Ocean Transportation

Chapter 14

Chapter 14: Ocean Transportation

The agricultural community uses the ocean transportation network extensively to serve its global customers. An estimated 70 percent of all agricultural exports in 2007 were moved via ocean transportation to their foreign destinations. U.S. agriculture is known for its high standards, quality, and the efficient movements of its goods to customers all over the world, and the marine transportation system is critical to its continued growth.

For the purposes of this study, the ocean transportation system is defined as the combination of ocean ports, rail and highway infrastructure adjacent to the port area, and the waterborne trade routes used to transport cargo to and from foreign markets. Intermodal transportation—defined as the movement of marine shipping containers between two or more transportation modes—is also described in this chapter.

A recent study by the U.S. Department of Transportation's (DOT) Maritime Administration (MARAD) reports one of its findings:

> America's ports and Marine Transportation System are critical to the national economy. The importance of our port system will only grow as globalization continues and the American economy becomes more integrated into the world economy. Increasing world trade has resulted in record levels of cargo entering and leaving our ports. This cargo flow has become a large part of the U.S. economy. In 2006, foreign trade accounted for nearly 22 percent of the nation's gross domestic product.[343]

This chapter focuses on the ocean transportation industry for both bulk and containerized movements, the importance of ocean transportation to agriculture, rate structures and influences, capacity availability and constraints, and service challenges.

Today's Ocean Transportation Industry

Three themes in today's ocean transportation industry affect agricultural shippers:

- Capacity limits and congestion
- Environmental stewardship and expansion conflicts
- Container availability

This section broadly sketches out these themes and sets the stage for later discussion of why they are important to agricultural shippers.

Port Capacity Limits and Congestion

Most major ocean ports in the United States are approaching their capacity limits. Congestion at the ports and the availability of landside infrastructure is a major concern of U.S. exporters and importers. The challenge to the marine transportation system lies in the projected growth of the nation's international trade, and the ability of the marine, highway, and rail systems to accommodate the increased volumes of freight shipments so vital to our nation's continued

economic growth. DOT projects total freight volumes will increase by more than 50 percent in the next 20 years. U.S. international container traffic is projected to at least double from 2001 to 2020. Nowhere will this pressure be felt more than at U.S. ports. As trade volumes increase, the capacity of America's intermodal transportation system must increase in order to maintain and expand the nation's economy.[344]

Environmental Stewardship & Expansion Conflicts

Promoting, developing, and implementing environmental stewardship while expanding to accommodate increased volume is a challenge for the maritime industry, particularly for the ports. The property available for marine development in and around existing port facilities is limited. Port expansion plans face competing development issues and environmental concerns that limit expansion activities. Property that may be suitable for port development is subject to pressures for non-port uses, such as office, residential, or recreational development.[345]

Vessel Capacity and Container Availability

Shippers of containerized cargo are faced with these challenges to container availability**:**

- Growing economies in developing countries demand U.S. agricultural exports, but fewer containers being available in locations suitable for export can result in lost sales and unreliable service to overseas buyers.
- Importers have increased the use of distribution centers near ocean ports. This practice has constrained the number of containers that are moved to inland locations and therefore limits container availability for agricultural exporters in the heartland.
- The increased demand for vessel capacity and container supplies can push up freight rates.
- Increasing demand in other trade lanes (Asia-Europe and Intra-Asia) more profitable to ocean carriers could further reduce vessel calls and, as a result, vessel capacity and container availability for U.S. exports.
- The use of the largest container ships in the U.S. trade lanes reduces the number of vessel calls at U.S. ports, but decreases costs for carriers when vessels are full due to economies of scale. Larger ships carry more containers per trip; therefore, the vessel makes fewer trips.
- The continued ocean container carrier consolidation and vessel sharing agreements do their part in reducing vessel calls at some U.S. ports and the number of carriers serving the U.S. market, ultimately affecting competition in the market.
- The potential for a rise in bulk ocean freight rates relative to container rates to increase the demand for ocean container service.

Characteristics of the Ocean Shipping Industry

The demand for ocean transportation is a function of global supply and demand for basic commodities and finished goods. Therefore, the condition of the world economy, which determines the level of international trade, is a primary factor in ocean shipping demand. Other economic factors that influence the demand for shipping include currency exchange rates, shifts in interregional trade patterns, and seasonal variations in production or consumption.

Ocean transportation is composed of two major commercial markets**:** "tramp" and "liner."[346] Tramp vessels are contracted to shippers on an as-needed basis; they do not have regularly scheduled routes. These vessels are usually deployed by their owners when and where they can find the greatest profit. Many tramp vessels are designed to carry dry bulk cargo such as grain, ore, coal, or fertilizer. Some are designed to carry either dry bulk cargo or liquid bulk cargo. Four basic types of tramp vessel charter (lease) agreements govern bulk ocean grain transportation**:** voyage charter, time charter, bareboat charter, and contract of affreightment. In the dry bulk industry, the voyage and time charters are the most common.

Shipping Charters

Voyage (or trip) Charter: An agreement to lease a vessel to complete one trip between a specified origin and destination.

Time Charter: An agreement to lease a vessel for a period of time (months or years).

Bareboat Charter: An agreement similar to a time charter agreement, except the charterer operates and controls the use of the vessel during the term of the agreement.

