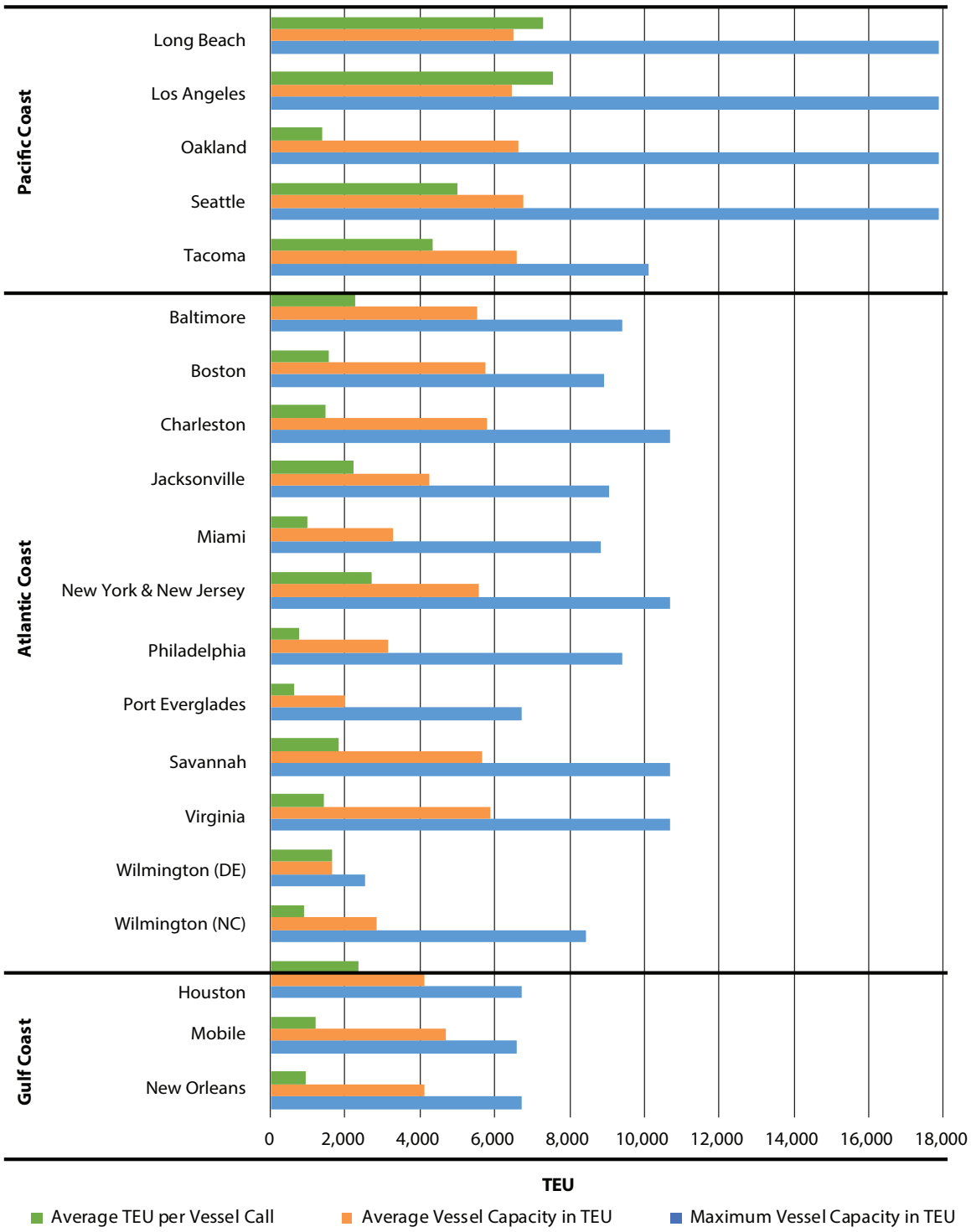
Increases in vessel height has made air draft limits critical at some ports. As Table 4-1 indicates, the height of the largest vessels may approach 200 feet. The Bayonne Bridge between New York and New Jersey has been raised to a height of 215 feet and the replacement for the Gerald Desmond Bridge in Southern California will have a clearance of 205 feet; each project has a cost of roughly $1 billion.

Carriers use a variety of methods that allow these vessels to call at ports that do not have sufficient draft for fully laden megaships. Partially loaded vessels do not require their full design draft, nor do vessels loaded with a large percentage of empty containers. Vessel operators can also wait for high tides to obtain additional water depth. To cope with restrictive air drafts, vessel operators may seek heavy outbound loads, wait for low tides, or use folding masts.

Pragmatically, the impact of larger vessels on U.S. ports depends on how those vessels compare with the container ships already being handled. Figure 4-5 shows the average and maximum 2016 container vessel capacity in TEU at major U.S. container ports. The average TEU per vessel call for the Ports of Anchorage, Honolulu, Ketchikan, and San Juan are not included because the vessel call data for these ports does not consistently reflect their exceptionally complex mix of foreign and domestic vessels and types. As shown in Figure 4-5:

- Pacific Coast ports routinely handle vessels of 12–14,000 TEU. The average vessel size calling at these ports is over 6,000 TEU.
- Atlantic Coast ports are seeing 9–10,000 TEU vessels from Suez and Panama routes. The average vessel size calling at these ports is about 5,000 TEU.
- Gulf Coast ports see vessels of 6–7,000 TEU. The average vessel size calling at Gulf ports is about 4,000 TEU.

Figure 4-5 2016 Vessel Capacities at Major Mainland U.S. Container Ports



SOURCE: *Average and maximum vessel size*: USDOT, MARAD, *special tabulation*, as of November 20, 2017. *Container volumes*: AAPA, *NAFTA Region Container Traffic* available http://www.aapa-ports.org/ as of October 2017, and port authorities. *Vessel calls*: USACE, Waterborne Commerce Statistics Center, 2016 data, special tabulation, as of October 2017.

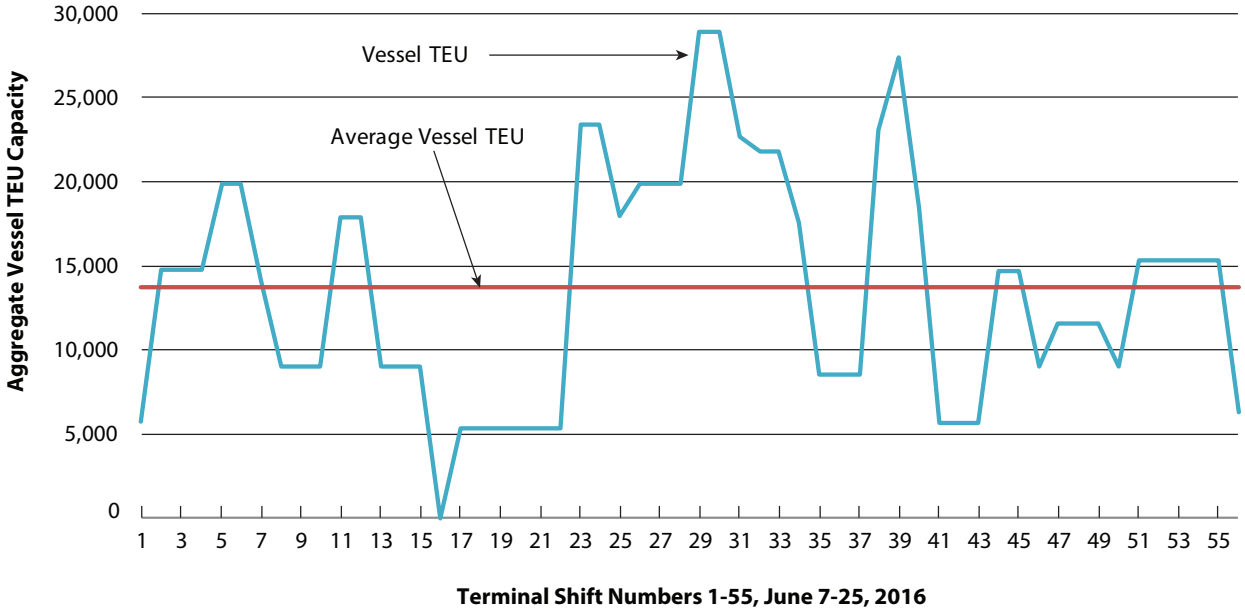
Many of the maximums in Figure 4-5 are identical because the same vessels call at multiple ports.

Figure 4-5 also shows the average TEU handled per vessel call. Atlantic Coast and Gulf Coast ports have typically handled 1,000–2,500 TEU per call versus 7,000–8,000 from vessel calls at Los Angeles and Long Beach. The maximum TEU per container vessel call is twice the vessel capacity (200 percent), which would be attained by discharging the full capacity inbound and loading the full capacity again outbound. As of 2016, only the Ports of Los Angeles and Long Beach utilize more than 100 percent of vessel capacity for an average call.

4.2.1 Port and Terminal Challenges

Megaships can produce short-term cargo surges that challenge terminal capacity. Figure 4-5 indicates the wide range of average TEU volumes handled per call. Figure 4-6 shows an example of vessel capacity at berth by shift for one of the largest container terminals at San Pedro Bay in Southern California. On some days, the aggregate capacity of vessels at berth reached 28,000 TEU. On average, those vessels would have generated about 12,000 container moves within the terminal, 5,000 rail container moves, and 10,000 truck trips. Those volumes have serious implications for the road and rail systems in Southern California, and would have even more serious

Figure 4-6 Aggregate Vessel Capacity at a Major San Pedro Bay Container Terminal by Shift, June 7-25 2016



KEY: TEU =Twenty-foot equivalent unit

NOTE: The graphic shows the 55 labor shifts that occurred during June 7-25 of 2016, and the aggregate TEU capacity of vessels scheduled to be at that terminal during those shifts

SOURCE: USDOT, BTS research based upon terminal vessel schedule.

implications for port regions unaccustomed to such cargo surges.

A vessel generally requires a berth equal to its length plus its beam. A typical 1,300-foot megaship with a 200-foot beam therefore needs a 1,500-foot berth. As the port profiles included in this report indicate, many container terminals have berth lengths sufficient for multiple smaller vessels, but only for one to two megaships at a time.

As Figure 4-2 depicted, larger vessels are also wider and taller, implying that more cargo must be moved for any given berth length. As such, megaship beams and heights can also have implications for crane size and speed. New Super Post-Panamax cranes that can reach 23 containers across and 19 high cost more than $12 million each, and common practice at the largest container terminals worldwide is to use six to seven of these cranes on a megaship.[18] As the port profiles show, few U.S. container terminals have that many Super Post-Panamax cranes. Assuming an average move is halfway across the deck and halfway down the hold, an 18,000 TEU megaship requires up to 28 percent more crane travel than a 7,000 TEU Post-Panamax vessel. While modern cranes are faster than those they replace, it can still take them longer to handle the same number of moves on a megaship than it would on a smaller ship due to the increased vertical and horizontal travel distance. Raising the height of an existing crane costs $2–4 million.[19]

The beams and heights of megaships imply dramatic increases in the cargo volume that must be handled per foot of berth. A terminal handling 4,000 TEU Panamax vessels at most U.S. ports operates at about 1.3 TEU per foot of berth.[20] A Post-Panamax vessel unloading and reloading the same share of its capacity requires 2.3 TEU per foot of berth. An 18,000 TEU megaship unloading and loading a similar share of its capacity raises that requirement to 4.2 TEU per foot, nearly double that of a Post-Panamax vessel and triple that of a Panamax ship.

4.2.2 Anticipated Trends

Ocean carrier adoption of container vessels with a capacity of 10,000 TEU and larger has increased rapidly since 2010. By the end of 2016, the 392 vessels in that category accounted for 25.8 percent of the available TEU capacity, despite comprising just 7.6 percent of the 5,159 vessels in the fleet.[21] At the end of 2010, just 6.2 percent of the total container fleet TEU capacity was in vessels with a size of 10,000 TEU and greater, compared to a forecast 29.4 percent at the end of 2017 (see Figure 4-7). Vessels of 13,300

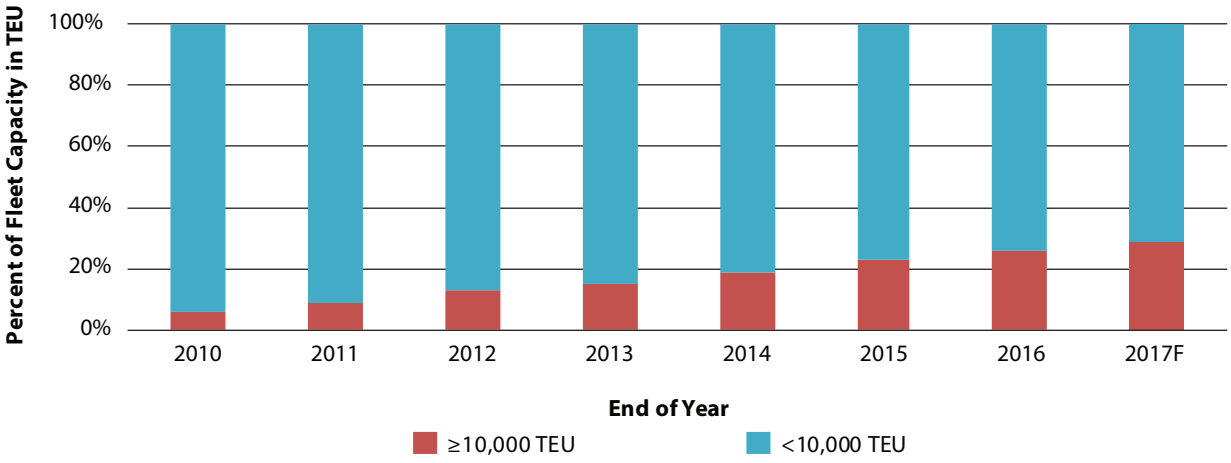
[18] USDOT, BTS research based upon industry publications.

[19] USDOT, BTS research based upon personal communications with the Port of Oakland.

[20] Given that most U.S. ports handle roughly 35 percent of the vessel capacity per call, as shown in Figure 3.5.

[21] Alphaliner, *Alphaliner Monthly Monitor: December 2017*, available https://www.alphaliner.com/ on December 21, 2017.

Figure 4-7 Fleet Capacity Share by Vessel Size Class: 2010-2017



KEY: TEU =Twenty-foot equivalent unit, F = Forecast.

NOTE: 2017 data are forecast.

SOURCE: Alphaliner, *Alphaliner Monthly Monitor: December 2017*, available https://www.alphaliner.com/ as of December 21, 2017.

TEU and larger account for 61.7 percent of the orders of large vessels (those with a capacity of at least 7,500 TEU) scheduled for delivery in 2017, 2018, and 2019.[22]

The number of megaships built has also increased rapidly over the past 2 years, which may lead to a more rapid assignment of megaships to U.S. calls. According to Alphaliner, there were just 15 vessels with a capacity between 18,000 and 21,000 TEU at the start of 2015; this increased to 47 vessels by the start of 2017.[23]

Since the greatest operational savings that megaships provide are realized on the longest voyages, as of the end of 2016 every vessel with a capacity of 18,000 TEU and greater was deployed in the Asia-Europe trade.[24] The latest generation of megaships is not expected to call at U.S. ports as part of a regular service rotation in the near future. However, as the number of megaships in service increases, the size of vessels that serve the United States will likely increase due to "cascading" of vessels from the Asia-Europe trade. The highest capacity vessels to call at U.S. ports typically operate on Asia-U.S. Pacific Coast routes, as shown in Table 4-2.

As the newest and largest vessels are introduced in the Asia-Europe trade, older vessels are shifted to other trades. During the fourth quarter of 2016, 29 vessels with a capacity of 13,000+ TEU were calling at U.S. ports.[25]

[22] Ibid.

[23] Alphaliner, *Alphaliner Monthly Monitor: January 2017*, available https://www.alphaliner.com/ on November 30, 2017.

[24] Blue Water Reporting, World Liner Supply Report: Quarter 4 2016, available http://www.bluewaterreporting.com on November 30, 2017.

[25] Ibid.

Table 4-2 Largest Container Ships Calling at U.S. Ports
(as of the Fourth Quarter of 2016)

Trade route	Maximum vessel capacity (TEU)
Asia-U.S. Pacific Coast	13,102
Asia-U.S. Atlantic Coast	10,700
North Europe-U.S. Atlantic Coast	9,403
Europe-U.S. Gulf Coast	6,732

KEY: TEU =Twenty-foot equivalent unit

SOURCE: Blue Water Reporting, World Liner Supply Report: Quarter 4 2016, available http://www.bluewaterreporting.com as of November 30, 2017.

4.3 Emerging Issue: Energy Products

The top 25 tonnage and dry bulk ports include several that handle substantial quantities of the Nation's energy resources. The contrasting growth rates over the past decade for outbound and inbound foreign cargo (a 41.4 percent increase in tonnage between 2007 and 2016 for outbound cargo compared to a 29.8 percent decrease for inbound cargo) is in part due to the changing composition of energy products that the U.S. exports and imports.[26] The infrastructure requirements for coal, crude petroleum and petroleum products, as well as LNG differ sufficiently that it can be difficult for a terminal to transition between them. Terminals designed to handle a specific commodity may face reduced cargo volumes if national inbound and outbound volumes decline. New terminals may be needed to handle those commodities experiencing rapid growth.

4.3.1 Liquified Natural Gas (LNG)

U.S. natural gas production rose by 40.1 percent from 2007 to reach a marketed total of 28.3 trillion cubic feet in 2016.[27] Although domestic consumption accounts for 96 percent of the natural gas produced domestically in 2016, an export market is developing and numerous LNG export terminals along the Gulf Coast are in the planning, permitting, or construction phases.[28] New pipelines are being built to move LNG to these new terminals because rail transportation of LNG is forbidden by the Federal Railroad Administration (aside from a demonstration project in Alaska).

LNG imports declined from a peak of 770.8 billion cubic feet in 2007 to 88.4 billion cubic feet in 2016, an 88.5 percent drop and a

[26] USACE, Waterborne Commerce Statistics Center, *Final Waterborne Commerce Statistics for Calendar Year 2016*, available http://www.navigationdatacenter.us/ on December 21, 2017.

[27] USDOE, EIA, U.S. *Natural Gas Marketed Production*, August 31 2017. Available https://www.eia.gov/ on October 20, 2017.

[28] USDOE, EIA, Today in Energy, "Growth in domestic natural gas production leads to development of LNG export terminals," March 4, 2016. Available https://www.eia.gov/ on October 20, 2017.

compound annual decrease of 21.4 percent.[29] LNG imports stabilized in 2013, and decreased by just 3.4 percent between 2015 and 2016. The U.S. began to export LNG in 2014 when 13.3 billion cubic feet were shipped, and by 2016 exports exceeded imports as the export volume surged to 67.5 percent of the combined total with 183.9 billion cubic feet (see Figure 4-8).[30]

4.3.2 *Petroleum and Petroleum Products*

The Gulf Coast is home to 45 percent of the Nation's petroleum refining capacity and 51 percent of the Nation's natural gas processing capacity.[31] The Gulf of Mexico holds significant offshore energy reserves, with current extraction accounting for 17 percent of total U.S. crude oil production and 5 percent of dry natural gas production.[32]

The USACE Waterborne Commerce Statistics Center (WCSC) reported that 157.6 million tons of petroleum and petroleum products were transported internally along domestic waterways in 2016.[33] Increased use of pipelines for domestic transportation has resulted in a 4.4 percent decrease in waterborne transport of petroleum and petroleum products between 2007 and 2016, despite an overall increase in production.[34]

[29] USDOE, EIA, Natural Gas, "U.S. Natural Gas Imports by Country," July 31, 2017. Available at https://www.eia.gov/ accessed October 2017,

[30] Ibid.

[31] USDOE, EIA, Gulf of Mexico Fact Sheet, "Energy Infrastructure with Real-time Storm Information," Available at: https://www.eia.gov/ accessed October 2017.

[32] Dry natural gas consists almost entirely of methane, while wet natural gas also includes compounds like butane or ethane that can be separated from the methane and sold separately.

[33] USACE, Waterborne Commerce Statistics Center, *Final Waterborne Commerce Statistics for Calendar Year 2016*, available http://www.navigationdatacenter.us/ on December 21, 2017.

[34] USACE, Waterborne Commerce Statistics Center, *The U.S. Waterway System Fact Cards, 2007-2016*, available http://www.navigationdatacenter.us/ on December 21, 2017.

Figure 4-8 Waterborne Import and Export of LNG, 2007–2016

SOURCES: U.S. Department of Energy (USDOE), Energy Information Administration (EIA), *U.S. Natural Gas Exports and Re-Exports by Country* and USDOE, EIA, *U.S. Natural Gas Imports by Country*, available at https://www.eia.gov/ as of October 20, 2017.

Inbound waterborne crude petroleum tonnage has fallen sharply, from 522 million tons in 2007 to 280 million tons in 2016, a 46.3 percent drop and a compound annual decrease of 6.7 percent.[35] In contrast, outbound tonnage over the same period has surged, from 83,000 tons in 2007 to 18 million tons in 2016 (see Figure 4-9). Yet in 2016, inbound tonnage still accounted for 94.1 percent of the crude petroleum volume, while outbound tonnage accounted for only 5.9 percent.[36]

The decrease in volume of inbound crude petroleum has been accompanied by a reduction in inbound foreign petroleum products, which decreased by 27.8 percent between 2007 and 2016, from 161.2 million tons to 116.4 million tons (see Figure 4-10).[37] The impact on port throughput has been mitigated by growth of outbound petroleum products, which increased 145.6 percent between 2007 and 2016, from 82.3 million tons to 202.1 million tons.

The combined movement of inbound and outbound crude petroleum and petroleum products (the combination of Figures 4-9 and 4-10) has decreased by 19.5 percent over the past 10 years, for a compound annual decrease of 2.4 percent, although there was an 8.0 percent increase between 2015 and 2016.[38]

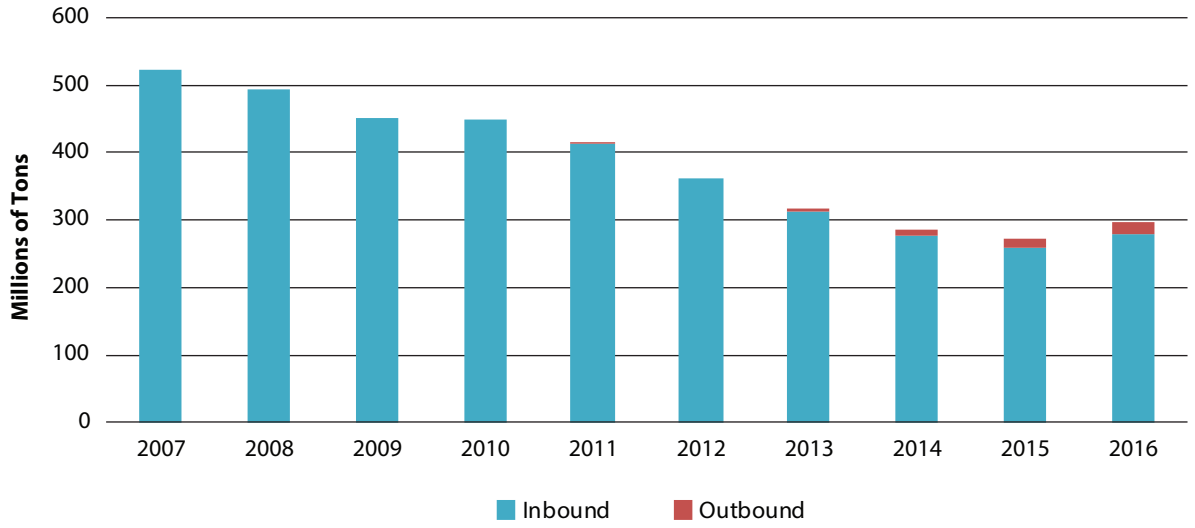
[35] Ibid.

[36] Ibid.

[37] Ibid.

[38] Ibid.

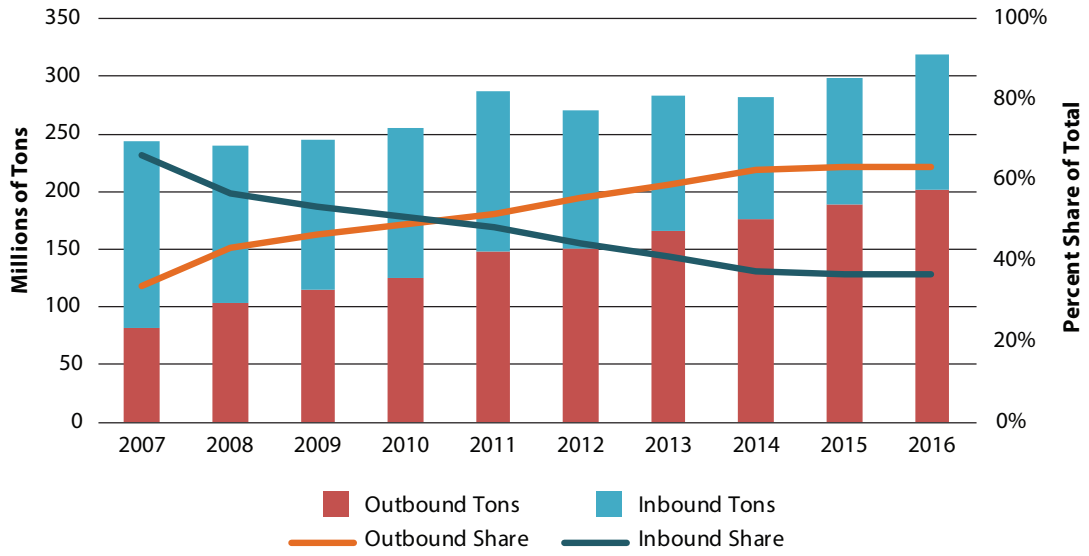
Figure 4-9 Foreign Waterborne Inbound and Outbound Movement of Crude Petroleum, 2007–2016



NOTES: Inbound and Outbound do not include domestic cargo.

SOURCE: USACE, Waterborne Commerce Statistics Center, *The U.S. Waterway System Fact Cards, 2007-2016*, available http://www.navigationdatacenter.us/ as of December 21, 2017.

Figure 4-10 Foreign Waterborne Inbound and Outbound Movement of Petroleum Products, 2007–2016



NOTES: Inbound and Outbound do not include domestic cargo. Does not include crude petroleum.

SOURCE: USACE, Waterborne Commerce Statistics Center, *The U.S. Waterway System Fact Cards, 2007-2016*, available http://www.navigationdatacenter.us/ as of December 21, 2017.

4.3.3 Coal

The USACE WCSC reported that 109.8 million tons of coal were transported internally along domestic waterways in 2016, 13.0 percent less than the 126.2 million tons in 2015.[39] This reduction is in line with decreased U.S. coal production, which fell by 18.8 percent between 2015 and 2016.[40]

The Energy Information Administration (EIA) reports that coal exports from the U.S. to countries other than Canada and Mexico have decreased since 2012 (see Figure 4-11), although they remain 29.7 percent higher than in 2007.[41] The 52.2 million tons exported in 2016 is an 18.8 percent decrease from 2015; the 10-year compound annual growth rate is 2.9 percent.

Coal imports from outside of North America fell 13.4 percent between 2015 and 2016. Imports decreased from 34.4 million tons in 2007 to 8.8 million short tons; this equates to a 74.5 percent fall and a 14.1 percent compound annual decrease.[42] In 2016, exports were 85.6 percent of the foreign coal trade and imports were 14.4 percent.

Atlantic and Gulf Coast ports handle most coal exports, with the Norfolk, VA, customs district (home to the Port of Virginia)

[39] WCSC, USACE, *Final Waterborne Commerce Statistics for Calendar Year 2016*, November 2017, available http://www.navigationdatacenter.us/ on November 30, 2017.

[40] USDOE, EIA, *Annual Coal Report*, November 15, 2017, available https://www.eia.gov/ on December 18, 2017

[41] USDOE, EIA, *Quarterly Coal Reports* 2007 through 2016, available https://www.eia.gov/ on December 19, 2017

[42] Ibid.

Figure 4-11 Imports and Exports of Coal, 2007–2016

NOTE: Excludes exports to and imports from Canada and Mexico.

SOURCE: USDOE, EIA, *Quarterly Coal Reports 2007 through 2016*, available https://www.eia.gov/ as of October 20, 2017.

accounting for 38.3 percent of U.S. exports in 2016, and the Baltimore, MD, district a further 23.9 percent.[43] The EIA reports that total coal export capacity in 2016 stood at 257 million tons, compared to actual total exports of 60.3 million tons. Thus, no additional export capacity is currently planned.[44] The EIA estimated 2016 export capacity utilizations, based on the combined annual throughput capacity of coal export facilities, ranged from 13 percent on the Gulf Coast to 32 percent on the Atlantic Coast.[45]

The decreased tonnage of coal arriving at dedicated maritime terminals and the resulting excess capacity at existing ports combined with environmental concerns has led to plans for new coal facilities being cancelled or delayed at several locations, including Morrow, OR; Cherry Point, WA; Longview, WA; and Oakland, CA.

[43] USDOE, EIA, *Quarterly Coal Report October-December 2016*, April 2017, https://www.eia.gov/ on October 20, 2017.

[44] USDOE, EIA, *Today in Energy*, Jul. 18, 2017. Available at: https://www.eia.gov/ on October 20, 2017.

[45] USDOE, EIA, *Today in Energy, "U.S. coal exports have increased over the past six months,"* July 18, 2017, available https://www.eia.gov/ on October 20, 2017.

5 Looking Ahead

This effort to present nationally consistent statistics on port throughput and capacity represents a continuing evolution in the development of a complete national port performance picture. This evolution is guided by recommendations delivered by the 2016 Working Group to the BTS Director on December 4, 2016.

As discussed with the 2016 Working Group, BTS must consider six basic questions when considering development of a new measure for port performance (or any other topic in the Bureau's domain):

- Is the proposed statistic relevant to capacity and throughput?
- Is the statistic nationally consistent?
- Is the statistic reasonably accurate, timely, and verifiable?
- Are data collection and estimation methods transparent?
- Is the statistic based on data that are affordable to collect or obtain?
- If data collection is required, is respondent burden kept to a minimum?

The evolving nature of the port industry and of data collection itself presents BTS with both challenges and opportunities in further developing the Port Performance Freight Statistics Program. USACE collected extensive data on port infrastructure for many years through on-site surveys by its staff. The resulting information was compiled into a database that contained information on load capacity, mechanical handling facilities, berth space, apron width, and other details. The information was compiled for piers, wharves, and docks at principal ports. However, the collection of these detailed characteristics was discontinued in 2008 due to budget constraints, and a significant portion of the information is now a decade or more old.

Some of the key information formerly collected in this legacy program may be extracted from overhead imagery. In the past, aerial photography typically required expensive arrangements with specialized aviation firms. Satellite imagery with adequate resolution is now available at lower cost and greater frequency. However, information cannot be extracted from aerial photography or satellite imagery until precise landside boundaries of the port are identified. USACE identifies what facilities are included in a port's definition, but does not provide precise geo-spatial boundaries of those facilities. Landside boundaries are rarely clear because port infrastructure often blends with surrounding port-related land uses. A nationally consistent method is required for identifying the landside boundary of ports so that calculations of available space and facilities can be comparable. BTS is working with port stakeholders and interagency teams,

such as the U.S. Committee on the Marine Transportation's Maritime Data Integrated Action Team, to identify comparable port boundaries; and is exploring methods to extract additional measures on port capacity from satellite imagery for future editions of this *Annual Report*.

BTS recognizes that some desired statistics might require data collection through surveys of port administrators, terminal operators, or other members of the port community. BTS also recognizes that such data collection would be complex given the variety of organizations involved in port governance. Whether data are collected through surveys or administrative records, BTS recognizes the need to continue to work with the varied organizations and interests represented in the 2016 Working Group to develop standard definitions for measurement units.

BTS will continue to review stakeholders' comments to this *Annual Report* and develop strategies for improving and expanding statistics on port throughput and capacity. BTS will work with USACE, MARAD, and the other principal Federal statistical agencies to develop and implement those strategies, as resources allow. BTS looks forward to comments on this second *Annual Report* and ideas for future improvements. Comments and ideas should be sent to PortStatistics@dot.gov or to the Port Performance Freight Statistics Program, Bureau of Transportation Statistics, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC, 20590.

APPENDIX A: PORT PROFILES

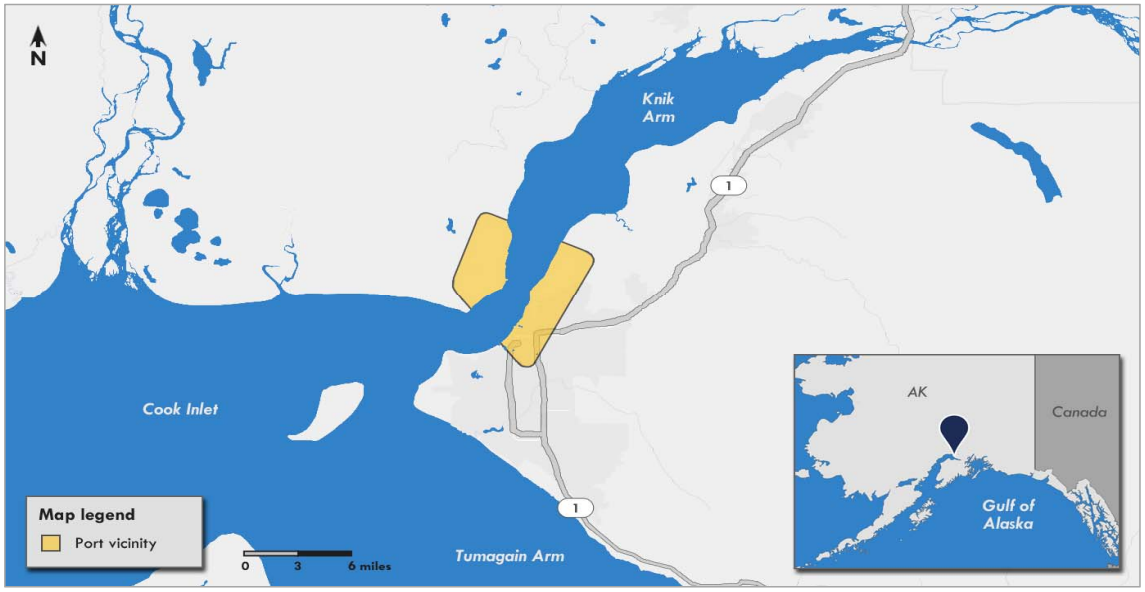
PORT OF ANCHORAGE

Alaska

Pacific Coast

Port list:

Container



Port vicinity map illustrates area facilities.

Port overview

The Port of Anchorage is located on the Knik Arm of the Cook Inlet, which stretches from Anchorage to the Gulf of Alaska. The port is governed by a nine-member Anchorage Port Commission Board.

The port's public facilities include three general cargo terminals that accommodate containerized, break-bulk, bulk, and Ro/Ro cargoes. The port handles break-bulk freight including iron, steel, and cement, and a variety of manufactured products. Private facilities include a liquid bulk dock that primarily handles distillate fuel oil. There are also several private barge and tugboat docks that are operational during the ice-free season.

This port has access to Class II rail service.

Port Updates:
Recent investments in the port have focused on reinforcing the port's current infrastructure. The port is also conducting technical tests associated with a planned five-phase Port Modernization Program. This program will replace current infrastructure and deepen existing terminals to allow them to accommodate larger, deeper draft vessels.

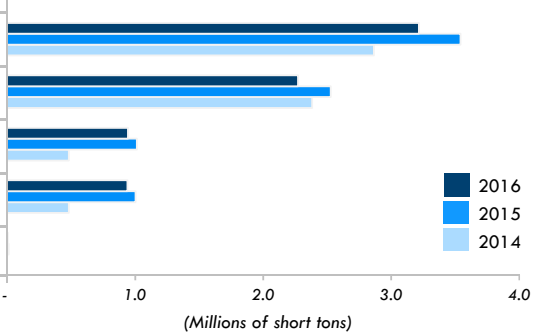
PORT OF ANCHORAGE (CONTINUED)

THROUGHPUT

Cargo

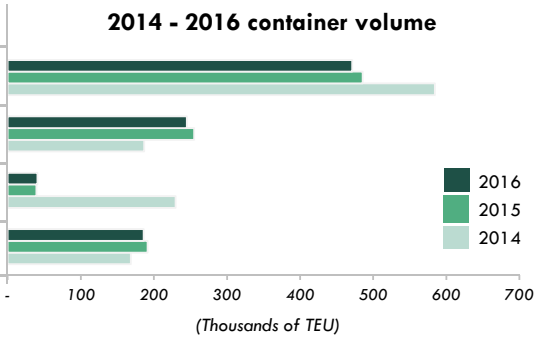
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**3.2**	▼ **-9.2%**
• Domestic	2.3	▼ -10.1%
• Foreign	0.9	▼ -6.9%
▫ Imports	0.9	▼ -6.4%
▫ Exports	0.0	▼ -53.6%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**471**	▼ **-3.0%**
• Inbound loaded TEU	245	▼ -4.0%
• Outbound loaded TEU	41	▲ 4.0%
• Empties (in- & outbound)	186	▼ -2.9%

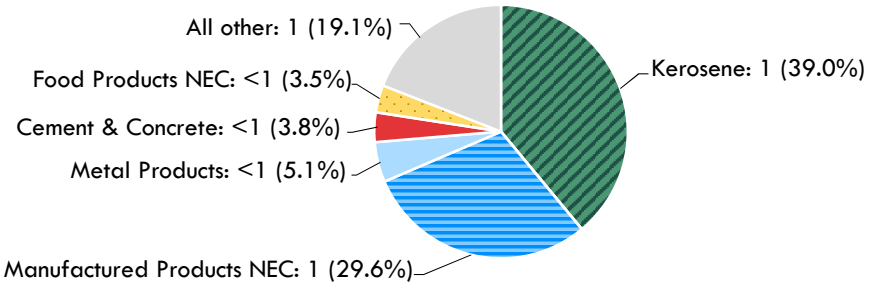


PORT OF ANCHORAGE (CONTINUED)

THROUGHPUT

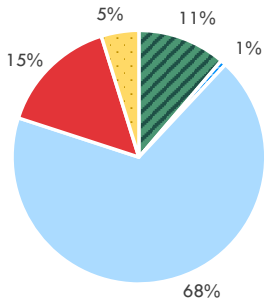
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

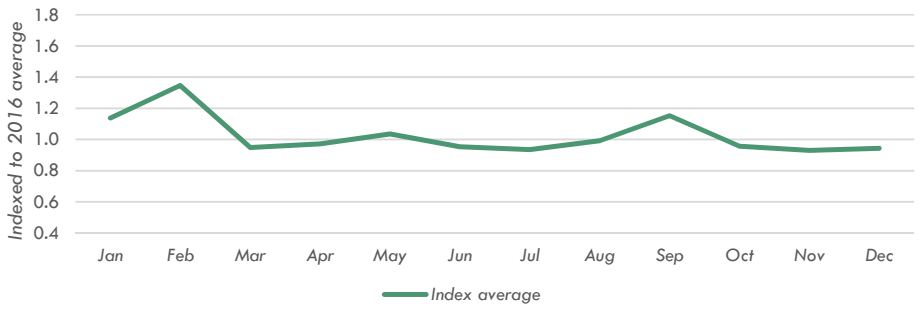
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**846**	▼ **-24.3%**
Container vessel	95	▼ -5.9%
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	6	0.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	576	▼ -29.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	129	▼ -1.9%
Other freight barge	41	▼ -31.4%

Vessel dwell time

2016 container vessel dwell time index



PORT OF ANCHORAGE (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
General Cargo Terminals	100	2,100	N/A	N/A	35	3	-	-	N

Non-container terminals

In addition to the terminals listed above, the Port of Anchorage complex includes two petroleum product terminals.

Channel depth

Authorized channel depth (ft)	**35.0**	Maximum depth of approach channel (ft)	**35.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Port of Anchorage container cargo is handled at its general cargo terminal. This port is served by a mix of container vessels and barges that can carry both containers and non-container Ro/Ro or break-bulk cargo. Available data on vessel calls may not accurately reflect vessel counts or average TEU handled for container cargo. The high average dwell time for February 2016 is due to an additional call that month by one of the larger vessels serving the port.

SOURCES: Port Overview/Terminals—Port of Anchorage website, available at http://www.portofanc.com, including terminal websites accessed through the main port website, as of November 2017.

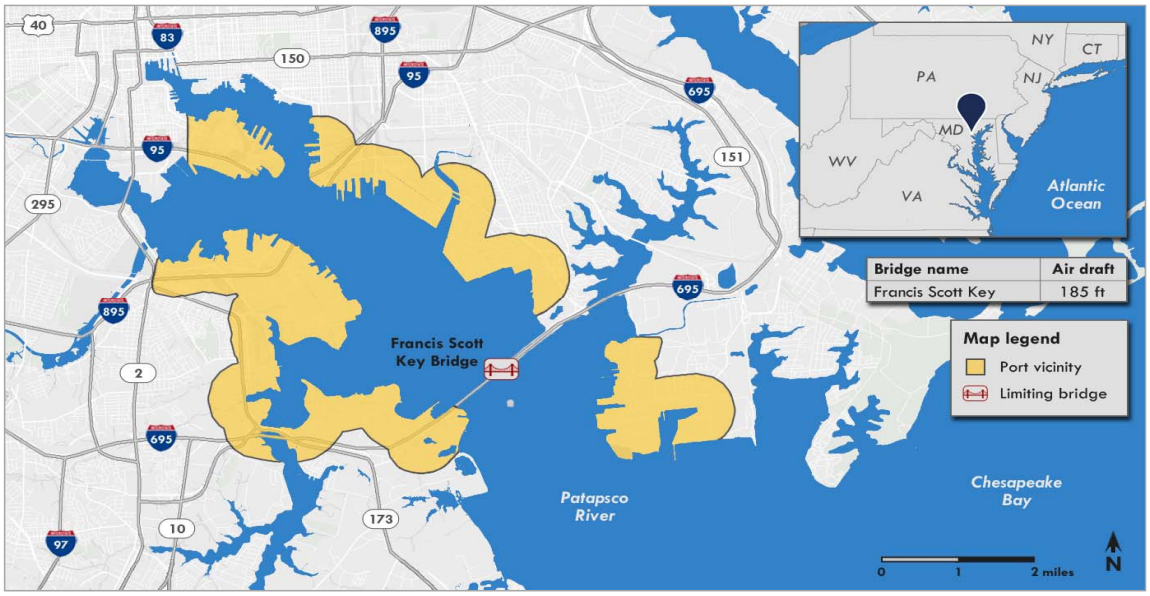
PORT OF BALTIMORE

Maryland

Atlantic Coast

Port list:

Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Chesapeake Bay Bridge (182 ft), not shown, may limit vessels serviced at the Port of Baltimore.

Port overview

The Port of Baltimore is located on the Patapsco River, 150 miles from the mouth of the Chesapeake Bay. The Port of Baltimore is governed by a seven-member Maryland Port Administration (MPA) board.

The port complex includes five public terminals and numerous private terminals. MPA terminals include Seagirt, the container terminal, and Dundalk, which has acreage dedicated to container operations but also handles Ro/Ro cargoes such as automobiles, agricultural equipment, and construction equipment. Other MPA terminals include the Fairfield/Masonville terminal that handles Ro/Ro cargo, and the North and South Locust terminals that handle break-bulk cargoes. Additional commodities handled by the port include coal, vehicles and parts, salt, gasoline, and wood pulp.

The port has access to two Class I railroads via Class III switching service.

Port Updates:
In July 2017, the MPA announced that it recently purchased 70 acres of land near the Seagirt terminal, which it plans to use for additional container and Ro/Ro storage.

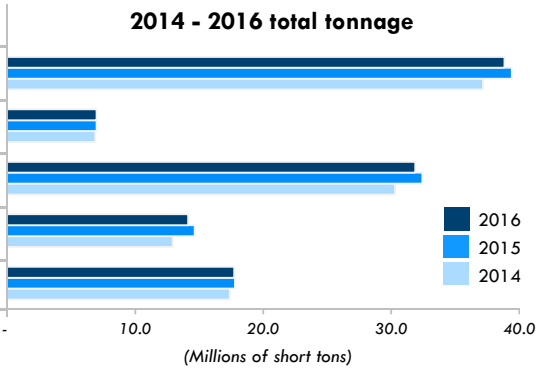
PORT OF BALTIMORE (CONTINUED)

THROUGHPUT

Cargo

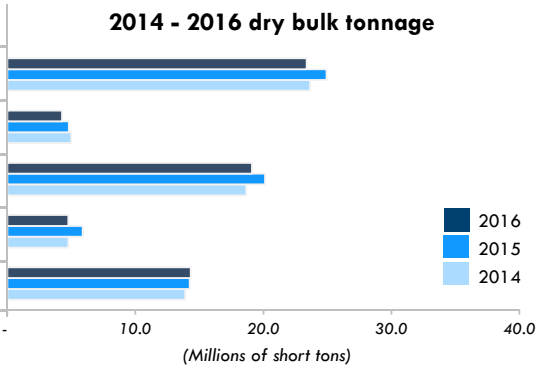
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**38.8**	▼ **-1.4%**
• Domestic	7.0	▲ 0.0%
• Foreign	31.9	▼ -1.8%
▫ Imports	14.1	▼ -3.5%
▫ Exports	17.7	▼ -0.3%



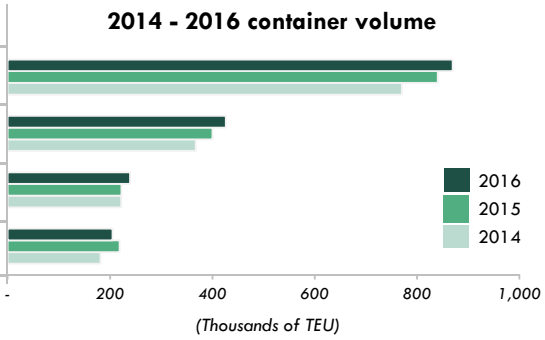
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**23.4**	▼ **-6.2%**
• Domestic	4.3	▼ -11.0%
• Foreign	19.1	▼ -5.1%
▫ Imports	4.8	▼ -19.1%
▫ Exports	14.3	▲ 0.7%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**869**	▲ **3.5%**
• Inbound loaded TEU	426	▲ 6.5%
• Outbound loaded TEU	239	▲ 7.5%
• Empties (in- & outbound)	205	▼ -6.2%

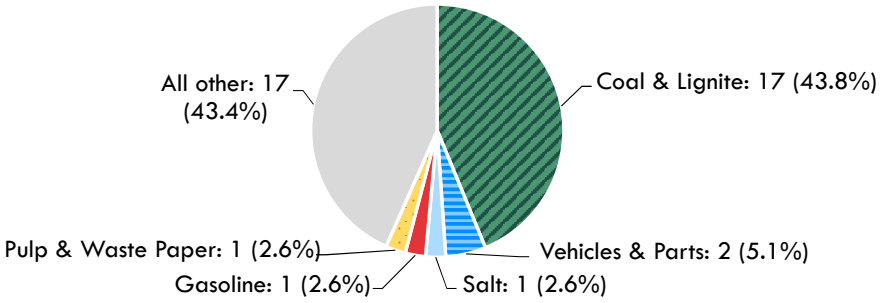


PORT OF BALTIMORE (CONTINUED)

THROUGHPUT

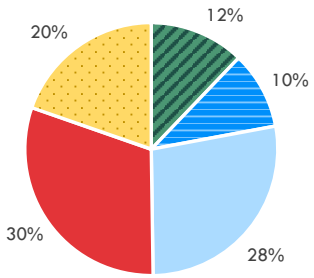
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

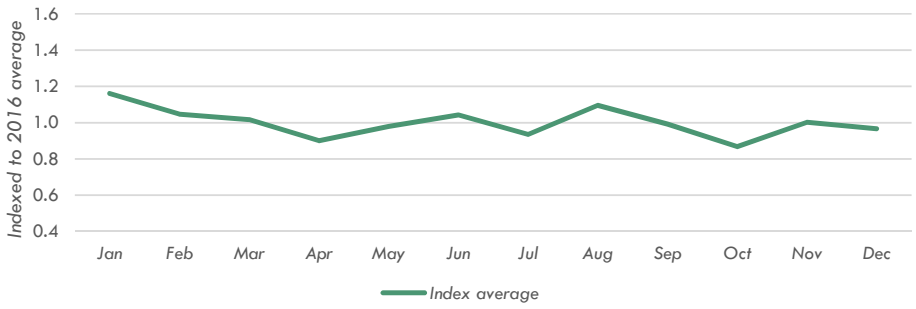
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**3,440**	▼ **-6.2%**
Container vessel	418	▼ -0.6%
Average TEU per container vessel	2,080	▲ 4.1%
Dry bulk vessel	342	▼ -4.9%
Average dry bulk tonnage (short tons) per dry bulk vessel	56,041	
Dry bulk barge	952	▼ -29.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	4,459	
Other freight vessel	1,051	▼ -1.0%
Other freight barge	677	▲ 44.2%

Vessel dwell time

2016 container vessel dwell time index



PORT OF BALTIMORE (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Dundalk Marine Terminal	10	2,874	182	Chesapeake Bay	42	4	-	-	N
Seagirt Marine Terminal	284	4,352	182	Chesapeake Bay	42	-	7	4	N

Non-container terminals

In addition to the container terminals listed above, the Port of Baltimore complex includes the following terminals: Fairfield/Masonville Automobile Terminals, North Locust Point Marine Terminal, South Locust Point Marine Terminal, and a portion of Dundalk Terminal that handles non-container cargoes.

Channel depth

Authorized channel depth (ft)	**50.0**	Maximum depth of approach channel (ft)	**50.0**

NOTES: Capacity information verified by port per AAPA communication. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Baltimore website, available at http://mpa.maryland.gov/Pages/port-information.aspx, including terminal websites accessed through the main port website, as of December 2017.