Contract of Affreightment: An agreement with a ship owner to carry cargo at a set rate, within a set time period, without the ship owner obligating a specific vessel.

The liner shipping market is composed of carriers that provide service over fixed time and route schedules. Vessels in this market are designed to carry containerized cargo, including such agricultural commodities as meat, hay, horticultural cargo, high-value specialty grains, etc.

The operation and management of liner and bulk vessels are significantly different. Liner vessels carry containers uniform in size, shape, and function with a variety of cargos. Also, the ocean container carrier is legally bound to the container after it is discharged in a country; part of the ocean container carrier's operational costs requires the carrier to follow the container through the inland transportation system to its final destination. Bulk ocean carriers do not have the extra responsibility and costs associated with inland transportation.

Bulk Shipping

The ocean shipping industry—especially the bulk transportation market—is governed by a complex set of economic relationships. The bulk transportation market is marked by high competition, frequent changes in charter rate levels, and the relative absence of economic regulations. Some characteristics of the bulk market are:[347]

- Many firms and vessels compete; no single operator or cartel dominates or influences the market.
- Rates are determined in a competitive environment.
- Current information about freight rates, trade patterns, and vessel availability is publicized.
- Vessels can be rapidly shifted into different markets and can generally be used to transport a wide array of bulk products.
- Vessel operators have minimal shore-side fixed costs.
- Barriers to entry for ship owners are relatively low.

Figure 14-1: Bulk shipping vessel

Source: Wikimedia Commons

Global Dry Bulk Vessel Fleet Capacity

The total capacity of the dry bulk fleet depends on vessel size and number. Bulk vessels are categorized by size:

- Handysize vessel
- Handymax vessel
- Panamax vessel
- Post-Panamax vessel
- Capesize vessel
- Very large ore carrier (Vloc)

Due to the high volume of trade and shipping economies of scale, Panamax vessels are commonly used to transport grain from the United States to markets in Asia since they are the largest ships that can transit the Panama Canal at its current size. Handysize vessels are frequently used to transport grain from the Great Lakes to ports situated in shallow waters or on other lower-volume trade routes.

The capacity of the world fleet is determined by fleet performance, ship building, and ship scrapping activities. The addition of new vessels to the fleet increases the supply, and the retirement or scrapping of older vessels diminishes it. Fleet performance is influenced by vessel traffic congestion at major ports, vessel operating speed, occurrence of vessel breakdowns, and other factors. As of February 2010, the total bulk vessel operating fleet (both dry and liquid bulk vessels) was 10,258 vessels, resulting in 833.6 million deadweight tons (mdwt).[348] About 7,121 vessels, accounting for 55 percent (462.3 mdwt) of the total deadweight, were dry bulk carriers (Table 14-1). During the same period, the Panamax bulk vessel fleet was estimated at 1,841 vessels, accounting for a total of 131.2 mdwt. The dry bulk Panamax vessel fleet was 1,483 vessels, representing 100.1 mdwt. Approximately 76 percent of the Panamax vessels are allocated to dry bulk shipments.

Table 14-1: Global dry bulk fleet, February 2010

Type of Vessel	Size (dwt)	No. of Vessels	Capacity in mdwt
Handysize	10,000-40,000	2,636	72.0
Handymax	40,000-60,000	1,801	89.2
Panamax	60,000-80,000	1,408	101.1
Post-Panamax	80,000-110,000	311	27.7
Capesize	110,000-200,000	793	131.0
Vloc	200,000+	172	41.4
Total		**7,121**	**462.4**

Source: Drewry Shipping Consultants

Indicators of expansion in the fleet size are the industry orderbook for new vessels and new building activity; demolition activity is a good measure of the vessels' retirement rate. Orderbook statistics represent the scheduled delivery date for newly built vessels (Table14-2). Owners were encouraged by the relatively high ocean freight rates during the 2004–2008 period to order additional vessels.

During February 2010, 1,779 bulk vessels were on order and scheduled for delivery, totaling about 168.5 mdwt. Just over 73 percent of these vessels were dry bulk carriers, about 124.3 mdwt total. However, demolition activity was almost non-existent. Only 23 bulk vessels were scrapped during February, representing about 1.9 mdwt. About 0.411 mdwt of the scrapped vessels were dry bulk vessels. Dry bulk vessels on order until 2015 totaled 287.9 mdwt and represent about 63 percent of the existing fleet (Table14-2). The implication of a lower scrapping rate and a robust orderbook is that vessel supply will keep increasing and may keep the cost of shipping and return on vessel assets low if the demand for vessel loading activity does not catch up.

Table 14-2: Global dry bulk orderbook, 2010-2015

Type of vessel	Size (dwt)	No. of vessels	Capacity (mdwt)	% of fleet
Handsize	10,000-40,000	793	25.878	35.4%
Handymax	40,000-60,000	884	50.418	55.9%
Panamax	60,000-80,000	273	20.316	20.2%
Post-Panamax	80,000-110,000	461	40.459	153.0%
Capesize	110,000-200,000	625	106.997	83.0%
Vloc	200,000+	151	43.785	109.8%
Total		**3,187**	**287.852**	**62.7%**

Source: Drewry Shipping Consultants.

Global Network Impact of Vessel Allocation

Although bulk ocean vessels are owned and operated by many companies in many nations, the majority are registered in just ten countries**:** Panama, Hong Kong, Malta, China, Cyprus, Liberia, Bahamas, Greece, Marshall Island, and Singapore (Table14-3).

Vessel owners often consider financial, regulatory, and other inducements offered by the respective countries when registering their vessels under a national flag. Analysts have found that U.S.-flag merchant vessels have higher operating costs than foreign-flag ships, partly due to federal regulations relating to ship construction, repair, and on-board labor. In addition, some governments operate or subsidize their national-flag ships to create or grow market share. Because of higher U.S. flag operational costs, commercial grain exporters usually prefer foreign-flag vessels.[349] In 2006, over 74 percent of the vessels in the world bulk fleet were registered in the 10 countries listed above, totaling about 296 mdwt. Panama registered the largest bulk fleet, with 1,865 vessels and a total deadweight capacity of over 124 million tons.

Table 14-3: World oceangoing merchant fleet

World Oceangoing Merchant Fleet, by Top 25 Flag and Type, 2006 Vessels 10,000 Deadweight Tons or Greater		
Flag of Registry	No.	Dry Bulk Deadweight
Panama	1,865	124,341,017
Hong Kong	515	33,473,162
Malta	443	21,600,993
China, P.R.	377	15,013,083
Cyprus	349	18,427,515
Liberia	345	21,388,903
Bahamas	327	17,349,346
Greece	263	19,555,654
Marshall Is.	196	12,011,331
Singapore	189	13,041,638
South Korea	126	8,769,334
St. Vincent & G.	122	5,136,256
Norwegian Int'l	102	7,085,562
India	76	3,652,772
United States	60	2,314,141
Italy	49	3,486,859
Japan	48	3,919,701
Isle of Man	41	3,413,001
Iran	40	1,789,317
Bermuda	26	3,626,865
United Kingdom	24	1,784,583
Malaysia	22	752,186
Belgium	21	2,920,003
Germany	4	456,170
Danish Int'l	4	321,829
Top 25	5,634	345,631,221
Total	6,562	380,154,143
Top 25 % of Total	85.9%	90.9%
Top 10	4,869	296,202,642
Total	6,562	380,154,143
Top 10% of Total	74.2%	77.9%

Source: Clarkson Research Studies, Vessel Registers, London: Clarkson Shipbrokers, <www.clarksonresearch.com>

Similarly, about 75 percent of the vessels (totaling about 308 mdwt) in the world bulk vessels were owned by just 10 countries**:** Greece, Japan, China, Germany, United States, Singapore, Norway, United Kingdom, South Korea, and Taiwan (Table 14-4). Greece and Japan owned the two largest bulk fleets, totaling 1,362 (83 mdwt) and 1,150 (85 mdwt) vessels, respectively.

Table 14-4: World merchant fleet by country of owner and type

Top 25 World Merchant Fleet by Country of Owner and Type, 2006 Vessels 10,000 Deadweight Tons or Greater		
Country Owner	No.	Dry Bulk Deadweight
Greece	1,362	83,170,382
Japan	1,150	85,120,593
China, P.R.	1,023	54,268,927
South Korea	222	15,878,835
Taiwan	218	15,042,539
United States	207	10,373,176
Norway	196	10,212,906
Germany	192	12,054,911
Singapore	188	10,958,086
United Kingdom	158	11,245,701
Turkey	146	5,868,794
India	106	5,130,285
Canada	98	3,291,335
Cyprus	91	3,469,128
Italy	80	5,077,201
Monaco	73	5,127,946
Russia	73	1,633,449
Iran	52	2,533,518
U.A.E.	48	2,184,908
Denmark	41	1,822,437
Switzerland	26	1,195,222
Bermuda	14	1,589,328
France	12	790,367
Malaysia	5	145,766
Saudi Arabia	-	-
Top 25	5,781	348,185,740
Total	6,562	380,154,143
Top 25 % of Total	88.1%	91.6%
Top 10	4,916	308,326,056
Total	6,562	380,154,143
Top 25 % of Total	74.9%	81.1%

Source: Clarkson Research Studies, Vessel Registers, London: Clarkson Shipbrokers, <www.clarksonresearch.com>

Container Shipping

The container phenomenon began in the 1950's, allowing shippers to save time and money using marine shipping containers to transport their goods. Containers reduce the need for products to be handled several times between modes of transportation. Less handling also results in a higher-quality product upon arrival at the destination. Containers provide product segregation, which allows buyers to be specific about the type and quantity of product they are buying. Containers provide added safety and reliability during the transportation process, thus reducing product deterioration, pilferage, and exposure to the elements during transport. Containers also facilitate just-in-time delivery, which reduces inventory costs and increases efficiencies of production.

Most marine containers are a standard length of either 20 or 40 feet long. Container movements are often described in terms of equivalent units. A Twenty-foot equivalent unit (TEU) is equal to a 20-foot container and a 40-foot container is equal to 2 TEUs. Other sizes of containers exist, including 45, 48, and 53-foot containers, but slot availability on ocean vessels is limited for them. A 20-foot container holds maximum of 22–25 metric tons of cargo and a 40-foot container holds 32–36 tons.