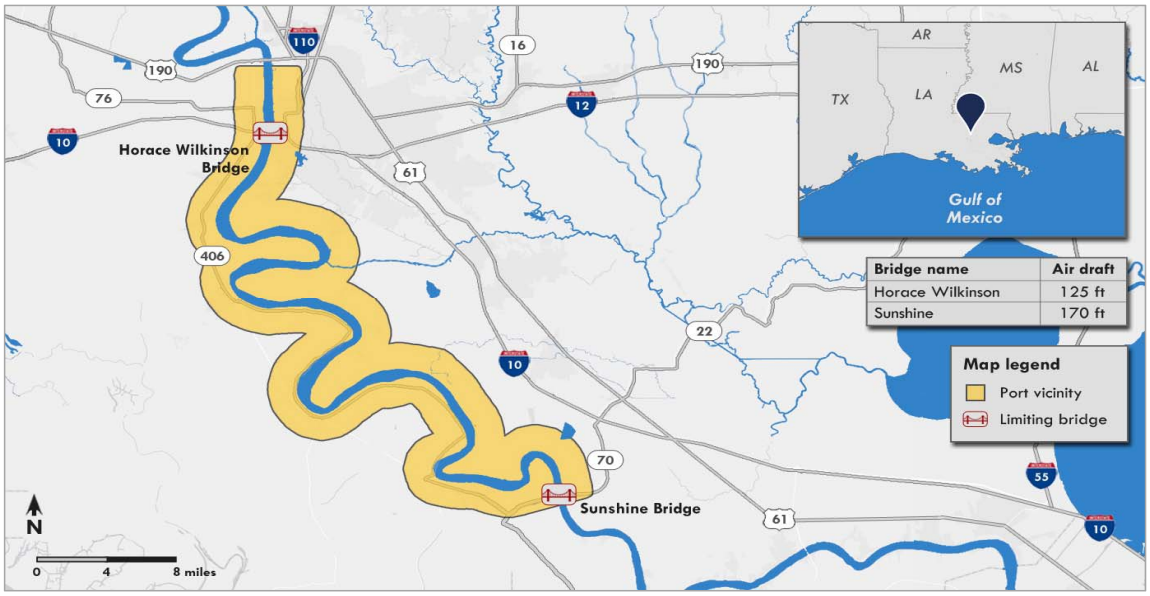
PORT OF GREATER BATON ROUGE

Louisiana

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Huey P. Long Bridge (132 ft), not shown, may limit vessels serviced at the Port of Greater Baton Rouge.

Port overview

The Port of Greater Baton Rouge is located along 85 miles of the Mississippi River. Adjacent to the port is the Port Allen Lock, the northern-most access point to the Gulf Intracoastal Waterway on the Mississippi. The port is governed by a 15-member Greater Baton Rouge Port Commission.

The port has ten public facilities, including:

- A bulk flour mill, a warehouse complex, a wood-pellet export facility, and a molasses terminal.
- Inland Rivers Marine Terminal (IRMT), which handles containerized, break-bulk, dry bulk, and Ro/Ro cargoes. IRMT also provides container-on-barge services.
- General Cargo Docks and adjacent Mid-Stream Transfer Buoys, which are the northernmost Mississippi River facilities that provide dockside and vessel-to-barge services for Panamax vessels.

There are also many private processing facilities and docks owned by the region's large petrochemical and agricultural industries within the port's jurisdiction. Major commodities handled by the port include agricultural products such as soybeans and corn, diesel and fuel oil, fertilizer, and crude petroleum.

Three Class I railroads provide service to the port.

Port Updates:
In November 2016, MARAD jointly awarded the Ports of Greater Baton Rouge and New Orleans $1.75 million for investing in new container-loading infrastructure to improve the efficiency of the container-on-barge shuttle service between the two ports.

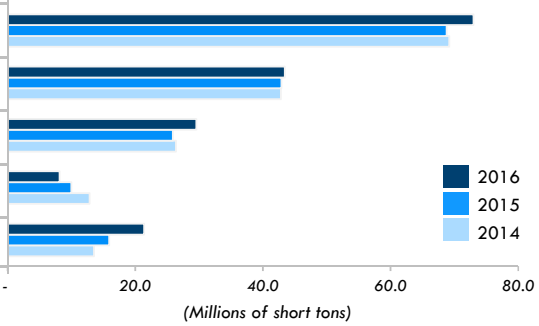
PORT OF GREATER BATON ROUGE (CONTINUED)

THROUGHPUT

Cargo

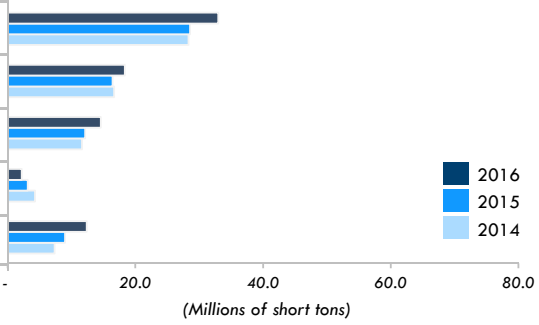
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**73.0**	▲ **6.1%**
• Domestic	43.4	▲ 1.3%
• Foreign	29.6	▲ 14.2%
▫ Imports	8.2	▼ -18.3%
▫ Exports	21.4	▲ 34.5%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**33.0**	▲ **15.4%**
• Domestic	18.4	▲ 11.8%
• Foreign	14.6	▲ 20.4%
▫ Imports	2.2	▼ -30.3%
▫ Exports	12.4	▲ 38.2%

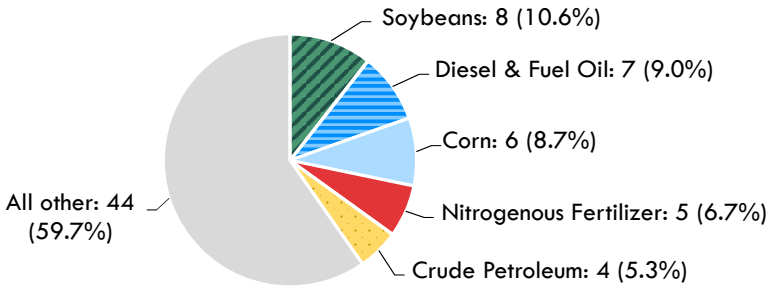


PORT OF GREATER BATON ROUGE (CONTINUED)

THROUGHPUT

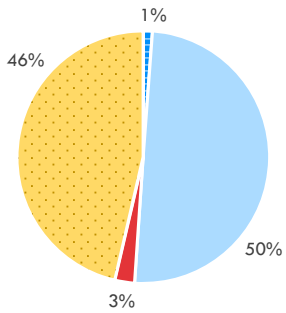
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**17,943**	▲ **1.9%**
Container vessel	1	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	209	▲ 5.3%
Average dry bulk tonnage (short tons) per dry bulk vessel	70,543	
Dry bulk barge	8,956	▲ 14.1%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,039	
Other freight vessel	457	▲ 14.5%
Other freight barge	8,321	▼ -9.2%

PORT OF GREATER BATON ROUGE (CONTINUED)

CAPACITY

Non-container terminals

The Port of Greater Baton Rouge complex includes the following terminals: Inland Rivers Marine Terminal, General Cargo Docks 1&2, Baton Rouge Barge Terminal, Petroleum Terminal, Export Grain Elevator, Bulk Flour Mill, Mid-Stream Buoys, Molasses Terminal, Sugar Distribution and Warehouse Complex, and Export Biomass Facility (Baton Rouge Transit Facility).

Channel depth

Authorized channel depth (ft)	**45.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Greater Baton Rouge website, available at http://www.portgbr.com, including terminal websites accessed through the main port website, as of December 2017.

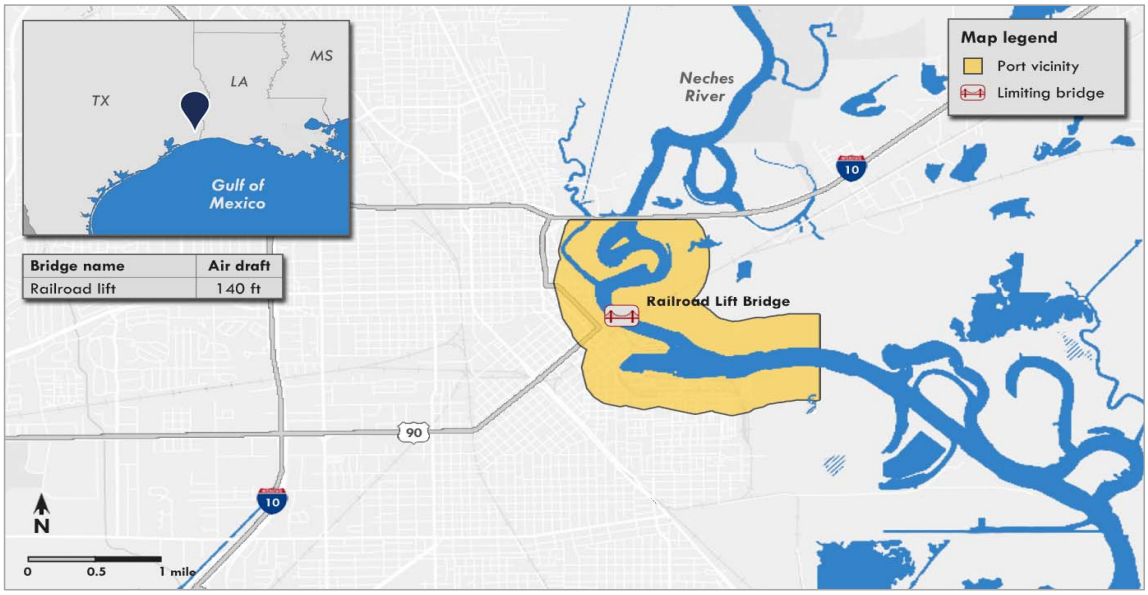
PORT OF BEAUMONT

Texas

Gulf Coast & Mississippi River

Port list:

Tonnage



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Beaumont is located on the Neches River, about 42 miles upriver from the Gulf of Mexico and about 84 miles east of Houston. The port is connected to inland waterways and the Gulf Intracoastal Waterway via the Sabine-Neches Channel, and is governed by a six-member Board of Commissioners.

There are multiple public facilities that can handle a variety of cargoes as well as a private petroleum terminal. The port primarily handles liquid and dry bulk cargoes such as crude petroleum, petroleum products (e.g., gasoline, naphtha), and grain. Port terminals also handle break-bulk cargoes such as forest products and steel, Ro/Ro cargoes, and military cargoes.

The port has access to three Class I railroads.

Port Updates:
In November 2017, voters passed an $85 million bond measure that will enable the port to upgrade facilities and improve rail and highway access.

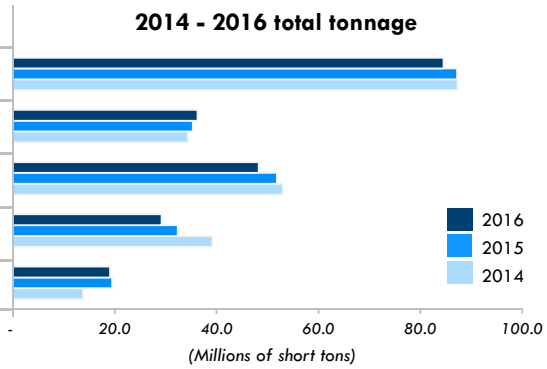
PORT OF BEAUMONT (CONTINUED)

THROUGHPUT

Cargo

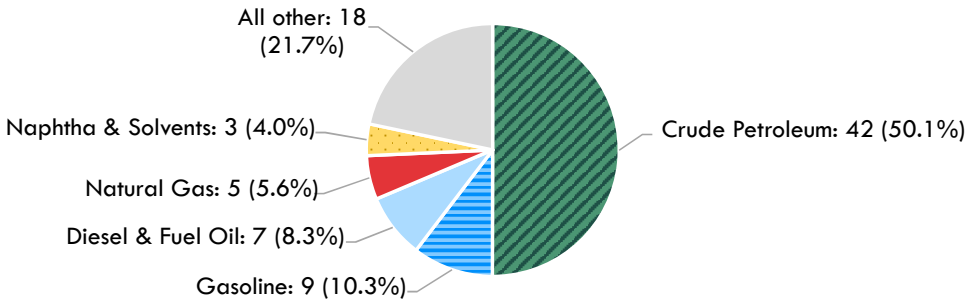
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**84.5**	▼ -3.0%
• Domestic	36.3	▲ 2.6%
• Foreign	48.3	▼ -6.9%
▫ Imports	29.2	▼ -9.8%
▫ Exports	19.1	▼ -2.1%



Commodities

Tonnage *Millions of short tons (percent of total)*

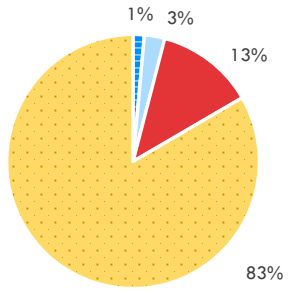


PORT OF BEAUMONT (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**8,689**	▼ **-5.0%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	125	▲ 1.6%
Average dry bulk tonnage (short tons) per dry bulk vessel	40,313	
Dry bulk barge	228	▲ 12.1%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,620	
Other freight vessel	1,094	▼ -3.8%
Other freight barge	7,243	▼ -5.7%

CAPACITY

Non-container terminals

The Port of Beaumont complex includes the following terminals: Main Street Terminal, Carroll Street Terminal (Beaumont Bulk Terminal), Harbor Island Terminal, Barge Dock, Grain Elevator Terminal, and Orange County Terminal.

Channel depth

Authorized channel depth (ft)	**40.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Beaumont website, available at http://www.portofbeaumont.com, including terminal websites accessed through the main port website, as of November 2017. *The Examiner* news article, http://www.theexaminer.com/stories/news/beaumont-voters-approve-85-million-port-bonds, as of December 2017.

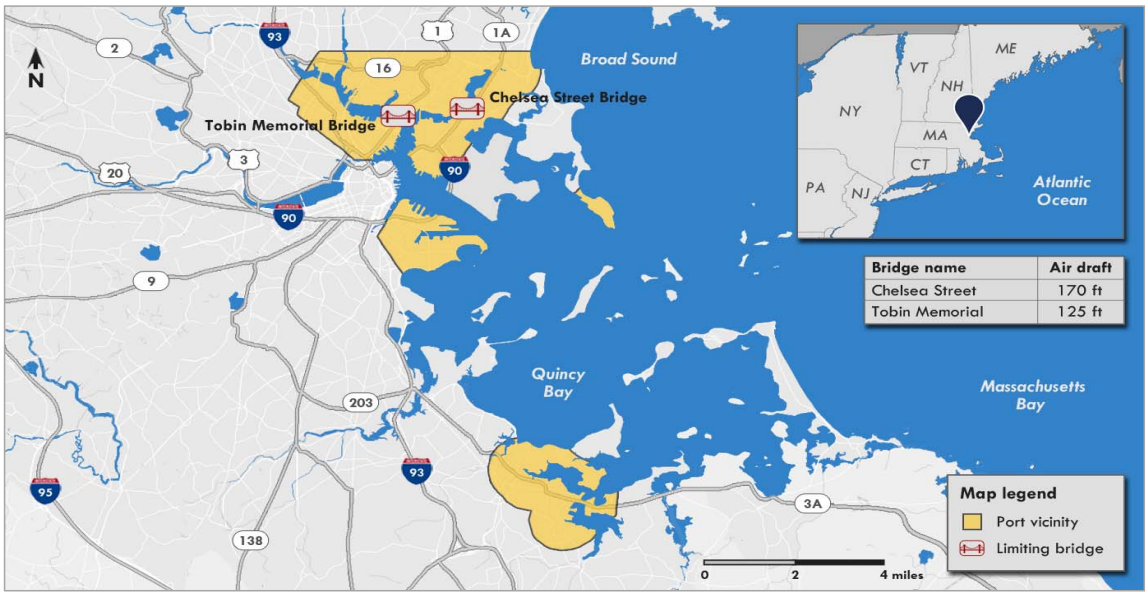
PORT OF BOSTON

Massachusetts

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Boston is located on Boston Harbor in Massachusetts Bay. A seven-member Massachusetts Port Authority (Massport) board governs the port.

The port complex includes one public container terminal (Conley Terminal) located in South Boston at the entrance to the Massachusetts Bay, as well as the Massport Marine Terminal and the Moran Marine Terminal (also called Boston Autoport). The Moran Marine Terminal is located in Charlestown alongside the Mystic River. Moran Marine Terminal handles all of the port's Ro/Ro cargoes. The port also includes several private terminals located within the port's jurisdiction that handle liquid and dry bulk cargoes, including petroleum products, fuel oils, and cement.

Port Updates:
In 2016 Massport received $42 million in Federal grant funds to repair and construct berths at Conley Terminal, implement refrigerated container storage improvements, and build new gate facilities. In October 2017, Massport opened a new, 3,100-foot freight corridor. This corridor moves truck traffic coming from Conley Terminal off local streets and onto a dedicated bypass road.

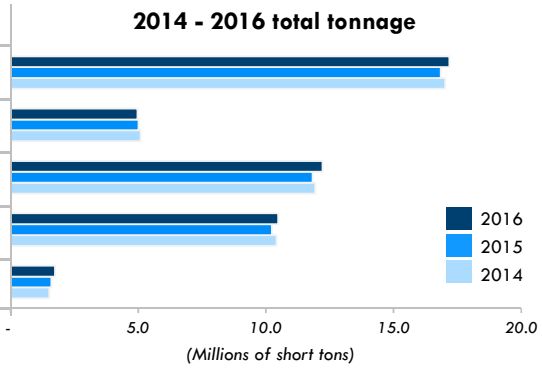
PORT OF BOSTON (CONTINUED)

THROUGHPUT

Cargo

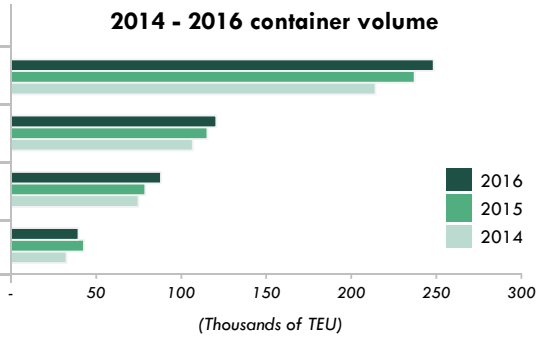
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**17.2**	▲ **2.0%**
• Domestic	5.0	▼ -0.9%
• Foreign	12.2	▲ 3.3%
▫ Imports	10.5	▲ 2.4%
▫ Exports	1.7	▲ 8.9%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**248**	▲ **4.7%**
• Inbound loaded TEU	121	▲ 4.5%
• Outbound loaded TEU	88	▲ 11.7%
• Empties (in- & outbound)	40	▼ -7.4%

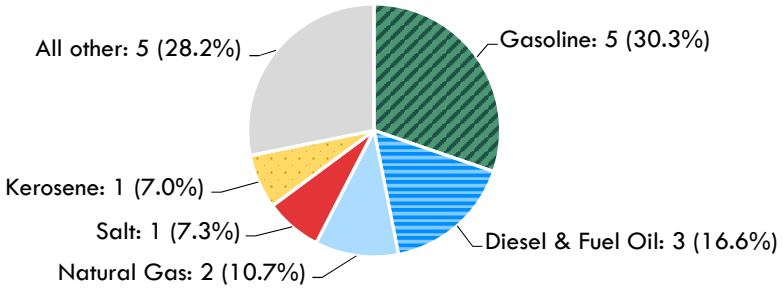


PORT OF BOSTON (CONTINUED)

THROUGHPUT

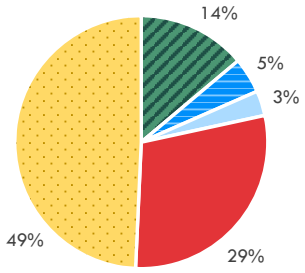
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

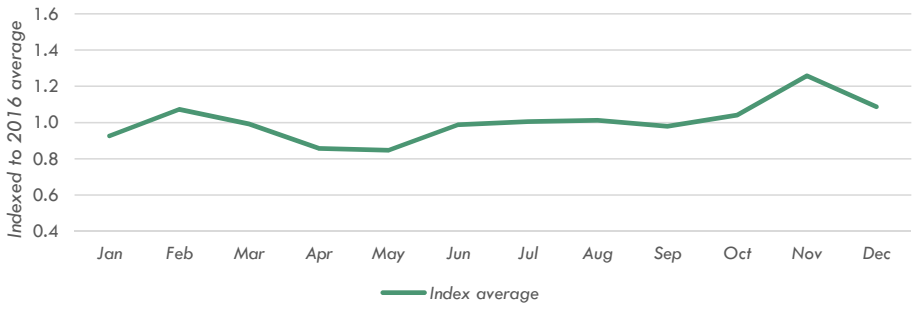
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,132**	▼ **-4.3%**
Container vessel	157	▼ -0.6%
Average TEU per container vessel	1,582	▲ 5.4%
Dry bulk vessel	52	▼ -20.8%
Average dry bulk tonnage (short tons) per dry bulk vessel	39,519	
Dry bulk barge	36	▲ 22.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	5,081	
Other freight vessel	330	▼ -7.7%
Other freight barge	558	▼ -2.7%

Vessel dwell time

2016 container vessel dwell time index



PORT OF BOSTON (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Conley Container Terminal	90	1,850	N/A	N/A	40	2	4	-	N

Non-container terminals

In addition to the container terminal listed above, the Port of Boston complex includes the following terminals: Massport Marine Terminal, Moran Marine Terminal (Autoport), and several private terminals.

Channel depth

Authorized channel depth (ft)	**40.0**	Maximum depth of approach channel (ft)	**40.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. The higher November 2016 vessel dwell time average is due to an extended dwell time for a single vessel call that month.

SOURCES: Port Overview/Terminals—Massport website, available at https://www.massport.com, including terminal websites accessed through the main port website, as of November 2017.

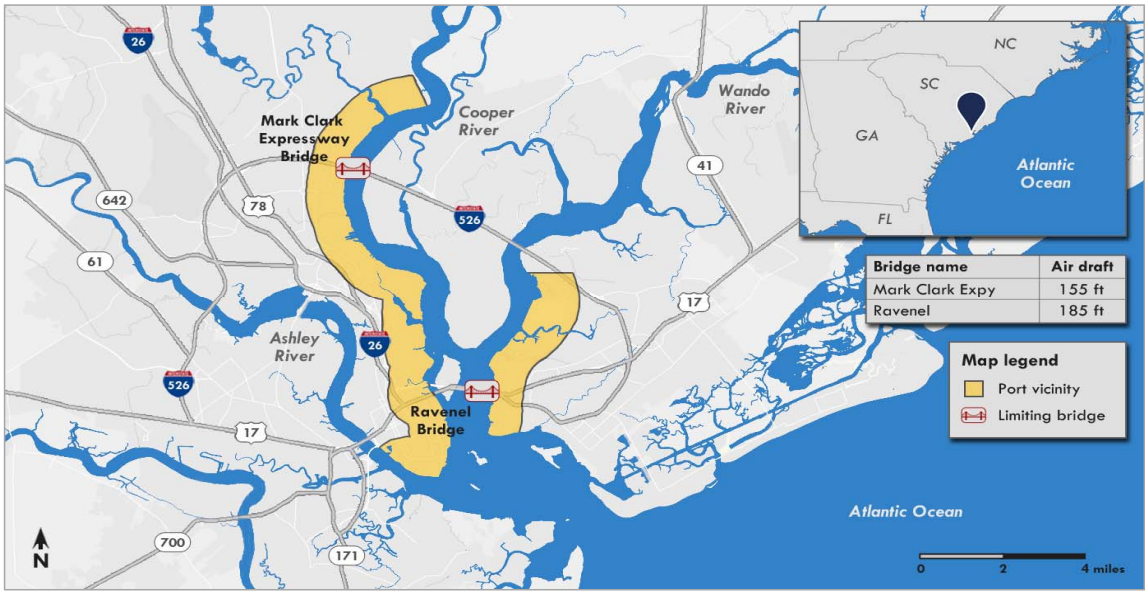
PORT OF CHARLESTON

South Carolina

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Charleston is located at the mouths of the Cooper and Wando Rivers on the South Carolina coast, and its terminals stretch inland for several miles. The port is governed by a nine-member South Carolina Ports Authority (SCPA) board.

The port has two public container terminals, Wando Welch and North Charleston, as well as three terminals that handle break-bulk, dry bulk, and Ro/Ro cargoes. Major commodities handled by the port include vehicles and parts, dry bulk (e.g., iron ore, sand and gravel), textile products, manufactured goods, paper products, and food.

All SCPA terminals have access to Class I rail lines directly or via short-line rail service.

Port Updates:
SCPA is building a new 280-acre container terminal, due to be completed in 2020, and is adding two new container cranes at the Wando Welch Terminal. USACE is overseeing a project to deepen the Charleston harbor to 52 feet; completion of this project is anticipated in 2020. The port plans to expand its cold storage facilities by 50 percent. As part of this initiative, SCPA opened a six-acre refrigerated container service area at the Wando Welch Terminal in 2017.

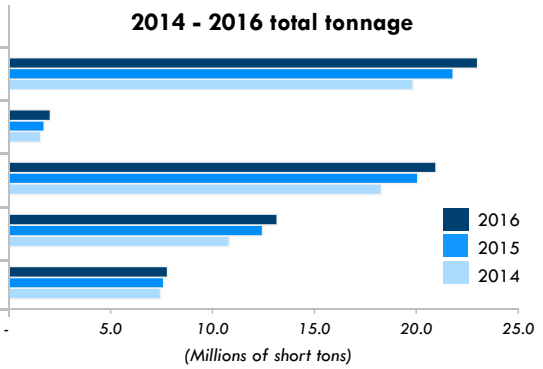
PORT OF CHARLESTON (CONTINUED)

THROUGHPUT

Cargo

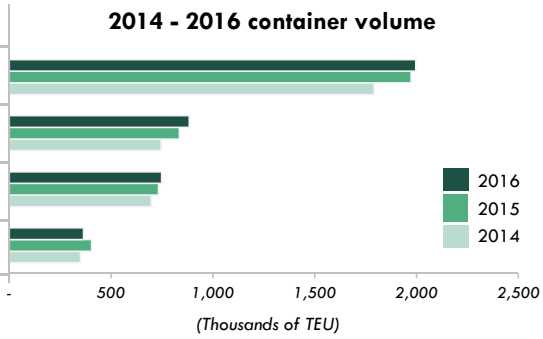
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**23.0**	▲ **5.5%**
• Domestic	2.1	▲ 17.9%
• Foreign	21.0	▲ 4.5%
▫ Imports	13.2	▲ 5.7%
▫ Exports	7.8	▲ 2.4%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,996**	▲ **1.2%**
• Inbound loaded TEU	883	▲ 5.8%
• Outbound loaded TEU	749	▲ 2.1%
• Empties (in- & outbound)	364	▼ -10.0%

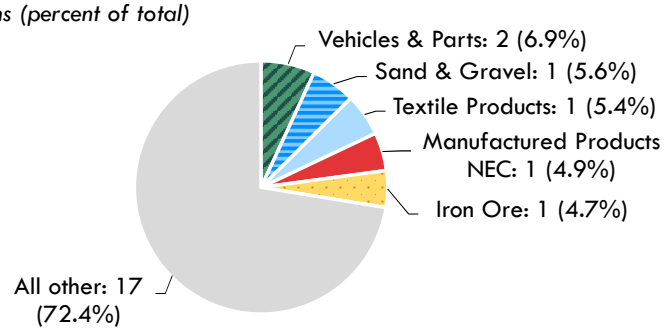


PORT OF CHARLESTON (CONTINUED)

THROUGHPUT

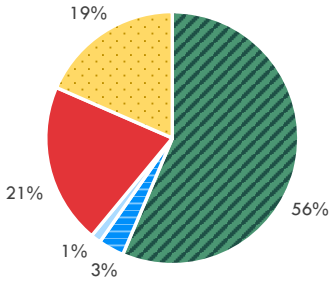
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

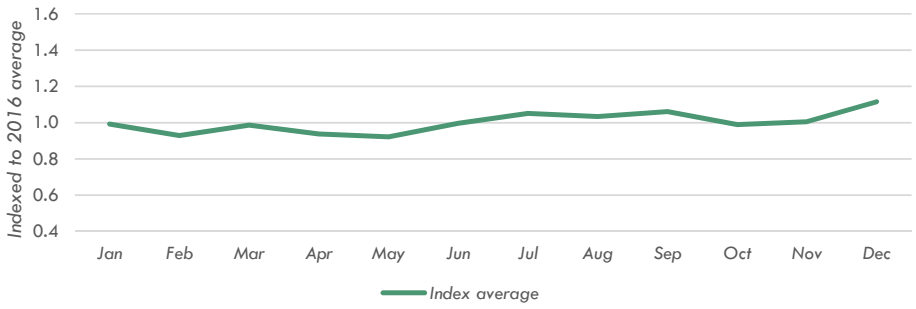
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,439**	▼ **-3.4%**
Container vessel	1,376	▼ -8.7%
Average TEU per container vessel	1,451	▲ 10.8%
Dry bulk vessel	80	▲ 8.1%
Average dry bulk tonnage (short tons) per dry bulk vessel	40,609	
Dry bulk barge	32	▼ -7.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,951	
Other freight vessel	502	▲ 1.8%
Other freight barge	450	▲ 7.9%

Vessel dwell time

2016 container vessel dwell time index



PORT OF CHARLESTON (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
North Charleston Terminal	198	2,500	155	Mark Clark	45	-	4	2	N
Wando Welch Terminal	399	3,800	185	Ravenel	45	-	4	6	N

Non-container terminals

In addition to the container terminals listed above, the Port of Charleston complex includes the following terminals: Columbus Street Terminal, Cruise Terminal, Veterans Terminal/Navy Base Terminal, and multiple private bulk terminals.

Channel depth

Authorized channel depth (ft)	**47.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—SCPA website, available at http://www.scspa.com/, including terminal websites accessed through the main port website, as of November 2017.

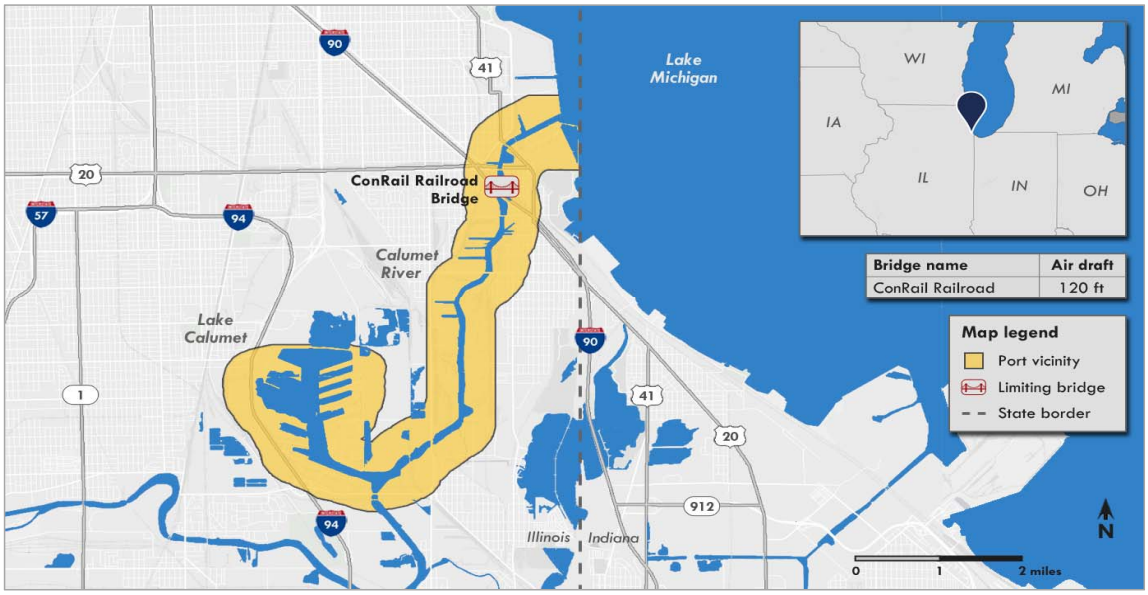
PORT OF CHICAGO

Illinois

Great Lakes

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Chicago is located at the mouth of the Calumet River, within Calumet Harbor on Lake Michigan. Due to its location the port handles cargoes traveling both on inland waterways and on the Great Lakes. A nine-member Board of Directors for the Illinois International Port District (IIPD) governs the port.

The Iroquois Landing Terminal and Lake Calumet Terminal (also called the Senator Dan Dougherty Harbor) handle a variety of dry and liquid bulk, break-bulk, and containerized cargoes. IIPD Lake Calumet facilities also include two grain elevators and liquid bulk tank storage. Major commodities handled by the port include sand and gravel, cement, salt, asphalt, and petroleum.

The port has access to several Class III and other rail services, which provide connections to Class I rail service in Chicago.

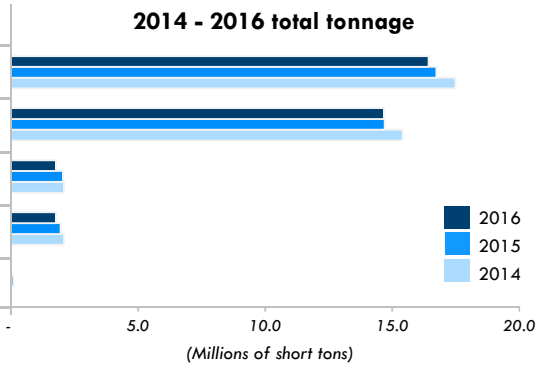
PORT OF CHICAGO (CONTINUED)

THROUGHPUT

Cargo

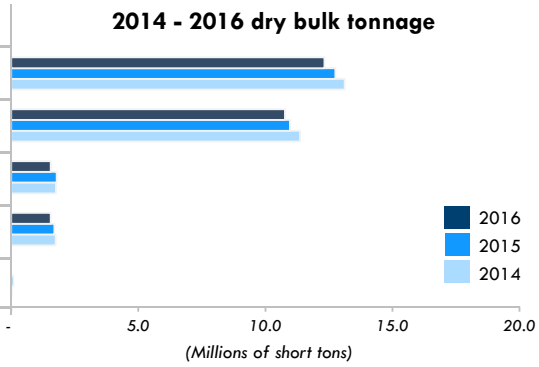
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**16.4**	▼ **-1.9%**
• Domestic	14.7	▼ -0.2%
• Foreign	1.8	▼ -13.6%
▫ Imports	1.8	▼ -9.8%
▫ Exports	0.0	▼ -100.0%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.3**	▼ **-3.3%**
• Domestic	10.8	▼ -1.8%
• Foreign	1.6	▼ -12.7%
▫ Imports	1.6	▼ -8.3%
▫ Exports	0.0	▼ -100.0%

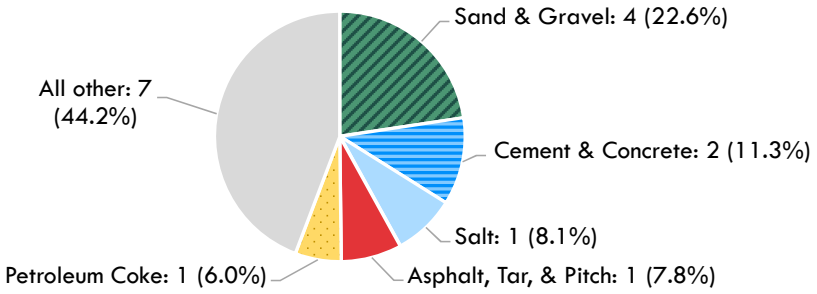


PORT OF CHICAGO (CONTINUED)

THROUGHPUT

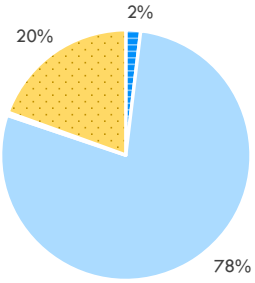
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**7,249**	▲ **7.2%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	139	▼ -37.9%
Average dry bulk tonnage (short tons) per dry bulk vessel	18,416	
Dry bulk barge	5,673	▲ 9.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,723	
Other freight vessel	29	▲ 48.7%
Other freight barge	1,409	▲ 5.4%

PORT OF CHICAGO (CONTINUED)

CAPACITY

Non-container terminals

The Port of Chicago complex includes the following terminals: Iroquois Landing Terminal, Lake Calumet Terminal/Dan Dougherty Harbor, and multiple private terminals.

Channel depth

Authorized channel depth (ft)	**21.0**	Maximum depth of approach channel (ft)	**21.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—IIPD website, available at http://www.iipd.com, including terminal websites accessed through the main port website, as of November 2017.

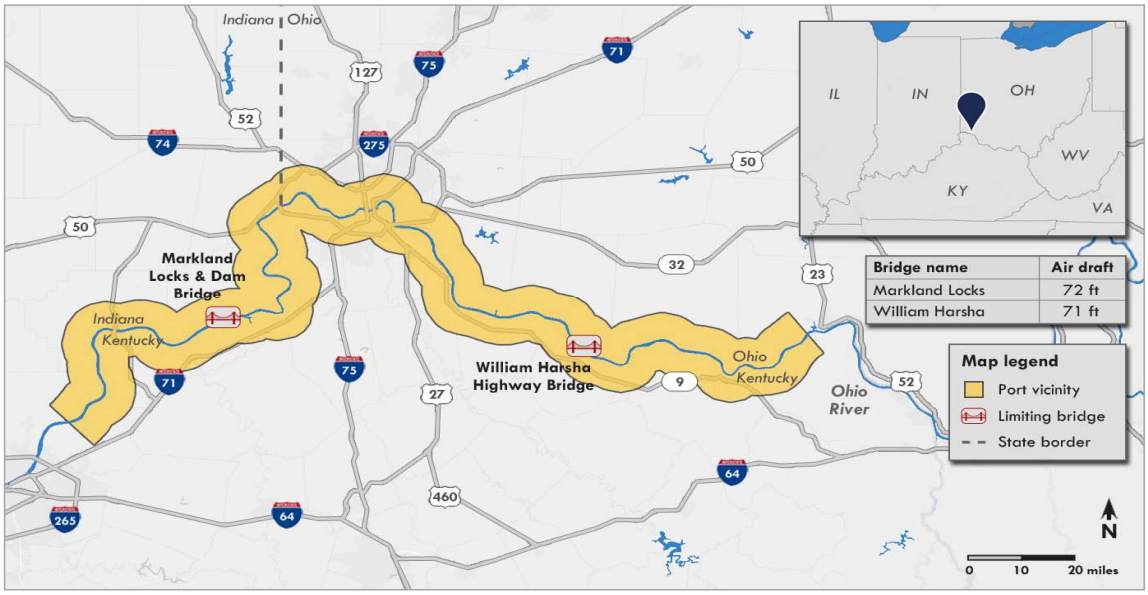
PORTS OF CINCINNATI-NORTHERN KY

Kentucky and Ohio

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Ohio River forms the border between Indiana and Ohio to the north and Kentucky to the south.

Port overview

The Ports of Cincinnati-Northern Kentucky form an inland port jurisdiction that includes over 220 miles of commercially navigable waterways adjacent to Ohio, Kentucky, and Indiana. The combined port district was created in 2015 by the Port of Greater Cincinnati Development Authority and the Northern Kentucky Port Authority.

The port district contains over 70 active marine terminals. These terminals handle a wide range of commodities, including coal, limestone, sand and gravel, gypsum, petroleum and petroleum products, grain, steel, cement, and fertilizer.

Many port terminals have access to Class I rail service either directly or via short-line operators.

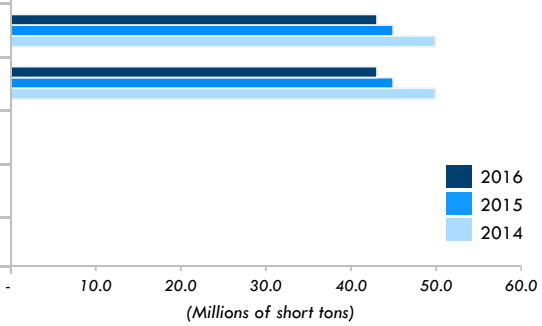
PORTS OF CINCINNATI-NORTHERN KY (CONTINUED)

THROUGHPUT

Cargo

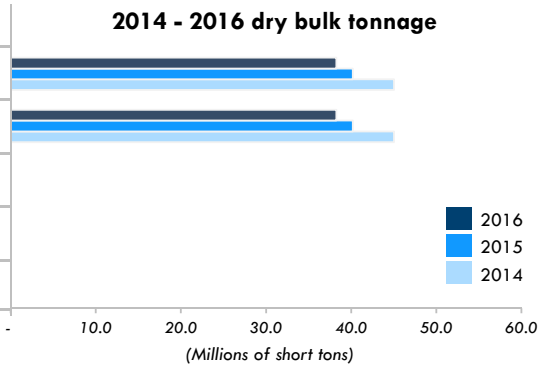
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**43.1**	▼ **-4.3%**
• Domestic	43.1	▼ -4.3%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**38.3**	▼ **-4.8%**
• Domestic	38.3	▼ -4.8%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A

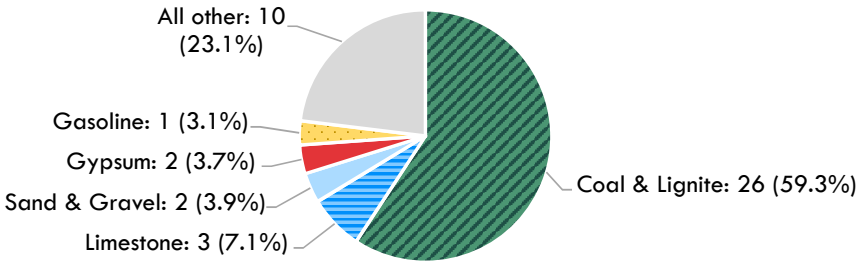


PORTS OF CINCINNATI-NORTHERN KY (CONTINUED)

THROUGHPUT

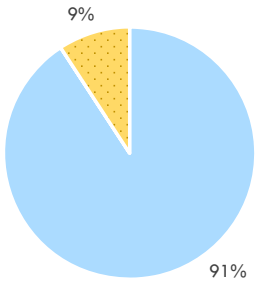
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**24,985**	▼ **-3.1%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	22,683	▼ -3.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,686	
Other freight vessel	0	N/A
Other freight barge	2,303	▲ 4.4%

PORTS OF CINCINNATI-NORTHERN KY (CONTINUED)

CAPACITY

Non-container terminals

The Ports of Cincinnati - Northern Kentucky complex includes over 70 active marine terminals.

Channel depth

Authorized channel depth (ft)	**9.0**	Maximum depth of approach channel (ft)	**9.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Greater Cincinnati Redevelopment Authority website, available at https://www.cincinnatiport.org, including terminal websites accessed through the main port website, as of December 2017.

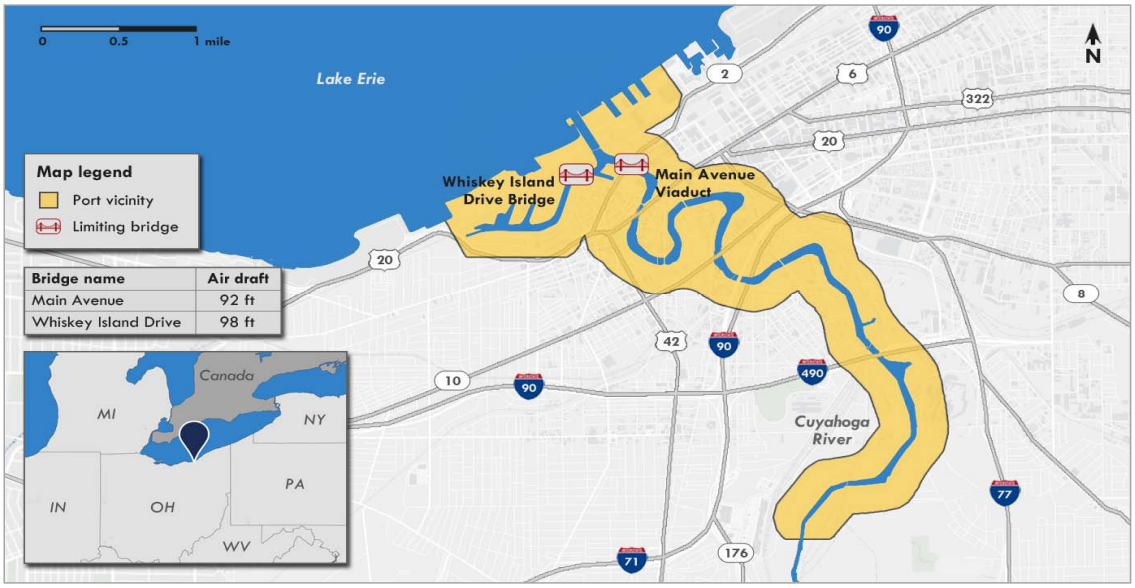
PORT OF CLEVELAND

Ohio

Great Lakes

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Cleveland is located on the southern shore of Lake Erie, at the mouth of the Cuyahoga River. It is a port of call for vessels transiting the Saint Lawrence Seaway. The Cleveland-Cuyahoga County Port Authority's (CCCPA) nine-member board of directors governs the port's facilities, leasing operations to private operators.

CCCPA oversees two marine terminals, the Cleveland Bulk Terminal and a general cargo terminal. Major commodities handled by the port include iron ores, limestone, salt, and cement. Additional private docks and other terminal facilities handle bulk commodities including sand and aggregates, coal, salt, cement, and petroleum products.

The port has access to two Class I rail lines.

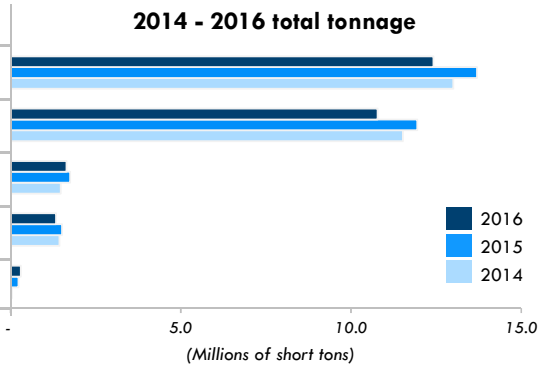
PORT OF CLEVELAND (CONTINUED)

THROUGHPUT

Cargo

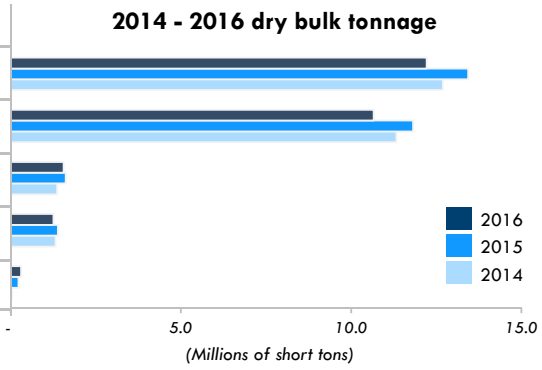
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.4**	▼ **-9.3%**
• Domestic	10.8	▼ -9.8%
• Foreign	1.6	▼ -6.2%
▫ Imports	1.3	▼ -11.8%
▫ Exports	0.3	▲ 30.0%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.2**	▼ **-9.1%**
• Domestic	10.7	▼ -9.8%
• Foreign	1.6	▼ -3.4%
▫ Imports	1.3	▼ -9.3%
▫ Exports	0.3	▲ 31.7%

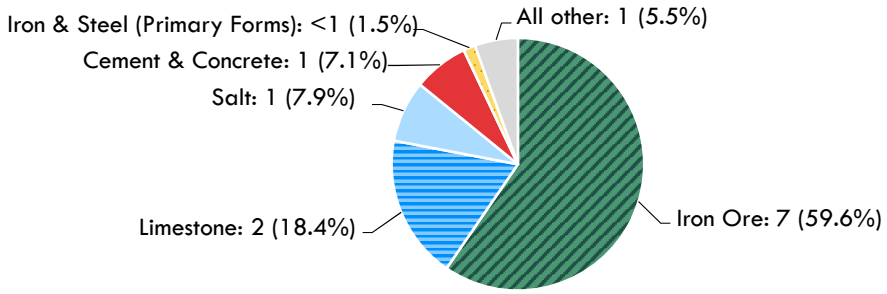


PORT OF CLEVELAND (CONTINUED)

THROUGHPUT

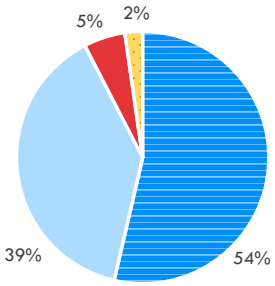
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**839**	▼ **-8.0%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	450	▼ -23.7%
Average dry bulk tonnage (short tons) per dry bulk vessel	16,993	
Dry bulk barge	326	▲ 25.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	14,041	
Other freight vessel	45	▲ 8.5%
Other freight barge	19	▼ -11.6%

PORT OF CLEVELAND (CONTINUED)

CAPACITY

Non-container terminals

The Port of Cleveland complex includes the following terminals: General Cargo Terminal, Bulk Terminal, and multiple private terminals.

Channel depth

Authorized channel depth (ft)	**27.0**	Maximum depth of approach channel (ft)	**29.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Cleveland website, available at http://www.portofcleveland.com, including terminal websites accessed through the main port website, as of November 2017.

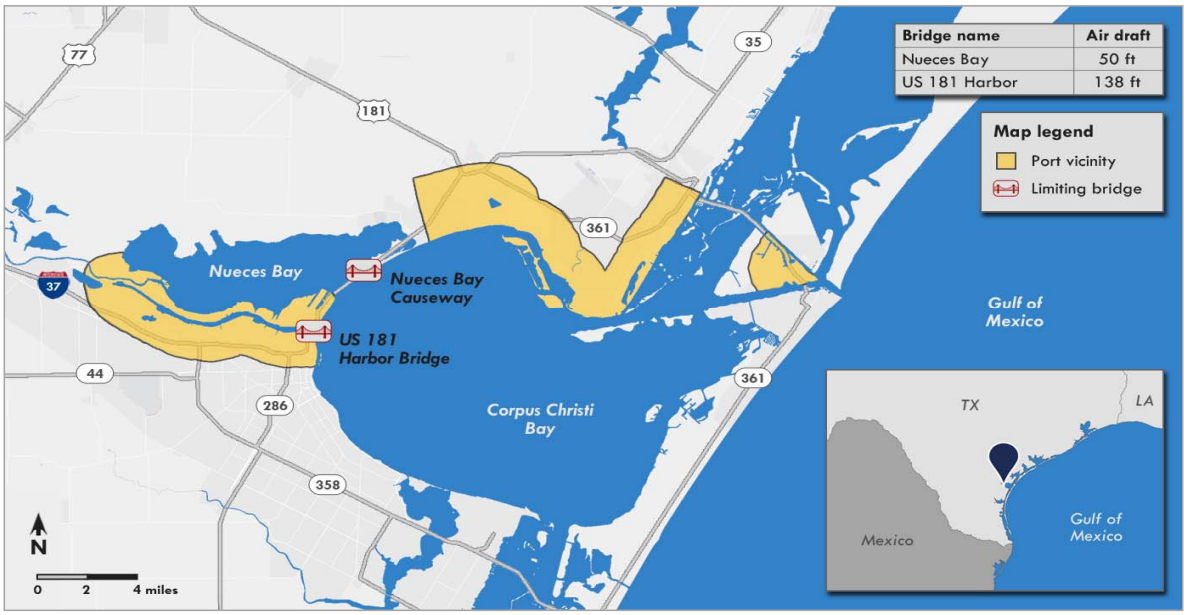
PORT OF CORPUS CHRISTI

Texas

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Corpus Christi is located in Corpus Christi Bay, along the coast of the Gulf of Mexico south of San Antonio, Texas. The port serves as a hub between barges moving on inland waterways and oceangoing vessels from the Gulf of Mexico. The port is governed by a seven-member Board of Commissioners for the Port of Corpus Christi Authority (PCCA).