The industry refers to ocean container carriers in several categories, including liner carriers, shipping lines, and common carriers. An ocean container carrier is a company that provides ocean transportation service for containerized cargo on vessels operating on fixed itineraries or regular schedules and provides established rates available to all shippers.[350]

Freight rates were historically based on the ocean carrier's tariff. A tariff is a document published by the carrier setting forth applicable rules, rates, and charges for the movement of goods. The document sets up a contract of carriage between the shipper, consignee, and carrier. The term "tariff" is sometimes confused by those outside the industry with a tariff assessed in the form of a customs duty that is payable on imported merchandise. In the context of ocean shipping rates, they have distinctly different meanings and should not be confused. Additionally, ocean ports sometimes use the term "tariff" to refer to a document or set of rules that sets forth terms of port services and charges. Since the passage of OSRA in 1998 the general rate in a shipping company's tariff has become less indicative of actual rates charged, as the vast majority of ocean freight rates are now individually negotiated in confidential annual "service contracts" between shippers and carriers. Tariff rates and conditions are made available by the carrier to all comers; service contracts, on the other hand, are confidential, individually negotiated agreements between shipper and carrier. Tariffs are required by U.S. law to be published by the carrier; service contracts are filed confidentially with the Federal Maritime Commission (FMC). Freight charges are discussed in more detail later in the chapter.

Figure 14-2: Container Shipping Vessel

Source: Port of Los Angeles

Container vessels come in various sizes and configurations. In 1956, the first container ship carried 58 reinforced highway trailers on the deck of an old World War II tanker vessel. The voyage took 6 days to go from Newark, NJ, to Houston, TX. Today a standard container vessel can cross the Pacific Ocean from Los Angeles to Tokyo in 9 days carrying as many as 10,000 TEUs. Because of the nature of containerization, one vessel could be carrying car parts, motorcycles, personal electronics, apparel, oranges, grain, wastepaper, scrap metal, or any number of varied and unrelated products, all on the same ship. These cargo combinations would be impossible to move on a bulk vessel. The newest generation of container vessels can carry as many as 12,000 TEUs. These large ships allow shipping lines to create greater economies of scale with large amounts of cargo on one voyage.

Global Container Ship Fleet Capacity

At the end of February 2010, the global container ship fleet consisted of more than 4,680 vessels with more than 12.9 million TEU in capacity. Much like the bulk fleet, the container ship fleet is organized in categories ranging from a feeder vessel, which has capacity of less than 1,000 TEU to the very large Post-Panamax* vessels that can carry more than 15,000 TEU. Orderbook statistics also show that the number of vessels on order and scheduled to be delivered between February 2010 and 2014 is estimated to be 873 total vessels, with an

* A Panamax vessel is the largest vessel that can currently fit through the Panama Canal. A Post-Panamax vessel is too large to fit through the Panama Canal at its current size.

additional capacity of 4.87 million TEU. The Very Large category is slated to experience the largest increase in capacity—163 vessels with capacity of 2.1 million TEU, more than 444.5 percent of the current fleet of ships of this size. Demolition or scrapping activity statistics are not available for container ships. However, as larger vessels join the fleet, smaller vessels are often reallocated to the intra-Asia trade lanes where feeder vessels are needed to access smaller ports.

Table 14-5: Global container ship fleet, February 2010

Type of Vessel	Size (TEUs)	No. of Vessels	Capacity (thousand TEUs)
Feeder	<1,000	1,167	677
Handsize	1,000-1,999	1,186	1,705
Intermediate	2,000-2,999	718	1,820
Panamax	3,000-4,999	869	3,516
Post-Panamax	5,000-7,999	513	3,079
Large	8,000-9,999	192	1,650
Very Large	10,000+	41	463
Total		**4,686**	**12,910**

Source: Drewry Shipping Consultants

Table 14-6: Global container ship orderbook, 2010-2014

Type of Vessel	Size (TEUs)	No. of Vessels	Capacity (thousand TEUs)	% increase in fleet size
Feeder	<1,000	82	62	9.2%
Handsize	1,000-1,999	142	207	12.1%
Intermediate	2,000-2,999	73	182	10.0%
Panamax	3,000-4,999	211	881	25.1%
Post-Panamax	5,000-7,999	114	729	23.7%
Large	8,000-9,999	88	756	45.8%
Very Large	10,000+	163	2,056	444.5%
Total		**873**	**4,872**	**37.7%**

Source: Drewry Shipping Consultants

As with bulk vessel capacity, the U.S. agricultural community can benefit from this additional container vessel capacity. If demand is slow to recover from the recent economic downturn, the additional capacity will help to keep rates low. However, carriers must earn an adequate return on vessel assets to continue to offer service; otherwise, they will lay up or scrap their vessels.

In 2009, some carriers cancelled newbuilding orders as the economic slowdown diminished the carriers' confidence in the global trade arena. According to a report by Drewry Consulting,[351] the revised orderbook figures in February 2010 showed the orderbook numbers have dropped 26 percent from March 2009 reflecting vessel deliveries, some newbuilding cancelations, and less overall demand for vessel capacity.

In addition to canceling newbuilding orders, ocean container carriers are implementing several strategies to decrease costs during these challenging economic times**:**

- Employee layoffs—fewer customer service employees could reduce the quality of service to customers.
- Slow steaming—by reducing vessel speeds, carriers can greatly reduce bunker fuel costs (and associated emissions). Recently, numerous carriers have announced slow steaming initiatives. While slow steaming increases the amount of time for an individual voyage, carriers have generally added vessels to routes with slow steaming so that they can maintain the previous frequency of vessel calls at each port.
- Routing vessels around the Panama and Suez Canals to access East Coast ports to avoid canal transit fees. Intermodal transit by rail from the West Coast is more expensive than the Panama Canal option. All-water routes around the tips of Africa and South America are being used as cheaper alternatives.
- Using their ability to form alliances among the carriers to share vessel and container capacity. If the carrier doesn't have to operate its own vessel, but instead shares the cost of another company's vessel, both companies save money. However, this reduces vessel capacity for exporters.
- Pulling vessels from scheduled routes for dry docking, which reduces the total fleet capacity available to shippers.

In 2009, ocean carriers began idling vessels in response to the collapse in shipping rates and demand. According to the Paris-based AXS Alphaliner, the number of idled vessels reached a peak of 581 in January 2010[352], but carriers have recently been reactivating vessels, and the idle number dropped to 474 as of March 15, 2010.[353]

Global Impact on Container and Container Ship Allocation

The ocean container industry works within a global network of vessels, ports, routes, and container allocation. The strength of demand for service in a certain trade lane can impact the availability of service, vessels, and containers in another. For example, if ocean container carriers are able to receive high rates for cargo moving in the Asia-to-Europe trade lane, they will probably allocate service and equipment to that trade lane, reducing service and container supplies in other trade lanes. In essence, the U.S. shipper is competing for reliable ocean container service with other countries and the freight rates they are willing to pay.

However, over the long term, even as carriers acquire new vessels to support sustained demand around the world, unexpected shifts in demand to one country can strain the vessel and container pool for another country's service needs. For example, increased demand in the Asia-Europe trade lanes can pull vessel and container equipment away from U.S. trade lanes and increased rates, particularly in the Trans-Pacific trade lanes. During times of slow demand for ocean container service, the carriers are faced with overcapacity in the current fleet, and any new vessels being commissioned into the market only add to the surplus in capacity. Such times of overcapacity can provide shippers opportunities to negotiate lower rates, as they do through the service contract process or by "spot" rates.

Government Oversight

FMC has the authority under the Shipping Act of 1984 (Shipping Act) and its predecessor statutes to regulate the ocean common carriers, ocean transportation intermediaries, and marine terminal operators. The Shipping Act of 1984 was passed in order to reduce government intervention and regulatory costs in ocean transportation and to achieve a competitive and efficient liner fleet through greater reliance on the marketplace consistent with international shipping practices. FMC can influence the level of competition in maritime trade by policing and moving to block carrier agreements that are exempted from antitrust laws.

Most liner carriers that operate in the U.S. trade lanes participate in "discussion agreements" and other cooperative agreements regulated by FMC under the Shipping Act, as amended by the Ocean Shipping Reform Act of 1998 (OSRA). Discussion agreements are the forum through which carriers exercise their anti-trust exemption to discuss market conditions and establish voluntary rate guidelines. Several other types of agreements are filed with the Federal Maritime Commission and immunized by the Shipping Act from the antitrust laws, such as agreements among carriers to share vessels and equipment (e.g., the *Ocean Carrier Equipment Management Agreement*) and agreements among marine terminal operators to discuss rates and to coordinate practices and policies (e.g., the *California Association of Port Authorities* and the *Los Angeles and Long Beach Port Infrastructure and Environmental Programs Cooperative Working Agreement*).

The Shipping Act was crafted in an attempt to make the ocean liner industry more responsive to shipper needs. The legislation was designed to**:**

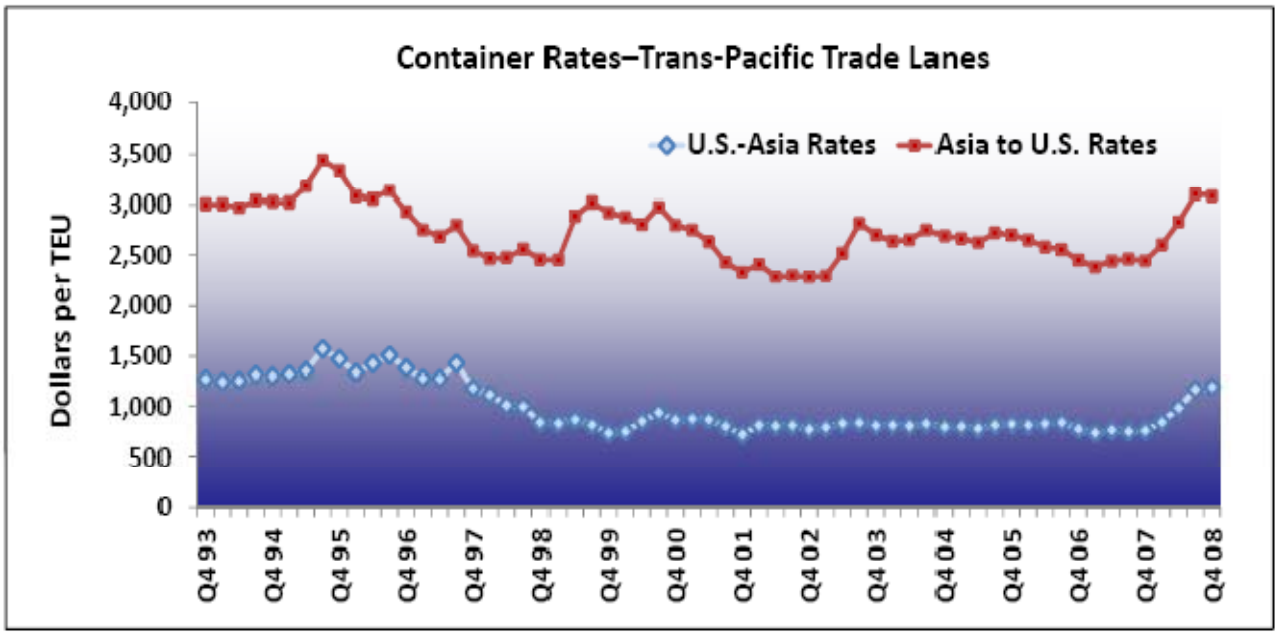
- Establish a nondiscriminatory regulatory process for the transportation of trade by sea.
- Provide an efficient and economic system to carry ocean commerce.
- Encourage the development of the U.S. flag liner fleet.
- Promote the growth and development of U.S. exports through competitive and efficient ocean transportation.