- Northside and Southside Terminals handle break-bulk, Ro/Ro, heavy-lift, and project cargoes.
- Dry Bulk Terminal handles commodities such as iron ore, limestone, coal, and steel. Several standalone cargo docks handle other general cargoes.
- The port also has more than 10 public petroleum terminals that move large quantities of crude oil and petroleum products by ship and barge. Private companies operate over 15 additional oil docks handling a range of petroleum and petrochemical products.

Both the Northside and Southside Terminals have access to short-line rail service, with connections to three Class I rail lines.

Port Updates:
In September 2017, in coordination with USACE, PCCA began work to widen the port's shipping channel to 530 feet and deepen it to 54 feet. Other improvements ongoing in 2017 included construction of two new petroleum docks.

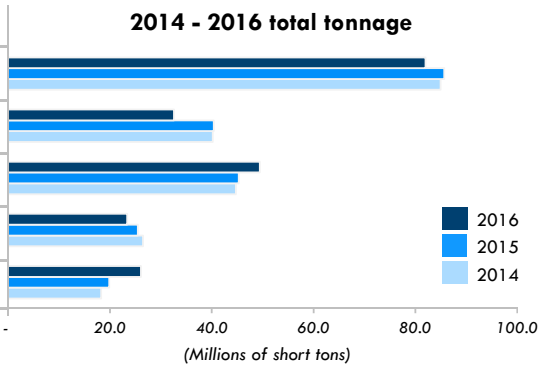
PORT OF CORPUS CHRISTI (CONTINUED)

THROUGHPUT

Cargo

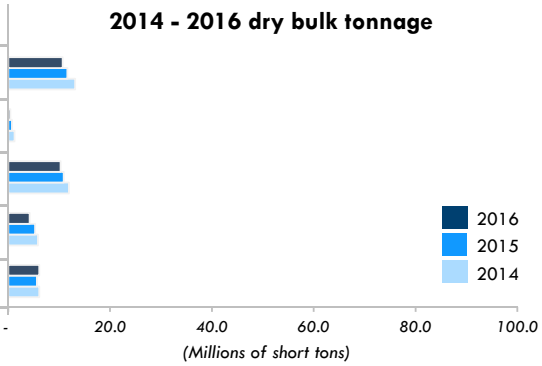
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**82.0**	▼ **-4.3%**
• Domestic	32.6	▼ -19.4%
• Foreign	49.4	▲ 9.1%
▫ Imports	23.4	▼ -8.3%
▫ Exports	26.1	▲ 31.5%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**10.7**	▼ **-8.2%**
• Domestic	0.4	▼ -45.1%
• Foreign	10.3	▼ -5.7%
▫ Imports	4.2	▼ -20.4%
▫ Exports	6.1	▲ 8.2%

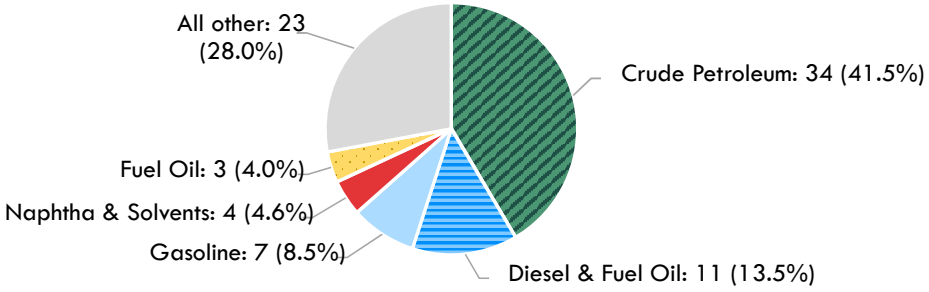


PORT OF CORPUS CHRISTI (CONTINUED)

THROUGHPUT

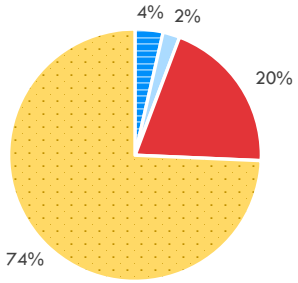
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**6,395**	▼ **-9.3%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	229	▲ 1.3%
Average dry bulk tonnage (short tons) per dry bulk vessel	44,779	
Dry bulk barge	139	▼ -54.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,905	
Other freight vessel	1,275	▼ -3.6%
Other freight barge	4,752	▼ -8.5%

PORT OF CORPUS CHRISTI (CONTINUED)

CAPACITY

Non-container terminals

The Port of Corpus Christi complex includes the following terminals: Dry Bulk Terminal - Docks 1 & 2, Oil Docks 1-12, 15; Northside General Cargo Terminal: Docks 9, 10, 12; Southside General Cargo Terminal: Docks 8, 14, 15; and multiple private bulk terminals.

Channel depth

Authorized channel depth (ft)	**52.0**	Maximum depth of approach channel (ft)	**47.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Corpus Christi website, available at http://portofcc.com/, including terminal websites accessed through the main port website, as of November 2017.

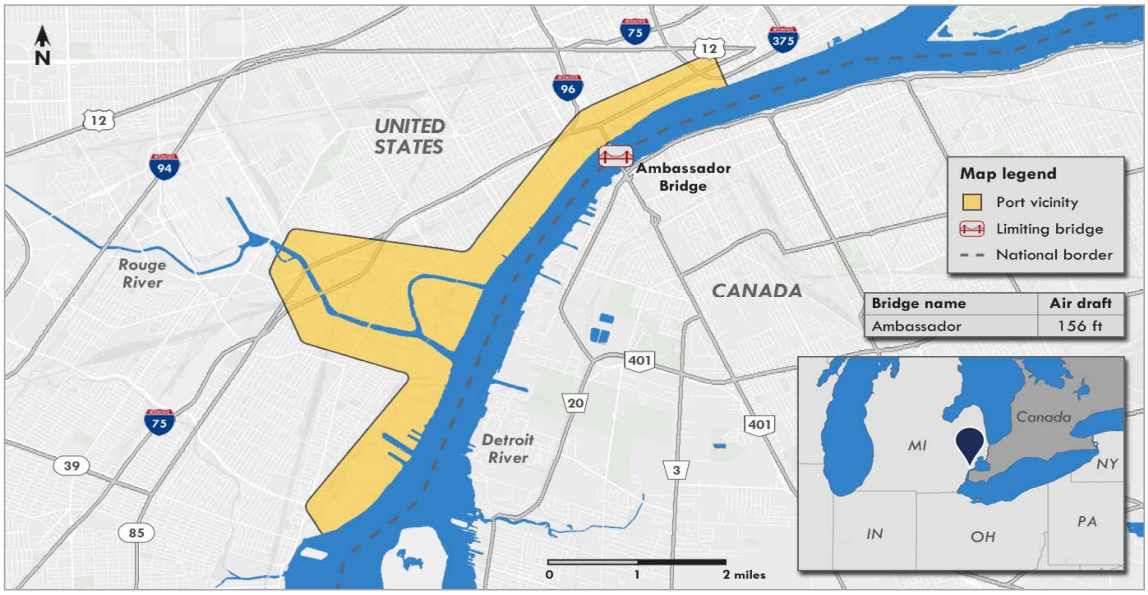
PORT OF DETROIT

Michigan

Great Lakes

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Detroit is located along the west side of the Detroit River between Lake St. Clair and Lake Erie. The river is one of two waterways between the Great Lakes and the St. Lawrence Seaway. The port is governed by the five-member Detroit/Wayne County Port Authority (DWCPA) board.

The port consists of one public and over 25 private terminals that handle general cargo, in addition to liquid and dry bulk. Major commodities moved through the port include iron ore, limestone, coal, cement, steel, aggregates, aluminum, and project cargoes.

One Class I railroad serves several port facilities.

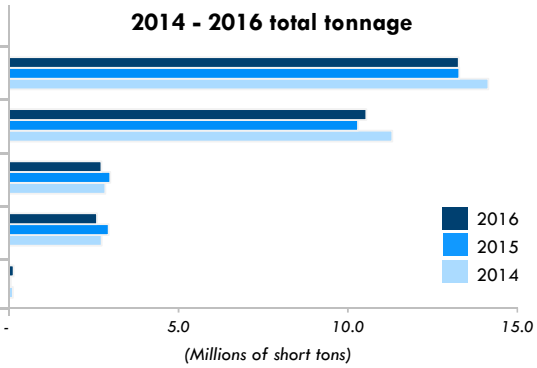
PORT OF DETROIT (CONTINUED)

THROUGHPUT

Cargo

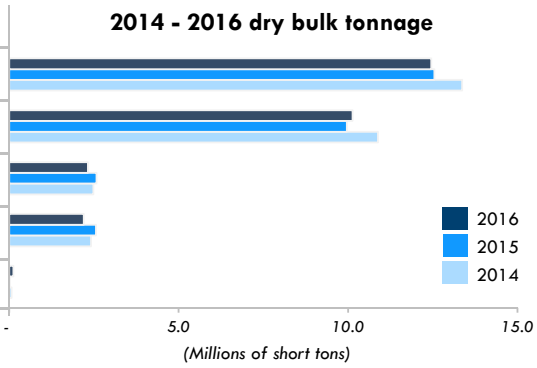
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**13.3**	▼ **-0.1%**
• Domestic	10.5	▲ 2.4%
• Foreign	2.7	▼ -8.8%
▫ Imports	2.6	▼ -11.8%
▫ Exports	0.1	▲ 157.2%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.5**	▼ **-0.7%**
• Domestic	10.1	▲ 1.6%
• Foreign	2.3	▼ -9.9%
▫ Imports	2.2	▼ -14.3%
▫ Exports	0.1	▲ 807.2%

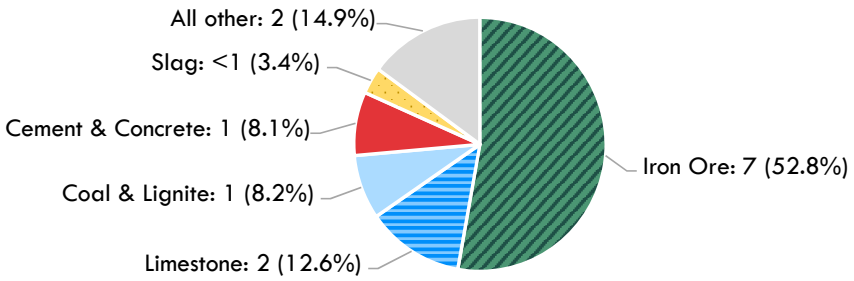


PORT OF DETROIT (CONTINUED)

THROUGHPUT

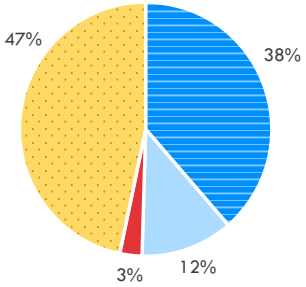
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,165**	▲ **14.2%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	450	▲ 3.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	22,987	
Dry bulk barge	138	▲ 12.2%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	15,279	
Other freight vessel	33	▲ 22.2%
Other freight barge	544	▲ 24.9%

PORT OF DETROIT (CONTINUED)

CAPACITY

Non-container terminals

The Port of Detroit complex includes one public terminal and over 25 private terminals.

Channel depth

Authorized channel depth (ft)	**29.5**	Maximum depth of approach channel (ft)	**29.5**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals— Port of Detroit website, available at http://www.portdetroit.com, including terminal websites accessed through the main port website, as of November 2017.

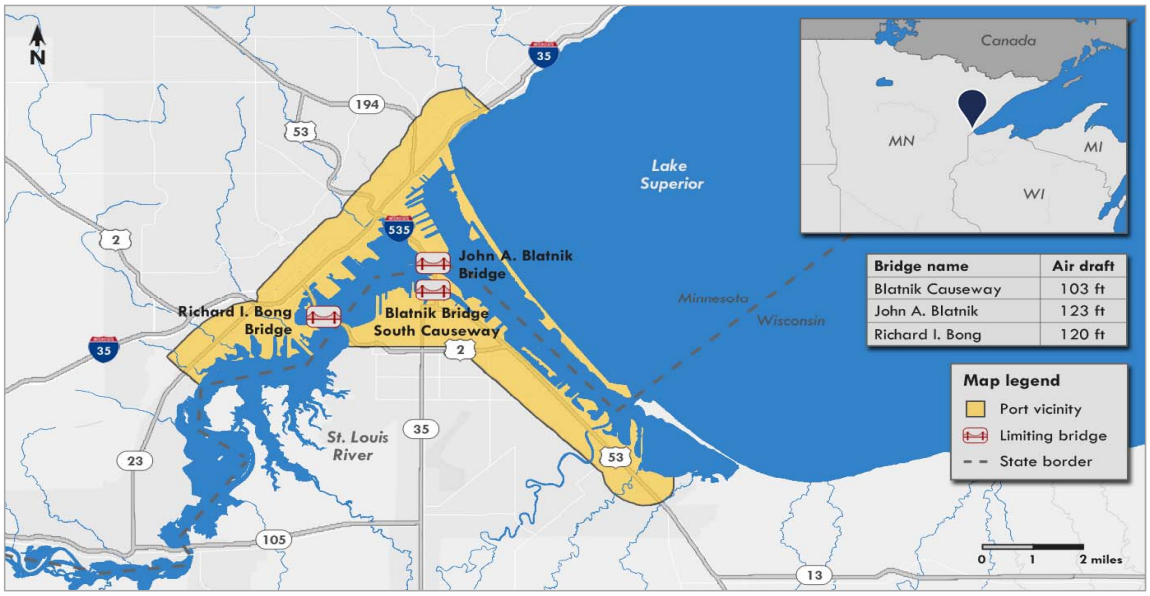
PORT OF DULUTH-SUPERIOR

Minnesota and Wisconsin

Great Lakes

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Duluth-Superior spans 49 miles of shoreline between Duluth, MN, and Superior, WI. The Duluth Seaway Port Authority (DSPA), led by a seven-member board of commissioners, governs the port.

DSPA oversees one terminal, the Clure Marine Terminal. This facility specializes in moving break-bulk and project cargo, such as wood pulp, paper, steel coils, and oil extraction equipment. There are approximately 20 private, non-DSPA facilities that handle dry bulk, liquid bulk, and break-bulk cargoes. Primary commodities moved through the port include iron ore, coal, limestone, cement, grain, and salt.

The port has connections to four Class I rail lines.

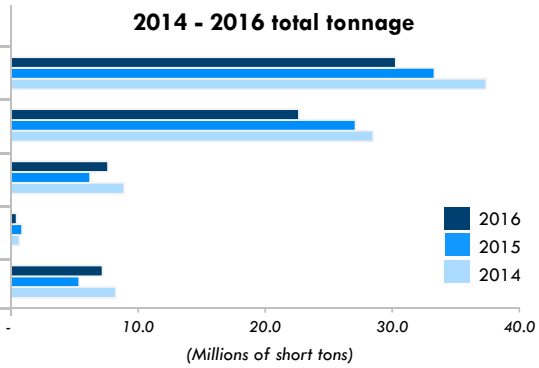
PORT OF DULUTH-SUPERIOR (CONTINUED)

THROUGHPUT

Cargo

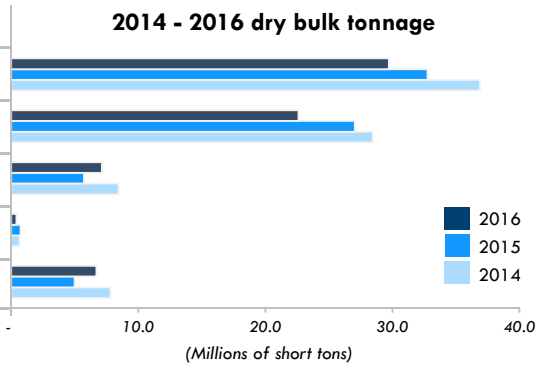
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**30.3**	▼ **-9.1%**
• Domestic	22.6	▼ -16.4%
• Foreign	7.6	▲ 22.6%
▫ Imports	0.4	▼ -50.7%
▫ Exports	7.2	▲ 34.3%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**29.7**	▼ **-9.3%**
• Domestic	22.6	▼ -16.4%
• Foreign	7.1	▲ 24.6%
▫ Imports	0.4	▼ -44.1%
▫ Exports	6.7	▲ 34.8%

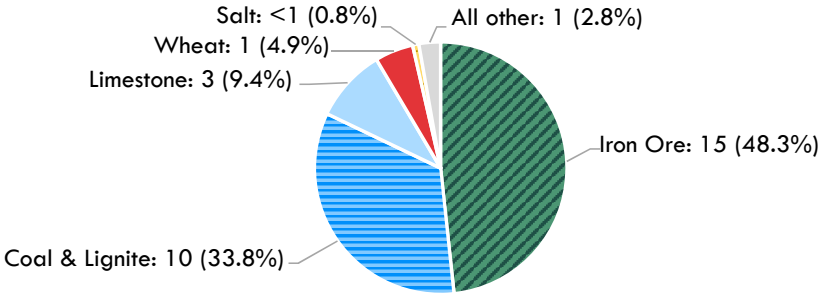


PORT OF DULUTH-SUPERIOR (CONTINUED)

THROUGHPUT

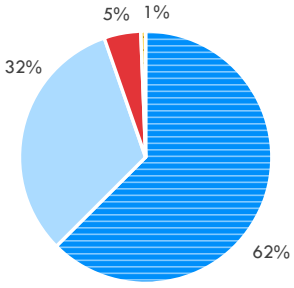
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**974**	▼ **-4.2%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	609	▼ -7.7%
Average dry bulk tonnage (short tons) per dry bulk vessel	46,235	
Dry bulk barge	313	▲ 0.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	5,005	
Other freight vessel	46	▲ 19.5%
Other freight barge	6	▼ -25.0%

PORT OF DULUTH-SUPERIOR (CONTINUED)

CAPACITY

Non-container terminals

The Port of Duluth-Superior complex includes the Clure Marine Terminal and some 20 private terminals.

Channel depth

Authorized channel depth (ft)	**27.0**	Maximum depth of approach channel (ft)	**32.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Duluth-Superior website, available at http://www.duluthport.com, including terminal websites accessed through the main port website, as of November 2017.

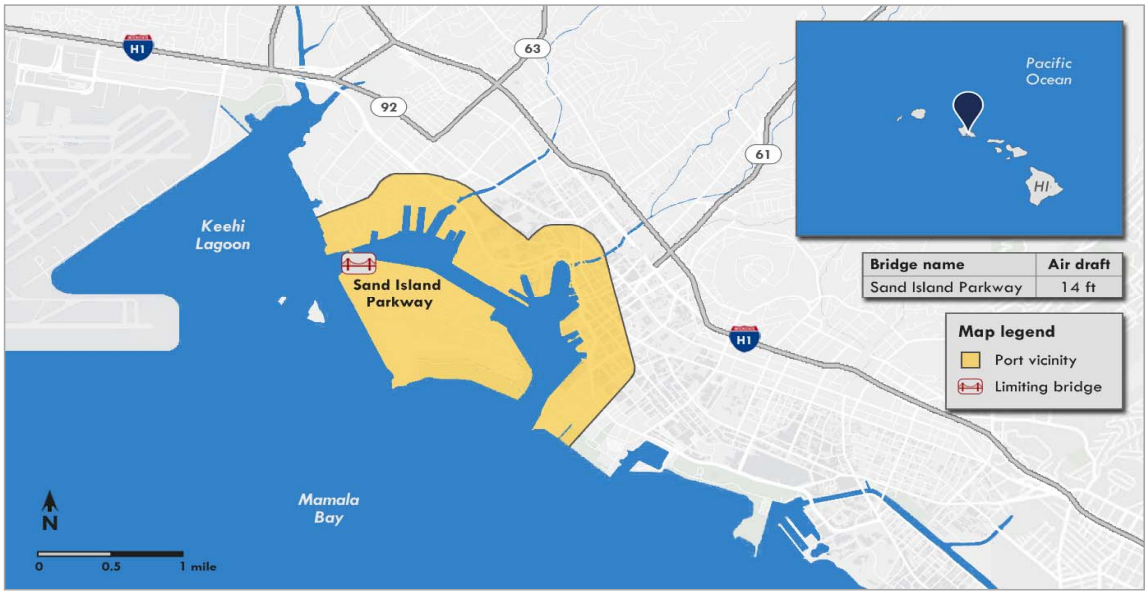
HONOLULU HARBOR

Hawaii

Pacific Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

Honolulu Harbor is located on the southern coast of the island of Oahu. The harbor is one of 10 Port Hawaii commercial harbors located on six of the Hawaiian Islands, and is one of three commercial harbors on Oahu. The Hawaii Department of Transportation (HDOT) Harbors Division oversees Port Hawaii operations.

Honolulu Harbor consists of more than 50 terminals, which handle an array of cargoes, including containers, liquid bulk, Ro/Ro, aggregates, and break-bulk. The harbor handles both conventional vessels and oceangoing barges, which sometimes carry both containers and Ro/Ro or break-bulk cargoes. A number of these piers accommodate passenger and commercial fishing vessels. Major commodities handled by the port include manufactured goods and food products.

Most goods for Hawaiian consumption are imported and the majority of those goods arrive by sea. The State of Hawaii has no freight rail service.

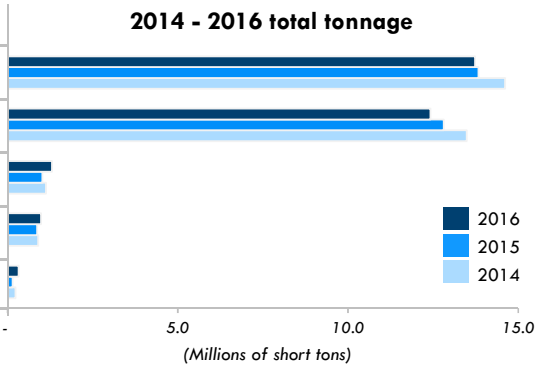
HONOLULU HARBOR (CONTINUED)

THROUGHPUT

Cargo

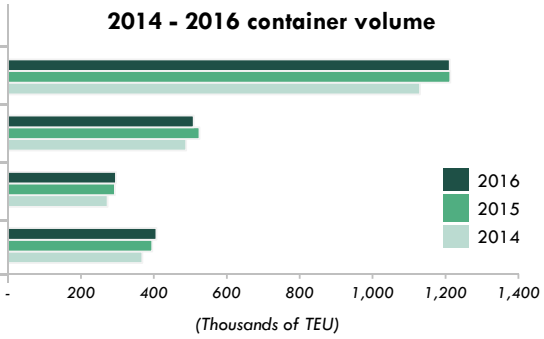
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**13.7**	▼ **-0.8%**
• Domestic	12.4	▼ -3.1%
• Foreign	1.3	▲ 28.3%
▫ Imports	1.0	▲ 12.5%
▫ Exports	0.3	▲ 121.4%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,212**	▼ **-0.1%**
• Inbound loaded TEU	509	▼ -3.0%
• Outbound loaded TEU	296	▲ 1.0%
• Empties (in- & outbound)	407	▲ 2.9%

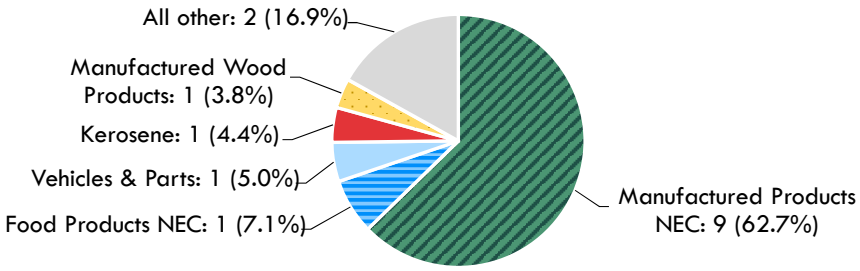


HONOLULU HARBOR (CONTINUED)

THROUGHPUT

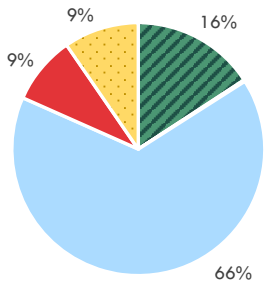
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

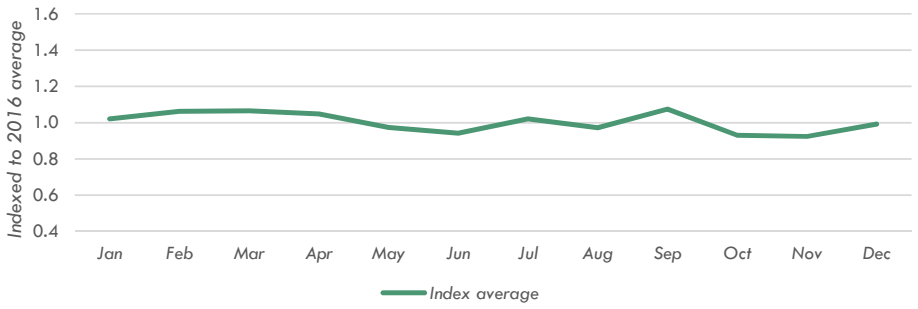
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,494**	▼ **-39.4%**
Container vessel	236	▼ -16.9%
Average TEU per container vessel	5,136	▲ 20.2%
Dry bulk vessel	3	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	982	▼ -47.9%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	131	▲ 3.2%
Other freight barge	144	▼ -15.3%

Vessel dwell time

2016 container vessel dwell time index



HONOLULU HARBOR (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Pier 1 - Fort Armstrong	23	1,175	N/A	N/A	45	-	-	-	N
Inter-Island Cargo Terminal Pier 39	18	1,026	N/A	N/A	40	-	-	-	N
Inter-Island Cargo Terminal - Pier 40	13	1,010	N/A	N/A	40	-	-	-	N
Sand Island Container Terminal	138	3,873	N/A	N/A	40	10	-	-	N

Non-container terminals

In addition to the container terminals listed above, the Port of Honolulu includes the following terminals: Pier 42, Piers 31 - 35, Pier 2 - Fort Armstrong, Piers 19 - 29, and multiple private terminals.

Channel depth

Authorized channel depth (ft)	**45.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: "N/A" designates a metric that does not apply for this port. The Inter-Island Container Terminal primarily handles domestic trade on barges. Vessel call numbers might not add to 100% due to rounding. Honolulu Harbor is served by a mix of container vessels and barges that can carry both containers and non-container Ro/Ro or break-bulk cargo. Available data on vessel calls may not accurately reflect vessel counts or average TEU handled for container cargo.

SOURCES: Port Overview/Terminals—HDOT Harbors Division website, available at http://hidot.hawaii.gov/harbors, including terminal websites accessed through the main website. **Container Volume**—HDOT Harbors Division, as of December 2017.

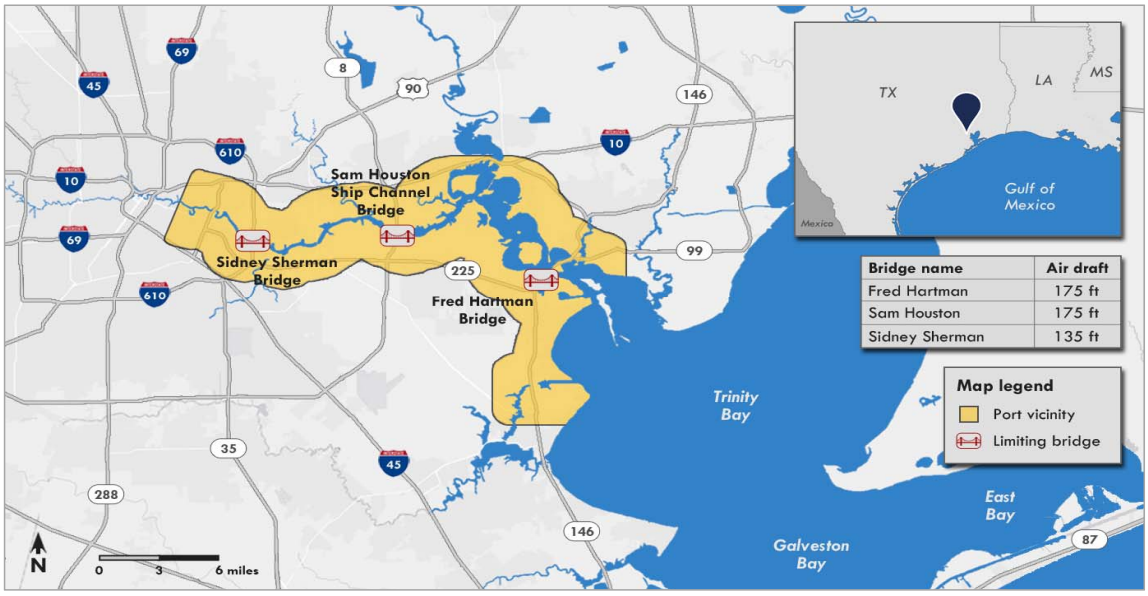
PORT OF HOUSTON

Texas

Gulf Coast & Mississippi River

Port list:

Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Houston (PHA) is a complex of over 150 public and private terminals located along the 52-mile-long Houston Ship Channel, alongside the Gulf of Mexico. The port is governed by a seven-member PHA commission.

The port includes eight public terminals that handle multiple cargo types in addition to the private terminals. The public Barbours Cut and Bayport container terminals together account for most of the Gulf Coast container trade. The other public terminals handle bulk, break-bulk, project, and Ro/Ro cargoes. Many of the port's private terminals handle materials and goods, such as petroleum and petrochemical products, that are related to the region's energy industry. Major commodities handled by the port include crude petroleum, distillate fuel, gasoline, hydrocarbons, and residual fuel oil.

The Port of Houston Port Terminal Railroad Association provides rail switching service to many of the port's public and private terminals, with connections to three Class I railroads.

Port Updates:
PHA recently expanded the Bayport container terminal. Additionally, in coordination with USACE, the port completed a project in December 2016 to increase the depth of the Bayport entrance channel to 45 feet and its width to 400 feet. A project to increase channel depth in front of Barbours Cut was completed in 2015. A project is now underway at the Barbours Cut terminal to upgrade 1,000 linear feet of wharf to allow for the installation of Post-Panamax ship-to-shore cranes.

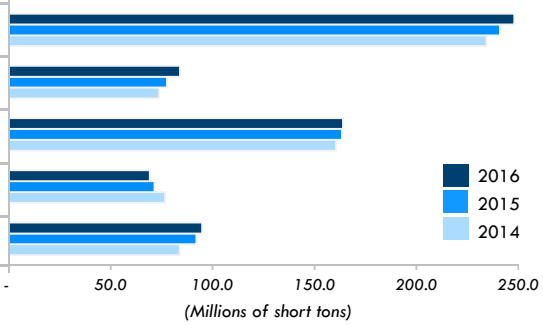
PORT OF HOUSTON (CONTINUED)

THROUGHPUT

Cargo

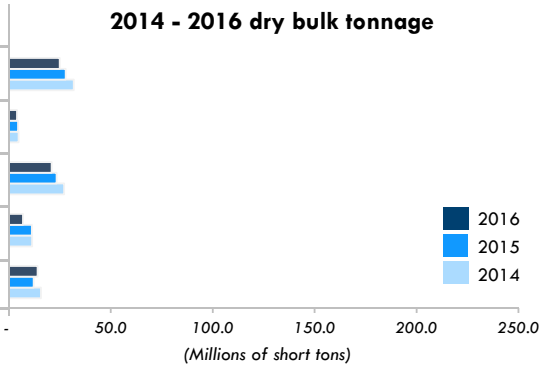
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**248.0**	▲ **2.9%**
• Domestic	84.0	▲ 8.4%
• Foreign	164.0	▲ 0.4%
▫ Imports	69.1	▼ -3.2%
▫ Exports	94.9	▲ 3.1%



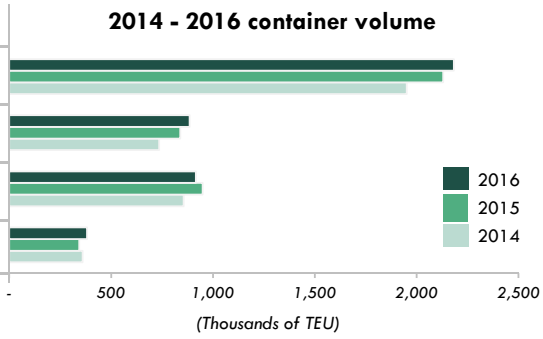
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**24.9**	▼ **-10.6%**
• Domestic	4.0	▼ -10.0%
• Foreign	20.9	▼ -10.7%
▫ Imports	6.9	▼ -38.8%
▫ Exports	14.0	▲ 15.3%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**2,183**	▲ **2.4%**
• Inbound loaded TEU	885	▲ 5.4%
• Outbound loaded TEU	916	▼ -3.4%
• Empties (in- & outbound)	382	▲ 11.5%

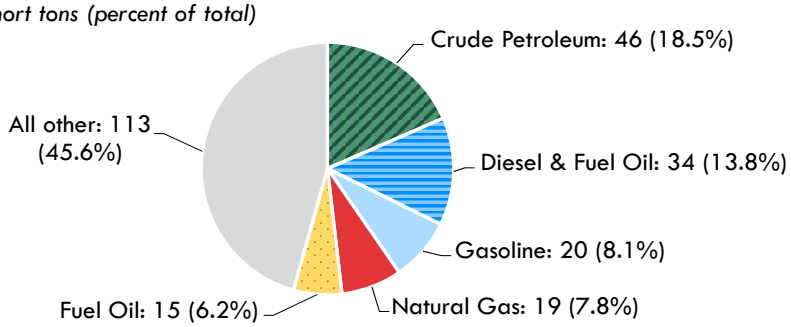


PORT OF HOUSTON (CONTINUED)

THROUGHPUT

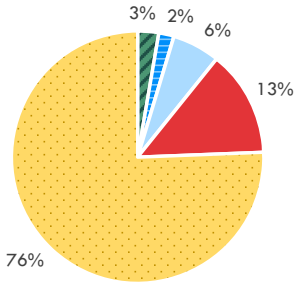
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

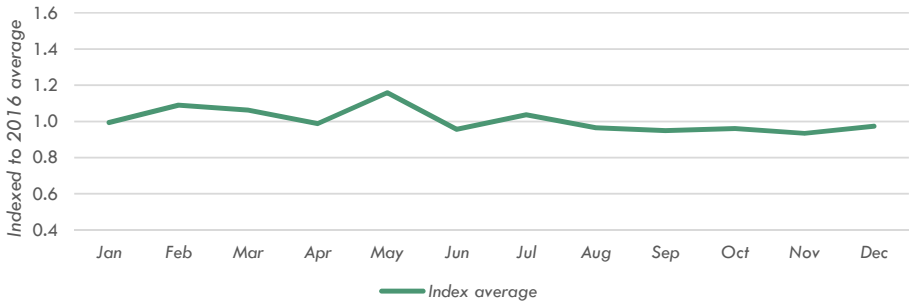
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**33,068**	▲ **2.6%**
Container vessel	890	▼ -4.7%
Average TEU per container vessel	2,452	▲ 7.5%
Dry bulk vessel	651	▼ -9.6%
Average dry bulk tonnage (short tons) per dry bulk vessel	32,131	
Dry bulk barge	2,019	▼ -11.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,986	
Other freight vessel	4,503	▲ 0.3%
Other freight barge	25,006	▲ 5.1%

Vessel dwell time

2016 container vessel dwell time index



PORT OF HOUSTON (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Barbours Cut Container Terminal	435	6,000	N/A	N/A	45	5	5	4	N
Bayport Container Terminal	376	3,500	N/A	N/A	45	-	6	3	N

Non-container terminals

In addition to the container terminals listed above, the Port of Houston complex includes the following terminals: Jacintoport Terminal, Bayport Auto Terminal, Bulk Materials Handling Plant, CARE Terminal, Public Elevator No. 2, Turning Basin Terminal - Northside (wharves 8-32), Southside Terminal/Southside Turning Basin (wharves 1-4, 41-48), Sims Bayou Terminal, and over 100 private terminals.

Channel depth

Authorized channel depth (ft) **45.0** Maximum depth of approach channel (ft) **45.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Houston website, available at http://porthouston.com, including terminal websites accessed through the main port website, as of November 2017.

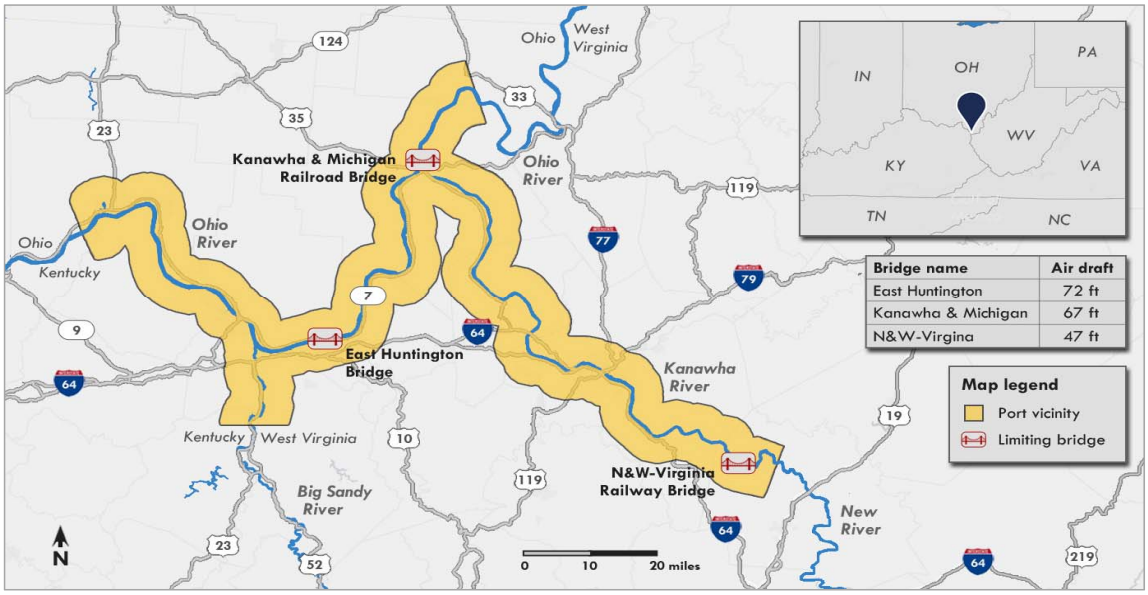
PORT OF HUNTINGTON-TRISTATE

Kentucky, Ohio, and West Virginia

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Ohio River forms the border between Ohio to the north and Kentucky and West Virginia to the south.
The Big Sandy River forms the border between Kentucky and West Virginia south of the Ohio River.

Port overview

The Port of Huntington-Tristate is a river port district along the State borders of Ohio, West Virginia, and Kentucky. It includes facilities located along 100 miles of the Ohio River, nine miles of the Big Sandy River, and 90 miles of the Kanawha River. A commercial association called the Huntington District Waterways Association (HDWA) oversees the port. HDWA convenes the towing companies, harbor services, shipyards, river terminals, and other entities that make up the district to promote and protect commercial navigation on the district's waterways.

Commodities traveling through the Port of Huntington-Tristate include coal, gasoline, petroleum, limestone, chemicals, steel, and other bulk products.

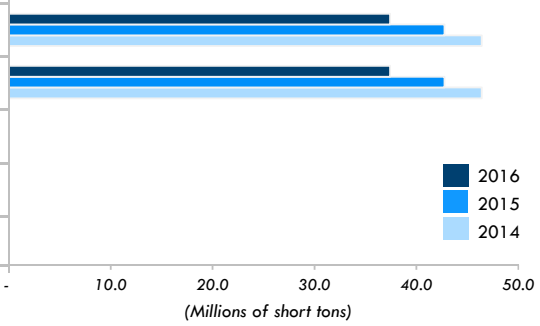
PORT OF HUNTINGTON-TRISTATE (CONTINUED)

THROUGHPUT

Cargo

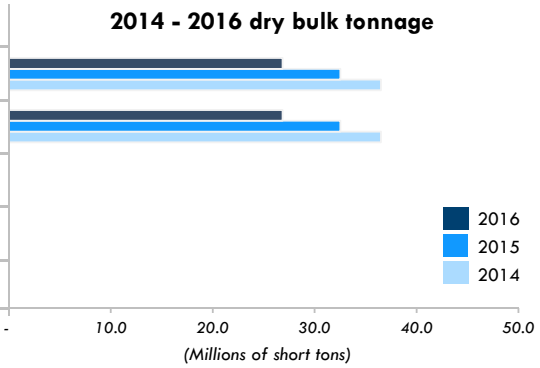
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**37.4**	▼ **-12.5%**
• Domestic	37.4	▼ -12.5%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**26.8**	▼ **-17.5%**
• Domestic	26.8	▼ -17.5%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A

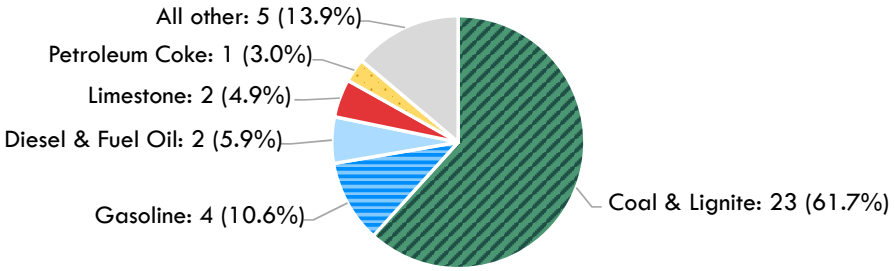


PORT OF HUNTINGTON-TRISTATE (CONTINUED)

THROUGHPUT

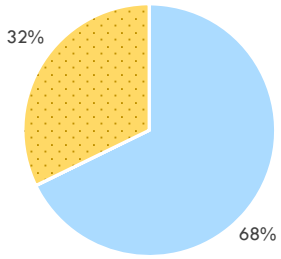
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**20,869**	▼ **-7.7%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	14,144	▼ -12.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,898	
Other freight vessel	0	N/A
Other freight barge	6,726	▲ 4.0%

PORT OF HUNTINGTON-TRISTATE (CONTINUED)

CAPACITY

Non-container terminals

The Huntington-Tristate port district includes numerous private terminals.

Channel depth

Authorized channel depth (ft)	**9.0**	Maximum depth of approach channel (ft)	**9.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Huntington District Waterways Association website, available at http://www.huntingtonwaterways.com, including terminal websites accessed through the main port website, as of November 2017.

INDIANA HARBOR

Indiana

Great Lakes

Port list:

Dry bulk

Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

Indiana Harbor is located in the City of East Chicago, Indiana, about 20 miles southeast of downtown Chicago (Illinois) along the shores of Lake Michigan. It is a steel mill and complex capable of handling dry bulk, liquid bulk, and break-bulk cargoes.

The Indiana Harbor steel facilities are privately owned and operated.

The harbor complex includes multiple steel handling and processing facilities (e.g., blast furnaces), as well as two docks capable of handling barge traffic. The Indiana Harbor facilities produce a wide variety of steel products that serve the automotive, construction, appliance, and machinery industries.

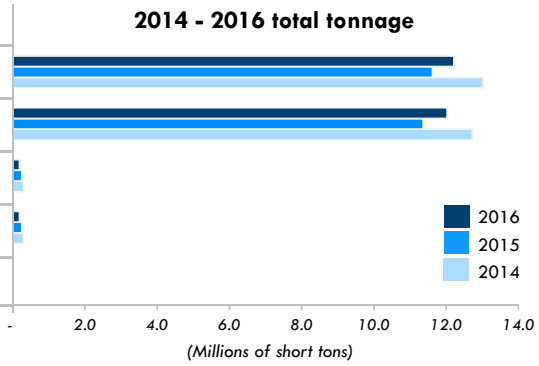
INDIANA HARBOR (CONTINUED)

THROUGHPUT

Cargo

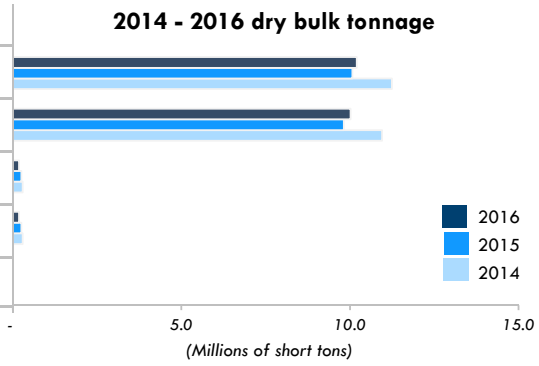
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.2**	▲ **5.2%**
• Domestic	12.0	▲ 5.9%
• Foreign	0.2	▼ -26.3%
▫ Imports	0.2	▼ -26.3%
▫ Exports	0.0	N/A



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**10.2**	▲ **1.3%**
• Domestic	10.0	▲ 2.1%
• Foreign	0.2	▼ -26.3%
▫ Imports	0.2	▼ -26.3%
▫ Exports	0.0	N/A

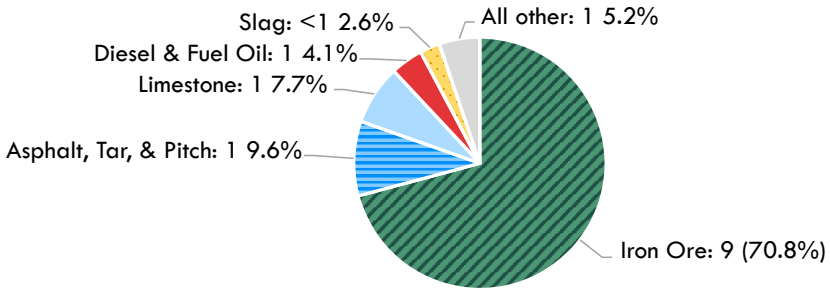


INDIANA HARBOR (CONTINUED)

THROUGHPUT

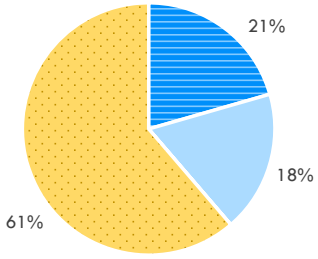
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**995**	▲ **16.4%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	205	▼ -10.7%
Average dry bulk tonnage (short tons) per dry bulk vessel	44,803	
Dry bulk barge	181	▼ -10.6%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	5,775	
Other freight vessel	0	N/A
Other freight barge	610	▲ 44.3%

INDIANA HARBOR (CONTINUED)

CAPACITY

Non-container terminals

All Indiana Harbor steel facilities are privately owned and operated.

Channel depth

Authorized channel depth (ft)	**29.0**	Maximum depth of approach channel (ft)	**29.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—ArcelorMittal website, available at http://usa.arcelormittal.com, including Indiana Harbor website accessed through the main company website, as of November 2017.

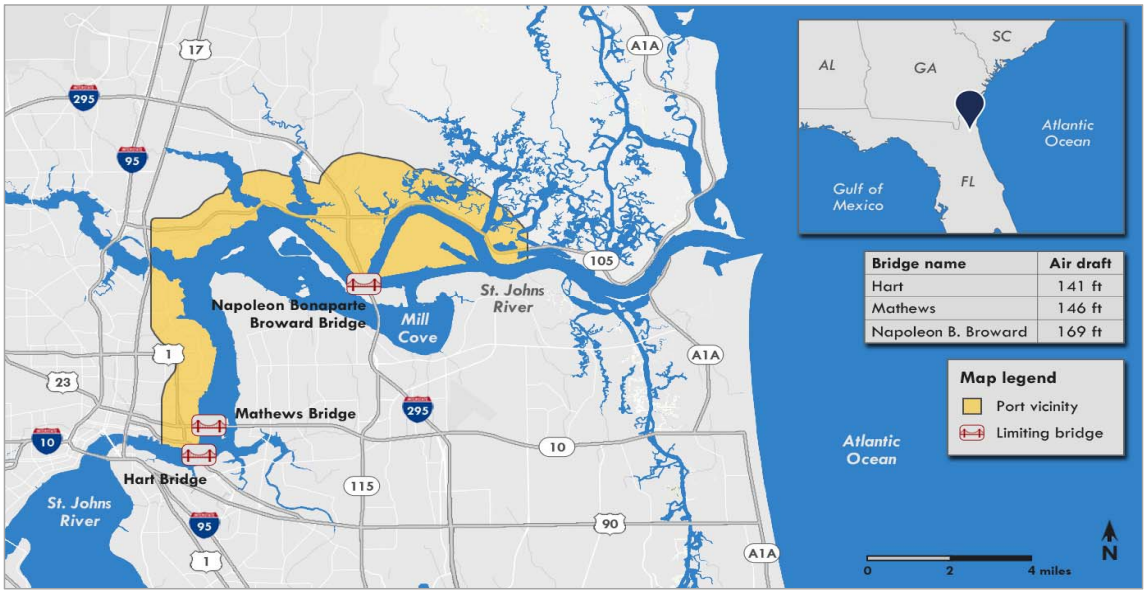
PORT OF JACKSONVILLE

Florida

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Jacksonville is located along the St. Johns River, about 10 nautical miles inland from the Atlantic Ocean. A seven-member Jacksonville Port Authority Board of Directors governs the port.

The Blount Island Marine Terminal handles containerized, break-bulk, and general cargoes, as well as Ro/Ro freight (mostly automobiles). The Dames Point Marine Terminal handles container cargo and bulk aggregates, such as limestone and gravel. The Talleyrand Marine Terminal handles containers, break-bulk forest and steel products, and liquid bulk such as molasses and vegetable oils. Other major commodities handled at the port include gasoline, coal and lignite, manufactured products, and fuel oil. In addition to these terminals, there are also private bulk terminals.

The terminals have access to two Class I rail lines, including on-dock rail at one terminal, as well as Class II service.

Port Updates:
In 2016 the port opened the Intermodal Container Transfer Facility, which brought near-dock rail access to the Blount Island Marine Terminal and Dames Point. This project was completed using $10 million in Federal Transportation Investment Generating Economic Recovery (TIGER) grant funding. In coordination with USACE, the port plans to begin a channel dredging project in 2018, which would deepen the harbor to 47 feet.