As a result of the Shipping Act, members of the discussion agreements (which have come to replace the liner conferences, which had mandatory rates set through a common tariff, that were common before the Ocean Shipping Reform Act amendments) can collectively agree on voluntary guidelines for rates and services.[354]

OSRA modified portions of the Shipping Act associated with collective rate setting and the use and confidentiality of service contracts negotiated between the shipper and carrier. Previously, tariff and contract rates were provided to the public; OSRA required that service contract rates be filed confidentially with the FMC. This allows shippers to enter into contracts with carriers individually without the carrier being influenced by other members of the discussion agreement. Member carriers may still discuss rates and develop rate guidelines, but it is up to individual carriers to decide on a customer-by-customer basis whether to implement a guideline wholly, in part, or not at all in their confidential service contract negotiations. These new regulations helped to increase the competitive nature of the industry.

OSRA went into effect on May 1, 1999. The biggest effects of OSRA were the increased competition among the ocean carriers and stabilization of rates particularly in the U.S. westbound Transpacific trade lanes. As shown in Figure 14-3, average westbound rates remained fairly flat for nearly 7 years after OSRA went into effect. However, as a result of record export demand in 2008, rates rose dramatically to levels not seen since the mid 1990's. In the first half of 2009, the economic downturn caused rates to drop significantly, but by early 2010, rates have begun to rebound to approach their pre-2008 levels.

Figure 14-3: Container rates for trans-pacific trade lanes



Source: Containerization International

Some U.S. shippers would like to do away with the liner carriers' antitrust exemption for rate discussion agreements, hoping to realize increased competition in the industry through the workings of the market. However, the carriers question whether adequate ocean services could be maintained without discussion agreements. Carriers feel that open competition might prove destructive, and ultimately lead to additional industry consolidation.[355] Carrier consolidations in 2005 and 2006 already reduced capacity available to agricultural shippers on some trade routes, particularly on the all-water routes from the U.S. West Coast to Europe. In October 2008, Europe eliminated its antitrust exemption for container carrier conferences, but retained some exemptions for "consortia agreements," which all carriers to agree to share vessel space. The FMC is in the process of studying the effects of Europe's repeal.

Negotiating Service Contracts

As a result of OSRA, exporters and importers typically negotiate confidential service contracts with ocean container carriers. These contracts stipulate the volume and type of cargo to be moved over a determined period of time between agreed-upon origin and destination port regions. Service contracts allow shippers and carriers to enter into agreements wherein shippers obtain rate and service concessions in return for cargo volume commitments. The negotiations are said to start with the carrier's tariff, but are refined to meet the service and operational needs of the carrier and shipper. Rates are partially determined by the value of the cargo being moved.

The confidential element of the service contract allows the shipper and carrier to develop rates in a more competitive environment; however, the carriers' antitrust exemption allows the carriers to discuss the market conditions and establish voluntary rate guidelines.

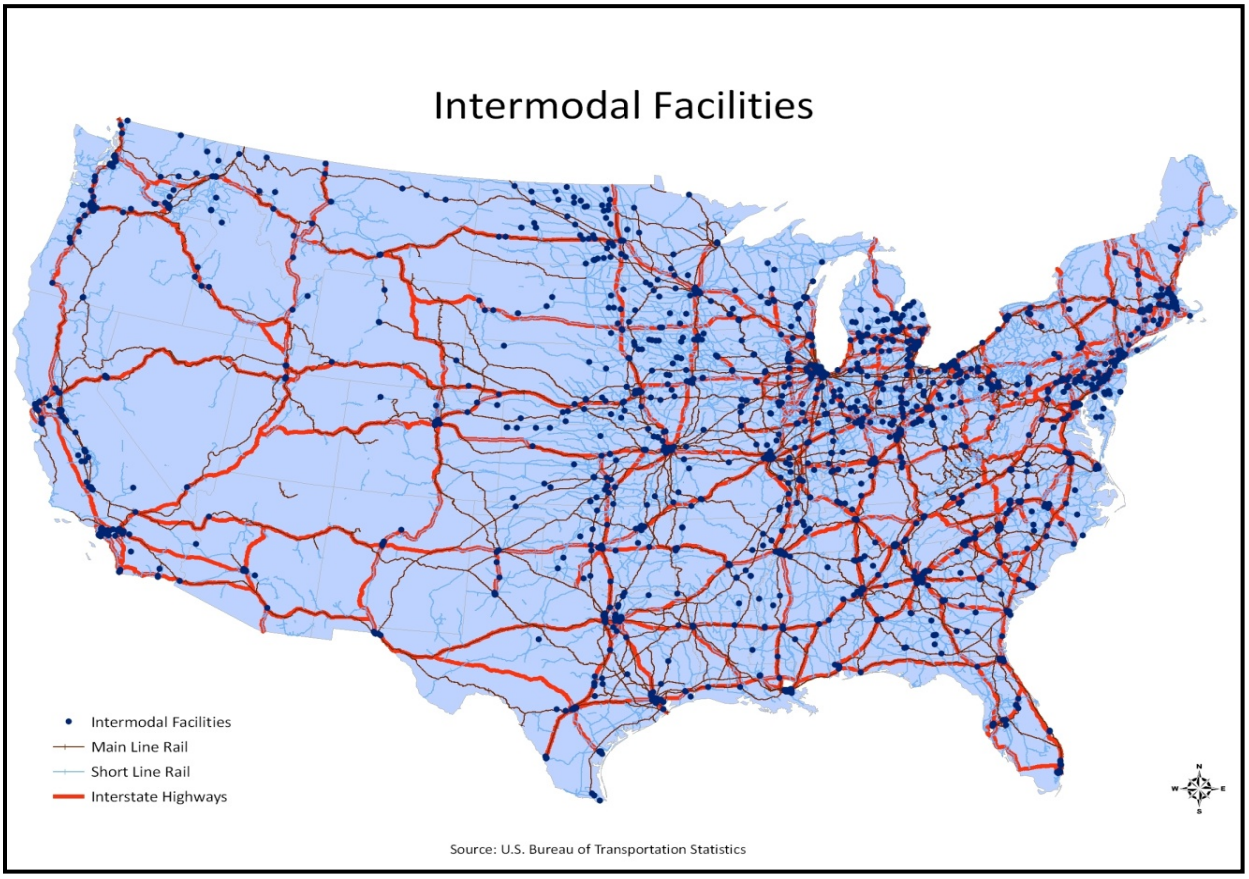
FMC Complaint Resolution Process

FMC is charged with administering the Shipping Act, as revised by OSRA. Under Sections 10 and 11 of this law, FMC provides both formal and informal complaint resolution processes for importers and exporters that believe ocean common carriers have violated the Shipping Act. FMC provides mediation services for disputes between individual importers and exporters and the ocean carrier. Additionally, FMC conducts investigations if it feels a carrier is in violation of the Shipping Act. Finally, any person can file a formal complaint or lawsuit with FMC alleging a violation of the Shipping Act. For more information about the FMC complaint resolution process see Appendix 14-1**:** FMC Complaint Resolution Process.

Intermodal Facilities

The use of landside intermodal facilities is essential when moving containerized cargo into international commerce. Intermodal facilities are locations where containers are moved from one conveyance to another to reach the ultimate destination. These facilities are located just outside the ports and throughout the country, mostly in major cities. Some of the intermodal hub locations are in Chicago, Memphis, Kansas City, Dallas, and Columbus (Figure 14-4).

Figure 14-4: Intermodal Facilities, 2002



Agricultural exporters in the heartland use these facilities to access container pools. Over the past few years, major importers such as Wal-Mart, Home Depot, and Target have developed distribution centers near ports. These distribution centers allow companies easy access to the ports of import where the cargo arrives. The cargo is moved by truck a relatively short distance to the distribution center, where the containers are emptied. They are then taken back to the ocean port. As a result, shippers located near the ports or within a few hours by truck are provided with a consistent pool of containers.

Over the years, ocean carriers in the U.S. transpacific trade lanes have fed the U.S. import cargo business (mostly high-valued electronics, apparel, and footwear), also known as the *headhaul* cargo, with sufficient container supplies since these cargoes bring higher rates for the carriers

than the lower-valued export cargo (the *backhaul* cargo, typically agricultural products, wastepaper, and scrap metal). The *headhaul* is the leg of a round trip that generates the greatest revenue to the carrier and greater volume. The backhaul is considered secondary because it generates less revenue. In recent years, the higher value of imported cargo has brought higher revenues for the carriers, making it the headhaul cargo and relegating the exported cargo to backhaul status. The import cargo can be so profitable for the carrier, that they return containers to Asia empty in order to more quickly and efficiently supply the eastbound cargo with sufficient equipment. Rates for westbound cargo in the Transpacific trades have not been sufficient to attract abundant container supplies to inland locations.

As a result, exporters located further inland struggle to get enough containers; there aren't as many import containers moving inland, as containers are unloaded at distribution centers closer to ports. For example, containerized grain shippers in the Midwest rely on import containers to supply the container pool for export movements. Even at large container hubs, such as Minneapolis and Chicago, containers are becoming increasingly scarce for the export community.