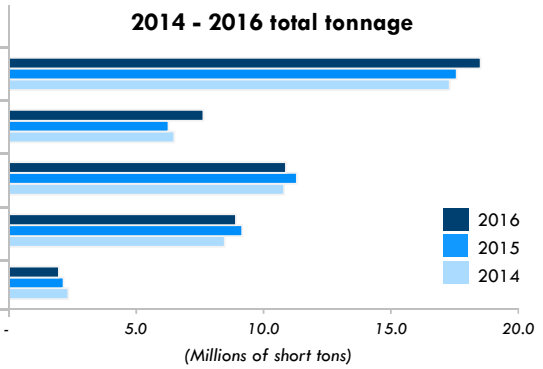
PORT OF JACKSONVILLE (CONTINUED)

THROUGHPUT

Cargo

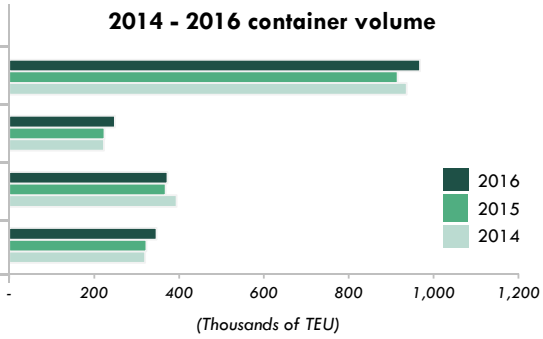
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**18.5**	▲ **5.4%**
• Domestic	7.6	▲ 21.8%
• Foreign	10.9	▼ -3.8%
▫ Imports	8.9	▼ -2.7%
▫ Exports	2.0	▼ -8.5%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**968**	▲ **5.8%**
• Inbound loaded TEU	249	▲ 11.0%
• Outbound loaded TEU	372	▲ 1.2%
• Empties (in- & outbound)	347	▲ 7.4%

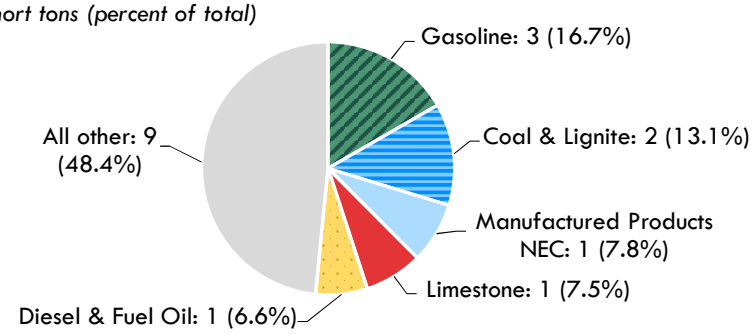


PORT OF JACKSONVILLE (CONTINUED)

THROUGHPUT

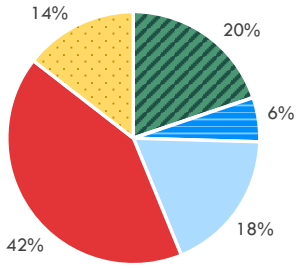
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

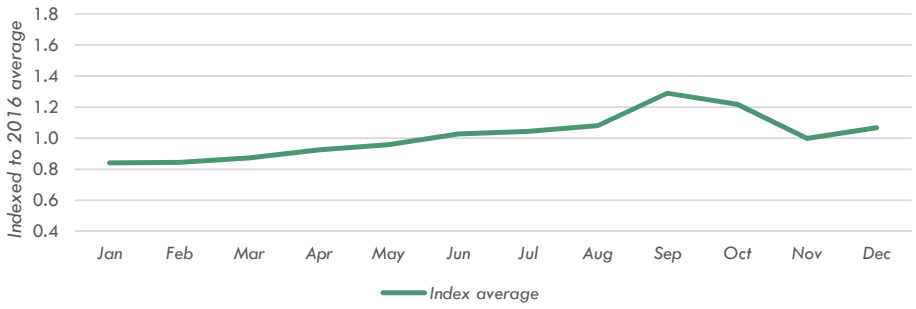
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,220**	▼ **-10.6%**
Container vessel	440	▼ -3.5%
Average TEU per container vessel	2,203	▲ 9.6%
Dry bulk vessel	126	▲ 7.7%
Average dry bulk tonnage (short tons) per dry bulk vessel	41,616	
Dry bulk barge	407	▼ -17.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	7,898	
Other freight vessel	926	▼ -2.3%
Other freight barge	322	▼ -31.4%

Vessel dwell time

2016 container vessel dwell time index



PORT OF JACKSONVILLE (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			
						Panamax	PPX	Super PPX	On-dock rail
Blount Island Marine Terminal	754	7,094	N/A	N/A	40	4	-	-	N
Dames Point Marine Terminal	158	5,002	N/A	N/A	40	4	2	-	N
Talleyrand Marine Terminal	173	4,780	169	Napoleon B. Broward	34	2	5	-	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Jacksonville includes multiple private bulk terminals.

Channel depth

Authorized channel depth (ft)	**47.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. The high September 2016 dwell time average is due to an extended dwell time for a single vessel call that month. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Jacksonville Port Authority website, available at https://www.jaxport.com, including terminal websites accessed through the main port website, as of November 2017.

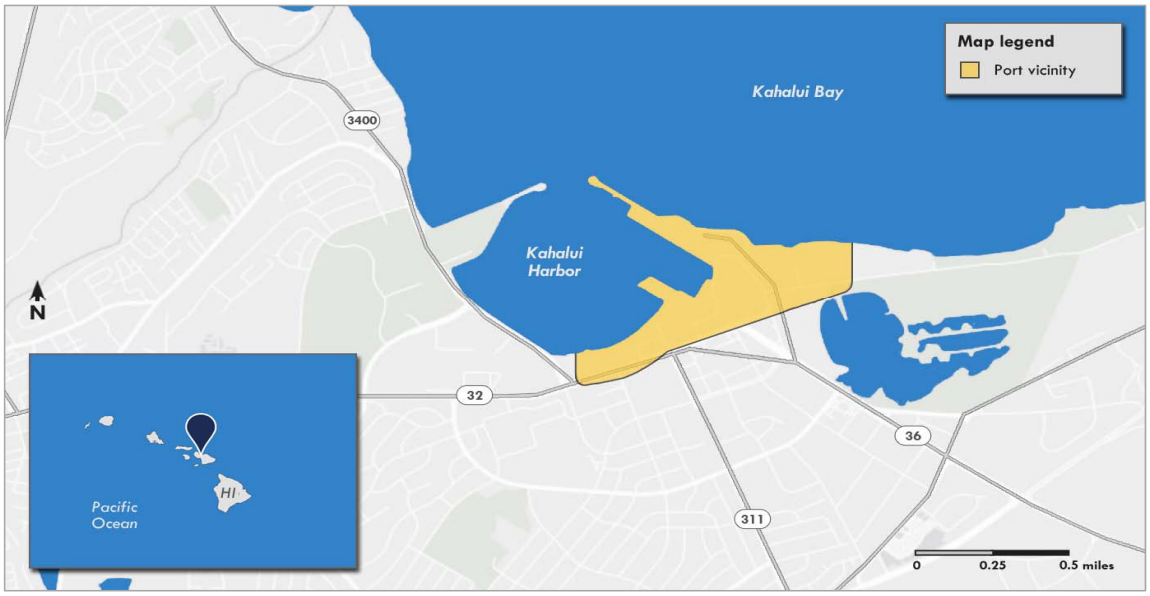
KAHULUI HARBOR

Hawaii

Pacific Coast

Port list:

Container



Port vicinity map illustrates area facilities.

Port overview

Kahului Harbor is located on the northern shore of the island of Maui, Hawaii. The harbor is one of 10 Port Hawaii commercial harbors located on six of the Hawaiian Islands. The HDOT Harbors Division oversees Port Hawaii operations.

Kahului Harbor does not have a separate container terminal as container cargo arrives via multi-purpose barges. Common commodities handled by Kahului Harbor include manufactured goods, vehicles, diesel and fuel oils, and sugar. Inbound containers make up much of the harbor's traffic.

Most goods for Hawaiian consumption are imported and the majority of those goods arrive by sea. The State of Hawaii has no freight rail service.

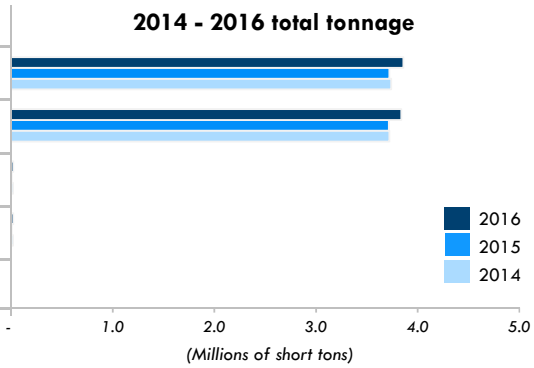
KAHULUI HARBOR (CONTINUED)

THROUGHPUT

Cargo

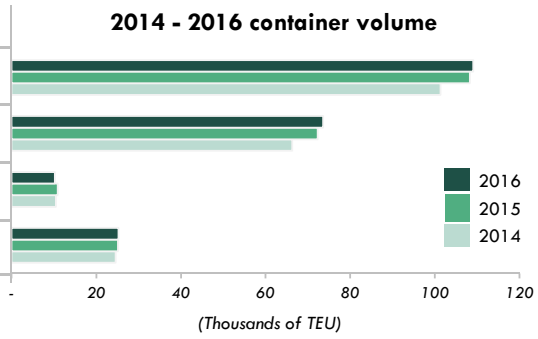
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**3.9**	▲ **3.7%**
• Domestic	3.8	▲ 3.3%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**109**	▲ **0.7%**
• Inbound loaded TEU	74	▲ 1.8%
• Outbound loaded TEU	10	▼ -6.2%
• Empties (in- & outbound)	25	▲ 0.4%

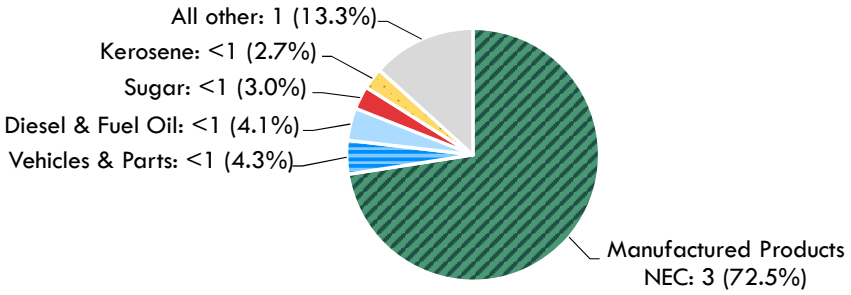


KAHULUI HARBOR (CONTINUED)

THROUGHPUT

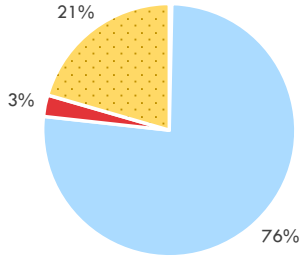
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**458**	▼ **-32.2%**
Container vessel	1	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	1	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	350	▼ -38.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	13	N/A
Other freight barge	94	▼ -6.5%

KAHULUI HARBOR (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Kahului Harbor	U	2,744	N/A	N/A	35	-	-	-	N

Non-container terminals

Kahului Harbor has a single terminal that handles containers and non-container cargo by barge.

Channel depth

Authorized channel depth (ft)	**35.0**	Maximum depth of approach channel (ft)	**U**

NOTES: "N/A" designates a metric that does not apply for this port. "U" designates data that was unavailable. Vessel call numbers might not add to 100% due to rounding. Container cargo is handled by barge at its single terminal; Kahului Harbor does not have a separate container terminal. Container vessel call data does not include barges, and therefore underreports the vessel calls at Kahului Harbor.

SOURCES: Port Overview/Terminals—HDOT Harbors Division website, available at http://hidot.hawaii.gov/harbors, including terminal websites accessed through the main website. **Container Volume**—HDOT Harbors Division, as of December 2017.

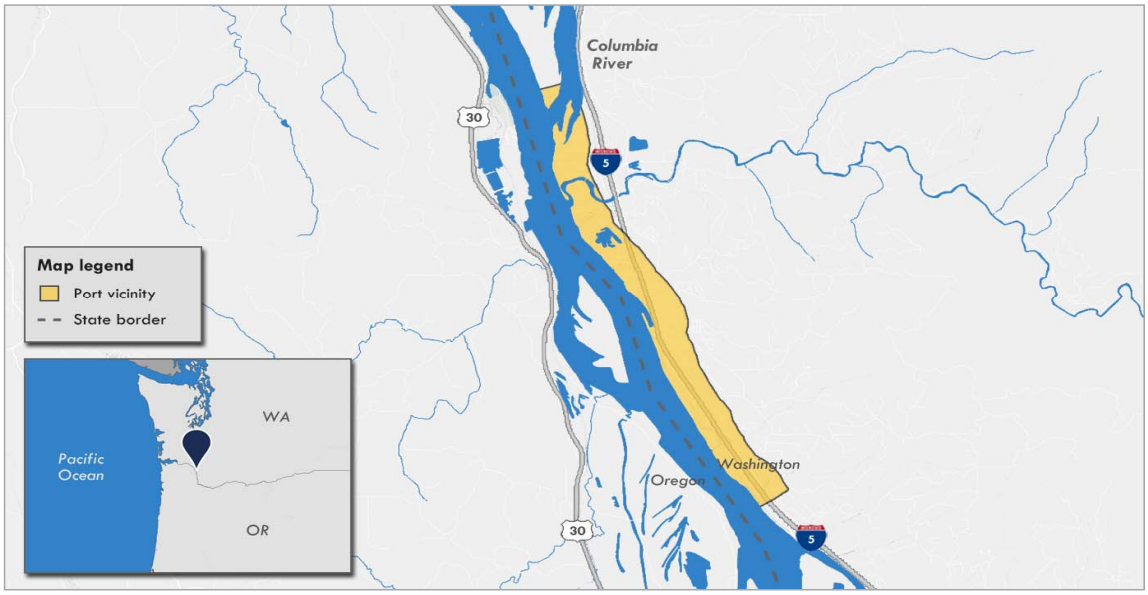
PORT OF KALAMA

Washington

Pacific Coast

Port list:

Dry bulk



Port vicinity map illustrates area facilities.
The Lewis & Clark Bridge (187 ft), not shown, may limit vessels serviced at the Port of Kalama.

Port overview

The Port of Kalama complex is approximately five miles long and is located along the Columbia River in southwest Washington, about 30 miles from Portland, Oregon. The Port of Kalama is governed by a three-member port commission.

The port consists of five marine terminal facilities. The port's public terminals include TEMCO, RSG Forest Products, and the North Port Marine Terminal, which handles general cargo such as steel products for a port-owned steel mill. Other, private terminals handle liquid bulk (primarily toluene, an industry solvent), dry bulk (e.g., soybeans, wheat, corn, sorghum grains, and lumber), and break-bulk. Barges handle some of these materials.

Two Class I railroads serve the port with railyards adjacent.

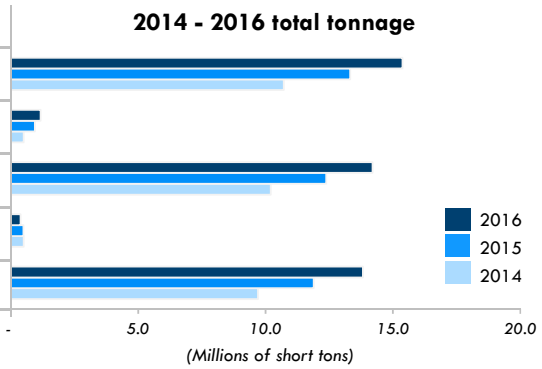
PORT OF KALAMA (CONTINUED)

THROUGHPUT

Cargo

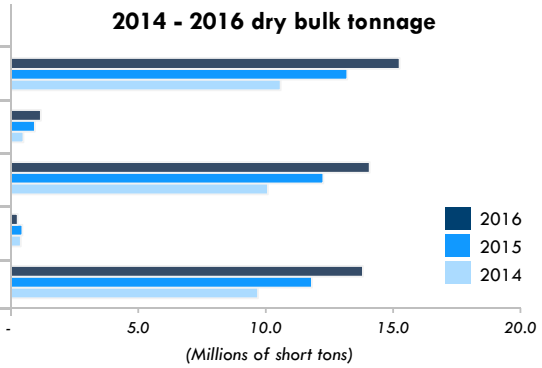
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**15.4**	▲ 15.4%
• Domestic	1.2	▲ 24.6%
• Foreign	14.2	▲ 14.7%
▫ Imports	0.4	▼ -23.8%
▫ Exports	13.8	▲ 16.3%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**15.3**	▲ 15.6%
• Domestic	1.2	▲ 24.7%
• Foreign	14.1	▲ 14.9%
▫ Imports	0.3	▼ -40.8%
▫ Exports	13.8	▲ 17.0%

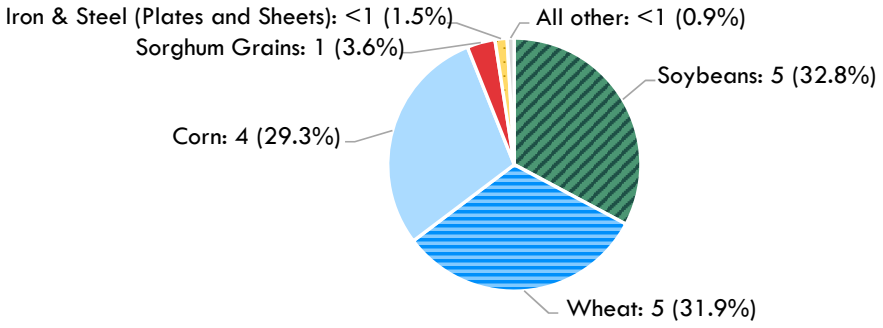


PORT OF KALAMA (CONTINUED)

THROUGHPUT

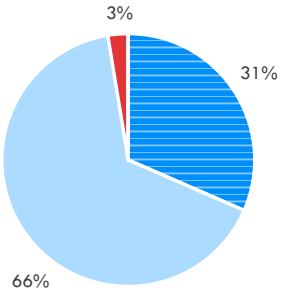
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**484**	▲ **27.1%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	153	▲ 10.1%
Average dry bulk tonnage (short tons) per dry bulk vessel	92,347	
Dry bulk barge	319	▲ 37.3%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	3,682	
Other freight vessel	13	▲ 31.6%
Other freight barge	0	N/A

PORT OF KALAMA (CONTINUED)

CAPACITY

Non-container terminals

The Port of Kalama complex includes the following terminals: North Port Marine Terminal, TEMCO LLC, and RSG Forest Products terminals.

Channel depth

Authorized channel depth (ft)	**55.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Kalama website, available at http://portofkalama.com/, including terminal websites accessed through the main port website, as of November 2017.

PORT OF KETCHIKAN

Alaska

Pacific Coast

Port list:

Container

Port vicinity map illustrates area facilities.

Port overview

The Port of Ketchikan is located along southeastern Alaska's Inside Passage, just north of the Canadian border. The port is governed by a nine-member City of Ketchikan Port and Harbors Advisory Board.

Containerized and non-containerized cargoes are handled at two multi-purpose private terminals.

Common commodities moving through the port include diesel and fuel oils, petroleum and petroleum products, manufactured goods, and general foodstuffs and groceries.

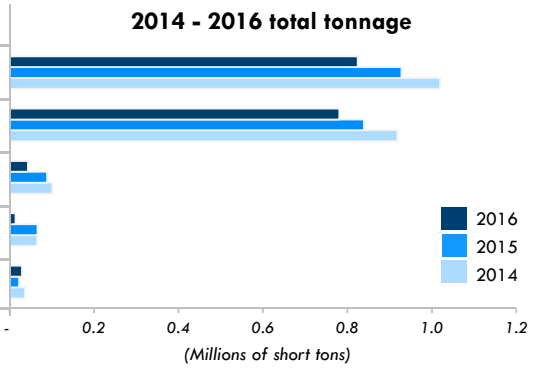
PORT OF KETCHIKAN (CONTINUED)

THROUGHPUT

Cargo

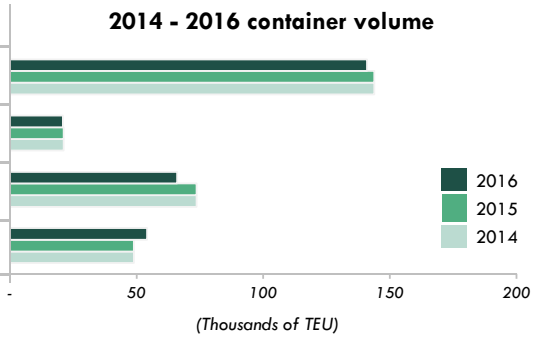
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**0.8**	▼ **-11.2%**
• Domestic	0.8	▼ -6.9%
• Foreign	<0.1	▼ -51.0%
▫ Imports	<0.1	▼ -78.4%
▫ Exports	<0.1	▲ 28.0%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**141**	▼ **-2.0%**
• Inbound loaded TEU	21	▼ -1.8%
• Outbound loaded TEU	66	▼ -10.5%
• Empties (in- & outbound)	54	▲ 10.6%

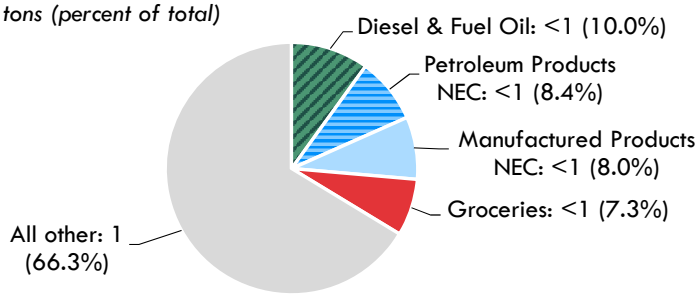


PORT OF KETCHIKAN (CONTINUED)

THROUGHPUT

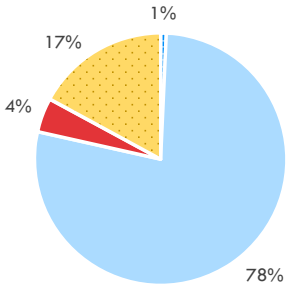
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**351**	▼ **-4.7%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	3	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	273	▼ -2.7%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	16	N/A
Other freight barge	60	▼ -27.7%

PORT OF KETCHIKAN (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Port of Ketchikan	U	U	N/A	N/A	U	-	-	-	N

Non-container terminals

The Port of Ketchikan includes two multi-purpose private terminals that handle all containerized and non-containerized cargoes.

Channel depth

Authorized channel depth (ft)	**U**	Maximum depth of approach channel (ft)	**U**

NOTES: "N/A" designates a metric that does not apply for this port. "U" designates data that was unavailable. Vessel call numbers might not add to 100% due to rounding. Container cargo is handled at private barge terminals. Container vessel call data does not include barges, and therefore underreports the vessel calls at the Port of Ketchikan.

SOURCES: Port Overview/Terminals—Port of Ketchikan website, available at https://www.ktn-ak.us/port, including terminal websites accessed through the main port website, as of November 2017. **Container Volume**—USACE, WCSC, 2016 data, special tabulation, as of November 2017.

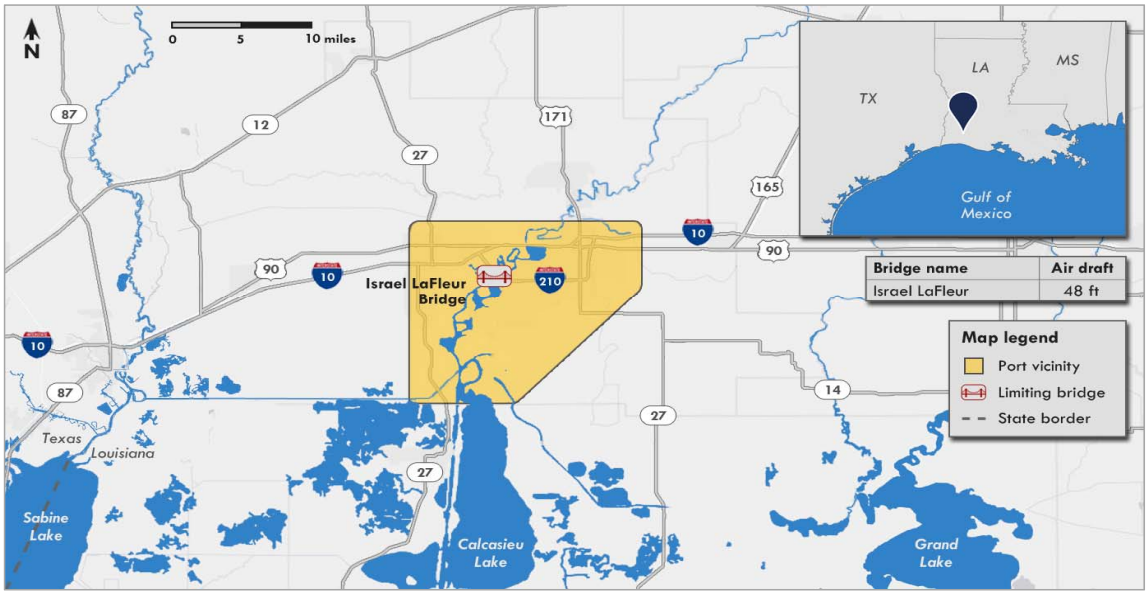
PORT OF LAKE CHARLES

Louisiana

Gulf Coast & Mississippi River

Port list:

Tonnage



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
North of Sabine Lake, the Sabine River forms the border between Texas and Louisiana.

Port overview

The Port of Lake Charles is located in Lake Charles, Louisiana, along the Calcasieu Ship Channel, which connects the Gulf of Mexico to Lake Charles (a distance of 36 miles). The port is governed by a five-member Lake Charles Harbor and Terminal District Board of Commissioners.

The port has four terminals (below) and a privately operated grain terminal within the port complex:

- Bulk Terminal Number 1 handles dry bulk commodities including petroleum coke and grain.
- City Docks primarily handles break-bulk cargo, including bagged flour and rice, lumber and logs.
- Automated Terminal, located at City Docks, handles a variety of cargo and has warehousing facilities.
- Inbound Aggregate Terminal handles inbound limestone and other aggregates.

The port also owns and operates two industrial parks and owns leasable sites along the Calcasieu Ship Channel. In addition to these terminals, multiple private terminals within the port district handle liquid bulk especially petroleum products like fuel oil and gasoline.

City Docks has access to Class I rail service via a short-line railroad.

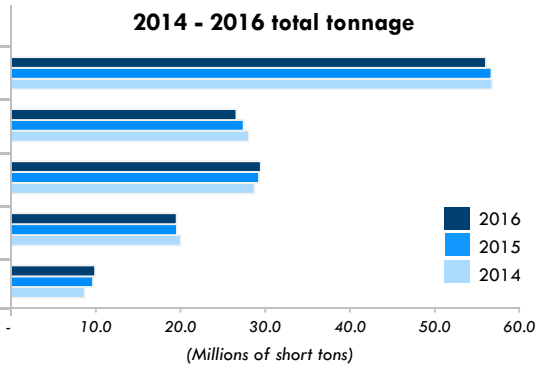
PORT OF LAKE CHARLES (CONTINUED)

THROUGHPUT

Cargo

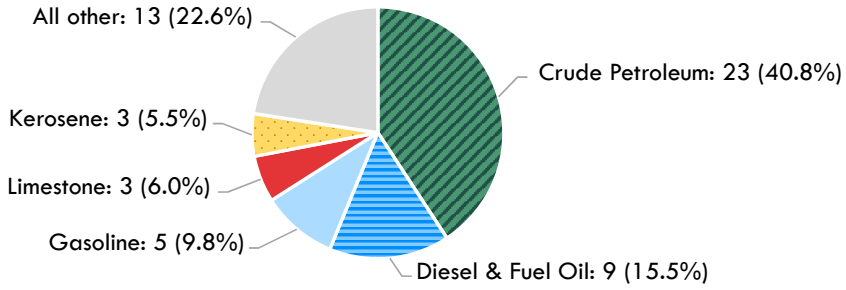
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**56.0**	▼ -1.1%
• Domestic	26.6	▼ -3.1%
• Foreign	29.5	▲ 0.7%
▫ Imports	19.5	▼ -0.2%
▫ Exports	9.9	▲ 2.5%



Commodities

Tonnage *Millions of short tons (percent of total)*

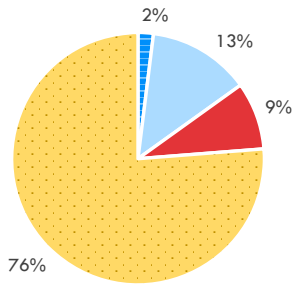


PORT OF LAKE CHARLES (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**7,705**	▼ **-0.8%**
Container vessel	1	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	152	▲ 1.7%
Average dry bulk tonnage (short tons) per dry bulk vessel	35,258	
Dry bulk barge	1,010	▲ 17.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,882	
Other freight vessel	670	▼ -4.8%
Other freight barge	5,873	▼ -3.0%

CAPACITY

Non-container terminals

The Port of Lake Charles complex includes the following terminals: Bulk Terminal Number 1, City Docks, Automated Terminal, Inbound Aggregate, and multiple private terminals.

Channel depth

Authorized channel depth (ft)	**42.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Vessel call numbers might not add to 100% due to rounding. "N/A" designates a metric that does not apply for this port.

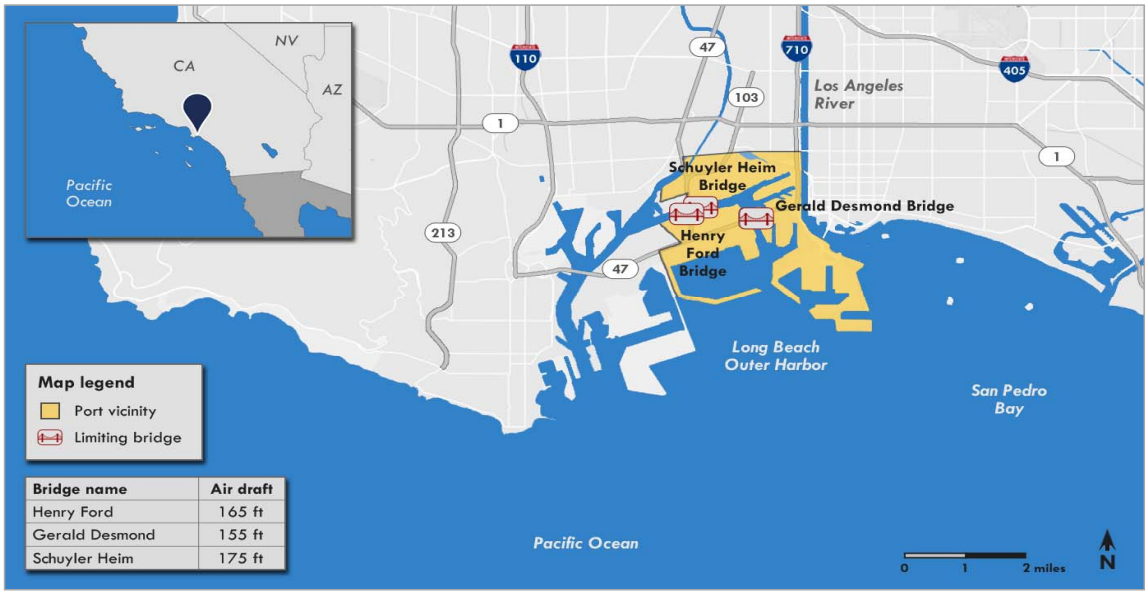
SOURCES: Port Overview/Terminals—Port of Lake Charles website, available at http://www.portlc.com/, including terminal websites accessed through the main port website, as of November 2017.

PORT OF LONG BEACH

California

Pacific Coast

Port list: Container | Tonnage



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Long Beach is located on San Pedro Bay, within the City of Long Beach. It is adjacent to the Port of Los Angeles. The port is governed by a five-member Long Beach Board of Harbor Commissioners.

The port complex includes over 20 terminals that handle all cargo types including containerized, break-bulk, dry bulk, liquid bulk, and Ro/Ro. Commodities handled by the port include crude oil and other liquid bulk petroleum products as well as petroleum coke, manufactured products, electrical machinery, and pulp and waste paper.

Six of the Port's seven container terminals have on-dock rail access, served by Class III rail. The port also has access to the Alameda Corridor, a 20-mile-long rail line connecting the Ports of Long Beach and Los Angeles to Class I railroads.

Port Updates:
In 2015, the port completed Phase 1 of its Middle Harbor Redevelopment Project to modernize infrastructure at two of its container terminals, including rehabilitating and upgrading container yards, water access, and railyards (Phase 2 is slated for completion in 2019). Also, the port is using a combination of Federal, State, and other funding sources to replace the Gerald Desmond Bridge that spans the port's main channel. This project, slated for completion in 2018, will result in a new, cable-stayed bridge with 205-foot clearance, as compared to the 155-foot clearance of the original bridge.

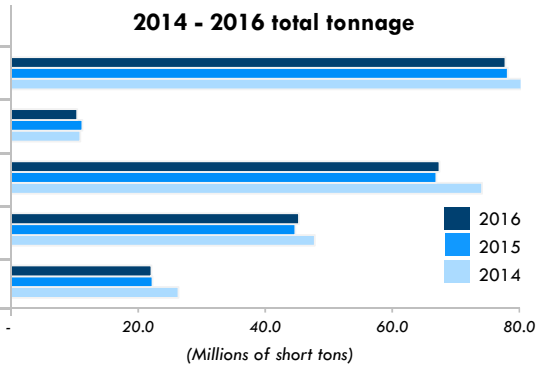
PORT OF LONG BEACH (CONTINUED)

THROUGHPUT

Cargo

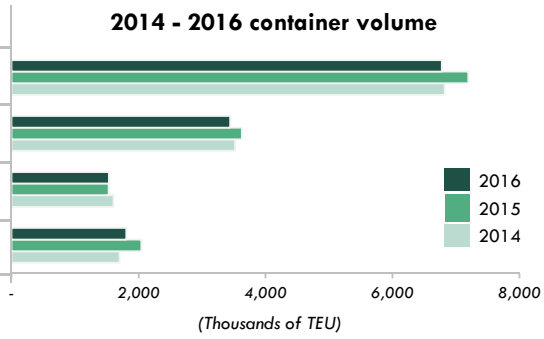
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**77.8**	▼ **-0.4%**
• Domestic	10.4	▼ -7.2%
• Foreign	67.4	▲ 0.7%
▫ Imports	45.3	▲ 1.3%
▫ Exports	22.1	▼ -0.6%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**6,775**	▼ **-5.8%**
• Inbound loaded TEU	3,443	▼ -5.0%
• Outbound loaded TEU	1,529	▲ 0.3%
• Empties (in- & outbound)	1,803	▼ -11.7%

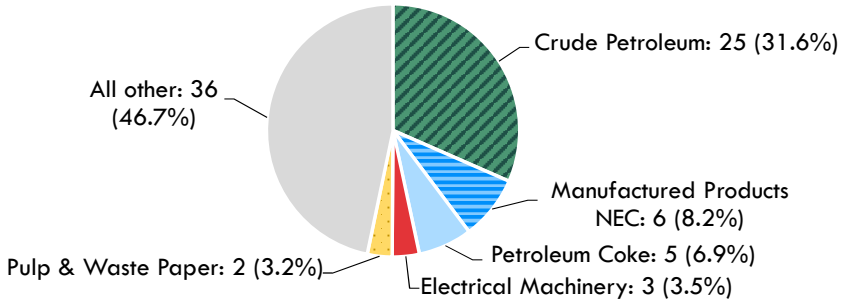


PORT OF LONG BEACH (CONTINUED)

THROUGHPUT

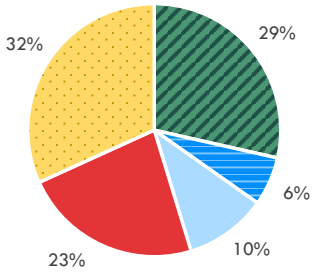
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

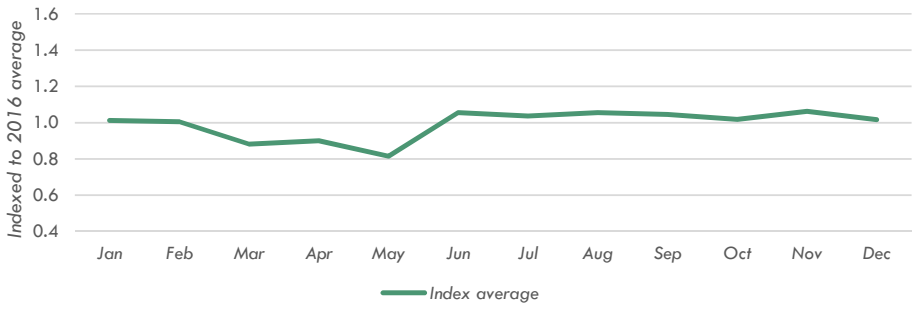
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**3,314**	▲ **7.0%**
Container vessel	946	▼ -3.1%
Average TEU per container vessel	7,162	▼ -2.8%
Dry bulk vessel	207	▲ 19.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	35,291	
Dry bulk barge	349	▲ 205.7%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	796	
Other freight vessel	760	▼ -0.8%
Other freight barge	1,053	▼ -1.5%

Vessel dwell time

2016 container vessel dwell time index



PORT OF LONG BEACH (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
TTI / Pier T	385	5,000	N/A	N/A	50	-	-	14	Y
SSA / Pier A	200	3,600	155	Gerald Desmond	50	-	-	10	Y
SSA / Pier C	70	1,800	155	Gerald Desmond	50	-	3	-	N
LBCT / Pier E	154	2,750	N/A	N/A	50	-	-	8	Y
LBCT / Pier F	88	2,750	N/A	N/A	50	-	5	2	Y
ITS / Pier G	246	6,379	N/A	N/A	50	2	11	2	Y
PCT / Pier J	256	5,900	N/A	N/A	50	-	6	9	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Long Beach complex includes over ten public and private bulk and break-bulk terminals

Channel depth

Authorized channel depth (ft)	**76.0**	Maximum depth of approach channel (ft)	**81.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Long Beach website, available at http://polb.com/, including terminal websites accessed through the main port website, as of November 2017.

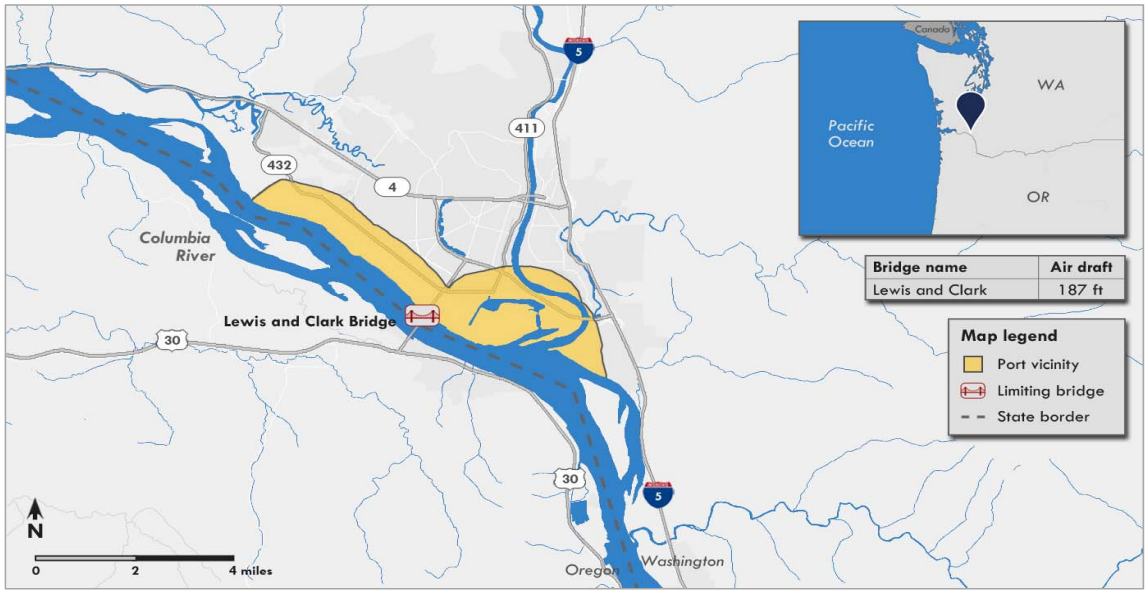
PORT OF LONGVIEW

Washington

Pacific Coast

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Longview is located on the Columbia River, 66 miles from the Pacific Ocean in southwest Washington. The port is governed by a three-member board of commissioners.

The port has six active terminals equipped to handle break-bulk, dry bulk, heavy-lift, and Ro/Ro cargoes. Major commodities handled by the port include agricultural products (e.g., corn and soybeans), lumber, and petroleum coke.

Several terminals have access to Class I rail service via the port's 3.2-mile-long Industrial Rail Corridor.

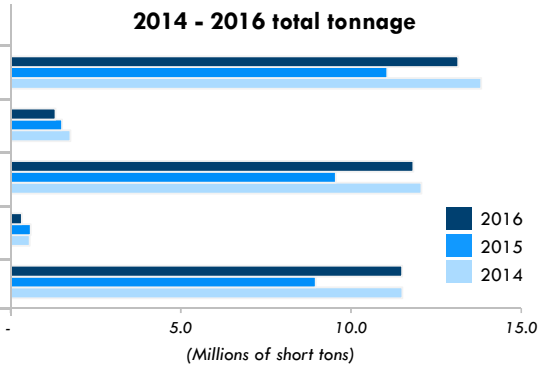
PORT OF LONGVIEW (CONTINUED)

THROUGHPUT

Cargo

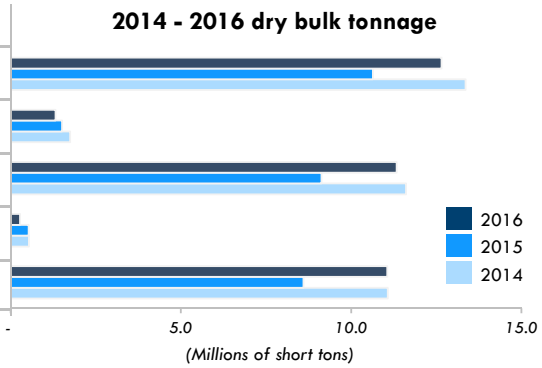
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**13.1**	▲ **18.9%**
• Domestic	1.3	▼ -12.8%
• Foreign	11.8	▲ 23.9%
▫ Imports	0.3	▼ -43.7%
▫ Exports	11.5	▲ 28.3%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.7**	▲ **18.9%**
• Domestic	1.3	▼ -12.7%
• Foreign	11.3	▲ 24.2%
▫ Imports	0.3	▼ -47.5%
▫ Exports	11.1	▲ 28.6%

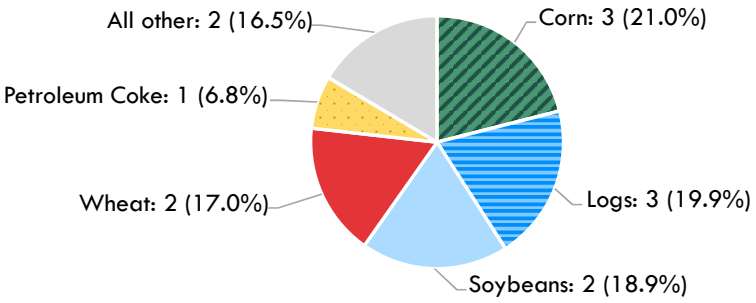


PORT OF LONGVIEW (CONTINUED)

THROUGHPUT

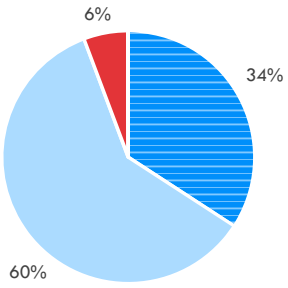
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**700**	▼ **-25.1%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	239	▲ 11.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	47,432	
Dry bulk barge	421	▼ -38.9%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	3,136	
Other freight vessel	40	▲ 27.4%
Other freight barge	1	N/A

PORT OF LONGVIEW (CONTINUED)

CAPACITY

Non-container terminals

The Port of Longview complex includes the following terminals: Berth 5, Berth 6, Berth 7, Berth 8, Berth 9, and Ro Ro terminals.

Channel depth

Authorized channel depth (ft)	**55.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Longview, http://www.portoflongview.com/, including terminal websites accessed through the main port website, as of November 2017.

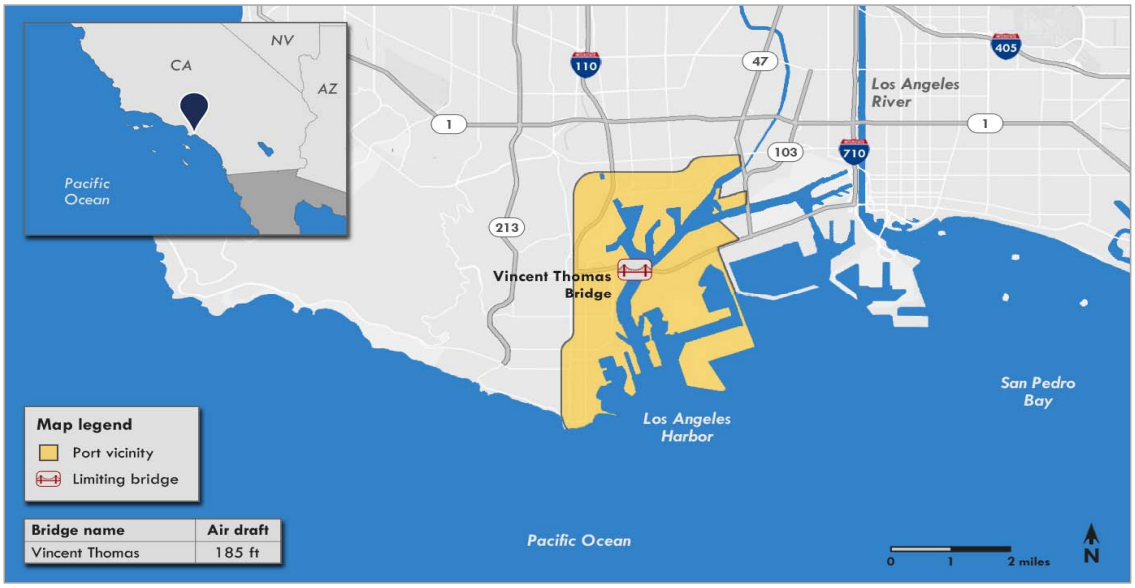
PORT OF LOS ANGELES

California

Pacific Coast

Port list:

Container | Tonnage



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Los Angeles is located on San Pedro Bay, about 20 miles south of downtown Los Angeles, California. It is adjacent to the Port of Long Beach. The port is governed by a five-member Board of Harbor Commissioners.

The port complex includes over 15 cargo terminals. These include seven active public container terminals as well as three public break-bulk terminals, a Ro/Ro terminal, a scrap metal terminal, a dry bulk terminal, and seven liquid bulk terminals. There is also a private terminal that handles dry bulk.

All container terminals have on-dock rail with access to Class I railroads via short-line rail. The port also has access to the Alameda Corridor, a 20-mile-long rail line connecting the Port of Los Angeles and Port of Long Beach with the national rail network.

Port Updates:
In 2015, the port began a two-year project to upgrade one of its container terminals. This effort will include upgrading the terminal's infrastructure and expanding its on-dock rail capacity. The project is expected to improve the terminal's ability to handle larger ships and to handle more ships at the same time.

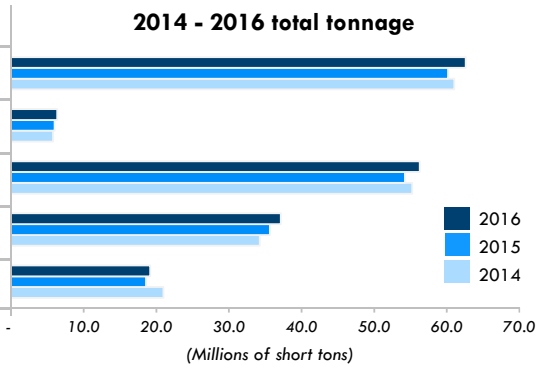
PORT OF LOS ANGELES (CONTINUED)

THROUGHPUT

Cargo

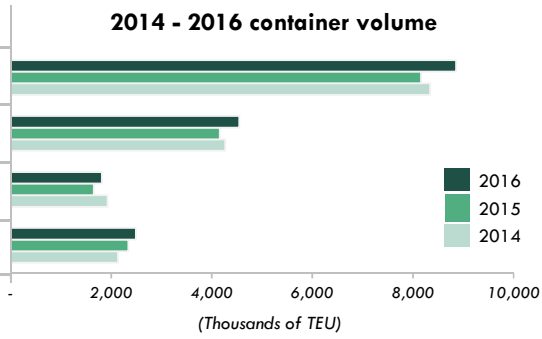
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**62.6**	▲ **4.0%**
• Domestic	6.3	▲ 6.1%
• Foreign	56.3	▲ 3.8%
▫ Imports	37.1	▲ 4.2%
▫ Exports	19.2	▲ 3.1%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**8,857**	▲ **8.5%**
• Inbound loaded TEU	4,545	▲ 9.3%
• Outbound loaded TEU	1,819	▲ 9.8%
• Empties (in- & outbound)	2,494	▲ 6.4%

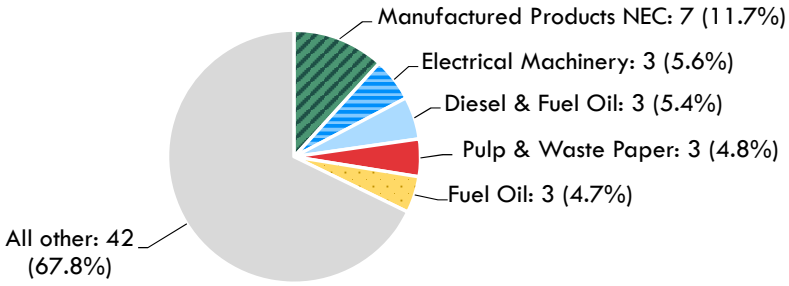


PORT OF LOS ANGELES (CONTINUED)

THROUGHPUT

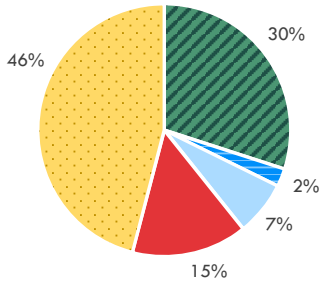
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

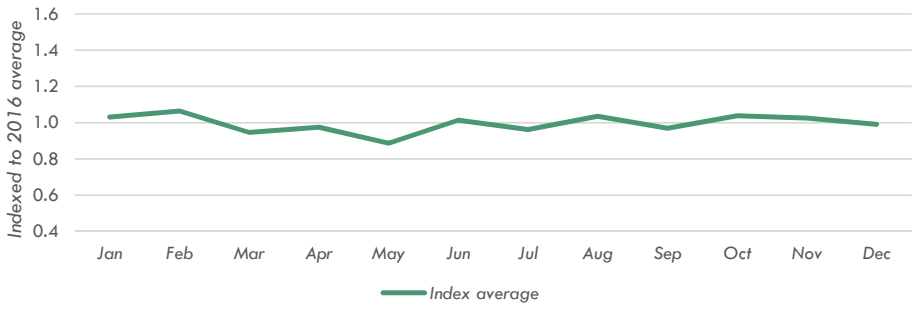
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**3,812**	▼ **-1.0%**
Container vessel	1,143	▲ 6.5%
Average TEU per container vessel	7,749	▲ 1.9%
Dry bulk vessel	87	▼ -22.3%
Average dry bulk tonnage (short tons) per dry bulk vessel	29,624	
Dry bulk barge	266	▼ -52.6%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	969	
Other freight vessel	565	▲ 56.2%
Other freight barge	1,751	▲ 0.6%

Vessel dwell time

2016 container vessel dwell time index



PORT OF LOS ANGELES (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
West Basin Container Terminal - 1	132	2,500	185	Vincent Thomas	53	-	-	10	Y
West Basin Container Terminal - 2	186	2,500	185	Vincent Thomas	53	-	5	-	Y
TraPac Inc.	220	4,630	185	Vincent Thomas	53	-	9	1	Y
Yusen Terminals Inc.	185	5,800	185	Vincent Thomas	53	-	6	6	Y
Everport Terminal Services	205	5,800	N/A	N/A	53	-	6	5	Y
Eagle Marine Services, Ltd.	292	4,000	N/A	N/A	53	-	12	4	Y
APM Terminals Pacific	484	7,300	N/A	N/A	53	-	-	19	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Los Angeles complex includes three break-bulk terminals, a Ro/Ro terminal, a scrap metal terminal, a dry bulk terminal, and seven liquid bulk terminals.

Channel depth

Authorized channel depth (ft)	**81.0**	Maximum depth of approach channel (ft)	**81.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Los Angeles website, https://www.portoflosangeles.org/, including terminal websites accessed through the main port website, as of November 2017.

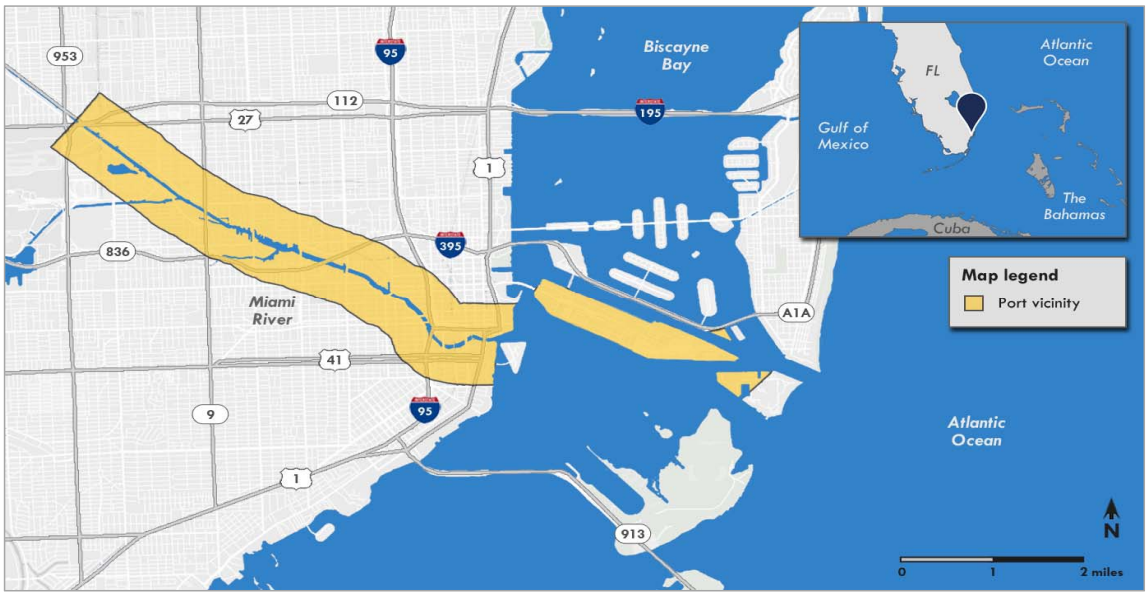
PORT OF MIAMI

Florida

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities.

Port overview

The Port of Miami is located east of downtown Miami on Biscayne Bay, on Florida's Atlantic coast. Miami-Dade County's Seaport Department oversees the port.

The port has three terminals: the Seaboard Marine Terminal, the South Florida Container Terminal, and the Port of Miami Terminal Operating Company. Through these terminals, the moves a wide range of cargoes including containerized commodities such as textiles, waste/recyclables, furniture, and perishable foodstuffs such as produce, as well as break-bulk and Ro/Ro cargoes. Additionally, there are multiple private terminals located along the Miami River that handle bulk and project cargoes.

The port has on-dock access to Class II rail service, with connections to Class I service via Class II service.

Port Updates:
The Port of Miami recently completed a series of capital improvement projects totaling $1 billion, which include construction of a new tunnel directly connecting the port's freight facilities to adjacent interstates (the tunnel opened to traffic in 2014) and rehabilitation of and improvements to rail facilities to address damage caused by Hurricane Wilma in 2005. In coordination with USACE, the port also completed a project in 2015 to widen, deepen, and dredge several channels within its harbor to 50 feet, and deepen its entrance channel to 52 feet.

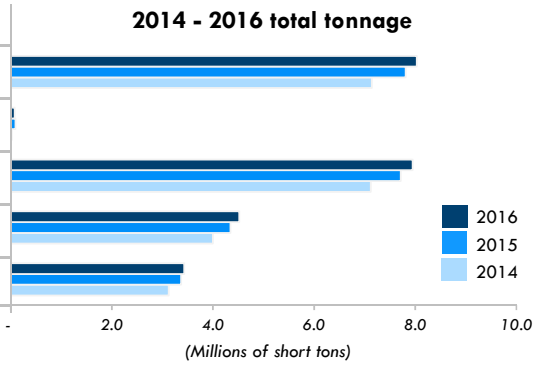
PORT OF MIAMI (CONTINUED)

THROUGHPUT

Cargo

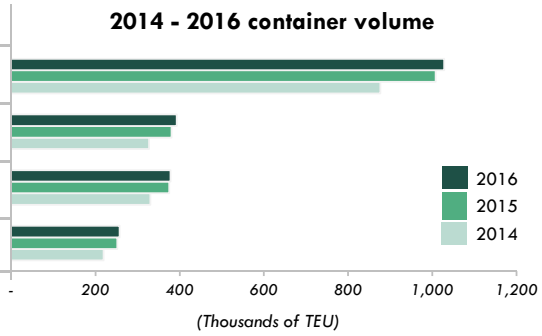
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**8.0**	▲ **2.8%**
• Domestic	0.1	▼ -17.3%
• Foreign	7.9	▲ 3.0%
▫ Imports	4.5	▲ 4.0%
▫ Exports	3.4	▲ 1.8%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,028**	▲ **2.0%**
• Inbound loaded TEU	393	▲ 3.3%
• Outbound loaded TEU	378	▲ 0.8%
• Empties (in- & outbound)	257	▲ 2.0%

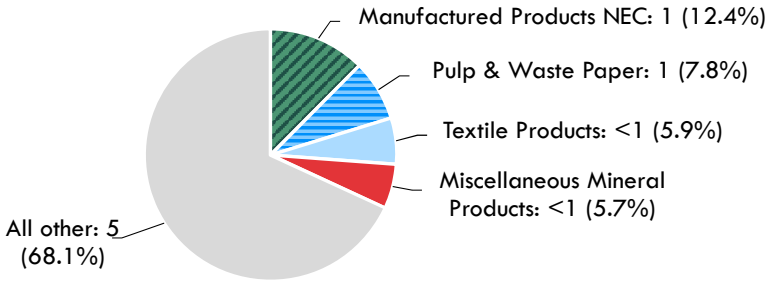


PORT OF MIAMI (CONTINUED)

THROUGHPUT

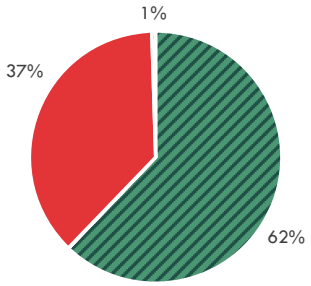
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

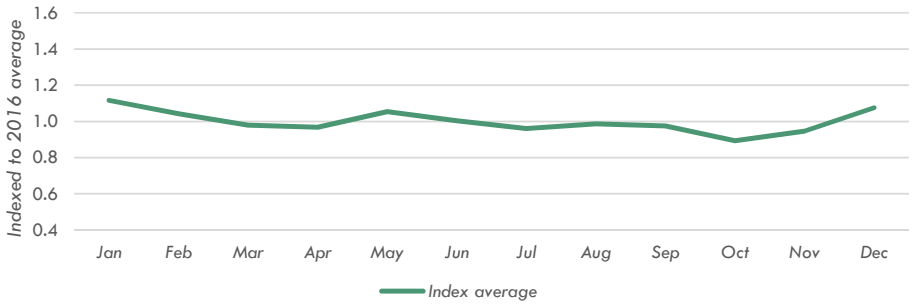
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,545**	▼ **-2.5%**
Container vessel	960	▲ 1.6%
Average TEU per container vessel	1,071	▲ 0.4%
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	1	N/A
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	577	▼ -4.5%
Other freight barge	8	▼ -77.6%

Vessel dwell time

2016 container vessel dwell time index



PORT OF MIAMI (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
South Florida Container Terminal	80	4,950	N/A	N/A	50	-	3	4	Y
POMTOC	120	5,000	N/A	N/A	50	-	2	2	Y
Seaboard Marine	80	3,919	N/A	N/A	34	-	2	-	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Miami complex includes multiple private terminals.

Channel depth

Authorized channel depth (ft)	**50.0**	Maximum depth of approach channel (ft)	**44.0**

NOTES: "N/A" designates a metric that does not apply for this port. Capacity information verified by port per AAPA communication. The Seaboard Marine Terminal handles self-unloading and Ro/Ro vessels. Container load rate is based on Port of Miami estimate of 75 percent for both inbound and outbound TEU counts. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Miami website, available at http://www.miamidade.gov/portmiami/, including terminal websites accessed through the main port website.

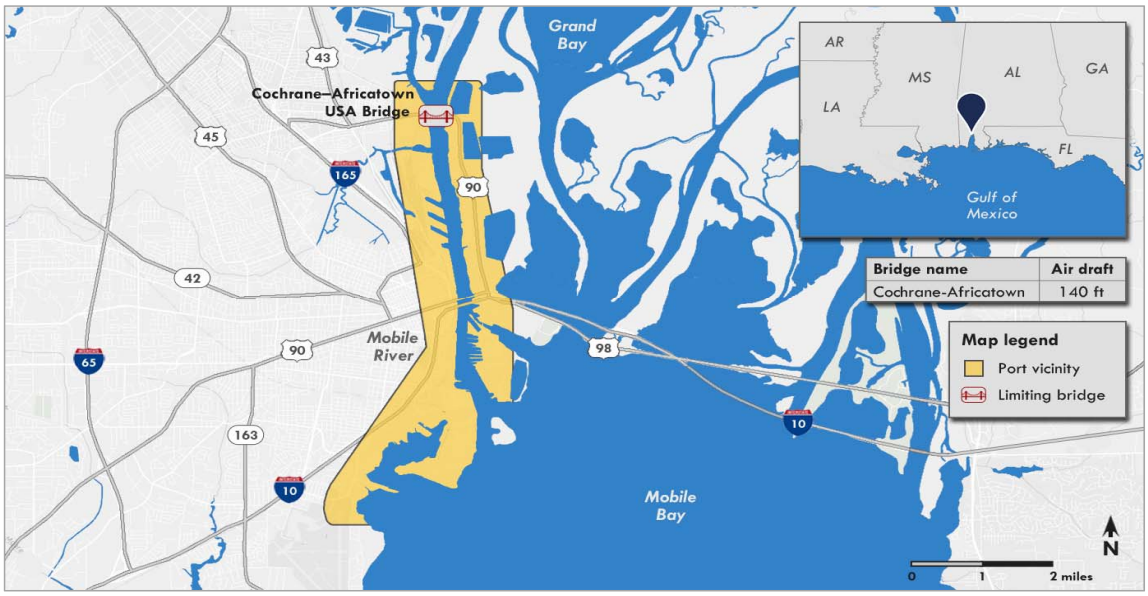
PORT OF MOBILE

Alabama

Gulf Coast & Mississippi River

Port list:

Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Mobile is located on the western shore of Mobile Bay, at the confluence of several rivers flowing into the Gulf of Mexico. Due to its location, the port has both inland waterway and ocean access. A nine-member Alabama State Port Authority (ASPA) board manages the port in conjunction with the Alabama State Docks Department.

The port has multiple public and private terminals that handle both ship and barge traffic. These facilities include a container terminal, a liquid bulk terminal, a general cargo terminal, and a bulk handling plant. There are also multiple additional private terminals that move a variety of dry and liquid bulk, break-bulk, project, and Ro/Ro cargoes. Major commodities handled at the port include coal, crude petroleum and petroleum products, iron and steel, aggregates, paper, aluminum, copper, and some perishable foodstuffs (e.g., poultry).

The port has access to four Class I rail lines.

Port Updates:
In June 2016, ASPA opened a new, near-dock Intermodal Container Transfer Facility that improves the port's ability to move containers to rail. This facility is served by CN.

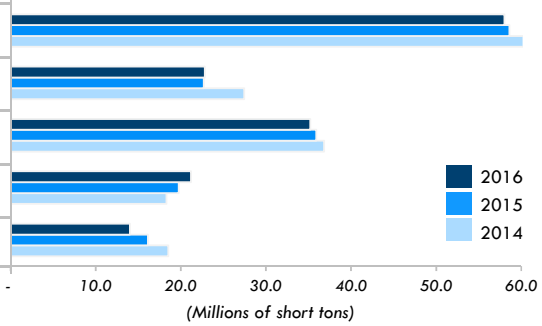
PORT OF MOBILE (CONTINUED)

THROUGHPUT

Cargo

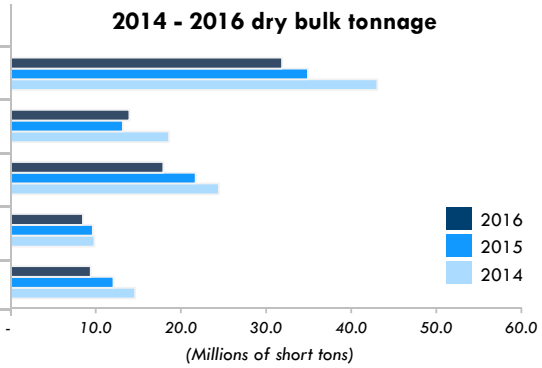
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**58.0**	▼ **-1.0%**
• Domestic	22.8	▲ 0.5%
• Foreign	35.2	▼ -1.9%
▫ Imports	21.2	▲ 7.3%
▫ Exports	14.0	▼ -13.1%



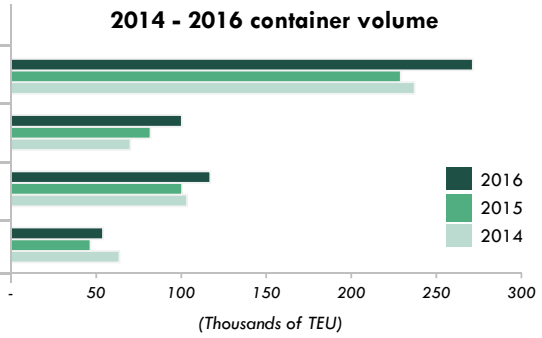
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**31.9**	▼ **-8.7%**
• Domestic	13.9	▲ 5.7%
• Foreign	17.9	▼ -17.5%
▫ Imports	8.5	▼ -12.0%
▫ Exports	9.4	▼ -21.9%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**271**	▲ **18.5%**
• Inbound loaded TEU	100	▲ 22.4%
• Outbound loaded TEU	117	▲ 16.5%
• Empties (in- & outbound)	54	▲ 15.8%

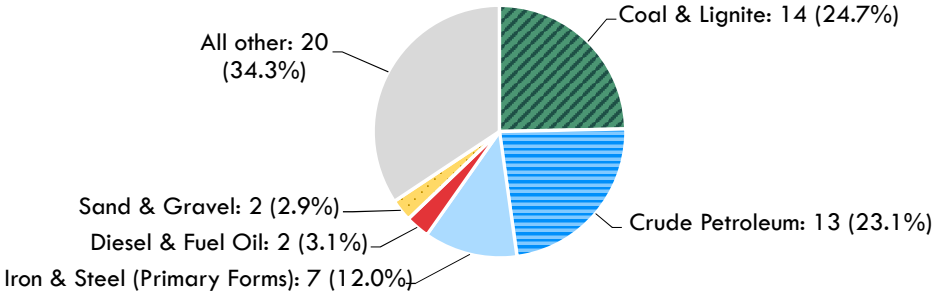


PORT OF MOBILE (CONTINUED)

THROUGHPUT

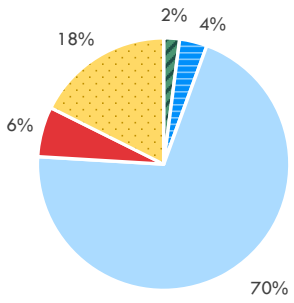
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

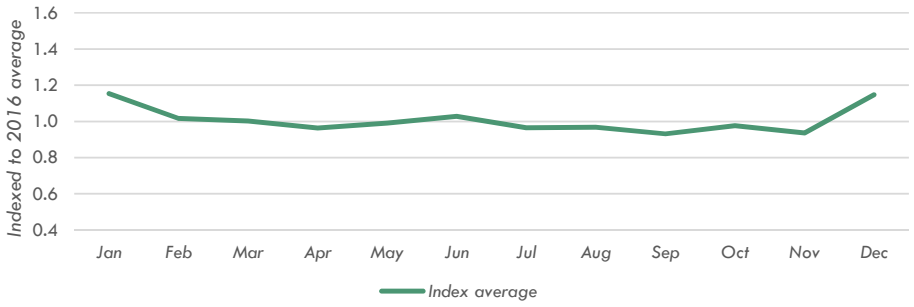
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**10,514**	▼ **-1.0%**
Container vessel	214	▲ 33.3%
Average TEU per container vessel	1,269	▼ -11.1%
Dry bulk vessel	370	▼ -9.3%
Average dry bulk tonnage (short tons) per dry bulk vessel	48,441	
Dry bulk barge	7,400	▼ -0.9%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,885	
Other freight vessel	676	▲ 13.8%
Other freight barge	1,854	▼ -7.0%

Vessel dwell time

2016 container vessel dwell time index



PORT OF MOBILE (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
APM Terminals	90	2,000	N/A	N/A	45	-	2	-	N

Non-container terminals

In addition to the container terminal listed above, the Port of Mobile complex includes a liquid bulk terminal, a general cargo/intermodal terminal, a bulk handling plant, and multiple private terminals.

Channel depth

Authorized channel depth (ft)	**57.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. The high March 2016 vessel dwell time average is due to an extended dwell time for a single vessel call that month.

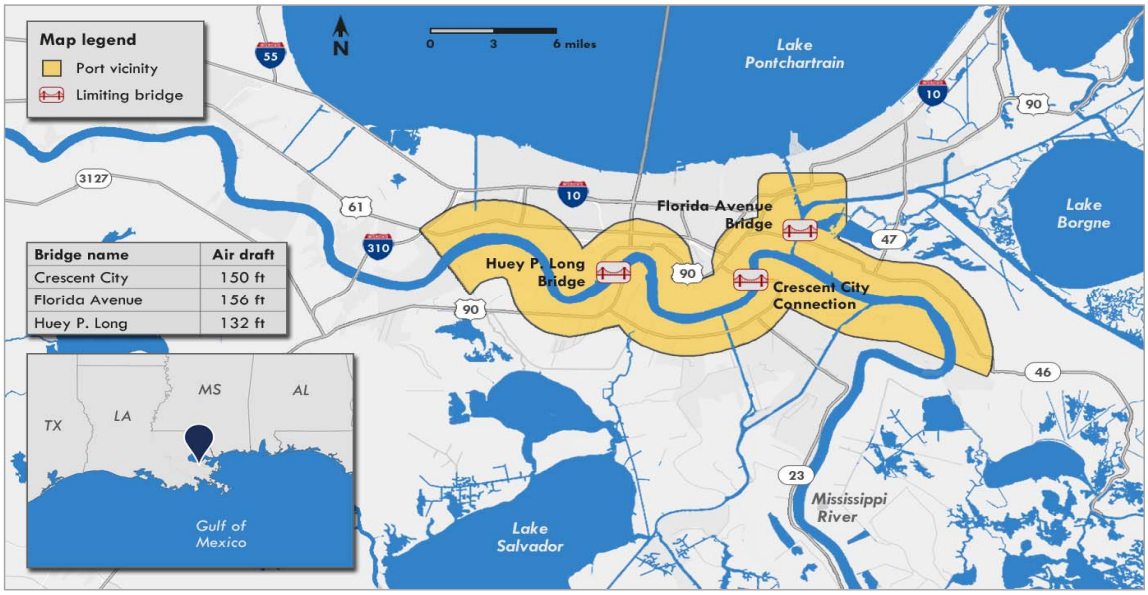
SOURCES: Port Overview/Terminals—ASPA website, available at http://www.asdd.com/, including terminal websites accessed through the main port website, as of November 2017. **Container Volume**—Port of Mobile, as of December 2017.

PORT OF NEW ORLEANS

Louisiana

Gulf Coast & Mississippi River

Port list: Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of New Orleans complex includes facilities located along Lake Pontchartrain and the Lower Mississippi River. A seven-member board of commissioners governs the port.

The port complex includes the Napoleon Avenue Terminal, which handles containerized cargo, and the France Road Container Terminal, which can handle containers and other cargo types (including Ro/Ro). The port also has multiple break-bulk terminals.

There are also numerous private bulk terminals handling fuel oil, other petroleum products, agricultural products (e.g., soy, corn), and other chemicals. Other commodities handled by the port include steel, natural rubber, coffee, forest products, aluminum, copper, zinc, chemicals, and frozen poultry.

The port has access to Class III rail service connecting to six Class I railways. The port also has access to barge service on inland waterways and the Gulf Intracoastal Waterway.

Port Updates:
In 2016, the port received a $1.75 million MARAD grant to improve its container-on-barge service between Baton Rouge and New Orleans. The grant allowed the port to purchase specialized equipment needed to move and reposition empty containers by barge that would otherwise move by truck or rail. Also in 2016, the port formally opened a new intermodal terminal (funded by a $16.7 million TIGER grant as well as the port's capital budget funds). The new terminal, the Mississippi Intermodal Terminal, replaced an outdated, 12-acre railyard to improve handling and transfer of containerized goods to rail.

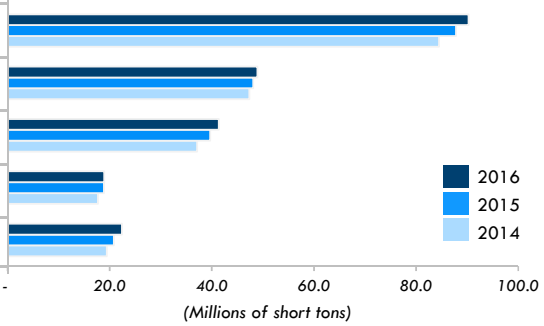
PORT OF NEW ORLEANS (CONTINUED)

THROUGHPUT

Cargo

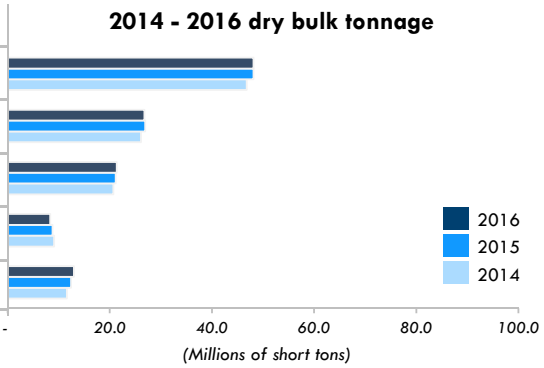
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**90.3**	▲ **2.8%**
• Domestic	48.9	▲ 1.7%
• Foreign	41.3	▲ 4.2%
▫ Imports	18.9	▲ 0.2%
▫ Exports	22.4	▲ 7.8%



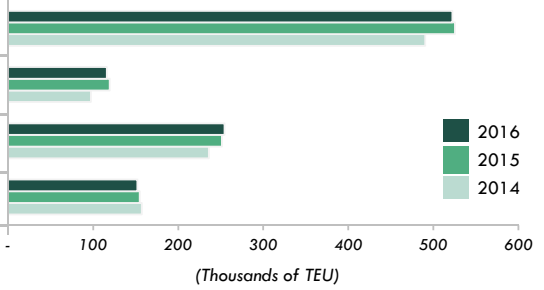
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**48.1**	▲ **0.1%**
• Domestic	26.8	▼ -0.5%
• Foreign	21.3	▲ 0.8%
▫ Imports	8.3	▼ -4.9%
▫ Exports	13.0	▲ 4.8%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**522**	▼ **-0.6%**
• Inbound loaded TEU	116	▼ -2.9%
• Outbound loaded TEU	254	▲ 1.2%
• Empties (in- & outbound)	152	▼ -1.7%

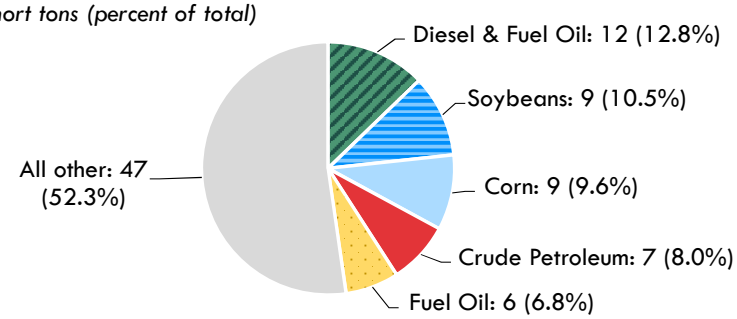


PORT OF NEW ORLEANS (CONTINUED)

THROUGHPUT

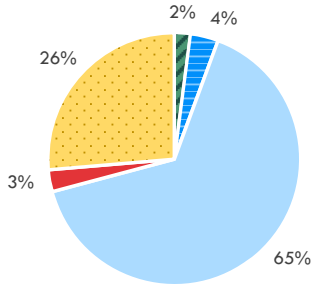
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

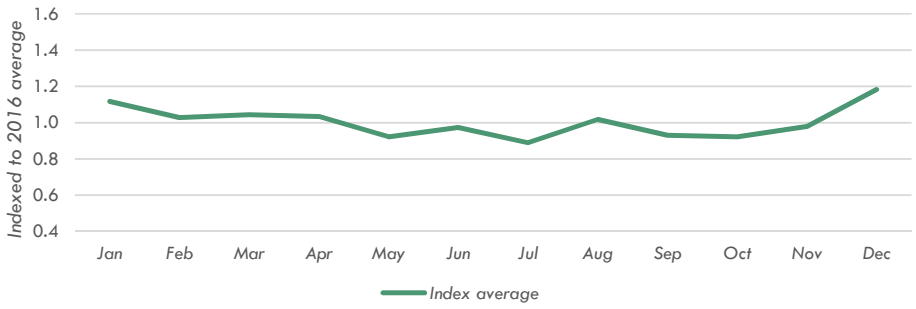
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**24,710**	▲ **10.6%**
Container vessel	507	▲ 2.1%
Average TEU per container vessel	1,031	▼ -2.7%
Dry bulk vessel	885	▼ -0.2%
Average dry bulk tonnage (short tons) per dry bulk vessel	24,263	
Dry bulk barge	16,115	▲ 13.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,655	
Other freight vessel	691	▲ 4.5%
Other freight barge	6,513	▲ 6.0%

Vessel dwell time

2016 container vessel dwell time index



PORT OF NEW ORLEANS (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Napoleon Avenue Container Terminal	61	2,000	150	Crescent City	45	2	4	-	N

Non-container terminals

In addition to the container terminal listed above, the Port of New Orleans complex includes the following terminals: France Road Container Terminal and multiple private and public bulk and break-bulk terminals.

Channel depth

Authorized channel depth (ft)	**55.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Capacity information verified by port per AAPA communication. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of New Orleans website, available at http://www.portno.com/, including terminal websites accessed through the main port website, as of November 2017.

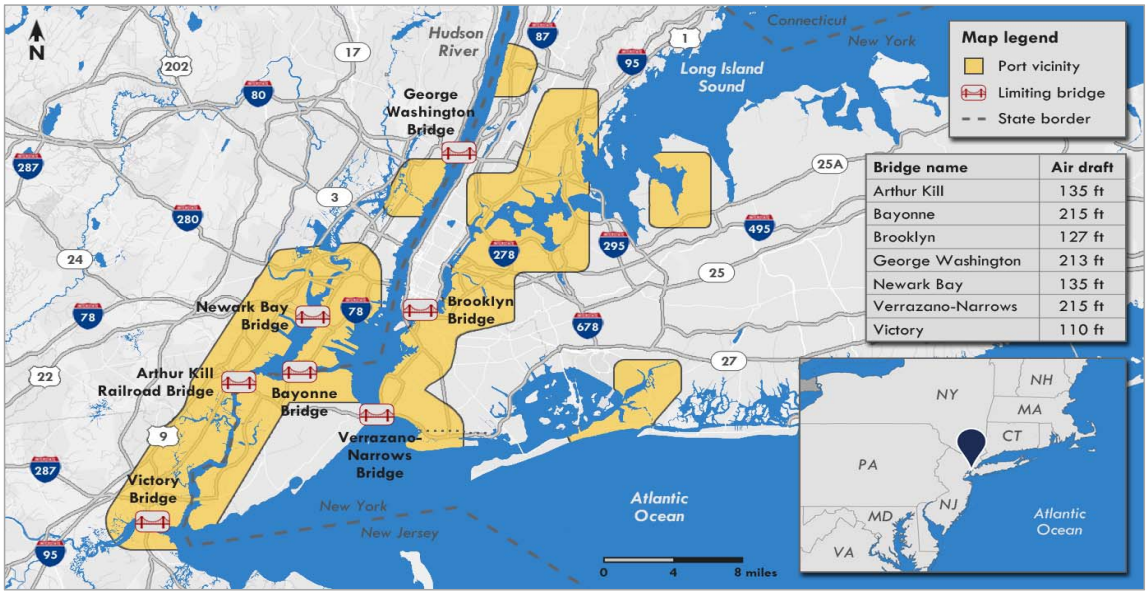
PORT OF NEW YORK AND NEW JERSEY

New Jersey and New York

Atlantic Coast

Port list:

Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of New York and New Jersey is located at the mouth of the Hudson River with facilities in Upper New York Bay and in Newark Bay. It is governed by a 12-member Port Authority of New York and New Jersey (PANYNJ) Board of Commissioners.

The port complex includes six public container terminals. Some of these terminals also handle other cargo types including Ro/Ro, project, and break-bulk. The port also has a public dry bulk terminal, the 25th Street Pier, which is leased to a private terminal operator and handles construction materials such as cement, sand, and stone. Multiple private facilities handle dry bulk, liquid bulk, and break-bulk cargoes. Commodities handled by the port include gasoline and fuel oils, manufactured products (e.g., furniture, apparel), paper, vehicles, foodstuffs, plastics, iron, and lumber.

Four of the port's six container terminals have on-dock Class I rail service.

Port Updates:
In 2016, PANYNJ received $10.67 million in Federal grant funds for the Cross Harbor Freight Program, which will implement intermodal rail improvements to facilitate freight traffic moving across New York Harbor. The PANYNJ is also rebuilding the Bayonne Bridge, which separates Newark Bay from the Upper New York Bay, to increase the bridge's air draft over the Kill Van Kull to 215 feet. The $1.6 billion project (funded by PANYNJ) reached a major milestone in 2017, raising the roadway to allow the newest generation of container vessels to reach all of the port's marine terminals. The project is slated for completion in mid-2019.

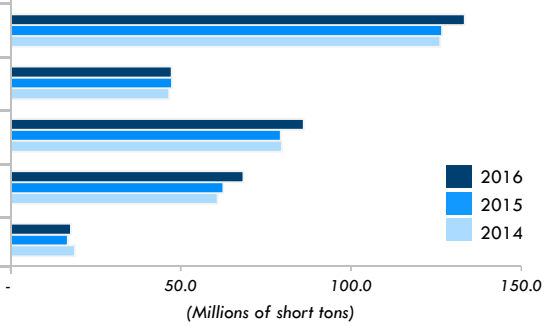
PORT OF NEW YORK AND NEW JERSEY (CONTINUED)

THROUGHPUT

Cargo

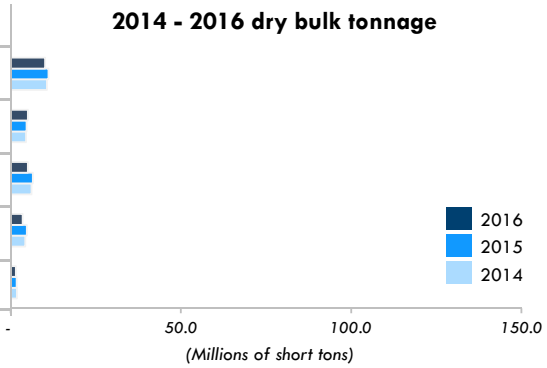
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**133.4**	▲ **5.3%**
• Domestic	47.3	▼ -0.2%
• Foreign	86.1	▲ 8.6%
▫ Imports	68.4	▲ 9.5%
▫ Exports	17.7	▲ 5.2%



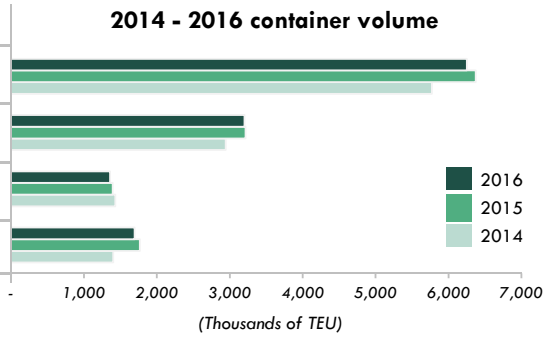
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**10.2**	▼ **-8.8%**
• Domestic	5.1	▲ 9.6%
• Foreign	5.1	▼ -22.0%
▫ Imports	3.5	▼ -25.4%
▫ Exports	1.5	▼ -12.6%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**6,252**	▼ **-1.9%**
• Inbound loaded TEU	3,203	▼ -0.4%
• Outbound loaded TEU	1,356	▼ -2.6%
• Empties (in- & outbound)	1,693	▼ -4.1%

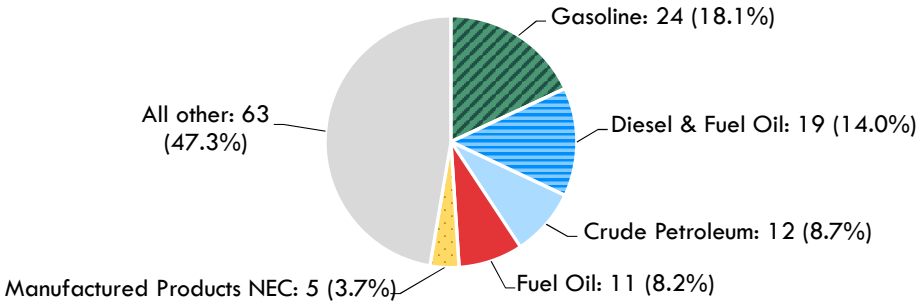


PORT OF NEW YORK AND NEW JERSEY (CONTINUED)

THROUGHPUT

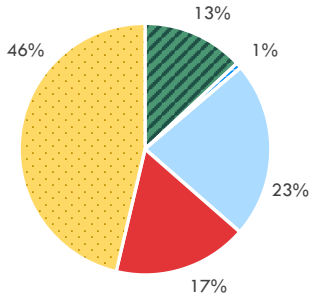
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

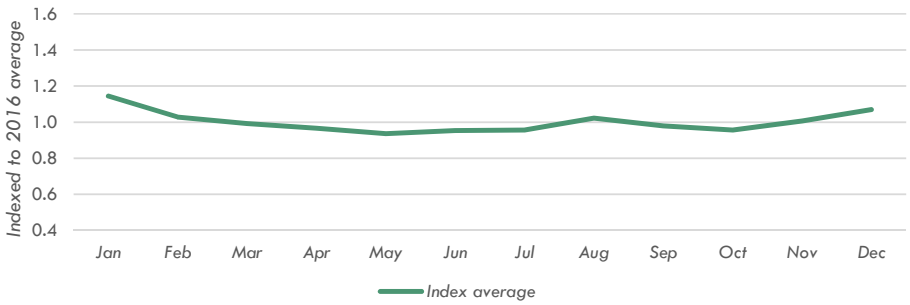
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**16,908**	▲ 3.1%
Container vessel	2,204	▼ -2.9%
Average TEU per container vessel	2,837	▲ 1.0%
Dry bulk vessel	125	▼ -21.2%
Average dry bulk tonnage (short tons) per dry bulk vessel	40,683	
Dry bulk barge	3,830	▲ 19.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,328	
Other freight vessel	2,919	▲ 4.8%
Other freight barge	7,830	▼ -1.7%

Vessel dwell time

2016 container vessel dwell time index



PORT OF NEW YORK AND NEW JERSEY (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Red Hook Container Terminal	80	5,490	215	Verrazano-Narrows	40	4	4	-	N
Port Newark Container Terminal	267	4,800	215	Bayonne	40	-	6	3	Y
Global Container Terminal Bayonne LP	167	2,700	215	Verrazano-Narrows	40	-	6	2	N
Maher Terminal	445	10,128	215	Bayonne	40	-	16	8	Y
APM Terminal	350	6,001	215	Bayonne	40	3	8	4	Y
Global Container Terminal New York LP	187	3,012	215	Bayonne	50	2	4	-	Y

Non-container terminals

In addition to the container terminals listed above, the Port of New York & New Jersey complex includes multiple private and public bulk and break-bulk terminals.

Channel depth

Authorized channel depth (ft)	**50.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Capacity information verified by port per AAPA communication. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—PANYNJ website, available at https://www.panynj.gov/, including terminal websites accessed through the main port website, as of November 2017.

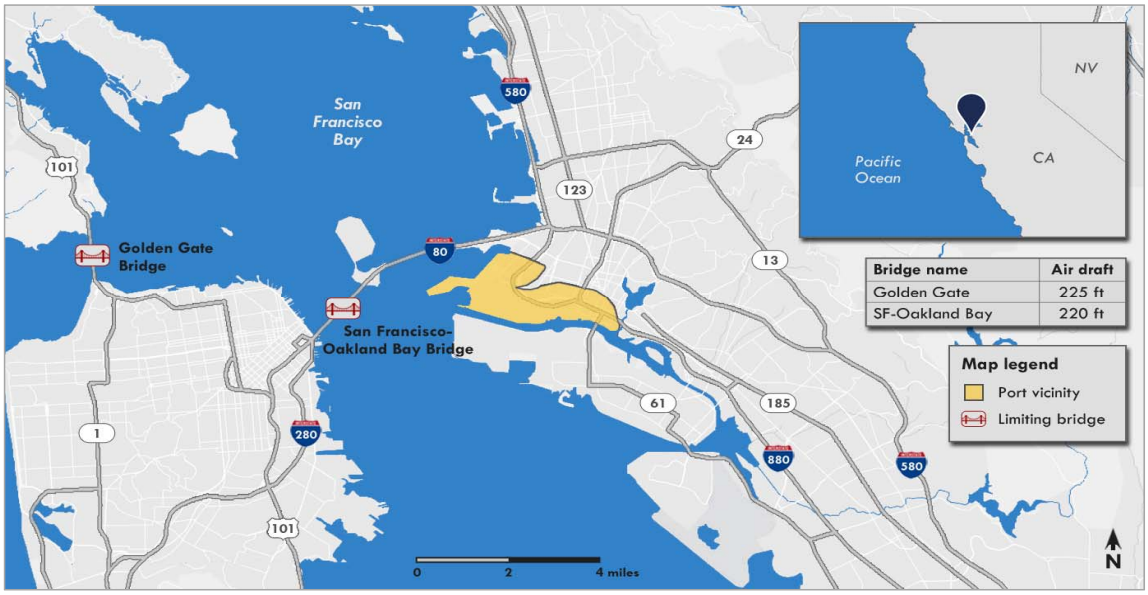
PORT OF OAKLAND

California

Pacific Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Oakland is located in Northern California on San Francisco Bay, about 9 miles from the Pacific Ocean. The port is governed by a seven-member Board of Commissioners.

The port has six container terminals, four of which presently handle cargo: the TraPac terminal, Oakland International Container Terminal (OICT), the Ben E. Nutter Terminal, and the Matson Terminal. A privately operated scrap terminal is located within the Oakland harbor. Commodities moving through the port include manufactured products, wastepaper, fruits and nuts, wine, animal feed, and iron and steel scrap.

All container terminals have access to near-dock rail intermodal terminals.

Port Updates:
The Port of Oakland is developing two major projects: Cool Port (a refrigerated import/export facility), and the Seaport Logistics Complex (a large distribution and transload facility on the former Oakland Army Base). The TraPac terminal is being expanded into the former Ports America terminal area. The port is also raising and upgrading container cranes at OICT.

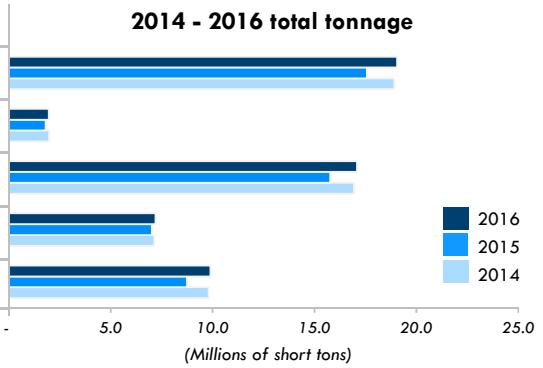
PORT OF OAKLAND (CONTINUED)

THROUGHPUT

Cargo

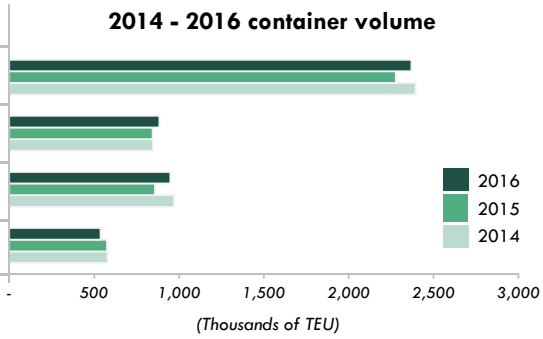
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**19.1**	▲ **8.5%**
• Domestic	2.0	▲ 9.1%
• Foreign	17.1	▲ 8.4%
▫ Imports	7.2	▲ 2.6%
▫ Exports	9.9	▲ 13.0%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**2,370**	▲ **4.0%**
• Inbound loaded TEU	884	▲ 4.7%
• Outbound loaded TEU	949	▲ 10.5%
• Empties (in- & outbound)	537	▼ -6.6%

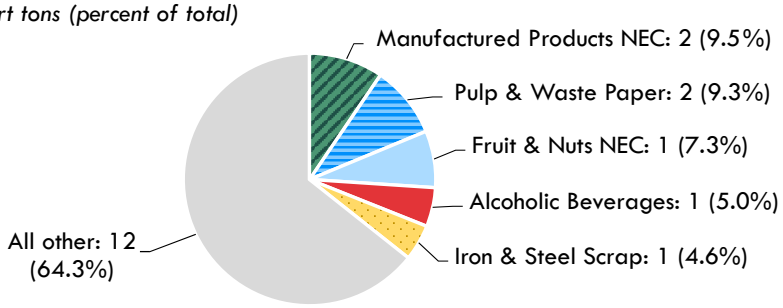


PORT OF OAKLAND (CONTINUED)

THROUGHPUT

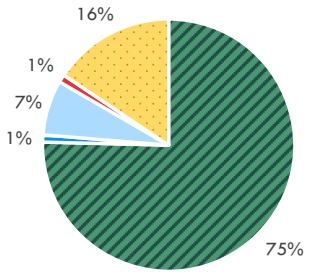
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

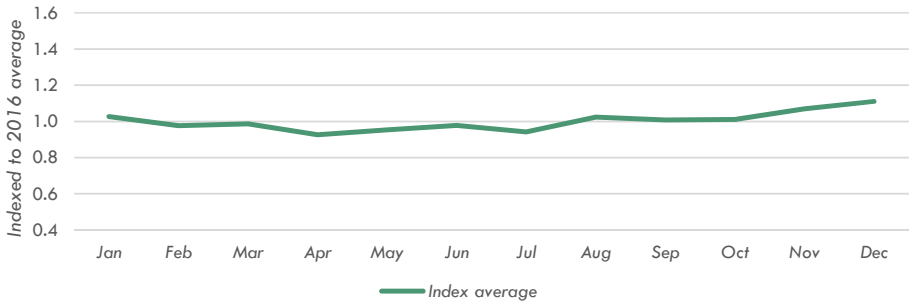
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,176**	▲ **21.0%**
Container vessel	1,640	▲ 20.4%
Average TEU per container vessel	1,445	▼ -13.6%
Dry bulk vessel	20	▼ -7.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	154	▲ 22.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	22	▲ 12.8%
Other freight barge	340	▲ 25.9%

Vessel dwell time

2016 container vessel dwell time index



PORT OF OAKLAND (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
TraPac Terminal	123	4,263	220	Bay Bridge	50	-	5	2	N
Ben E. Nutter Terminal	74	2,157	220	Bay Bridge	50	-	1	3	N
Oakland International Container Terminal	270	6,000	220	Bay Bridge	50	-	-	10	N
Matson Terminal	80	2,743	220	Bay Bridge	50	-	4	-	N

Non-container terminals

In addition to the container terminals listed above, the Port of Oakland complex includes a scrap metal export terminal.

Channel depth

Authorized channel depth (ft)	**50.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: "N/A" designates a metric that does not apply for this port. Capacity information verified by port per AAPA communication. Terminal data represent the 2015 configuration corresponding to 2015 cargo flows. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Oakland website, available at www.portofoakland.com, including terminal websites accessed through the main port website, as of December 2017.

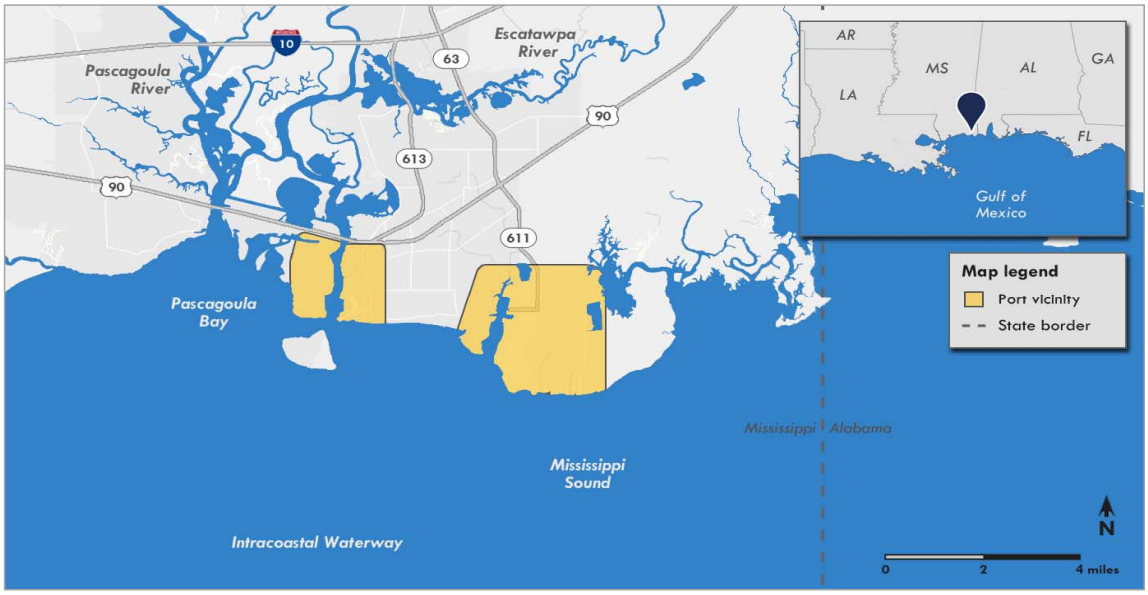
PORT OF PASCAGOULA

Mississippi

Gulf Coast & Mississippi River

Port list:

Tonnage



Port vicinity map illustrates area facilities.

Port overview

The Port of Pascagoula is located on the Gulf of Mexico. It is governed by a nine-member Jackson County Port Authority commission.

The port has two harbors that include eight public terminals, which handle a variety of dry and liquid bulk, break-bulk, and project cargoes. The port also has multiple (at least eight) additional private terminals. Petroleum and petroleum products (e.g., kerosene, gasoline) are major commodities handled by the port.

The port has access to two Class I rail lines.

Port Updates:
In coordination with USACE, the port is deepening the Pascagoula River Harbor Channel from 38 feet to 42 feet.

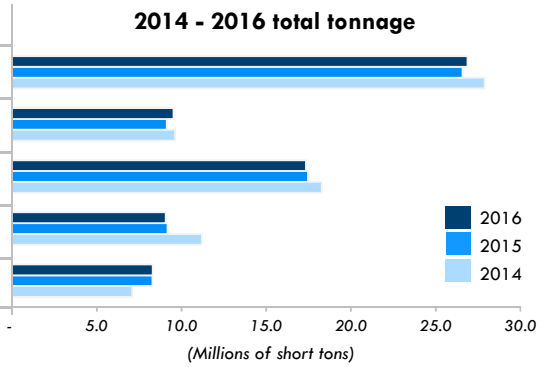
PORT OF PASCAGOULA (CONTINUED)

THROUGHPUT

Cargo

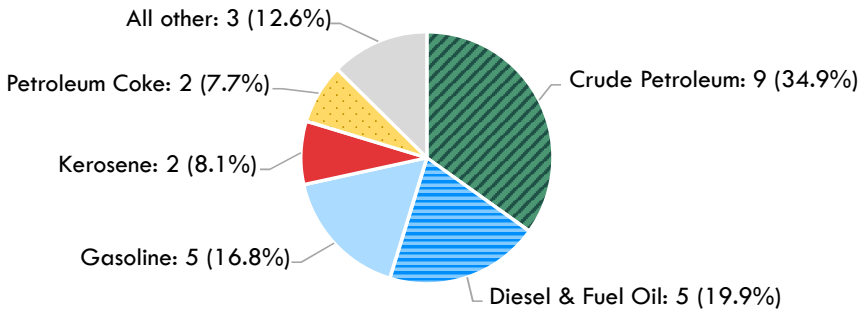
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**26.9**	▲ 1.1%
• Domestic	9.5	▲ 4.3%
• Foreign	17.3	▼ -0.6%
▫ Imports	9.1	▼ -1.3%
▫ Exports	8.3	▲ 0.1%



Commodities

Tonnage *Millions of short tons (percent of total)*

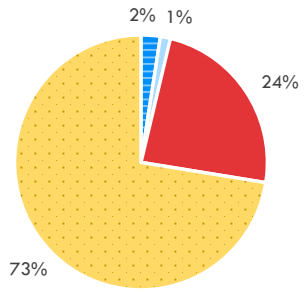


PORT OF PASCAGOULA (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,707**	▼ **-1.3%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	42	▲ 5.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	53,005	
Dry bulk barge	22	▼ -56.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,597	
Other freight vessel	406	▼ -3.2%
Other freight barge	1,237	▲ 1.4%

CAPACITY

Non-container terminals

The Port of Pascagoula complex includes the following terminals: Terminal A, Terminal B, Terminal C, Terminal D, South Terminal, Terminal E/F, Terminal G/H, and Terminal G extension.

Channel depth

Authorized channel depth (ft)	**42.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. Vessel call numbers might not add to 100% due to rounding. "N/A" designates a metric that does not apply for this port.

SOURCES: Port Overview/Terminals—Port of Pascagoula website, available at http://www.portofpascagoula.com/, including terminal websites accessed through the main port website.

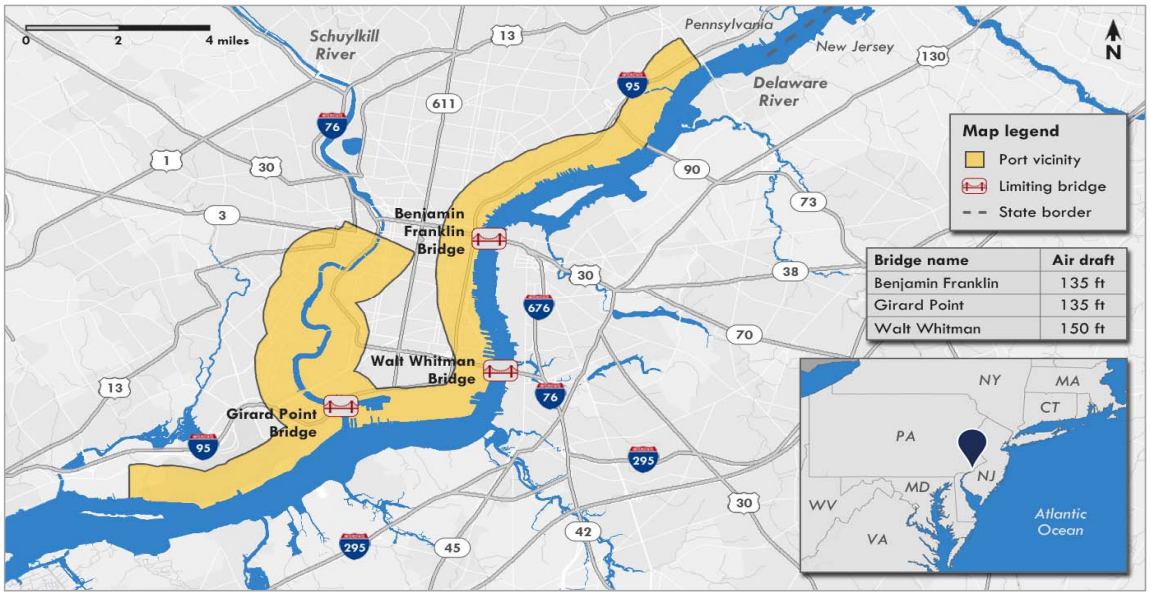
PORT OF PHILADELPHIA

Pennsylvania

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Delaware Memorial Bridge (188 ft), not shown, may limit vessels serviced south of the Walt Whitman Bridge.
The Delaware River forms the border between Pennsylvania and New Jersey.

Port overview

The Port of Philadelphia is located approximately 100 miles from the Atlantic Ocean along the western shore of the Delaware River. It is governed by an 11-member Philadelphia Regional Port Authority (PRPA) Board of Directors.

The port consists of several PRPA terminals and piers in addition to multiple private terminals. Both the Packer Avenue Marine and Tioga Terminals handle containerized cargo, while other dedicated facilities handle automobiles and forest products. Tioga also handles break-bulk and refrigerated cargoes. Other specialized terminals handle crude petroleum and fuel oil.

The port has access to two Class I rail lines. Pier 124, a liquid bulk terminal, offers direct access to barge and pipeline services.

Port Updates:
In coordination with USACE, PRPA is in the process of deepening the main channel of the Delaware River to 45 feet. The project is expected to be completed in 2017. The Commonwealth of Pennsylvania is also investing $300 million in major capital upgrades, including acquiring four Post-Panamax cranes and upgrading ship berths at the Packer Avenue Marine Terminal.

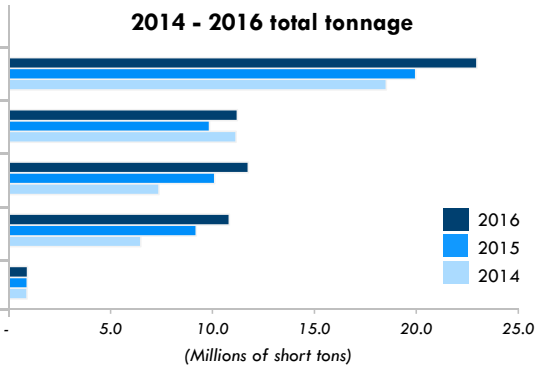
PORT OF PHILADELPHIA (CONTINUED)

THROUGHPUT

Cargo

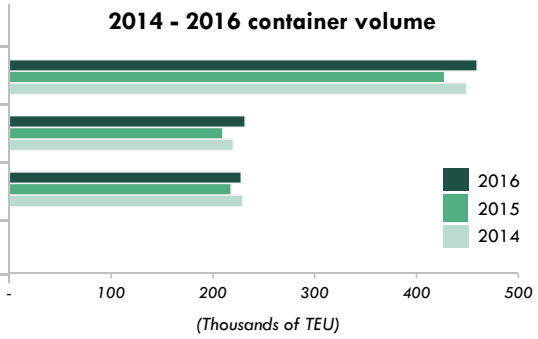
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**23.0**	▲ 15.1%
• Domestic	11.2	▲ 13.9%
• Foreign	11.8	▲ 16.2%
▫ Imports	10.8	▲ 17.7%
▫ Exports	0.9	▲ 1.1%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**460**	▲ 7.5%
• Inbound loaded TEU	232	▲ 10.5%
• Outbound loaded TEU	228	▲ 4.6%
• Empties (in- & outbound)	0	N/A

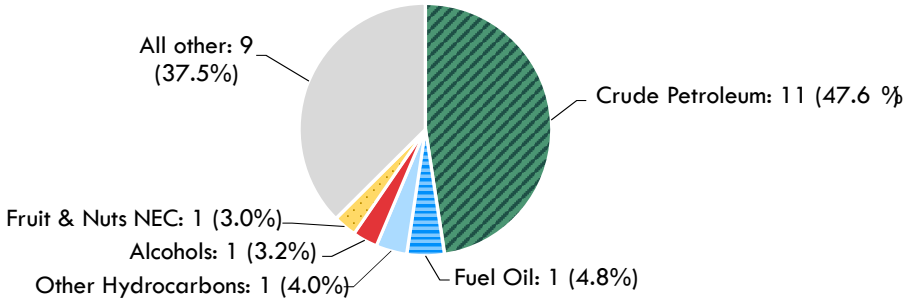


PORT OF PHILADELPHIA (CONTINUED)

THROUGHPUT

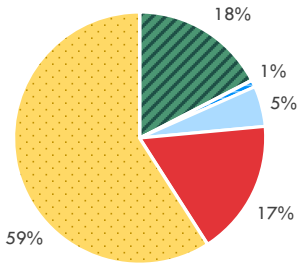
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

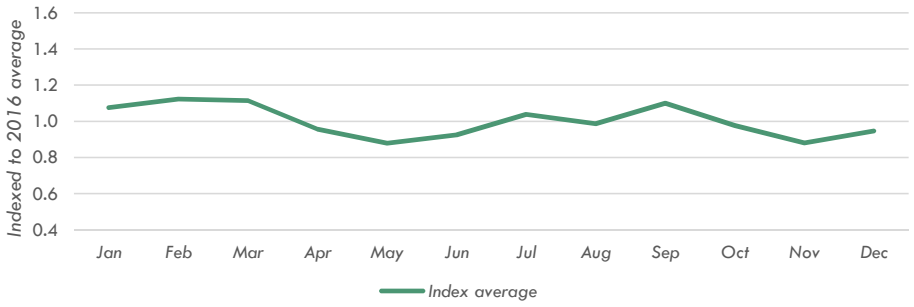
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,396**	▲ 1.3%
Container vessel	418	▲ 23.2%
Average TEU per container vessel	1,101	▼ -12.7%
Dry bulk vessel	22	▼ -20.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	125	▲ 19.1%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	418	▼ -2.7%
Other freight barge	1,415	▼ -3.5%

Vessel dwell time

2016 container vessel dwell time index



PORT OF PHILADELPHIA (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Tioga Marine Terminal	116	3,822	135	Benjamin Franklin	40	1	-	-	N
Packer Avenue Marine Terminal	106	4,600	188	Delaware Memorial	40	3	2	-	N

Non-container terminals

In addition to the container terminals listed above, the Port of Philadelphia complex includes the following terminals: Tioga Liquid Bulk Terminal, Philadelphia Forest Products Center, Pier 82, Pier 84, Pier 122, Pier 124, and Piers 96, 98 & 100.

Channel depth

Authorized channel depth (ft)	**40.0**	Maximum depth of approach channel (ft)	**40.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Philadelphia website, available at http://www.philaport.com/, including terminal websites accessed through the main port website, as of November 2017.

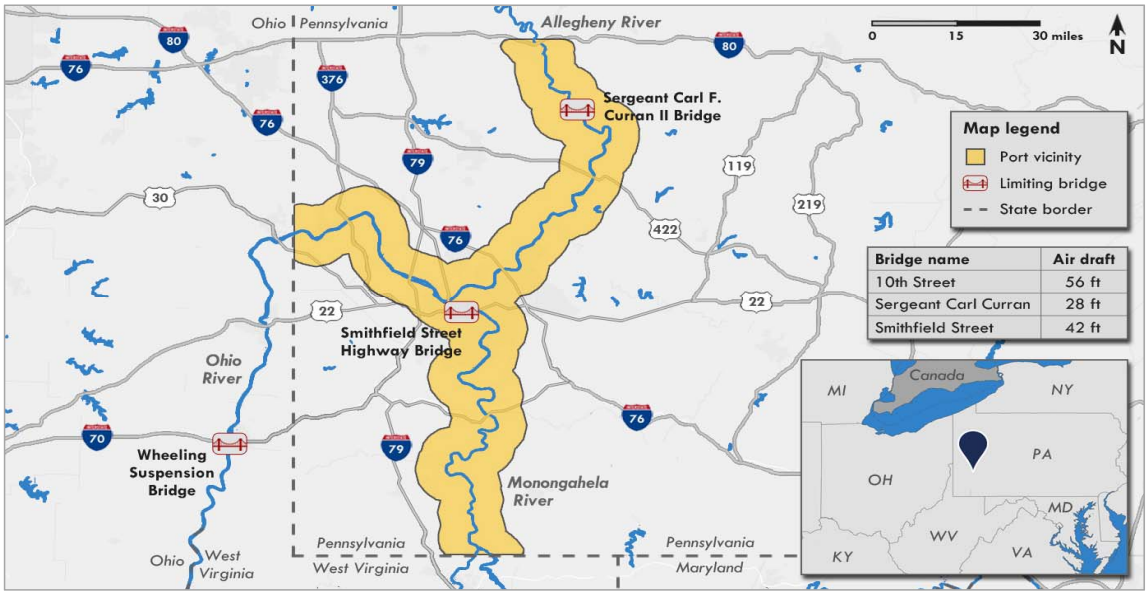
PORT OF PITTSBURGH

Pennsylvania

Gulf Coast & Mississippi River

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Ohio River forms the border between Ohio and West Virginia west of the Pennsylvania State line.

Port overview

The Pittsburgh Port District includes a 12-county area that makes up much of western Pennsylvania. The port district, which includes 17 locks and dams, is located along 200 miles of the Allegheny, Monongahela, and Ohio Rivers. The 15-member Port of Pittsburgh Board of Commissioners oversees the district's operations.

The port district has a mix of over 200 public and private river and barge terminals that handle a variety of raw materials and project cargoes, including coal, sand, limestone, salt, ores, forest products, and heavy machinery. Several terminals also handle liquid bulk cargoes, including petroleum products like gasoline.

Many of the port district's terminals have access to three Class I railroads; some terminals offer direct cargo transfer between barge, rail, and truck. Additional Class II and switching railroads also provide services within the district.

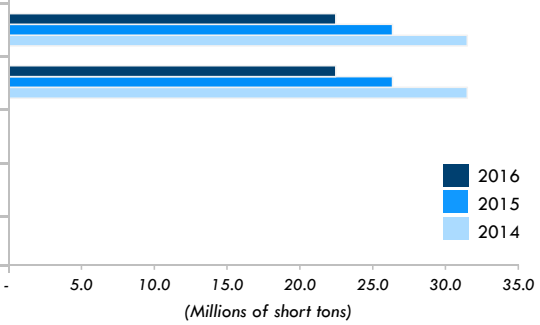
PORT OF PITTSBURGH (CONTINUED)

THROUGHPUT

Cargo

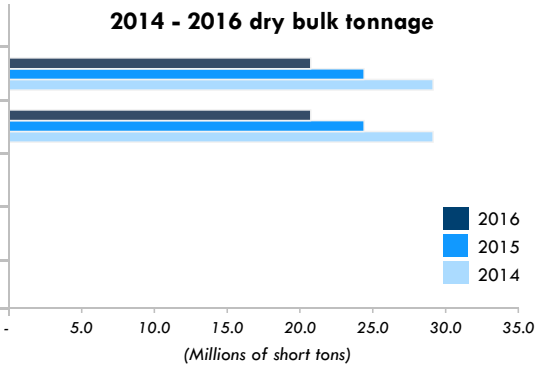
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**22.5**	▼ **-14.8%**
• Domestic	22.5	▼ -14.8%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**20.7**	▼ **-15.0%**
• Domestic	20.7	▼ -15.0%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A

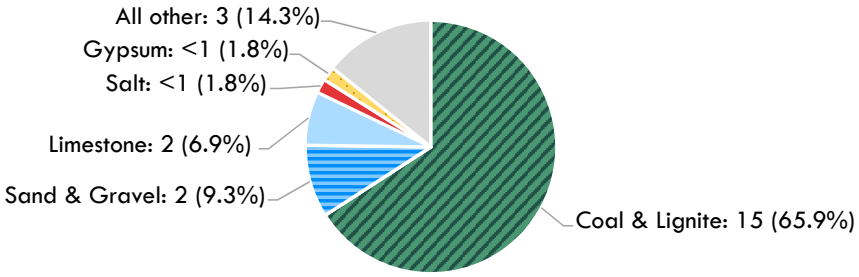


PORT OF PITTSBURGH (CONTINUED)

THROUGHPUT

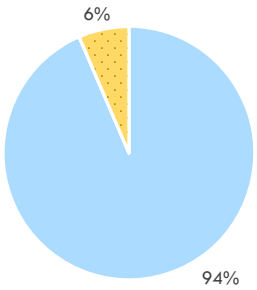
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**15,410**	▼ **-12.7%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	14,409	▼ -13.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,440	
Other freight vessel	0	N/A
Other freight barge	1,002	▼ -7.6%

PORT OF PITTSBURGH (CONTINUED)

CAPACITY

Non-container terminals

The Pittsburgh Port District includes a mixture of over 200 public and private river and barge terminals.

Channel depth

Authorized channel depth (ft)	**9.0**	Maximum depth of approach channel (ft)	**9.0**

NOTES: N/A designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Pittsburgh Commission website, available at http://www.port.pittsburgh.pa.us/, including terminal websites accessed through the main port website, as of November 2017.

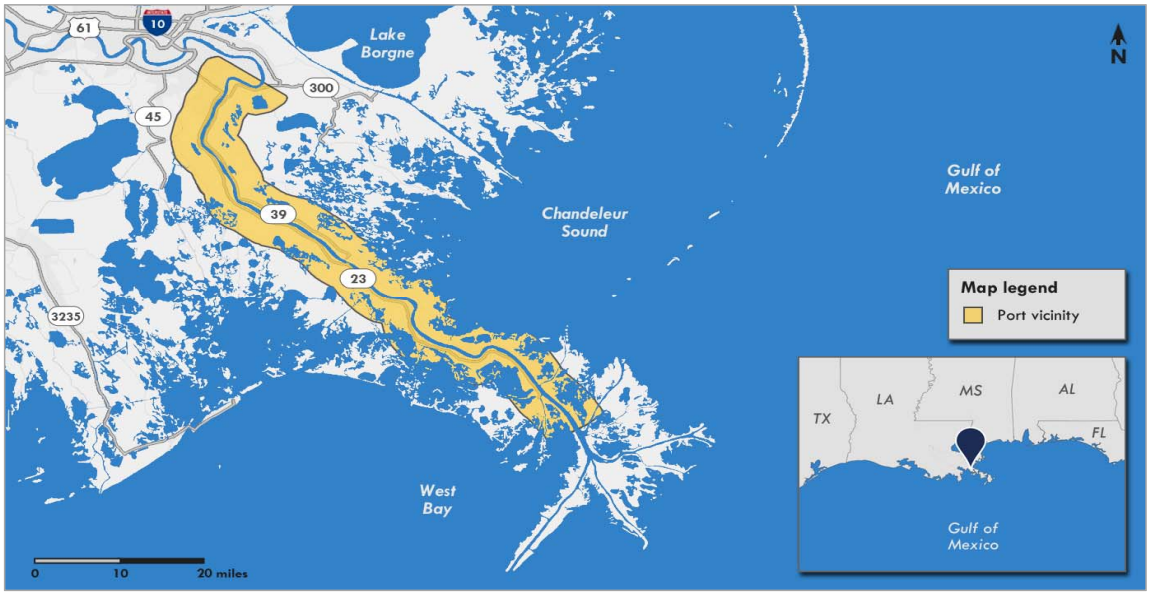
PORT OF PLAQUEMINES

Louisiana

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities.

Port overview

The Port of Plaquemines extends along approximately 80 nautical miles of the Mississippi River inland from the Gulf of Mexico. The nine-member Plaquemine Parish Council serves as the port's governing body.

All 24 of the port's terminals are private. They primarily handle coal, crude oil and petroleum products, corn and soybeans, chemicals, and fertilizers. Some terminals handle heavy machinery, such as equipment used for oil and gas extraction and production.

Many of the port's river terminals have the capability to transfer dry bulk commodities from barges to ocean-going ships. Several of the port's terminals are served by short-line rail service, with connections to a Class I rail line.

Port Updates:
The port anticipates development of a new natural gas liquefaction facility and LNG export terminal on port-owned property; this project will utilize private funds. The project is in Federal permitting, design, and engineering phases with construction slated to begin in 2018.

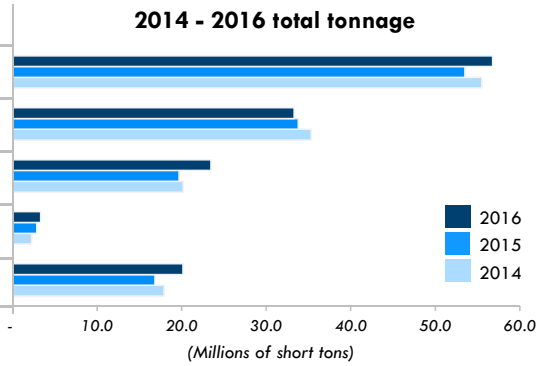
PORT OF PLAQUEMINES (CONTINUED)

THROUGHPUT

Cargo

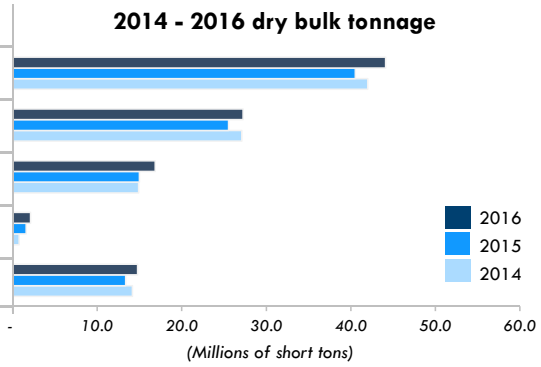
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**56.8**	▲ **6.1%**
• Domestic	33.3	▼ -1.4%
• Foreign	23.5	▲ 19.1%
▫ Imports	3.3	▲ 15.8%
▫ Exports	20.1	▲ 19.6%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**44.1**	▲ **8.9%**
• Domestic	27.3	▲ 6.7%
• Foreign	16.9	▲ 12.6%
▫ Imports	2.1	▲ 31.3%
▫ Exports	14.8	▲ 10.4%

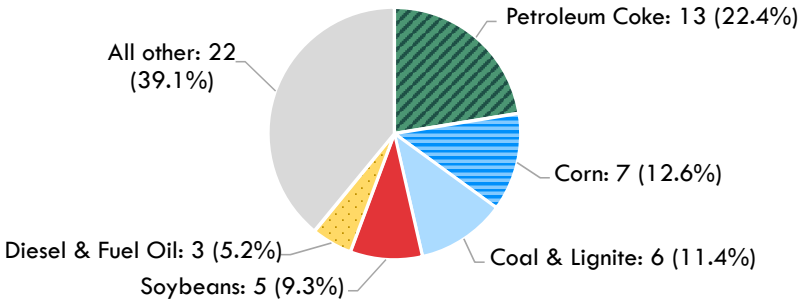


PORT OF PLAQUEMINES (CONTINUED)

THROUGHPUT

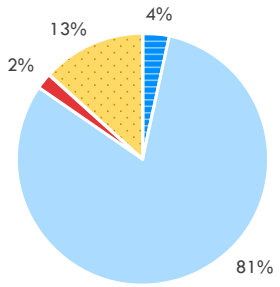
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**16,033**	▲ **8.3%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	548	▲ 8.5%
Average dry bulk tonnage (short tons) per dry bulk vessel	33,494	
Dry bulk barge	13,017	▲ 12.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,981	
Other freight vessel	333	▲ 21.4%
Other freight barge	2,137	▼ -12.4%

PORT OF PLAQUEMINES (CONTINUED)

CAPACITY

Non-container terminals

All 24 of the Port of Plaquemines's terminals are private.

Channel depth

Authorized channel depth (ft)	**45.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. N/A designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Plaquemines Port Harbor and Terminal District website, available at http://www.portofplaquemines.com, including terminal websites accessed through the main port website, as of November 2017. Rio Grande Pacific website, available at http://rgpc.com/, as of December 2017.

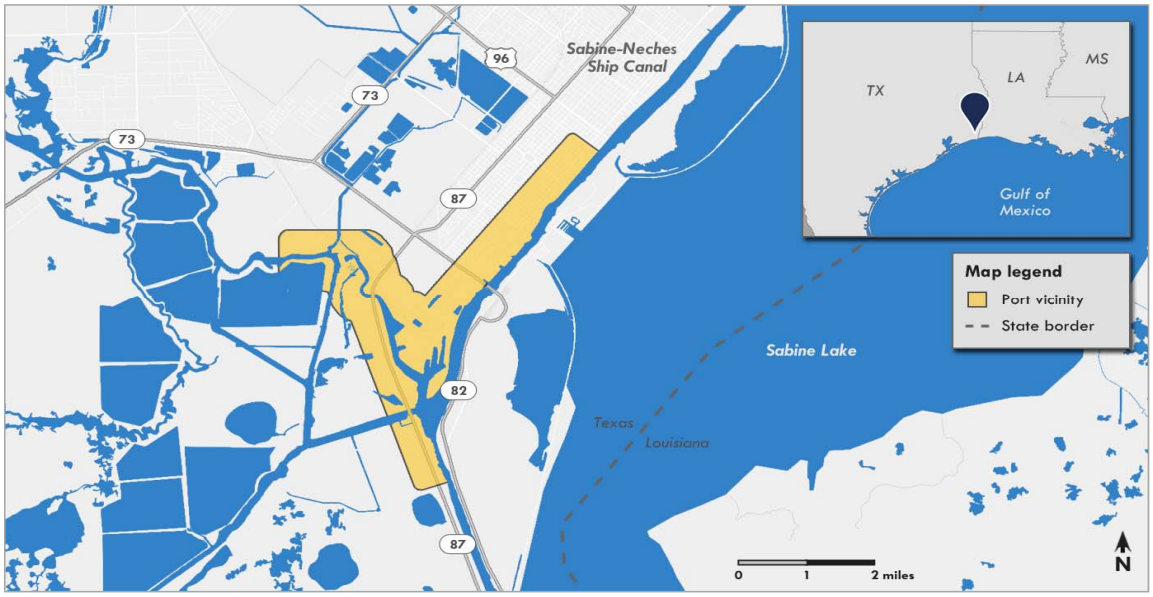
PORT OF PORT ARTHUR

Texas

Gulf Coast & Mississippi River

Port list:

Tonnage



Port vicinity map illustrates area facilities.

Port overview

The Port of Port Arthur is located 19 miles from the Gulf of Mexico, on Lake Sabine in southeastern Texas. It is located at the approximate midpoint of the Gulf Intracoastal Waterway, which stretches from St. Marks, Florida, to Brownsville, Texas. A five-member board of commissioners oversees the port.

The port has one public terminal that handles break-bulk and dry bulk cargoes; facilities also include a dedicated Ro/Ro area. The port's primary cargoes handled include petroleum products, chemical products (e.g., metallic salts, naphtha), and forest products such as lumber and wood pellets.

The port has access to one Class I rail service and to barge services on inland waterways and the Gulf Intracoastal Waterway.

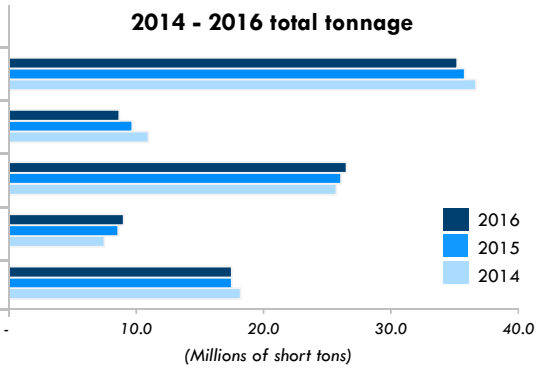
PORT OF PORT ARTHUR (CONTINUED)

THROUGHPUT

Cargo

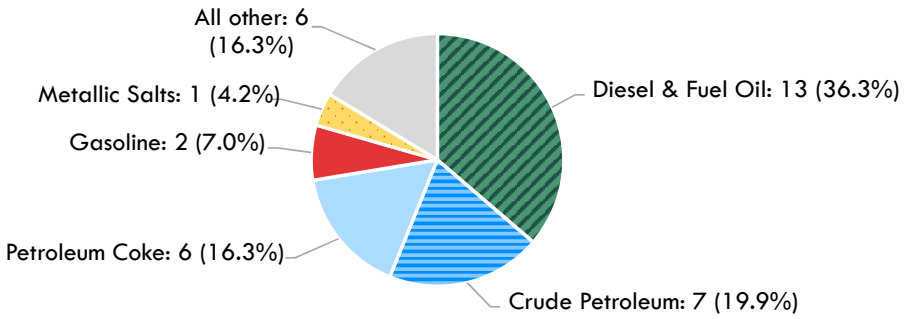
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**35.2**	▼ **-1.6%**
• Domestic	8.7	▼ -10.5%
• Foreign	26.5	▲ 1.6%
▫ Imports	9.0	▲ 4.8%
▫ Exports	17.5	▲ 0.1%



Commodities

Tonnage *Millions of short tons (percent of total)*

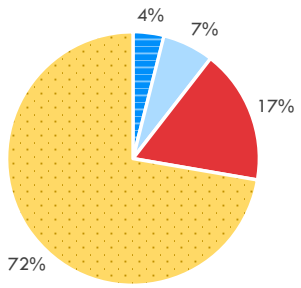


PORT OF PORT ARTHUR (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**3,404**	▲ **2.3%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	135	▼ -20.9%
Average dry bulk tonnage (short tons) per dry bulk vessel	42,614	
Dry bulk barge	224	▲ 33.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,880	
Other freight vessel	585	▲ 3.3%
Other freight barge	2,461	▲ 1.6%

CAPACITY

Non-container terminals

The Port of Port Arthur complex includes the following terminals: Port Arthur International Public Port.

Channel depth

Authorized channel depth (ft)	**42.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: N/A designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Port Arthur website, available at https://portpa.com, including terminal websites accessed through the main port website, as of November 2017.

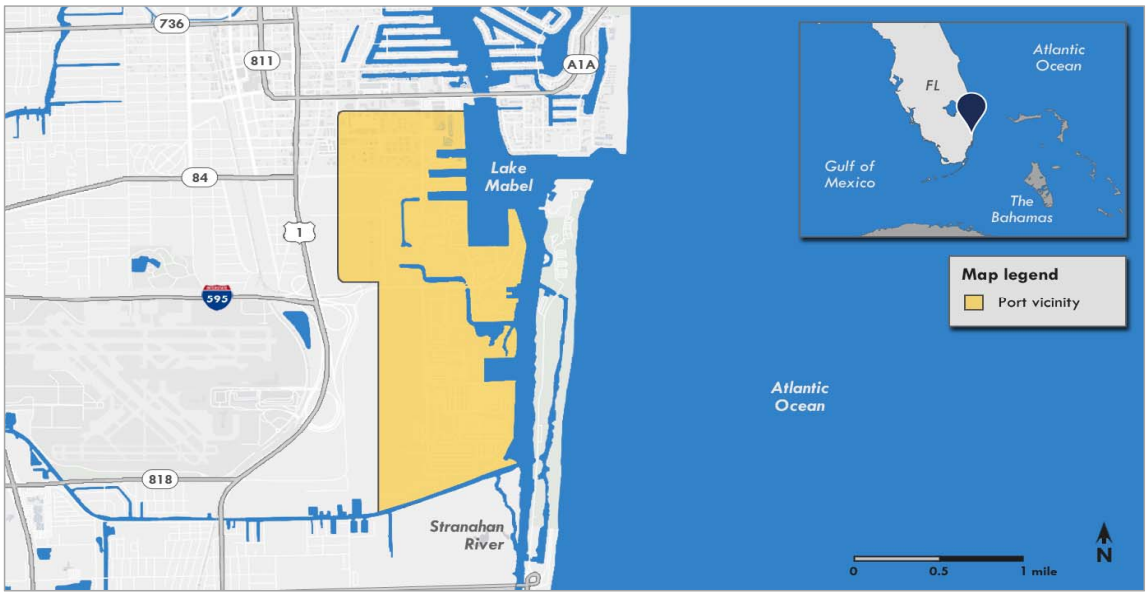
PORT EVERGLADES

Florida

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities.

Port overview

Port Everglades is located on Florida's southeastern coast, about 20 miles north of Miami. Broward County's Port Everglades Department oversees the port's public facilities.

The port has two terminals that mostly handle containerized cargo and others that handle non-container cargoes such as dry and liquid bulk. The port also has multiple private petroleum terminals and a Ro/Ro terminal that handles automobiles. Key containerized commodities handled include citrus fruit, apples, and grapes. Other major commodities include petroleum products (e.g., gasoline, kerosene, fuel oil), as well as cement, aggregate, gypsum, lumber, steel rebar, and other construction materials.

The port has access to Class II rail service with connections to two Class I rail lines.

Port Updates:
As of August 2017, the port is preparing designs for harbor navigational improvements in coordination with USACE. In June 2017, Port Everglades ordered three Super Post-Panamax cranes to be delivered in 2019.

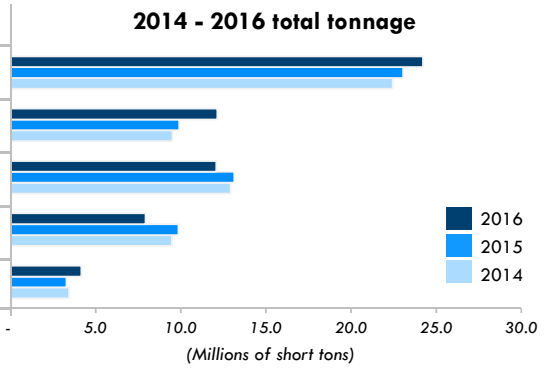
PORT EVERGLADES (CONTINUED)

THROUGHPUT

Cargo

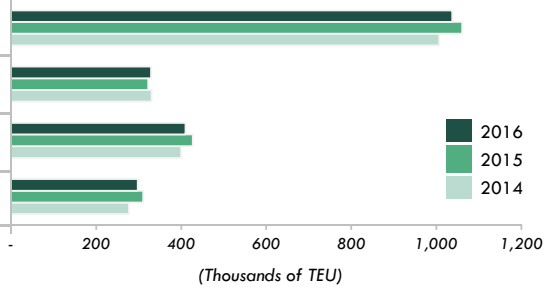
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**24.2**	▲ 5.1%
• Domestic	12.1	▲ 22.4%
• Foreign	12.1	▼ -8.0%
▫ Imports	7.9	▼ -19.5%
▫ Exports	4.2	▲ 26.4%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,037**	▼ -2.2%
• Inbound loaded TEU	329	▲ 2.0%
• Outbound loaded TEU	410	▼ -4.0%
• Empties (in- & outbound)	298	▼ -4.1%

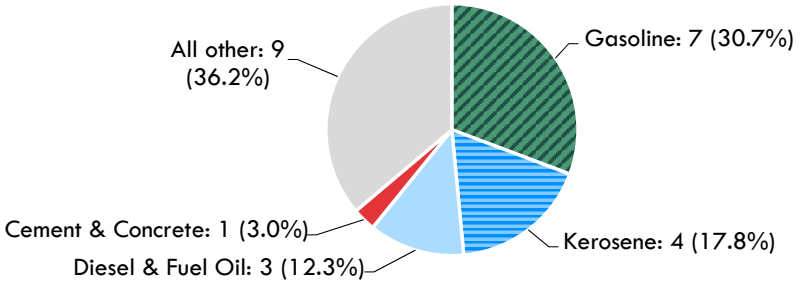


PORT EVERGLADES (CONTINUED)

THROUGHPUT

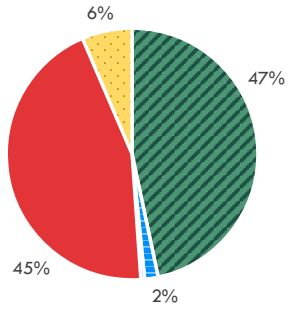
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

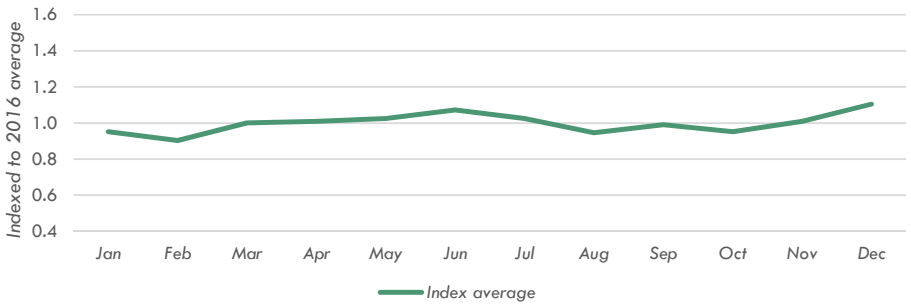
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**3,235**	▲ **6.9%**
Container vessel	1,510	▲ 26.1%
Average TEU per container vessel	687	▼ -22.4%
Dry bulk vessel	56	▲ 2.8%
Average dry bulk tonnage (short tons) per dry bulk vessel	24,665	
Dry bulk barge	16	0.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	7,959	
Other freight vessel	1,446	▼ -7.5%
Other freight barge	209	▲ 5.8%

Vessel dwell time

2016 container vessel dwell time index



PORT EVERGLADES (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Midport	40	800	N/A	N/A	42	1	1	-	N
Southport	300	2,900	N/A	N/A	42	-	7	-	N

Non-container terminals

In addition to the container terminals listed above, Port Everglades includes eight bulk and break-bulk terminals.

Channel depth

Authorized channel depth (ft)	**45.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port Everglades website, available at http://www.porteverglades.net, including terminal websites accessed through the main port website, as of November 2017.

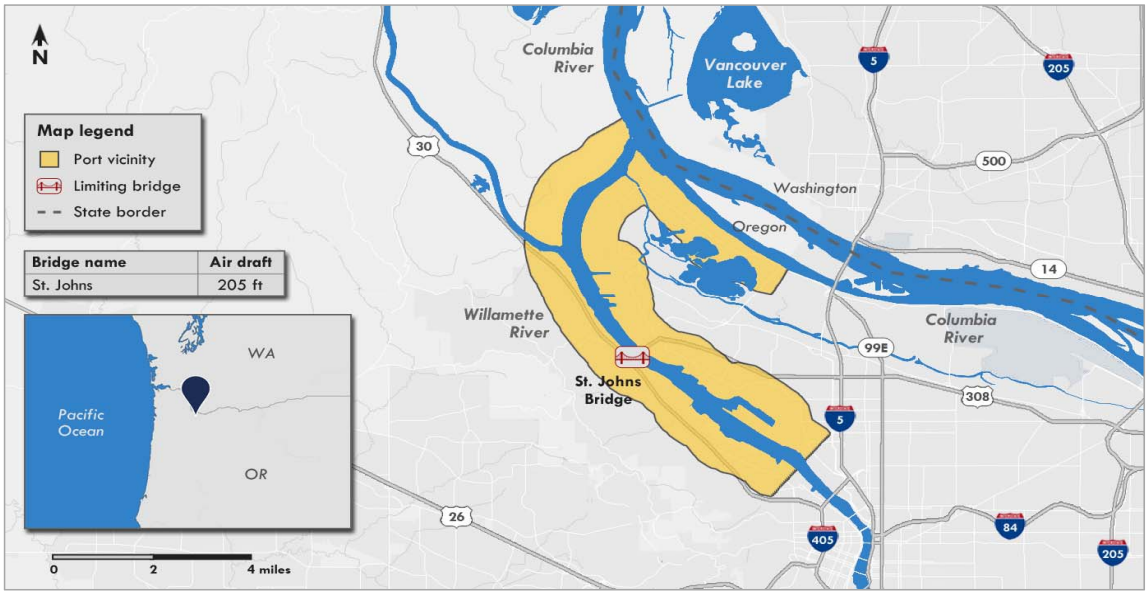
PORT OF PORTLAND

Oregon

Pacific Coast

Port list:

Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Lewis & Clark Bridge (187 ft), not shown, may limit vessels serviced at the Port of Portland.

Port overview

The Port of Portland is located 100 miles upriver from the Pacific Ocean, at the confluence of the Columbia and Willamette Rivers. The port is governed by a nine-member Port of Portland Commission.

The port complex includes four public marine terminals as well as an industrial park and industrial district with warehousing, distribution, manufacturing, and processing facilities. The marine terminals together handle all cargo types including dry bulk, liquid bulk, break-bulk, containerized, project, and Ro/Ro cargoes. Examples of major commodities handled by the port include bulk grains such as wheat, salts, sand and gravel, fertilizers (especially potash and soda ash), and liquid fuel.

The port has access to two Class I railroads, as well as Class II service and a short-line railroad.

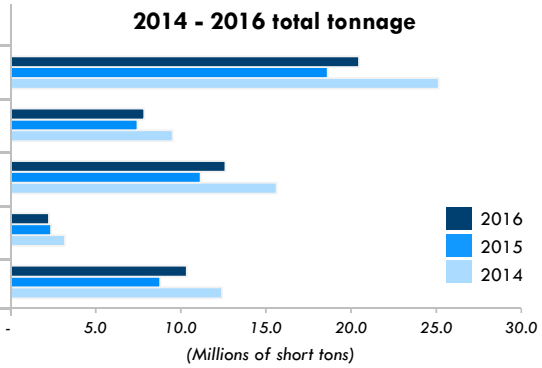
PORT OF PORTLAND (CONTINUED)

THROUGHPUT

Cargo

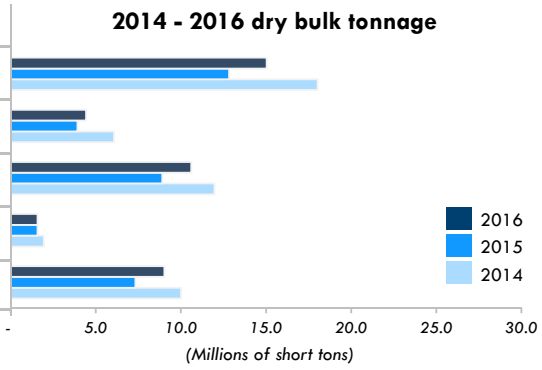
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**20.5**	▲ **9.9%**
• Domestic	7.9	▲ 5.4%
• Foreign	12.6	▲ 12.9%
▫ Imports	2.3	▼ -4.9%
▫ Exports	10.4	▲ 17.8%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**15.0**	▲ **17.3%**
• Domestic	4.4	▲ 12.9%
• Foreign	10.6	▲ 19.2%
▫ Imports	1.6	▲ 0.4%
▫ Exports	9.0	▲ 23.2%

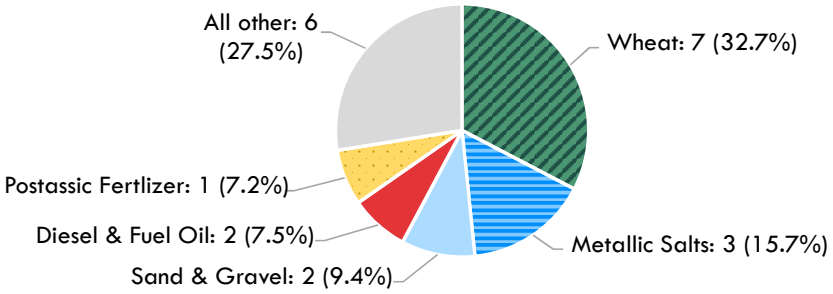


PORT OF PORTLAND (CONTINUED)

THROUGHPUT

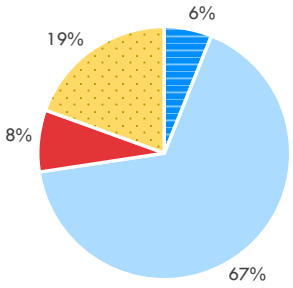
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,540**	▲ **11.0%**
Container vessel	0	▼ -100.0%
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	155	▲ 10.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	65,490	
Dry bulk barge	1,690	▲ 14.0%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,914	
Other freight vessel	201	▲ 3.1%
Other freight barge	495	▲ 7.2%

PORT OF PORTLAND (CONTINUED)

CAPACITY

Non-container terminals

The Port of Portland complex includes the following terminals: Terminal 2, Terminal 4, Terminal 5, and private bulk terminals. Terminal 6, a container terminal, was idle in 2016.

Channel depth

Authorized channel depth (ft)	**55.0**	Maximum depth of approach channel (ft)	**50.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Portland website, available at https://www2.portofportland.com, including terminal websites accessed through the main port website, as of November 2017.

PORT OF SAN JUAN

Puerto Rico

Gulf Coast & Mississippi River

Port list:

Container

Port vicinity map illustrates area facilities.

Port overview

The multiple public and private passenger and cargo facilities in and around San Juan Bay are collectively known as the Port of San Juan. Public facilities are administered by the Puerto Rico Ports Authority (PRPA), under Puerto Rico's Department of Transportation and Public Works. PRPA oversees all Puerto Rican seaports and airports, and is governed by an appointed Board of Directors.

The port's main public cargo facilities are located in the Puerto Nuevo complex, which handles containerized and break-bulk cargoes with and without shore-side cranes. Containers are also handled at the private Isla Grande barge terminal. Additional private facilities handle containers in Ro/Ro and barge service, and bulk commodities. Major commodities handled at the port include manufactured products, distillate fuel oil, gasoline, foodstuffs, and kerosene.

The Port of San Juan suffered major disruption and damage during the 2017 hurricane season.

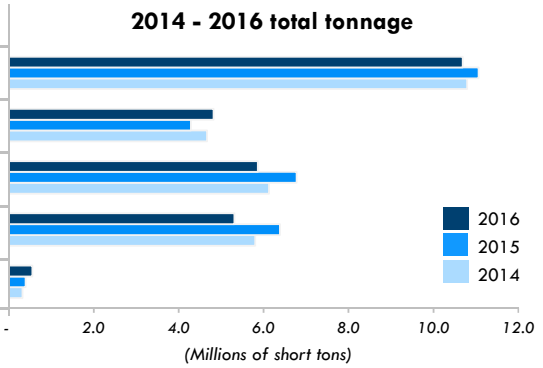
PORT OF SAN JUAN (CONTINUED)

THROUGHPUT

Cargo

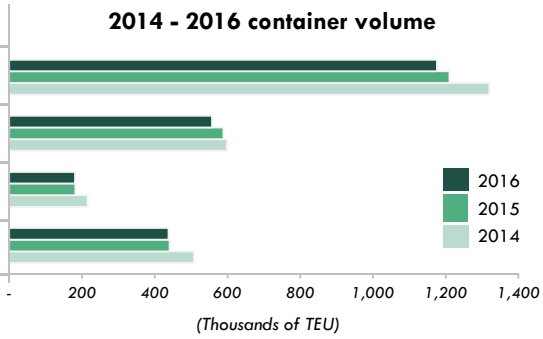
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**10.7**	▼ **-3.4%**
• Domestic	4.8	▲ 12.6%
• Foreign	5.9	▼ -13.5%
▫ Imports	5.3	▼ -16.9%
▫ Exports	0.6	▲ 41.0%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,176**	▼ **-2.9%**
• Inbound loaded TEU	557	▼ -5.4%
• Outbound loaded TEU	181	▼ -0.1%
• Empties (in- & outbound)	438	▼ -0.6%

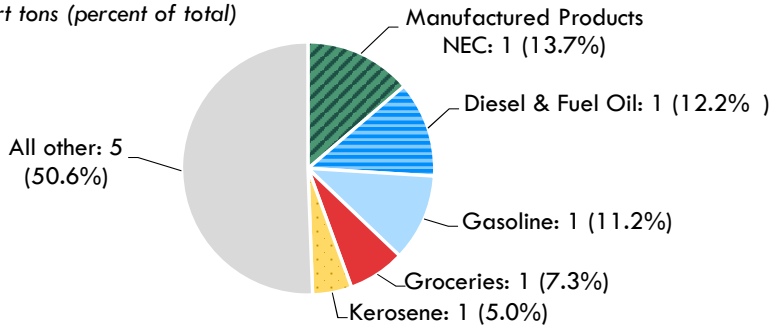


PORT OF SAN JUAN (CONTINUED)

THROUGHPUT

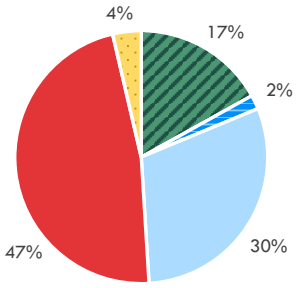
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

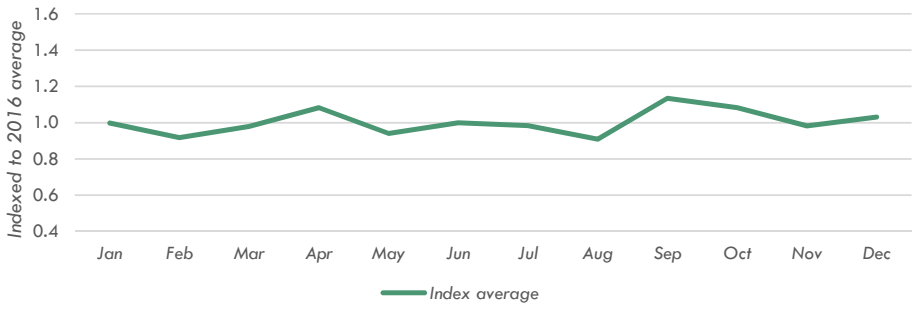
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,501**	▼ **-3.2%**
Container vessel	254	▼ -11.0%
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	27	▼ -47.6%
Average dry bulk tonnage (short tons) per dry bulk vessel	18,787	
Dry bulk barge	455	▼ -10.5%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	9,065	
Other freight vessel	711	▲ 13.9%
Other freight barge	55	▼ -32.3%

Vessel dwell time

2016 container vessel dwell time index



PORT OF SAN JUAN (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Puerto Nuevo Complex	25	7,150	N/A	N/A	39	9	2	-	N
Isla Grande	U	2,000	N/A	N/A	36	-	-	-	N

Non-container terminals

In addition to the container terminals listed above, the Port of San Juan complex includes multiple private and public terminals.

Channel depth

Authorized channel depth (ft)	**56.0**	Maximum depth of approach channel (ft)	**40.0**

NOTES: Vessel call numbers might not add to 100% due to rounding. "N/A" designates a metric that does not apply for this port. "U" designates data that was unavailable. This port is served by a mix of container vessels and barges that can carry both containers and non-container Ro/Ro or break-bulk cargo. Available data on vessel calls may not accurately reflect vessel counts or average TEU handled for container cargo.

SOURCES: Port Overview/Terminals—Port of San Juan website, available at http://www.prpa.gobierno.pr/maritime, accessed October 2016, including terminal websites accessed through the main port website, as of November 2017. **Container Volume**—PRPA, as of November 2017.

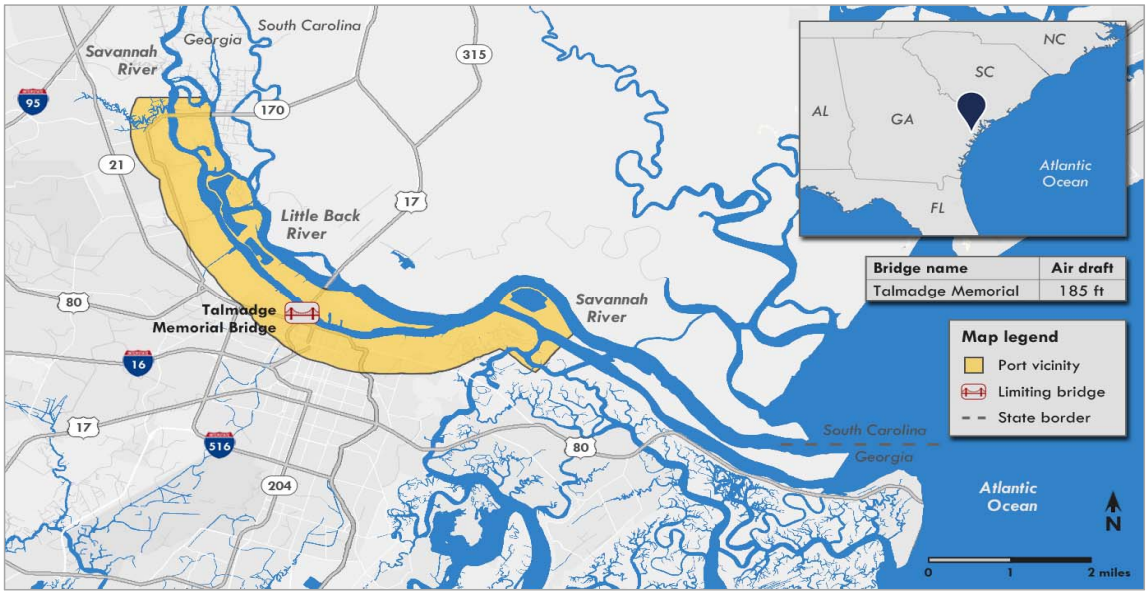
PORT OF SAVANNAH

Georgia

Atlantic Coast

Port list:

Container | Tonnage



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Savannah and Little Back Rivers form the border between South Carolina and Georgia.

Port overview

The Port of Savannah is located on the Savannah River, about 12 miles inland from the Atlantic Ocean. The port is governed by the 13-member Georgia Ports Authority (GPA) Board of Directors.

The port has two public terminals: Garden City, which handles containerized and liquid bulk cargoes, and Ocean, which handles break-bulk, project, and Ro/Ro cargoes. Commodities handled include manufactured products (e.g., consumer goods, furniture, appliances, and electronics), food products (especially fresh and frozen poultry), forest products, steel, automobiles, wood pulp, paper, and clay.

Both terminals have access to two Class I railroads.

Port Updates:
In coordination with USACE, in 2015 GPA began deepening Savannah Harbor and its shipping channel from an authorized depth of 44 feet to 47 feet. Outer harbor deepening is anticipated to be complete in 2018 while deepening of the inner harbor is slated for completion in 2022. The port is also planning to expand the Garden City Terminal's rail capacity over a two-year period between 2018 and 2020, in part supported by a $44 million Federal transportation grant received in 2016. In November 2017, the port received four new Super Post-Panamax cranes; six additional cranes are expected to arrive in 2020.

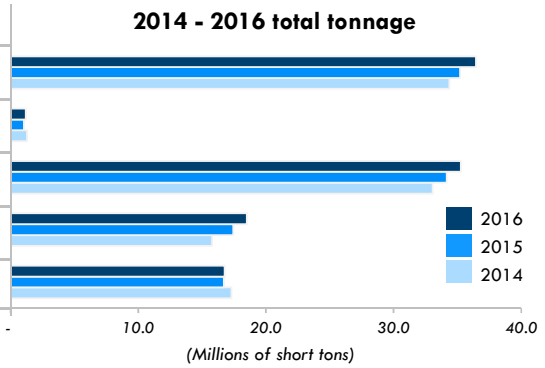
PORT OF SAVANNAH (CONTINUED)

THROUGHPUT

Cargo

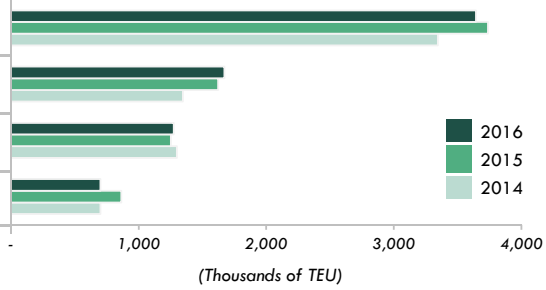
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**36.4**	▲ **3.5%**
• Domestic	1.2	▲ 12.7%
• Foreign	35.3	▲ 3.2%
▫ Imports	18.5	▲ 6.1%
▫ Exports	16.8	▲ 0.3%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**3,645**	▼ **-2.5%**
• Inbound loaded TEU	1,671	▲ 3.0%
• Outbound loaded TEU	1,274	▲ 1.8%
• Empties (in- & outbound)	699	▼ -19.0%

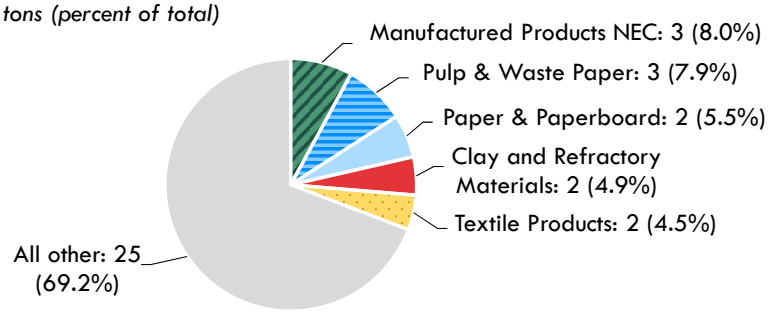


PORT OF SAVANNAH (CONTINUED)

THROUGHPUT

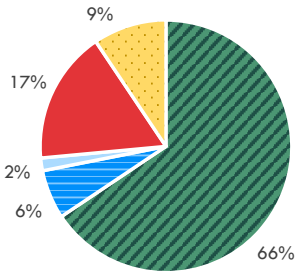
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

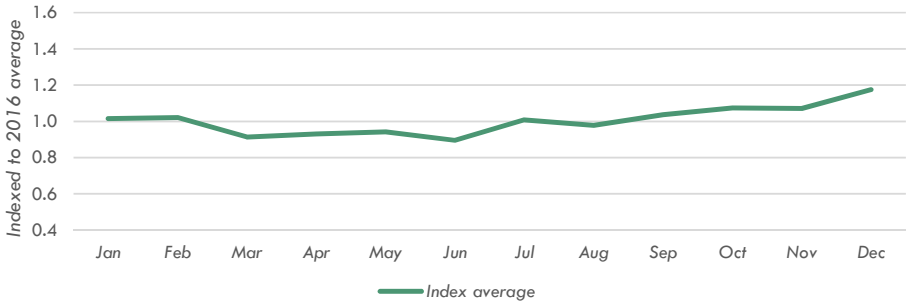
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,905**	▼ **-0.3%**
Container vessel	1,906	▲ 2.9%
Average TEU per container vessel	1,912	▼ -5.2%
Dry bulk vessel	183	▲ 0.6%
Average dry bulk tonnage (short tons) per dry bulk vessel	20,075	
Dry bulk barge	47	▲ 121.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	375	
Other freight vessel	496	▼ -8.9%
Other freight barge	274	▼ -13.0%

Vessel dwell time

2016 container vessel dwell time index



PORT OF SAVANNAH (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Garden City Terminal	1,200	9,693	185	Talmadge Memorial	42	-	6	20	Y

Non-container terminals

In addition to the container terminal listed above, the Port of Savannah complex includes the following terminal: Ocean Terminal.

Channel depth

Authorized channel depth (ft)	**44.0**	Maximum depth of approach channel (ft)	**44.0**

NOTES: Vessel call numbers might not add to 100% due to rounding. The northern end of the Garden City Terminal includes a project with a range of depths from 36 to 42 feet. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Savannah website, available at http://www.gaports.com, including terminal websites accessed through the main port website, as of November 2017. *Dredging Today.com* news article, https://www.dredgingtoday.com/2017/12/04/shep-moves-ahead-final-phase-of-outer-channel-deepening-kicks-off/, as of December 2017.

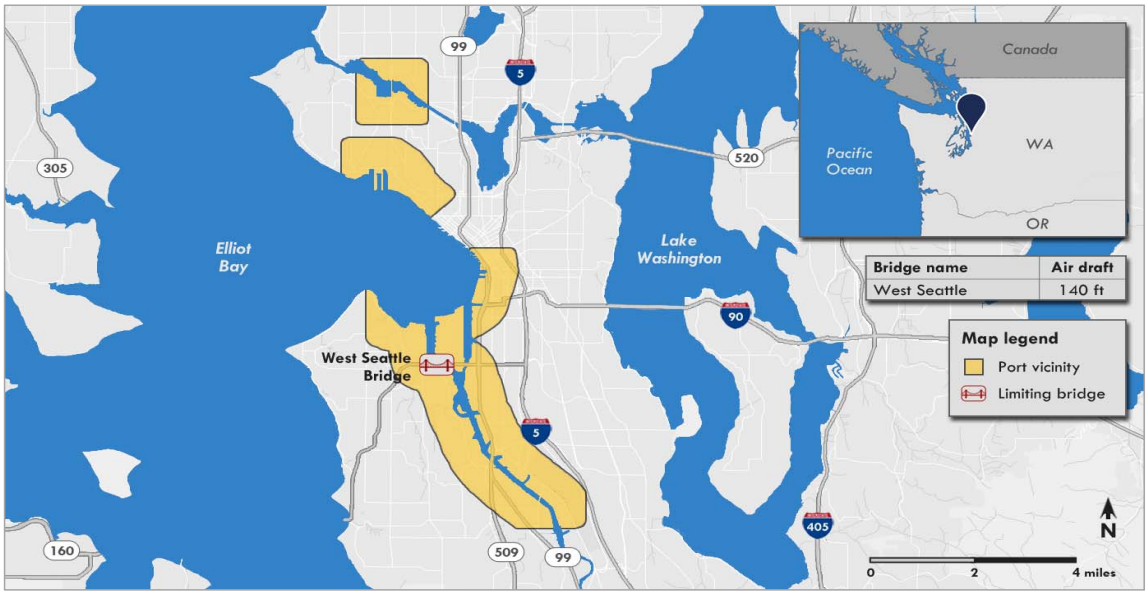
PORT OF SEATTLE

Washington

Pacific Coast

Port list:

Container | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.

Port overview

The Port of Seattle is located on Elliott Bay, just south of downtown Seattle. The port joined the Port of Tacoma in an operating partnership called the Northwest Seaport Alliance (NWSA) in 2015. The Port of Seattle is governed by the five-member Port of Seattle Commission (the Port of Tacoma has its own separate governing commission).

The port has four currently active public terminals:

- Terminals 18, 25/30, 46, and 115 handle container traffic (Terminal 18 also handles Ro/Ro cargoes and Terminal 25/30 also handle break-bulk cargoes).
- Terminal 115 is a barge terminal primarily engaged in domestic traffic.

The port primarily handles containerized and break-bulk cargoes including fresh seafood, sand and gravel, agricultural products (e.g., soybeans, corn), fuel oil, and manufactured products such as electronics, furniture, machinery, and sports equipment.

Terminal 18 has on-dock rail service via one Class I rail line; the other four terminals at the port have near-dock Class I rail access.

Port Updates:
In June 2017, the NWSA approved an additional $2.9 million in improvements to Terminal 18. NWSA also plans to modernize Seattle's Terminal 5 (currently idle, but being redeveloped) to prepare for larger vessel calls. The Port of Seattle will contribute to a $25 million overpass at the UP railroad crossing to reduce freight traffic delays and enhance safety.

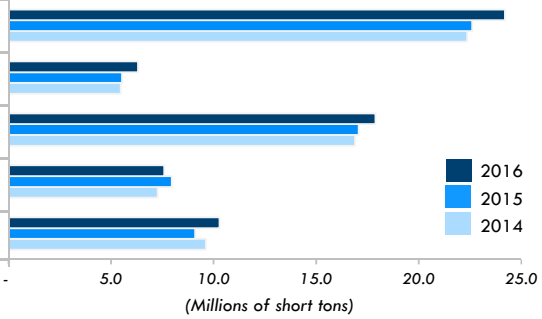
PORT OF SEATTLE (CONTINUED)

THROUGHPUT

Cargo

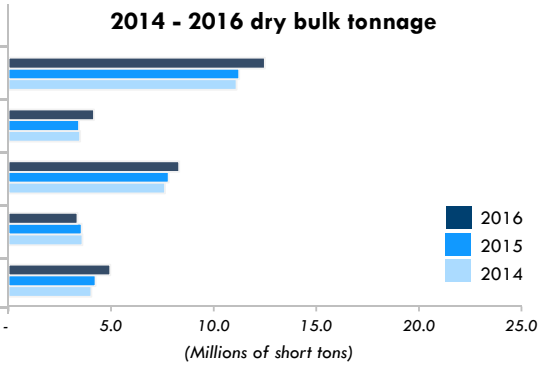
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**24.2**	▲ **7.1%**
• Domestic	6.3	▲ 14.1%
• Foreign	17.9	▲ 4.8%
▫ Imports	7.6	▼ -4.6%
▫ Exports	10.3	▲ 13.0%



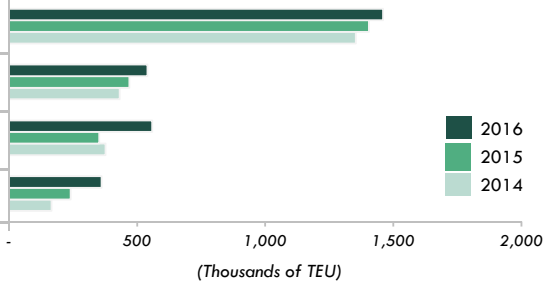
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**12.5**	▲ **11.1%**
• Domestic	4.2	▲ 21.3%
• Foreign	8.3	▲ 6.6%
▫ Imports	3.4	▼ -5.6%
▫ Exports	5.0	▲ 16.8%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**1,460**	▲ **3.9%**
• Inbound loaded TEU	540	▲ 15.0%
• Outbound loaded TEU	558	▲ 58.5%
• Empties (in- & outbound)	361	▲ 50.4%

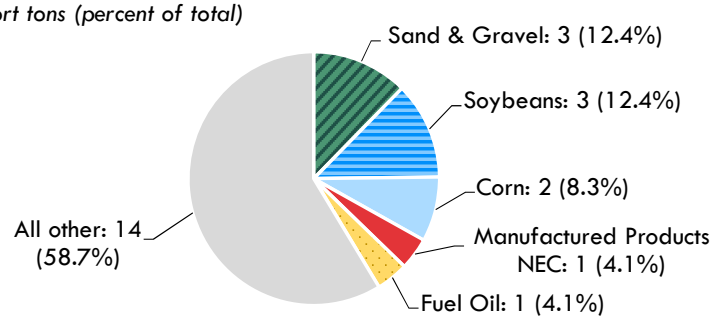


PORT OF SEATTLE (CONTINUED)

THROUGHPUT

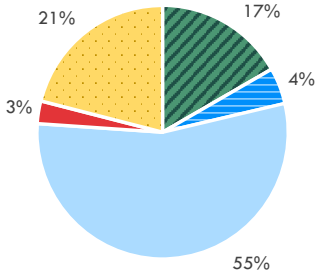
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

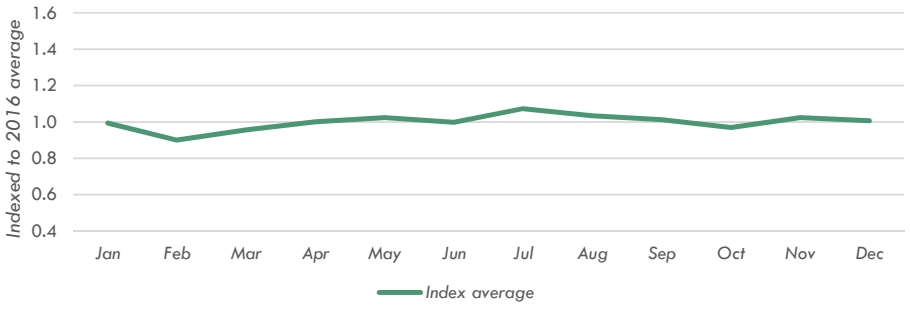
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,413**	▼ **-1.0%**
Container vessel	404	▲ 0.4%
Average TEU per container vessel	3,617	▲ 3.5%
Dry bulk vessel	112	▲ 10.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	53,268	
Dry bulk barge	1,321	▼ -2.7%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	4,958	
Other freight vessel	70	▼ -2.1%
Other freight barge	508	▲ 0.3%

Vessel dwell time

2016 container vessel dwell time index



PORT OF SEATTLE (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Terminal 18	196	4,440	N/A	N/A	34	-	3	7	Y
Terminal 25/ 30	70	2,700	N/A	N/A	34	3	-	3	N
Terminal 46	82	2,300	N/A	N/A	N/A	-	3	3	N
Terminal 115	70	1,600	140	West Seattle	30	-	-	-	N

Non-container terminals

N/A

Channel depth

Authorized channel depth (ft)	**51.0**	Maximum depth of approach channel (ft)	**51.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity. NWSA reports combined TEU figures for the Ports of Seattle and Tacoma. For 2015, BTS used TEU counts reported by the Port of Seattle; for 2016, BTS assigned the NWSA TEU counts to the two ports based on the distribution reported by USACE. Port of Seattle reported 2015 domestic transshipment of 342,260 TEU; 2016 domestic transshipment is calculated at 415,807 TEU based on division of NWSA statistics. Domestic transshipment volume is included in all TEU statistics presented in the profile.

SOURCES: Port Overview/Terminals—Port of Seattle website, available at http://www.portseattle.org, including terminal websites accessed through the main port website, as of November 2017. NWSA website, available at https://www.nwseaportalliance.com, as of November 2017. Kent, Washington website, available at https://www.kentwa.gov, as of November 2017. **Container Volume**—Seattle Annual Financial Report 2015, Schedule 19 Port of Seattle Container Volumes, p. 19, available at https://www.portseattle.org/About/Financial-Info/Documents/2015_cafr_final.pdf.

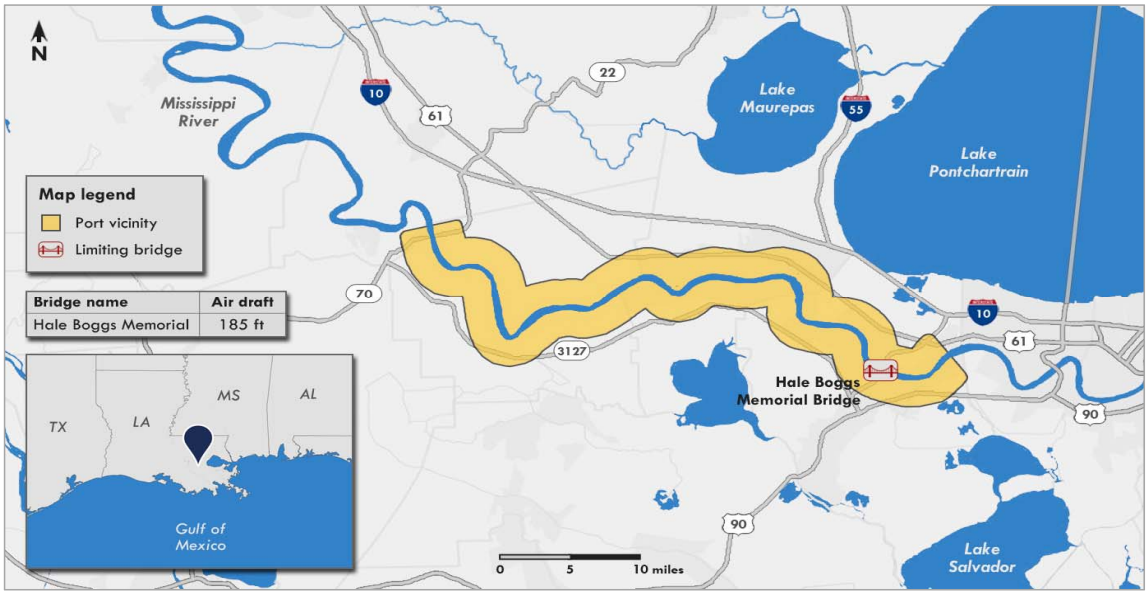
PORT OF SOUTH LOUISIANA

Louisiana

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The Huey P. Long Bridge (132 ft), not shown, may limit vessels serviced at the Port of South Louisiana.

Port overview

The Port of South Louisiana extends for 54 miles along the Mississippi River and includes more than 40 liquid and dry bulk terminals between Baton Rouge and New Orleans, Louisiana. A nine-member Board of Commissioners governs the port.

The port has one public terminal (Globalplex Intermodal Terminal), which handles dry bulk (including cement, mineral ores, and woodchips), break-bulk, and containerized cargo. The port also has four facilities leased to private operators, including grain elevators, oil terminals, and liquid and dry bulk terminals. The port handles a variety of bulk and liquid bulk cargoes, including soybeans, corn, and liquid fuel, as well as coal, cement, woodchips, fertilizers, and stone.

The port has access to three Class I railroads.

Port Updates:
In May 2017, the port expanded bulk storage facilities at the Globalplex Intermodal Terminal. This project also involved developing terminal infrastructure including a new roadway and loading dock ramp. In August 2017, the port opened a new liquid bulk terminal and storage facility in conjunction with a private terminal operator.

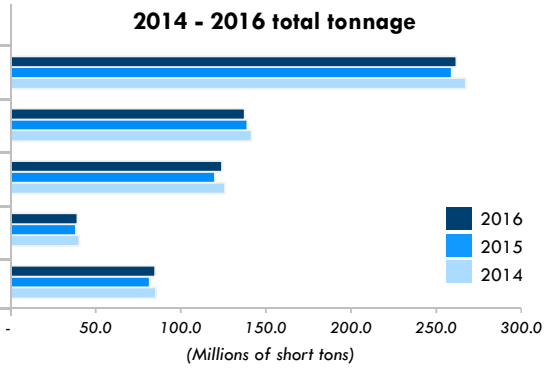
PORT OF SOUTH LOUISIANA (CONTINUED)

THROUGHPUT

Cargo

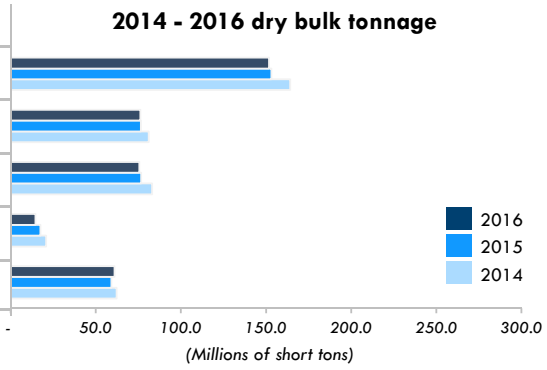
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**261.9**	▲ 1.1%
• Domestic	137.6	▼ -1.0%
• Foreign	124.3	▲ 3.5%
▫ Imports	39.3	▲ 2.7%
▫ Exports	84.9	▲ 3.9%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**151.8**	▼ **-0.9%**
• Domestic	76.2	▼ -0.4%
• Foreign	75.5	▼ -1.4%
▫ Imports	14.6	▼ -16.7%
▫ Exports	61.0	▲ 3.1%

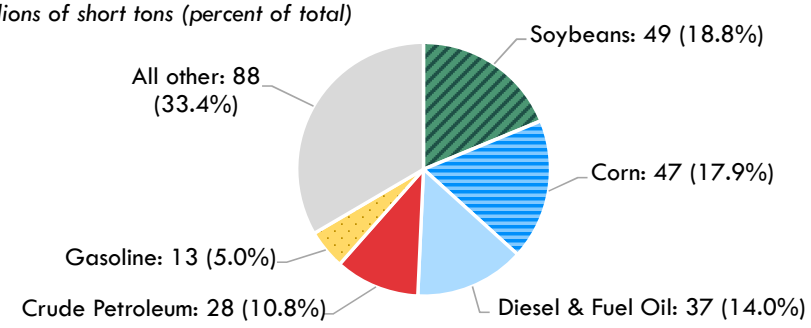


PORT OF SOUTH LOUISIANA (CONTINUED)

THROUGHPUT

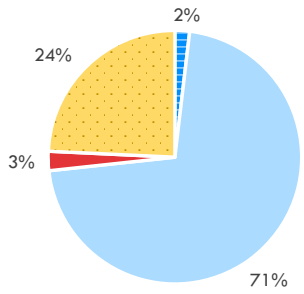
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**51,785**	▲ **3.7%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	975	▼ -4.6%
Average dry bulk tonnage (short tons) per dry bulk vessel	78,229	
Dry bulk barge	36,976	▲ 5.8%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,042	
Other freight vessel	1,276	▲ 11.8%
Other freight barge	12,559	▼ -1.9%

PORT OF SOUTH LOUISIANA (CONTINUED)

CAPACITY

Non-container terminals

The Port of South Louisiana complex includes the following terminals: Globalplex Intermodal Terminal and over 30 private terminals.

Channel depth

Authorized channel depth (ft)	**45.0**	Maximum depth of approach channel (ft)	**45.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of South Louisiana website, available at http://www.portsl.com, including terminal websites accessed through the main port website, as of November 2017.

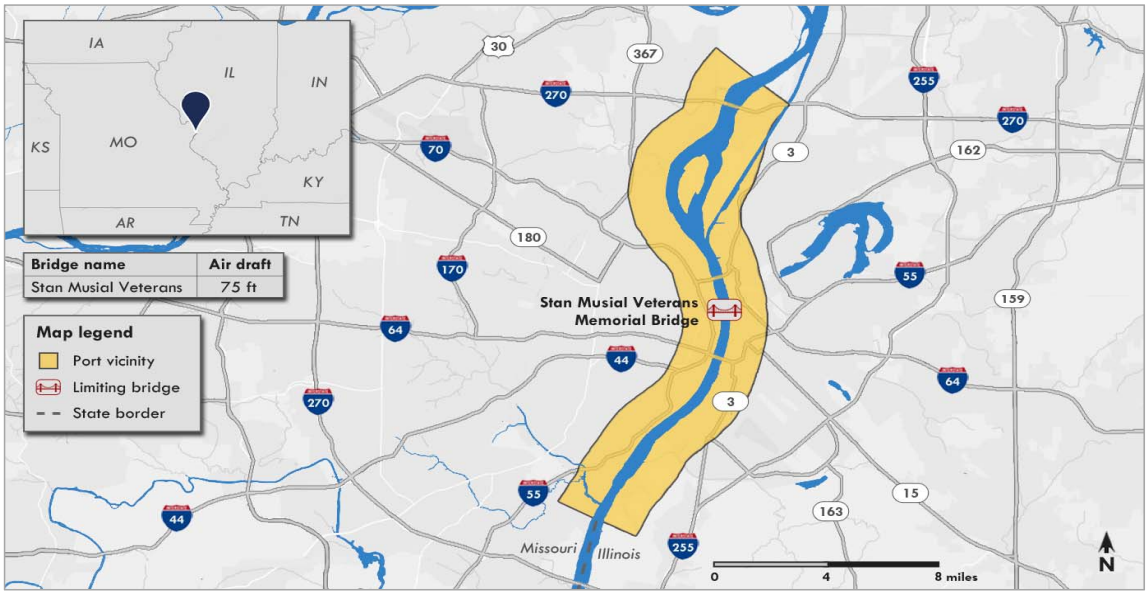
PORT OF METROPOLITAN ST. LOUIS

Illinois and Missouri

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic. The Mississippi River forms the border between Missouri and Illinois.

Port overview

The Port of Metropolitan St. Louis is located along 70 miles of the Mississippi River, on both the Missouri and Illinois shores. The St. Louis Port Authority governs the port's facilities within the City of St. Louis.

The St. Louis Port Authority oversees one terminal, the Municipal River Terminal, which is located within the limits of the City of St. Louis. This terminal handles a wide variety of dry, liquid, and break-bulk cargoes. The Port of Metropolitan St. Louis complex includes multiple additional private terminals that also handle these and other cargoes.

Major commodities handled by the Port of Metropolitan St. Louis complex include agricultural products (e.g., soybeans, corn), cement, coal, and petroleum coke.

The Port of Metropolitan St. Louis complex has access to six Class I railroads.

Port Updates:
The Port of Metropolitan St. Louis is currently engaged in several terminal and rail access upgrades.

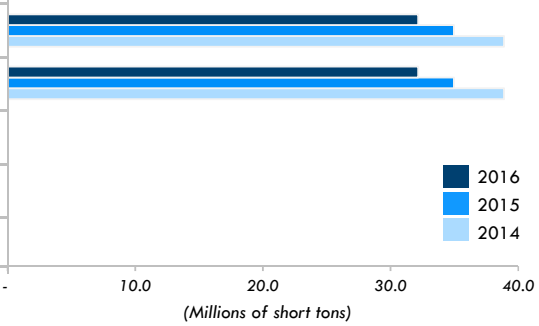
PORT OF METROPOLITAN ST. LOUIS (CONTINUED)

THROUGHPUT

Cargo

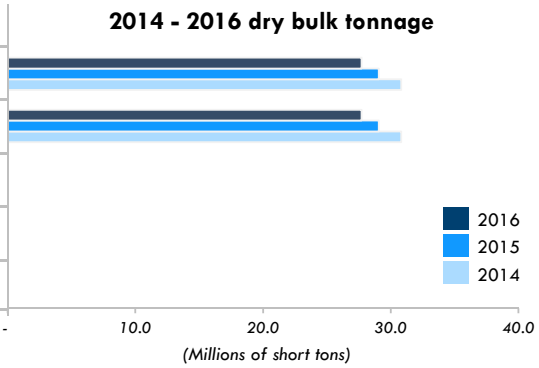
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**32.2**	▼ **-8.0%**
• Domestic	32.2	▼ -8.0%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**27.7**	▼ **-4.7%**
• Domestic	27.7	▼ -4.7%
• Foreign	0.0	N/A
▫ Imports	0.0	N/A
▫ Exports	0.0	N/A

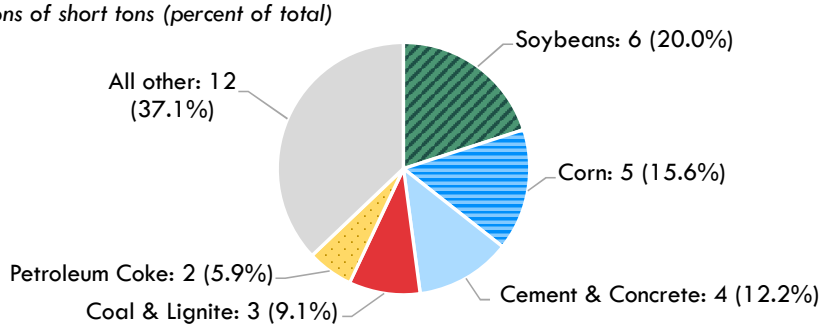


PORT OF METROPOLITAN ST. LOUIS (CONTINUED)

THROUGHPUT

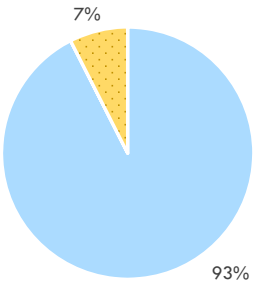
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**19,626**	▲ **6.6%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	18,159	▲ 9.6%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,526	
Other freight vessel	0	N/A
Other freight barge	1,468	▼ -20.3%

PORT OF METROPOLITAN ST. LOUIS (CONTINUED)

CAPACITY

Non-container terminals

The Port of St. Louis complex includes the following terminals: Municipal River Terminal and additional private terminals.

Channel depth

Authorized channel depth (ft)	**9.0**	Maximum depth of approach channel (ft)	**9.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

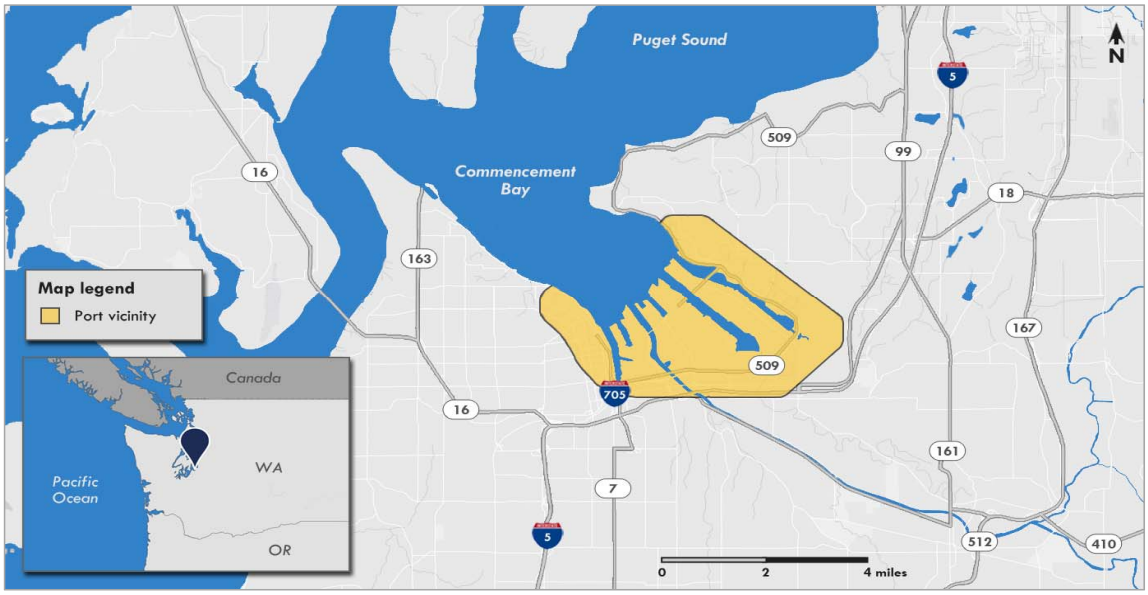
SOURCES: Port Overview/Terminals—Port of Metropolitan St. Louis website, available at https://www.stlouis-mo.gov/government/departments/sldc/slpa/port-of-metropolitan-st-louis.cfm, including terminal websites accessed through the main port website, as of November 2017.

PORT OF TACOMA

Washington

Pacific Coast

Port list: Container | Tonnage



Port vicinity map illustrates area facilities.

Port overview

The Port of Tacoma is located on Commencement Bay, east of downtown Tacoma, Washington. The port joined the Port of Seattle in an operating partnership called the Northwest Seaport Alliance (NWSA) in 2015. The Port of Tacoma is governed by a five-member Port of Tacoma Commission. (The Port of Seattle retains its own, separate governing commission).

The port includes six public container terminals: Husky, West Sitcum, East Sitcum, Pierce County, Washington United, and TOTE Maritime Alaska (a Ro/Ro barge facility serving the domestic trade). Additionally, the port has four public terminals (Blair, East Blair 1, West Hylebos, and Terminal 7) that handle bulk, break-bulk, and Ro/Ro cargoes. Commodities handled include fresh seafood, agricultural products (e.g., soybeans, corn, hay), fuel oil, autos, and a variety of manufactured products such as electronics, furniture, machinery, and sports equipment.

Four of the port's container terminals have on-dock rail connections via a short-line railroad to two Class I rail lines; other terminals have near-dock connections.

Port Updates:
The NWSA is reconfiguring an existing pier within the Husky Terminal to create one contiguous berth capable of serving two 18,000-TEU container ships at the same time. Expected costs for this project are $250 million. As of November 2017, the project is more than halfway complete. In June 2017, the NWSA approved the purchase of four additional cranes expected to be installed at the Husky Terminal by 2019, adding to four cranes previously approved. The NWSA also approved $2.9 million to improve infrastructure at the Pierce County Terminal and other facilities at the Port of Tacoma.

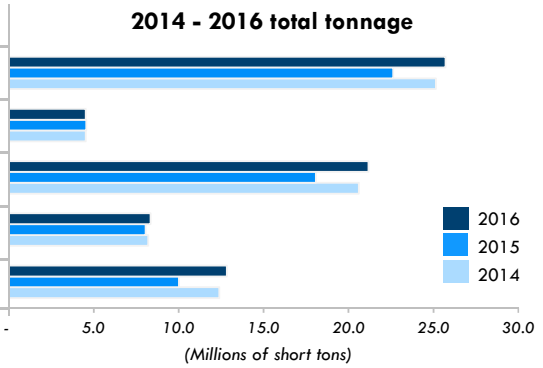
PORT OF TACOMA (CONTINUED)

THROUGHPUT

Cargo

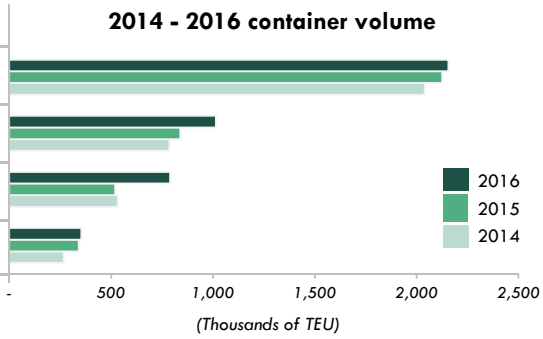
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**25.7**	▲ **13.6%**
• Domestic	4.5	▼ -0.4%
• Foreign	21.2	▲ 17.2%
▫ Imports	8.3	▲ 3.6%
▫ Exports	12.8	▲ 28.1%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**2,156**	▲ **1.5%**
• Inbound loaded TEU	1,014	▲ 20.9%
• Outbound loaded TEU	789	▲ 52.0%
• Empties (in- & outbound)	353	▲ 3.5%

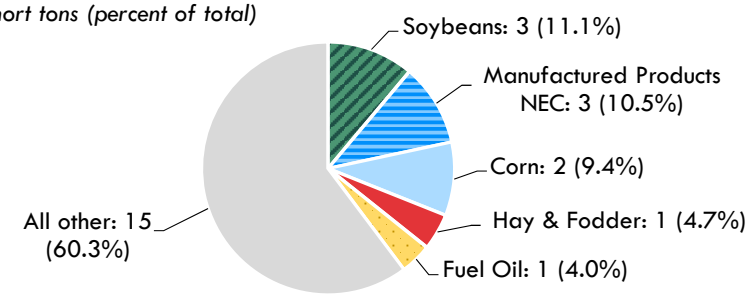


PORT OF TACOMA (CONTINUED)

THROUGHPUT

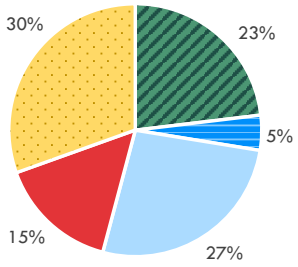
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

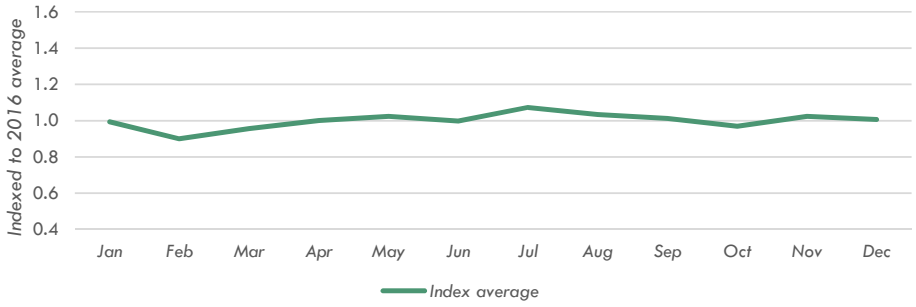
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**2,314**	▲ **8.4%**
Container vessel	535	▼ -5.0%
Average TEU per container vessel	4,034	▲ 6.8%
Dry bulk vessel	104	▲ 27.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	54,045	
Dry bulk barge	615	▲ 51.5%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,604	
Other freight vessel	356	▼ -4.0%
Other freight barge	705	▼ -1.3%

Vessel dwell time

2016 container vessel dwell time index



PORT OF TACOMA (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
TOTE Maritime Alaska Terminal	48	U	N/A	N/A	51	-	-	-	N
Husky Terminal	93	2,700	N/A	N/A	51	-	4	-	Y
East Sitcum Terminal	54	1,100	N/A	N/A	N/A	4	-	-	Y
West Sitcum Terminal	135	2,200	N/A	N/A	N/A	1	4	-	N
Washington United Terminals	123	2,600	N/A	N/A	51	-	4	2	Y
Pierce County Terminal	140	2,087	N/A	N/A	51	-	-	7	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Tacoma complex includes the following terminals: Terminal 7, East Blair 1, West Hylebos, and Blair Terminal.

Channel depth

Authorized channel depth (ft)	**51.0**	Maximum depth of approach channel (ft)	**51.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. "U" designates data that was unavailable. Vessel call numbers might not add to 100% due to rounding. NWSA reports combined TEU figures for the Ports of Seattle and Tacoma. For 2015, BTS used statistics reported by the Port of Seattle to determine container volume at the Port of Tacoma; for 2016, BTS assigned the NWSA TEU counts to the two ports based on the distribution reported by USACE. Domestic transshipment at the Port of Tacoma is calculated at 426,373 TEU in 2015, based on NWSA and Port of Seattle figures, and 341,132 TEU in 2016, based on division of NWSA TEU counts using USACE distribution. Domestic transshipment volume is included in all TEU statistics presented in the profile.

SOURCES: Port Overview/Terminals—Port of Tacoma website, available at http://www.portoftacoma.com, including terminal websites accessed through the main port website, as of November 2017. NWSA website, available at https://www.nwseaportalliance.com, as of November 2017. *JOC.com* news article, https://www.joc.com/port-news/us-ports/port-tacoma/seattle-tacoma-cranes-aid-mega-ship-handling_20170607.html, as of December 2017.

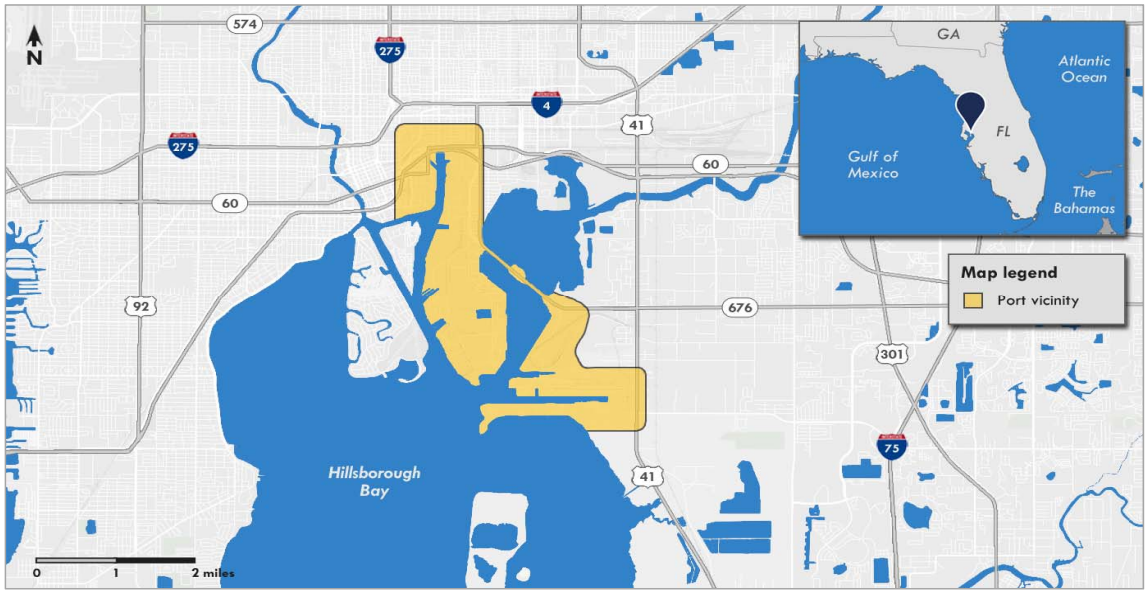
PORT OF TAMPA

Florida

Gulf Coast & Mississippi River

Port list:

Tonnage | Dry bulk



Port vicinity map illustrates area facilities.
The Sunshine Skyway Bridge (180 ft), not shown, may limit vessels serviced at the Port of Tampa.

Port overview

The Port of Tampa is located south of downtown Tampa, Florida, on the Gulf of Mexico. The seven-member Port Tampa Bay Governing Board oversees the port.

The port's Hooker's Point complex handles containers at three berths and general cargo at five berths. The port also has over 20 privately operated terminals handling liquid bulk, dry bulk, break-bulk, refrigerated, and Ro/Ro cargoes. Common commodities moving through the port include gasoline, fertilizers, distillate fuels, liquid sulphur, and limestone.

Hooker's Point has connections to a Class I railroad.

Port Updates:
In May 2017, the port received $9 million in funding from USACE to deepen and widen the Big Bend Channel, which connects to the port's main entrance channel. Additionally, in 2016 the port added two new post-Panamax container gantry cranes.

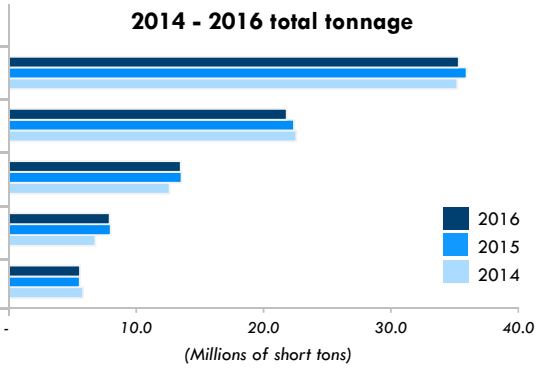
PORT OF TAMPA (CONTINUED)

THROUGHPUT

Cargo

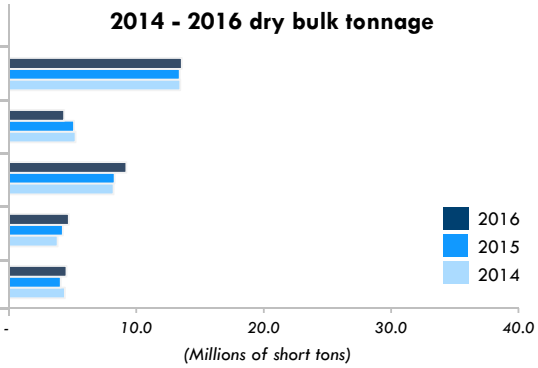
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**35.3**	▼ **-1.7%**
• Domestic	21.8	▼ -2.5%
• Foreign	13.5	▼ -0.4%
▫ Imports	7.9	▼ -0.9%
▫ Exports	5.6	▲ 0.3%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**13.6**	▲ **1.2%**
• Domestic	4.3	▼ -15.0%
• Foreign	9.2	▲ 11.2%
▫ Imports	4.7	▲ 11.5%
▫ Exports	4.5	▲ 10.9%

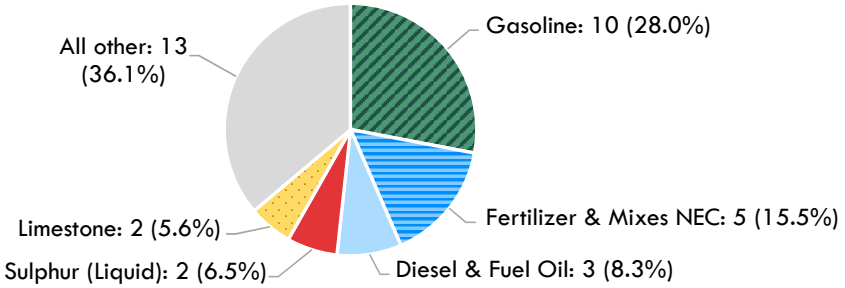


PORT OF TAMPA (CONTINUED)

THROUGHPUT

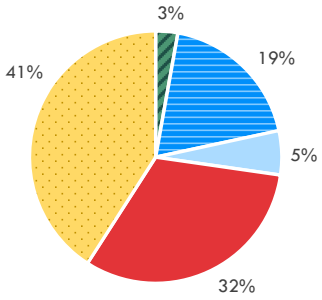
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,936**	▼ **-1.8%**
Container vessel	55	▲ 3.8%
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	364	▲ 10.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	30,839	
Dry bulk barge	110	▼ -9.1%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	21,470	
Other freight vessel	616	▲ 11.6%
Other freight barge	792	▼ -13.4%

PORT OF TAMPA (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Hooker's Point	40	3,000	180	Sunshine Skyway	43	3	2	-	N

Non-container terminals

In addition to the container terminal listed above, the Port of Tampa complex includes over 20 private terminals.

Channel depth

Authorized channel depth (ft)	**43.0**	Maximum depth of approach channel (ft)	**43.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Tampa website, available at https://www.porttb.com, including terminal websites accessed through the main port website, as of November 2017. Tampa Foreign Trade Zone No. 79 website, http://www.tampaftz.com, as of November 2017. *Tampa Bay Times* news article, available at http://www.tampabay.com/news/business/take-a-look-at-the-size-of-the-new-24-million-gantry-cranes-at-port-tampa/2286516, as of November 2017.

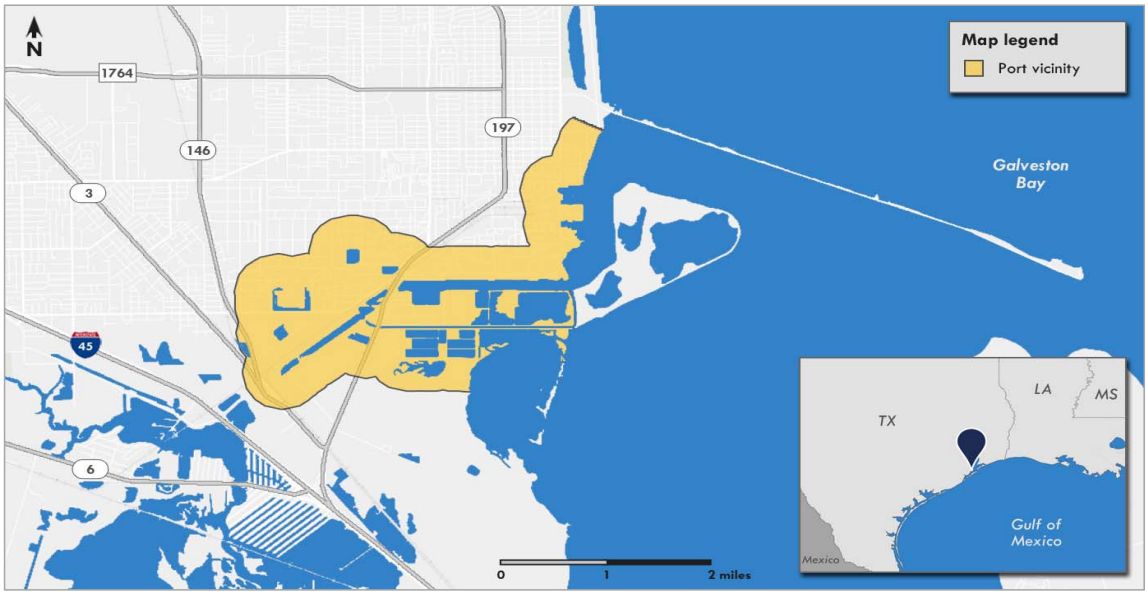
PORT OF TEXAS CITY

Texas

Gulf Coast & Mississippi River

Port list:

Tonnage



Port vicinity map illustrates area facilities.

Port overview

The Port of Texas City is located at the southwestern end of Galveston Bay, which it shares with the Port of Houston and the Port of Galveston. It is a privately owned port, led by a president and executive director.

The port specializes in handling petroleum liquid bulk cargo, principally crude oil imports, and exports of petroleum distillates and coke.

The port has direct access to two Class I railroads through its terminal railroad.

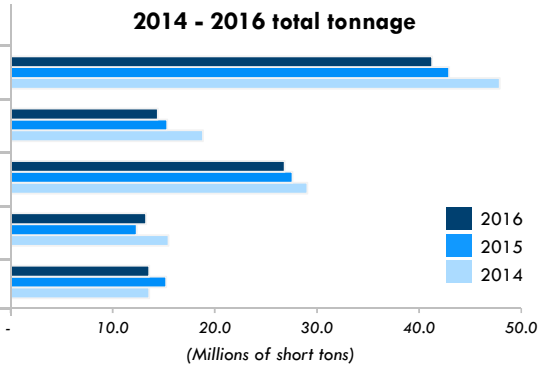
PORT OF TEXAS CITY (CONTINUED)

THROUGHPUT

Cargo

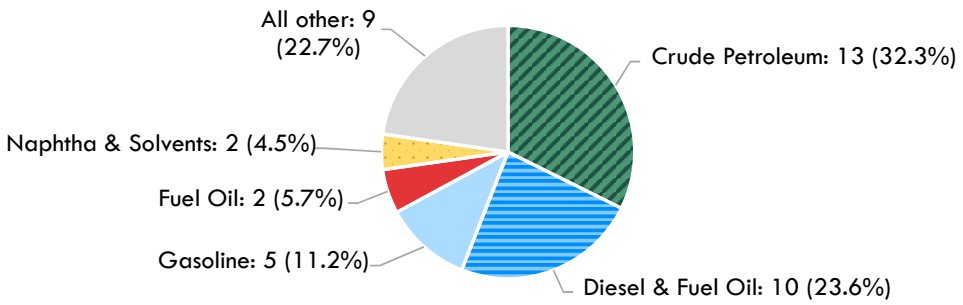
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**41.3**	▼ **-3.9%**
• Domestic	14.4	▼ -5.9%
• Foreign	26.8	▼ -2.7%
▫ Imports	13.3	▲ 7.4%
▫ Exports	13.6	▼ -10.9%



Commodities

Tonnage *Millions of short tons (percent of total)*

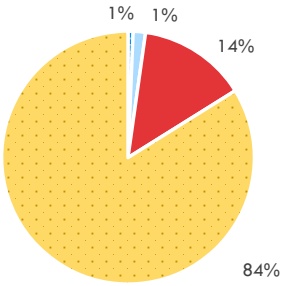


PORT OF TEXAS CITY (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**4,299**	▼ **-8.3%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	28	▼ -9.8%
Average dry bulk tonnage (short tons) per dry bulk vessel	48,444	
Dry bulk barge	68	▲ 134.5%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	1,380	
Other freight vessel	598	▼ -2.8%
Other freight barge	3,606	▼ -10.1%

CAPACITY

Non-container terminals

The Port of Texas City complex includes multiple private bulk terminals.

Channel depth

Authorized channel depth (ft)	**50.0**	Maximum depth of approach channel (ft)	**42.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Texas City website, available at https://www.texasports.org/ports/texas-city, including terminal websites accessed through the main port website, as of November 2017. Texas City Terminal Railway Company website, available at http://tctrr.com/, as of November 2017.

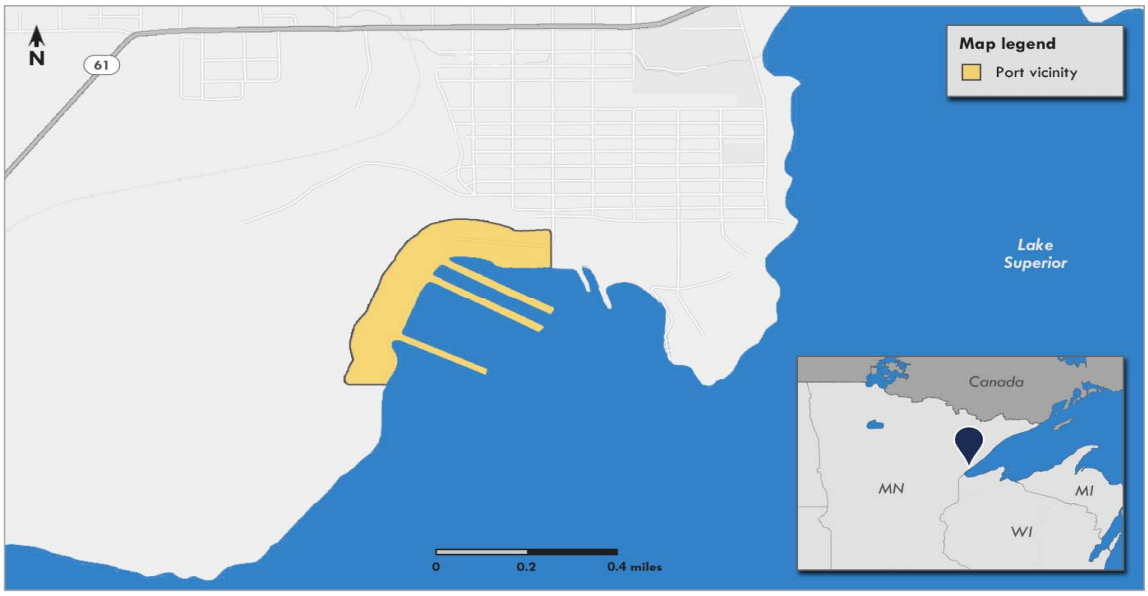
PORT OF TWO HARBORS

Minnesota

Great Lakes

Port list:

Dry bulk



Port vicinity map illustrates area facilities.

Port overview

The Port of Two Harbors is located on the north shore of Lake Superior, about 27 miles northeast of Duluth, MN. The port's facilities are operated by a Class I railroad.

The port has two bulk iron ore docks with multiple berths. Along with other Lake Superior ports, the Port of Two Harbors plays a critical role in Minnesota's iron ore (taconite) industry. Taconite is mined in northeastern Minnesota and shipped primarily via the Great Lakes to steel mills in Ohio and Pennsylvania.

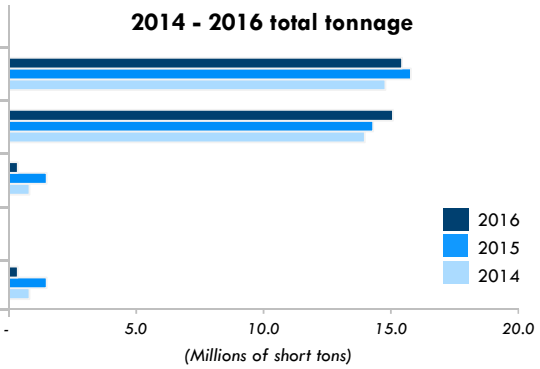
PORT OF TWO HARBORS (CONTINUED)

THROUGHPUT

Cargo

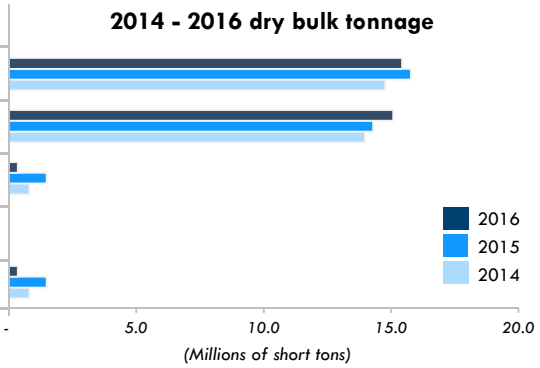
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**15.4**	▼ **-2.2%**
• Domestic	15.1	▲ 5.5%
• Foreign	0.4	▼ -76.4%
▫ Imports	0.0	N/A
▫ Exports	0.4	▼ -76.4%



Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**15.4**	▼ **-2.2%**
• Domestic	15.1	▲ 5.5%
• Foreign	0.4	▼ -76.4%
▫ Imports	0.0	N/A
▫ Exports	0.4	▼ -76.4%

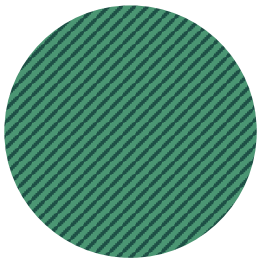


PORT OF TWO HARBORS (CONTINUED)

THROUGHPUT

Commodities

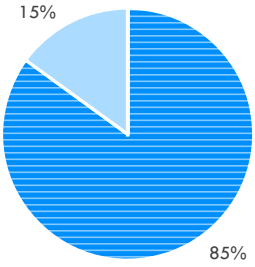
Tonnage *Millions of short tons (percent of total)*



Iron Ore: 15
100.0%

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**277**	▼ **-7.5%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	235	▼ -14.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	54,842	
Dry bulk barge	42	▲ 69.4%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	61,293	
Other freight vessel	0	N/A
Other freight barge	0	N/A

PORT OF TWO HARBORS (CONTINUED)

CAPACITY

Non-container terminals

The Port of Two Harbors complex includes the following terminals: DM&IR Railway Dock Nos. 1 & 2.

Channel depth

Authorized channel depth (ft)	**30.0**	Maximum depth of approach channel (ft)	**30.0**

NOTES: "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—USACE Infrastructure Inventory, http://www.lre.usace.army.mil/Portals/69/docs/Navigation/RiskCommunication/Two%20Harbors%20MN.pdf, as of December 2017.

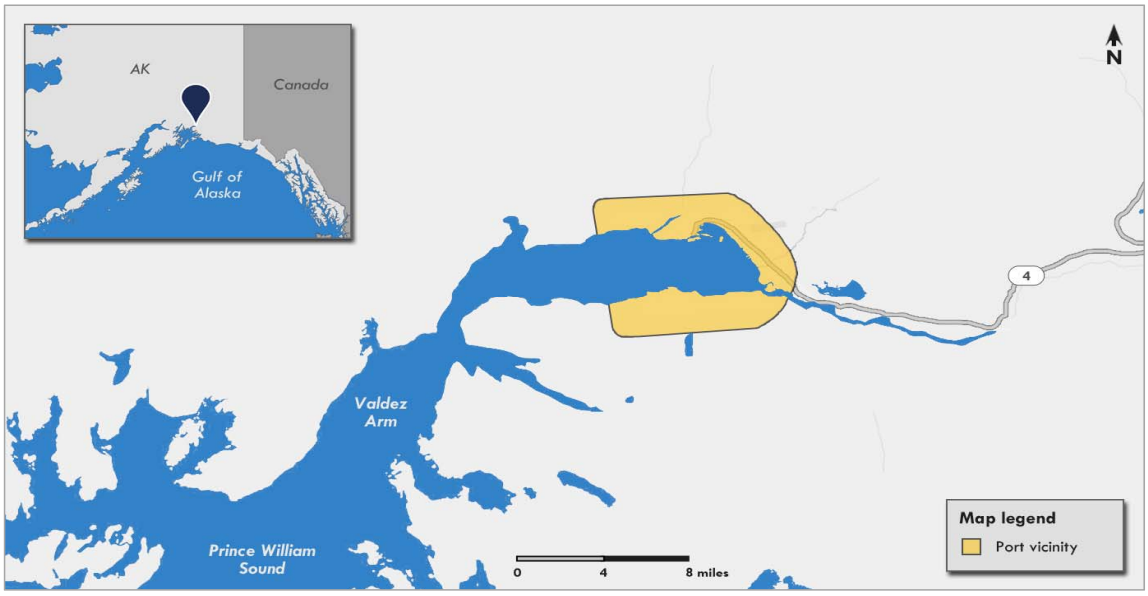
PORT OF VALDEZ

Alaska

Pacific Coast

Port list:

Tonnage



Port vicinity map illustrates area facilities.

Port overview

The Port of Valdez is located along the Prince William Sound on Alaska's southern coast. The port is the northernmost ice-free port in the United States. The City of Valdez governs the port.

The city operates the Valdez Container Terminal, with mobile crane and Ro/Ro capability (the terminal is served by container barge operators). The facility also includes a grain terminal. Ro/Ro and break-bulk cargoes are typically handled by barge. The Valdez Marine Terminal, a private, non-city terminal, handles oil from the Trans-Alaska pipeline that is loaded onto tanker vessels for export.

There are no rail connections to the Port of Valdez. The port offers access to the Alaskan interior via the nearby Richardson Highway.

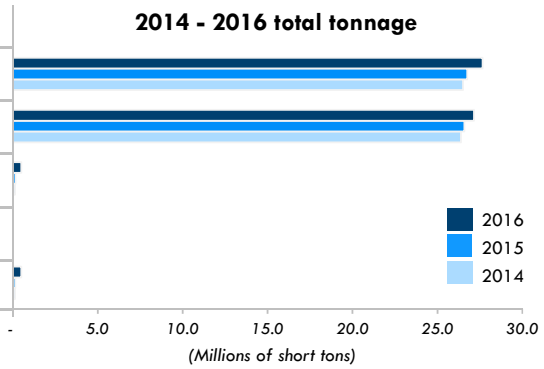
PORT OF VALDEZ (CONTINUED)

THROUGHPUT

Cargo

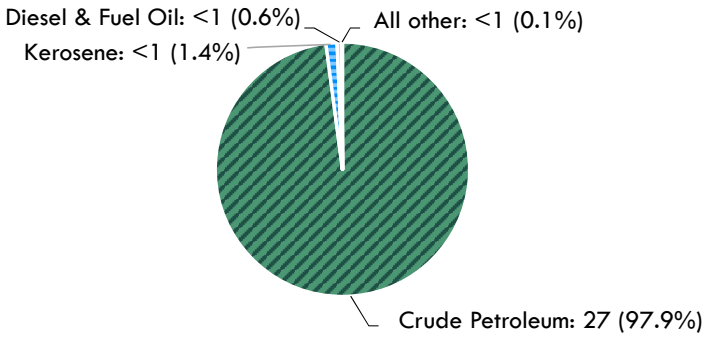
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**27.7**	▲ 3.4%
• Domestic	27.2	▲ 2.1%
• Foreign	0.5	▲ 216.6%
▫ Imports	0.0	▼ -100.0%
▫ Exports	0.5	▲ 237.4%



Commodities

Tonnage *Millions of short tons (percent of total)*

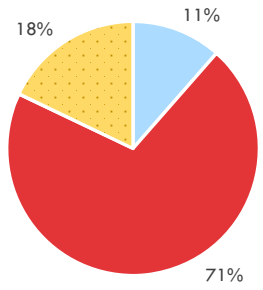


PORT OF VALDEZ (CONTINUED)

THROUGHPUT

Vessel calls

% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**287**	▲ **2.7%**
Container vessel	0	N/A
Average TEU per container vessel	N/A	N/A
Dry bulk vessel	0	N/A
Average dry bulk tonnage (short tons) per dry bulk vessel	N/A	
Dry bulk barge	33	▼ -4.3%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	N/A	
Other freight vessel	203	▲ 8.0%
Other freight barge	52	▼ -10.4%

CAPACITY

Non-container terminals

The Port of Valdez complex includes the following terminals: Valdez Container Terminal and private bulk terminals.

Channel depth

Authorized channel depth (ft)	**U**	Maximum depth of approach channel (ft)	**62.0**

NOTES: "N/A" designates a metric that does not apply for this port. "U" designates data that was unavailable. Vessel call numbers might not add to 100% due to rounding.

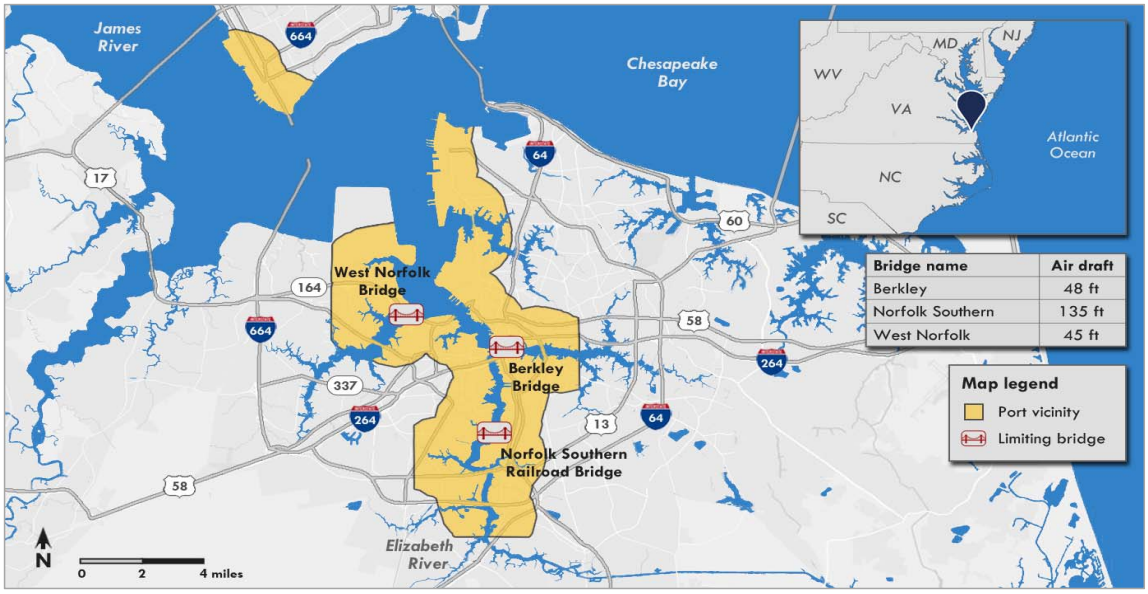
SOURCES: Port Overview/Terminals—City of Valdez, Alaska website, http://www.ci.valdez.ak.us, as of November 2017. USACE Alaska District website, http://www.poa.usace.army.mil, as of November 2017.

PORT OF VIRGINIA

Virginia

Atlantic Coast

Port list: Container | Tonnage | Dry bulk



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
Richmond Marine Terminal and Virginia Inland Port are not included in the port vicinity map.

Port overview

The Port of Virginia complex includes several terminals in and around the Hampton Roads region in Virginia. The Virginia Port Authority's (VPA) 13-member Board of Commissioners oversees the port.

The port's public terminals include the Newport News Marine Terminal (located along the north bank of the James River), the Norfolk International Terminals (located along the Elizabeth and Lafayette Rivers), and the Portsmouth Marine Terminal (located along the west bank of the Elizabeth River). Newport News handles break-bulk and Ro/Ro cargoes; Norfolk and Portsmouth are primarily container terminals.

VPA operates the Virginia International Gateway, a privately owned container terminal located on the Elizabeth River in Portsmouth, Virginia, and the Virginia Inland Port, an intermodal container transfer facility in Front Royal, Virginia. VPA also operates the Richmond Marine Terminal (formerly the Port of Richmond). This terminal handles containers, break-bulk, and other bulk cargoes. Coal, the major bulk cargo moving through the Port of Virginia, is handled by one large and several smaller private coal terminals.

All terminals have access to two Class I rail lines, with three terminals providing on-dock rail service.

Port Updates:
VPA is in the process of developing a new container terminal, Craney Island Marine Terminal, to handle the port's growing container cargo traffic. This project will involve using dredged material to create new land for the terminal's facilities.

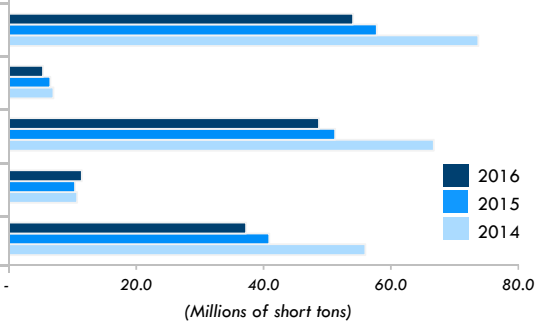
PORT OF VIRGINIA (CONTINUED)

THROUGHPUT

Cargo

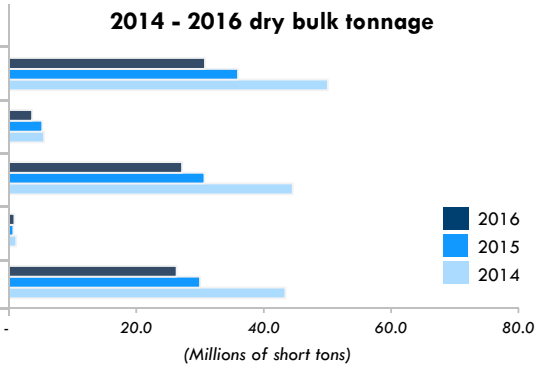
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**54.0**	▼ **-6.4%**
• Domestic	5.4	▼ -17.6%
• Foreign	48.7	▼ -5.0%
▫ Imports	11.4	▲ 10.2%
▫ Exports	37.2	▼ -8.9%



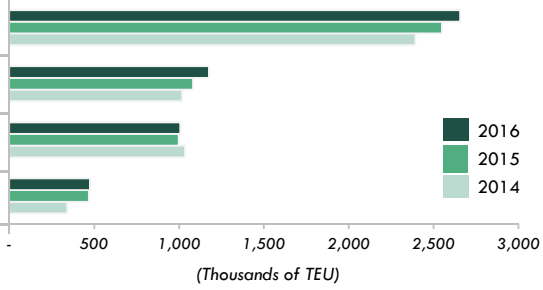
Dry bulk tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**30.8**	▼ **-14.3%**
• Domestic	3.6	▼ -30.7%
• Foreign	27.2	▼ -11.5%
▫ Imports	0.9	▲ 22.3%
▫ Exports	26.3	▼ -12.3%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**2,656**	▲ **4.2%**
• Inbound loaded TEU	1,175	▲ 8.5%
• Outbound loaded TEU	1,006	▲ 0.8%
• Empties (in- & outbound)	475	▲ 1.2%

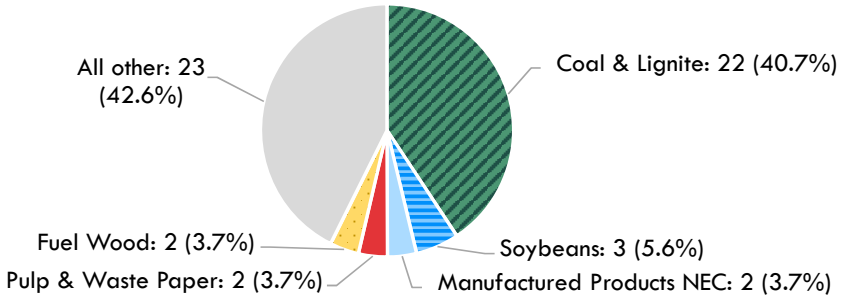


PORT OF VIRGINIA (CONTINUED)

THROUGHPUT

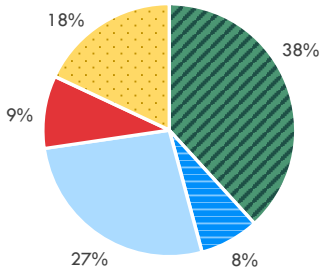
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

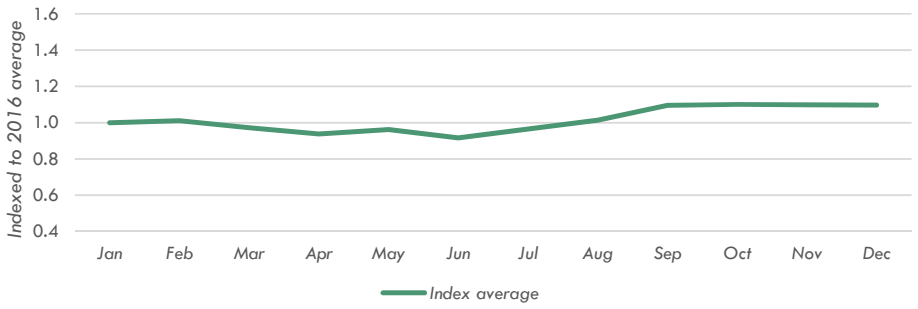
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**4,645**	▼ **-12.0%**
Container vessel	1,775	▼ -4.4%
Average TEU per container vessel	1,496	▲ 9.0%
Dry bulk vessel	353	▼ -14.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	77,287	
Dry bulk barge	1,248	▼ -22.7%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	2,818	
Other freight vessel	433	▲ 3.7%
Other freight barge	837	▼ -14.4%

Vessel dwell time

2016 container vessel dwell time index



PORT OF VIRGINIA (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Norfolk International Terminals	378	6,630	N/A	N/A	50	-	-	14	Y
Virginia International Gateway	231	3,200	N/A	N/A	50	-	-	8	Y
Portsmouth Marine Terminal	287	3,540	N/A	N/A	40	-	6	-	Y

Non-container terminals

In addition to the container terminals listed above, the Port of Virginia complex includes the following terminals: Newport News Marine Terminal, Virginia Inland Port, Richmond Marine Terminal, and multiple private bulk terminals.

Channel depth

Authorized channel depth (ft)	**55.0**	Maximum depth of approach channel (ft)	**50.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Virginia website, available at http://www.portofvirginia.com, including terminal websites accessed through the main port website, as of November 2017.

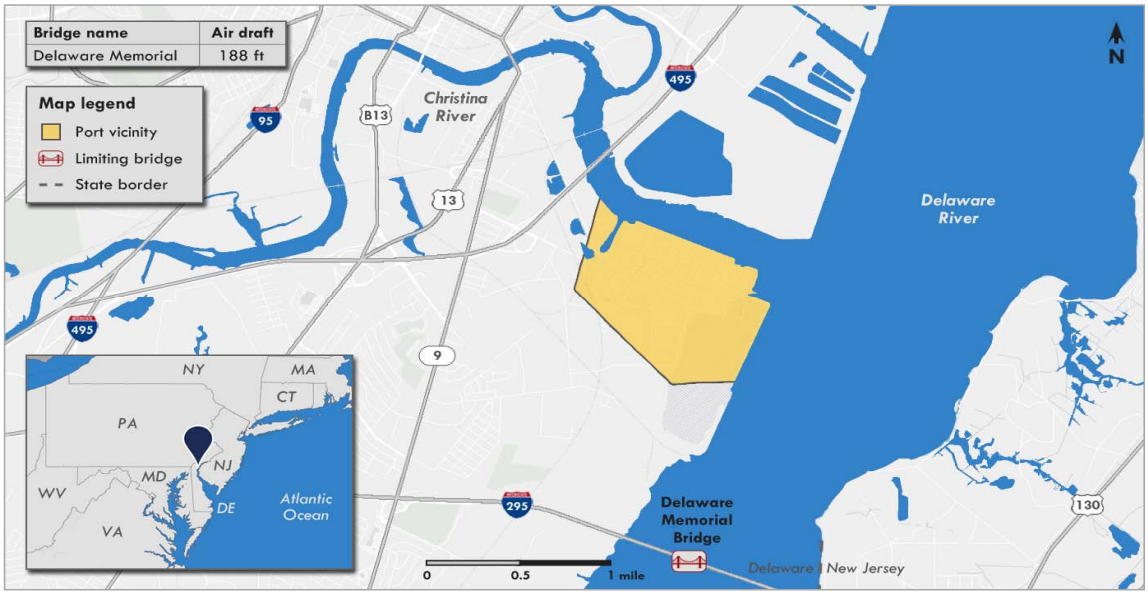
PORT OF WILMINGTON (DE)

Delaware

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities. Bridge air drafts may limit vessel traffic.
The eastern bank of the Delaware River forms the border between Delaware and New Jersey.

Port overview

The Port of Wilmington is located at the confluence of the Delaware and Christina Rivers, approximately 60 miles from the Atlantic Ocean. The Diamond State Port Corporation (DSPC), a corporate entity of the State of Delaware, governs the port.

The DSPC Dole Fresh Fruit (DFF) Wilmington Container terminal primarily handles perishables (fresh fruit) and connects to several on-site cold storage facilities. The port also has a dedicated Ro/Ro berth and auto storage area. Dry and liquid bulk commodities moved through the port include food products, residual fuel oil, bulk salt, crude petroleum, forest products, and steel.

The port has access to two Class I rail lines.

Port Updates:
USACE is dredging the Delaware River main channel to increase authorized depth to 45 feet (from 40). The project is expected to be complete in early 2018, with dredging to Wilmington complete in 2017. The port also added two new gantry cranes in mid-2017.

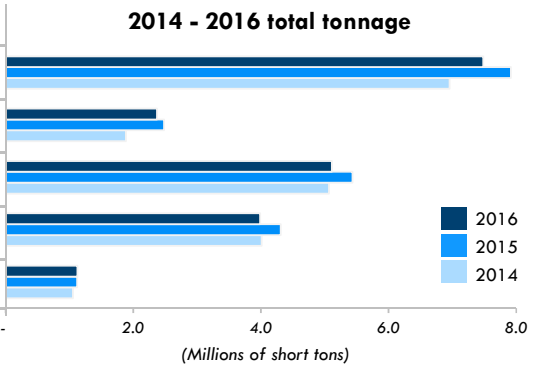
PORT OF WILMINGTON (DE) (CONTINUED)

THROUGHPUT

Cargo

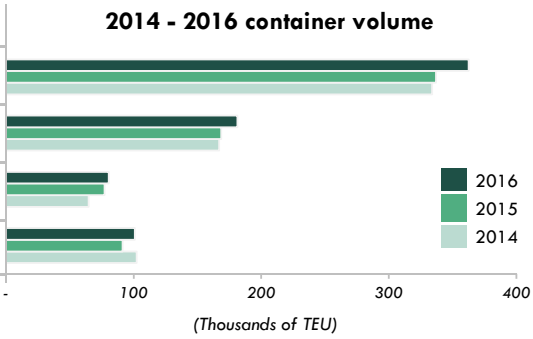
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**7.5**	▼ **-5.5%**
• Domestic	2.4	▼ -4.4%
• Foreign	5.1	▼ -6.0%
▫ Imports	4.0	▼ -7.5%
▫ Exports	1.1	▲ 0.1%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**362**	▲ **7.6%**
• Inbound loaded TEU	181	▲ 7.6%
• Outbound loaded TEU	80	▲ 4.1%
• Empties (in- & outbound)	101	▲ 10.5%

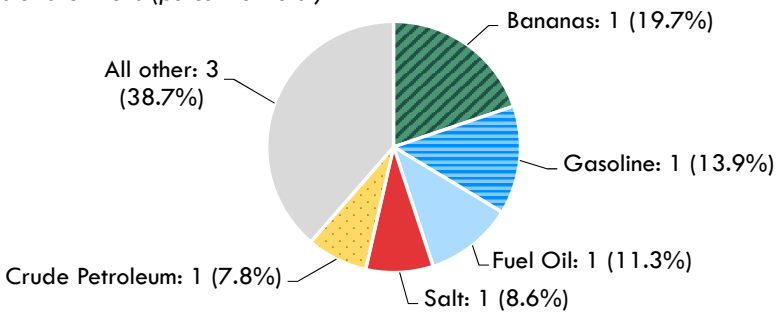


PORT OF WILMINGTON (DE) (CONTINUED)

THROUGHPUT

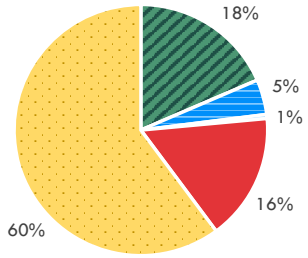
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

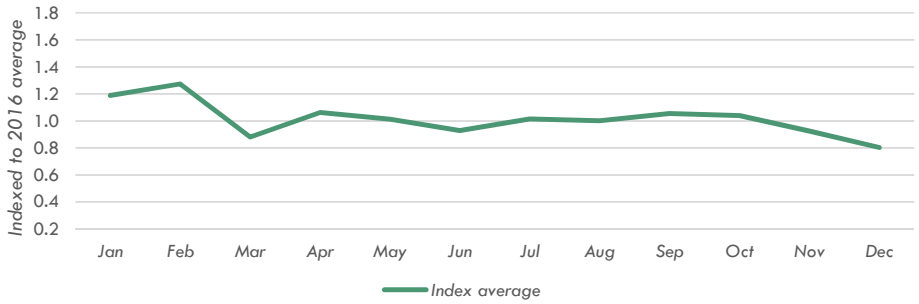
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**848**	▲ **3.5%**
Container vessel	157	▲ 49.8%
Average TEU per container vessel	2,316	▼ -28.2%
Dry bulk vessel	39	▼ -39.4%
Average dry bulk tonnage (short tons) per dry bulk vessel	33,286	
Dry bulk barge	5	N/A
Average dry bulk tonnage (short tons) per non-dry bulk vessel	3,246	
Other freight vessel	139	▼ -8.6%
Other freight barge	510	▲ 2.4%

Vessel dwell time

2016 container vessel dwell time index



PORT OF WILMINGTON (DE) (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
DFF Wilmington Container Terminal	70	1,850	188	Delaware Memorial	38	2	-	-	N

Non-container terminals

In addition to the container terminal listed above, the Port of Wilmington complex includes a dedicated Ro/Ro berth and auto storage area and private bulk terminals.

Channel depth

Authorized channel depth (ft)	**38.0**	Maximum depth of approach channel (ft)	**38.0**

NOTES: Capacity information verified by port per AAPA communication. Port is served by self-unloading and Ro/Ro vessels as well as cellular container ships. Vessel call numbers might not add to 100% due to rounding. Limiting bridges listed in the container terminal table apply to individual terminals, and may differ from limiting bridges shown in port vicinity map.

SOURCES: Port Overview/Terminals—Port of Wilmington website, available at http://www.portofwilmington.com, including terminal websites accessed through the main port website, as of November 2017. *Philadelphia Inquirer.com* news articles, http://www.philly.com/philly/business/delaware-river-channel-deepening-gets-final-29-25m-20170530.html and www.delawareonline.com/story/news/2017/01/27/new-cranes-rising-over-port/97098066, both as of November 2017.

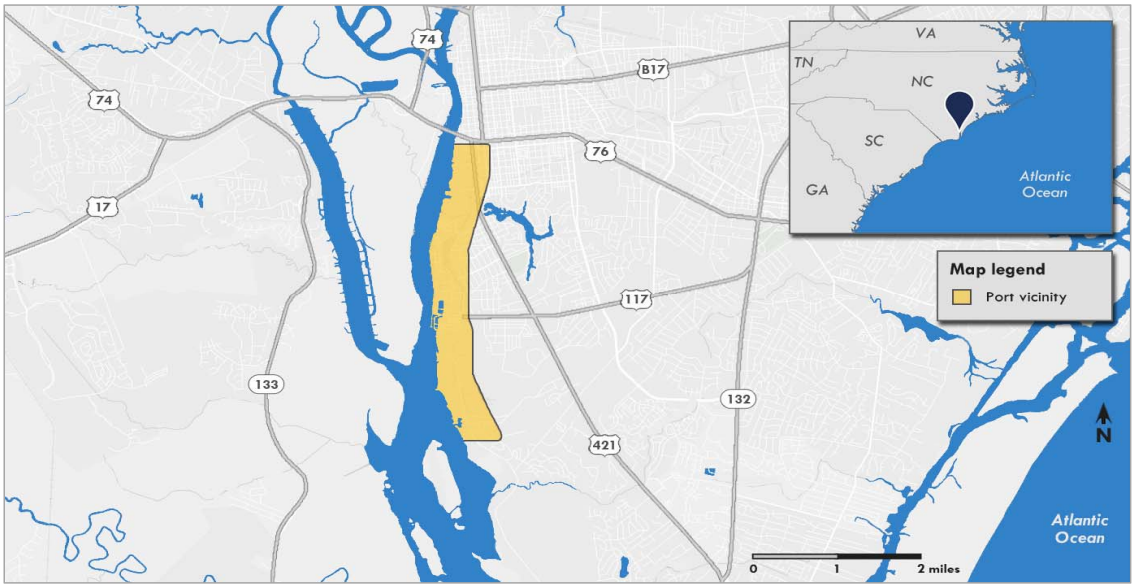
PORT OF WILMINGTON (NC)

North Carolina

Atlantic Coast

Port list:

Container



Port vicinity map illustrates area facilities.

Port overview

The Port of Wilmington, North Carolina, is located on the east bank of the Cape Fear River, about 26 miles upriver from the Atlantic Ocean. The 11-member Board of Directors for the North Carolina Ports Authority (NCPA) oversees the port.

The port has one public container terminal and a general cargo terminal that handles bulk, break-bulk, and Ro/Ro cargoes. Major commodities handled by the port include fertilizers, pulp and waste paper, textiles, grain, and chemicals. The port also has an onsite cold storage facility for perishable cargoes.

The port has on-dock rail container service with access to a Class I rail line; intermodal connections are provided from this Class I service via a new intermodal terminal (see port updates section below).

Port Updates:
In January 2017, NCPA ordered a pair of Super Post-Panamax cranes for delivery in early 2018, which will augment its existing four Post-Panamax cranes. In addition, in July 2017 the NCPA reached an agreement with CSX to begin daily double-stacked rail service (starting in late July 2017) between the Port of Wilmington and NCPA's intermodal facility in Charlotte, North Carolina.

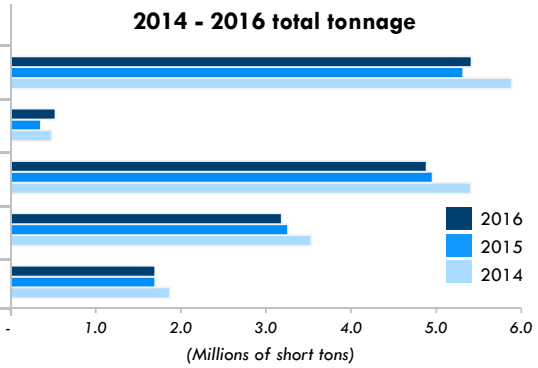
PORT OF WILMINGTON (NC) (CONTINUED)

THROUGHPUT

Cargo

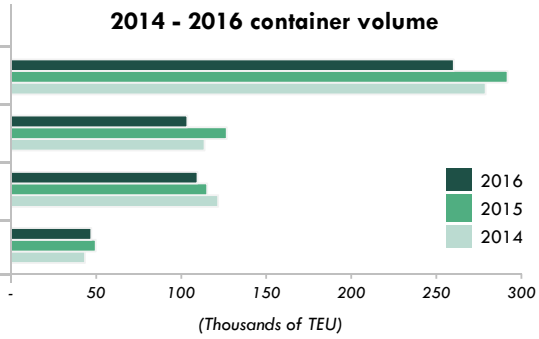
Total tonnage

(Millions of short tons)	2016	2015 - 2016
Total (domestic & foreign)	**5.4**	▲ **1.9%**
• Domestic	0.5	▲ 48.2%
• Foreign	4.9	▼ -1.5%
▫ Imports	3.2	▼ -2.2%
▫ Exports	1.7	▼ -0.1%



Container volume

(Thousands of TEU)	2016	2015 - 2016
Total TEU	**260**	▼ **-10.8%**
• Inbound loaded TEU	104	▼ -18.3%
• Outbound loaded TEU	110	▼ -5.0%
• Empties (in- & outbound)	47	▼ -5.4%

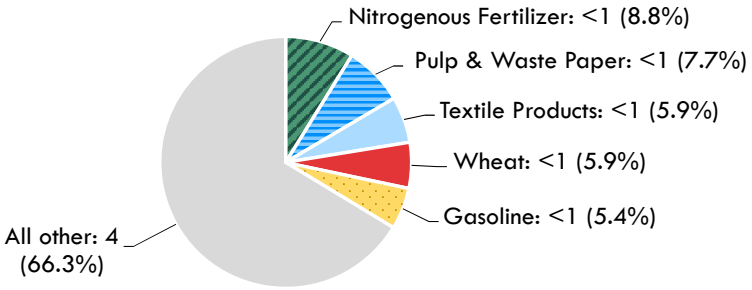


PORT OF WILMINGTON (NC) (CONTINUED)

THROUGHPUT

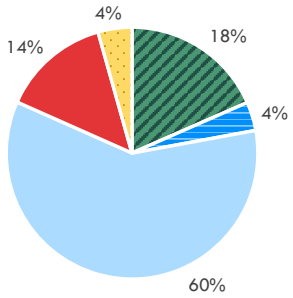
Commodities

Tonnage *Millions of short tons (percent of total)*



Vessel calls

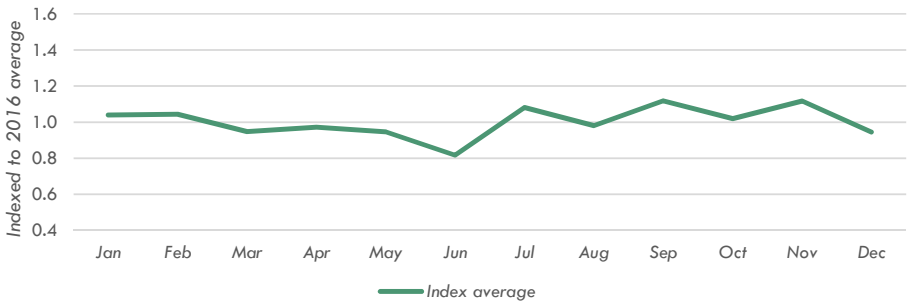
% of total vessel calls



By vessel type	2016	2015 - 2016
Total vessel calls	**1,499**	▲ **1.0%**
Container vessel	276	▲ 16.2%
Average TEU per container vessel	943	▼ -23.3%
Dry bulk vessel	56	0.0%
Average dry bulk tonnage (short tons) per dry bulk vessel	28,802	
Dry bulk barge	893	▼ -6.5%
Average dry bulk tonnage (short tons) per non-dry bulk vessel	56	
Other freight vessel	210	▲ 11.1%
Other freight barge	66	▲ 36.5%

Vessel dwell time

2016 container vessel dwell time index



PORT OF WILMINGTON (NC) (CONTINUED)

CAPACITY

Container terminals

Terminal Name	Acres	Berth length (ft)	Air draft (ft)	Limiting bridge name	Min. project depth	Cranes			On-dock rail
						Panamax	PPX	Super PPX	
Port of Wilmington Container Terminal	80	2,000	N/A	N/A	42	2	4	-	Y

Non-container terminals

In addition to the container terminal listed above, the Port of Wilmington complex includes the following terminals: Port of Wilmington General Cargo Terminal and private bulk terminals.

Channel depth

Authorized channel depth (ft)	**42.0**	Maximum depth of approach channel (ft)	**44.0**

NOTES: Capacity information verified by port per AAPA communication. "N/A" designates a metric that does not apply for this port. Vessel call numbers might not add to 100% due to rounding.

SOURCES: Port Overview/Terminals—Port of Wilmington website, available at http://ncports.com, including terminal websites accessed through the main port website, as of November 2017.

Key and additional profile sources

KEY:

AAPA = American Association of Port Authorities
Class I = main line railroad
Class II = regional railroad
Class III = short-line railroad
FT = feet
Min. project depth = Minimum project depth encountered between terminal and ocean/sea
N = No
NEC = not elsewhere classified
PPX = Post-Panamax
Super PPX = Super Post-Panamax
TEU = twenty-foot equivalent units
USACE = U.S. Army Corps of Engineers
Y = Yes

SOURCES: Port vicinity map—Derived from BTS-generated port and terminal boundaries using AIS data, as of 2016; Google Earth, as of September and October 2017; and port websites, as of 2017.
Bridge clearance—USCG compiled and verified using NOAA charts, as of November 2017.
Total tonnage, Vessel calls—USACE, WCSC, 2016 data, special tabulation, as of November 2017.
Container volume—AAPA, Port Industry Statistics, NAFTA Region Container Traffic available at http://www.aapaports.org/unifying/content.aspx?ItemNumber=21048#Statistics, as of October 2016.
Commodities—USACE, WCSC, by USACE Commodity Classification List major groupings, 2016 data, special tabulation, as of November 2017.
Vessel dwell time—U.S. DOT, BTS and Volpe Center, calculated using AIS data provided by ERDC.
Terminal minimum project depth—NOAA, National Ocean Service Coast Survey charts, 2014-2017, and USACE, eHydro Navigation Channel Condition Reporting, 2015-2017.
Port channel depth—USACE, Deep Draft and Shallow Draft Navigation Project listing, compiled by USACE, November 2016.

APPENDIX B: FAST ACT SECTION 6018

SEC. 6018. PORT PERFORMANCE FREIGHT STATISTICS PROGRAM.

(a) In General.--Chapter 63 of title 49, United States Code, is amended by adding at the end the following:

Sec. 6314. Port performance freight statistics program

(a) In General.--The Director shall establish, on behalf of the Secretary, a port performance statistics program to provide nationally consistent measures of performance of, at a minimum--

(1) the Nation's top 25 ports by tonnage;

(2) the Nation's top 25 ports by 20-foot equivalent unit; and

(3) the Nation's top 25 ports by dry bulk.

(b) Reports.--

(1) Port capacity and throughput.--Not later than January 15 of each year, the Director shall submit an annual report to Congress that includes statistics on capacity and throughput at the ports described in subsection (a).

(2) Port performance measures.--The Director shall collect port performance measures for each of the United States ports referred to in subsection (a) that--

(A) receives Federal assistance; or

(B) is subject to Federal regulation to submit necessary information to the Bureau that includes statistics on capacity and throughput as applicable to the specific configuration of the port.

(c) Recommendations.--

(1) In general.--The Director shall obtain recommendations for--

(A) port performance measures, including specifications and data measurements to be used in the program established under subsection (a); and

(B) a process for the Department to collect timely and consistent data, including identifying safeguards to protect proprietary information described in subsection (b)(2).

(2) Working group.--Not later than 60 days after the date of the enactment of the Transportation for Tomorrow Act of 2015, the Director shall commission a working group composed of--

(A) operating administrations of the Department;

(B) the Coast Guard;

(C) the Federal Maritime Commission;

(D) U.S. Customs and Border Protection;

(E) the Marine Transportation System National Advisory Council;

(F) the Army Corps of Engineers;

(G) the Saint Lawrence Seaway Development Corporation;

(H) the Bureau of Labor Statistics;

(I) the Maritime Advisory Committee for Occupational Safety and Health;

(J) the Advisory Committee on Supply Chain Competitiveness;

(K) 1 representative from the rail industry;

(L) 1 representative from the trucking industry;

(M) 1 representative from the maritime shipping industry;

(N) 1 representative from a labor organization for each industry described in subparagraphs (K) through (M);

(O) 1 representative from the International Longshoremen's Association;

(P) 1 representative from the International Longshore and Warehouse Union;

(Q) 1 representative from a port authority;

(R) 1 representative from a terminal operator;

(S) representatives of the National Freight Advisory Committee of the Department; and

(T) representatives of the Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine.

(3) Recommendations.--Not later than 1 year after the date of the enactment of the Transportation for Tomorrow Act of 2015, the working group commissioned under paragraph (2) shall submit its recommendations to the Director.

(d) Access to Data.--The Director shall ensure that--

(1) the statistics compiled under this section--

(A) are readily accessible to the public; and

(B) are consistent with applicable security constraints and confidentiality interests; and

(2) the data acquired, regardless of source, shall be protected in accordance with the Confidential Information Protection and Statistical Efficiency Act of 2002 (44 U.S.C. 3501 note; Public Law 107-347).".

(b) Prohibition on Certain Disclosures; Copies of Reports.--Section 6307(b) of such title is amended, by inserting ``or section 6314(b)" after ``section 6302(b)(3)(B)" each place it appears.

(c) Clerical Amendment.--The table of sections for chapter 63 of such title is amended by adding at the end the following:

6314. Port performance freight statistics program.

APPENDIX C: EXAMPLE FLOWS FOR CONTAINER AND DRY BULK TERMINALS

Figure C-1 Example of Container Terminal Flow

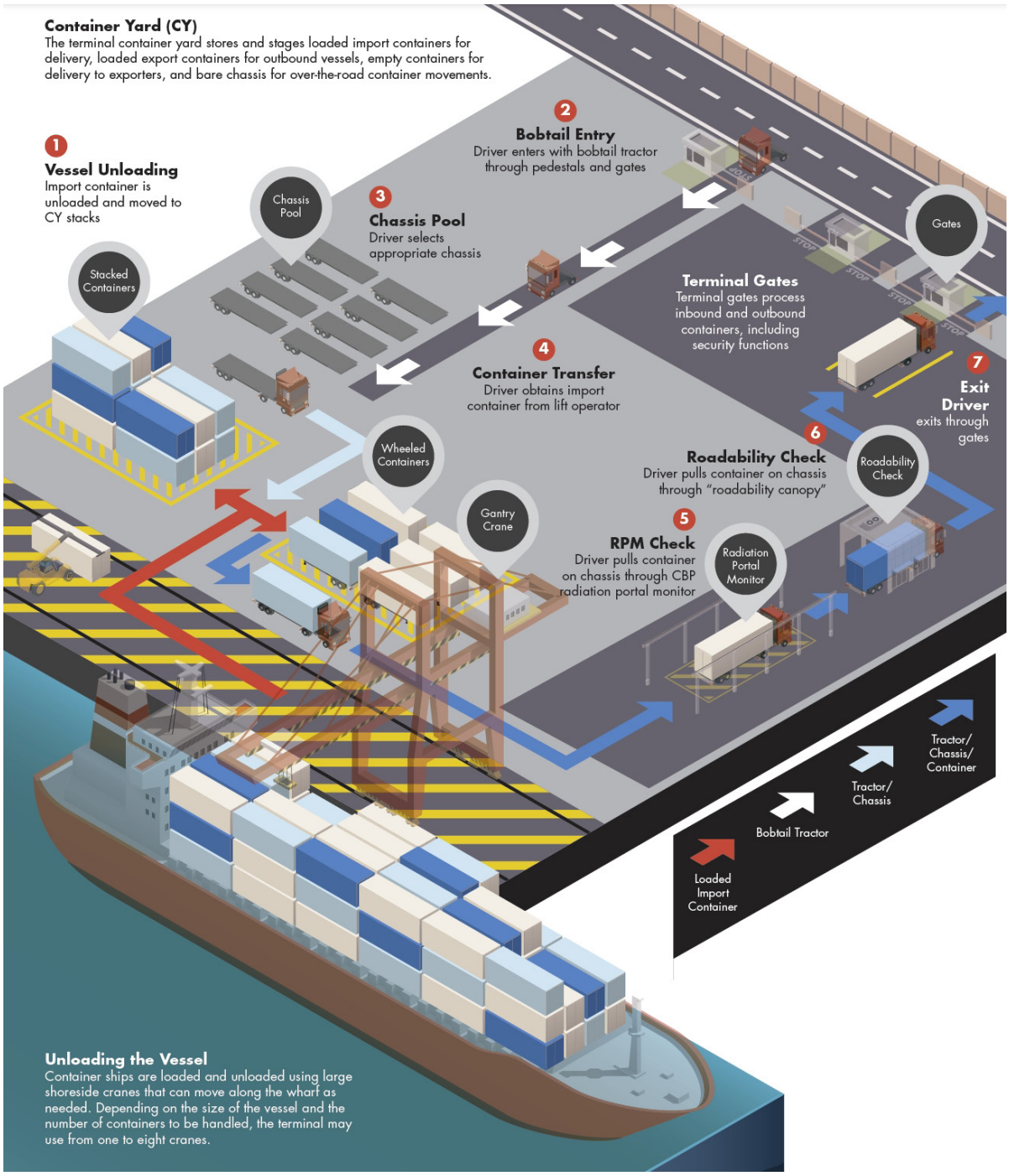


Figure C-2 Example of Dry Bulk Terminal Flow