Railroads have increased the rates for picking up loaded containers or dropping off empty containers at some rural intermodal hubs. As a result, shippers have to collect containers from a major transportation hub, move them to the production site, load them, then move them back to the city to get rail service to the port of export. These additional transits increase transportation costs for agricultural shippers compared to what they would have been if containers had been available at their local rail terminal. An example of this is a rural hub near Dilworth, MN/Fargo, ND, where the railroads now quote rates more than three times higher than they did just a few years ago. Because of this higher rate, it is now cheaper for exporters to use the Minneapolis transportation hub with the additional truck costs than to use the rail hub in their local community. When the value of the cargo cannot sustain the extra transportation costs, the shipper either loses the sale or loses profit from the sale.

Transportation options for agricultural exporters are also constrained by the fact that ocean carriers in U.S. trade lanes have a practice of only transporting "carrier-owned" containers, which are containers that they own or lease themselves. Ocean carriers sailing from U.S. ports often impose prohibitive charges for containers that are owned or leased by shippers or third-parties ("shipper owned" containers), or they refuse them altogether. By contrast, the same carriers routinely transport shipper-owned containers from exporters in Europe.[356]

Transload Facilities

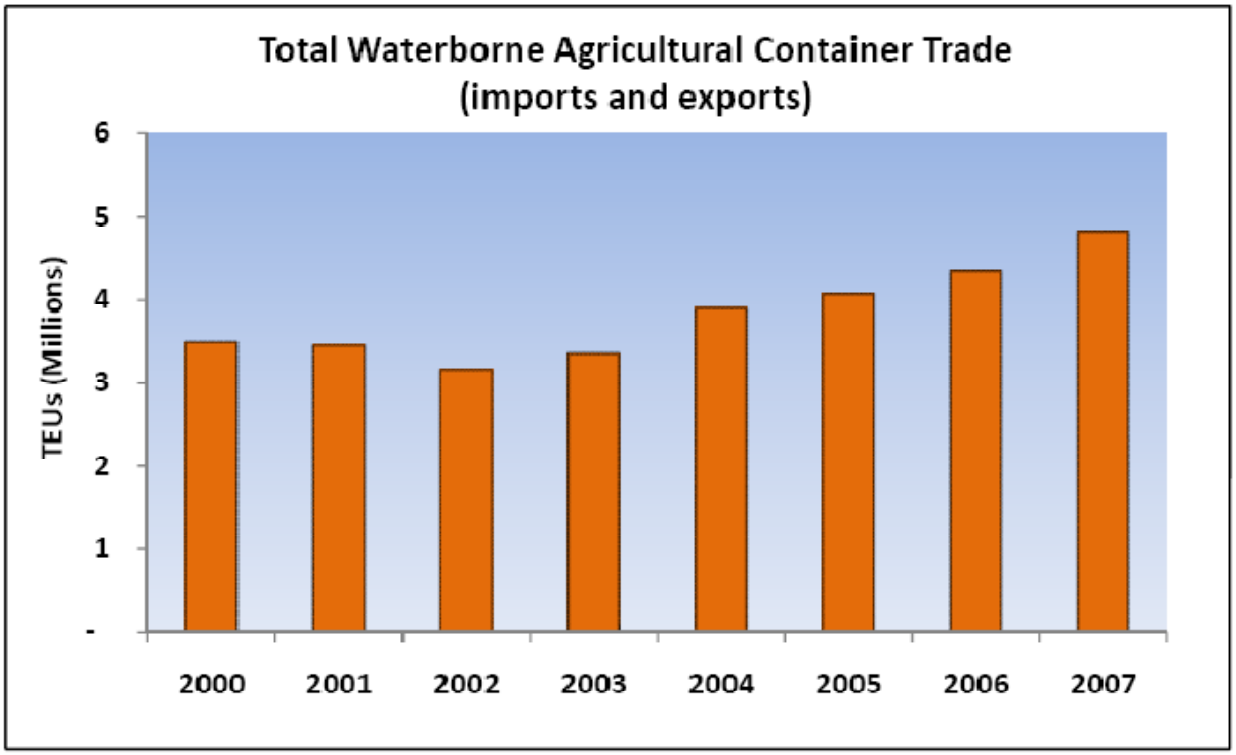
With increased frequency in recent years, some shippers use transload facilities located at major inland intermodal hubs or at facilities by ocean ports. Agricultural commodities are transported in bulk by railcar from the production area to the transloading facility. The commodity is then transloaded into a marine shipping container. This eliminates the added transportation costs to reposition containers and can provide the shipper the opportunity to take advantage of the benefits of container transportation even when containers are not available in the local production area. Transload facilities near ports also offer the advantage of

loading containers slightly heavier than they could be loaded at an inland location due to highway and railway weight restrictions.

Containerized Transportation of Agricultural Products

More than half of U.S. agricultural exports by value move in marine shipping containers each year. Containers are used to haul all types of products, including both low and high-valued agricultural products and grains. Whether it is U.S. grains to Asia, poultry to Russia, or wine to Europe, the container facilitates the movement of U.S. agricultural products all over the world. Figure 14-5 shows the overall upward trend in using containers for waterborne agricultural imports and exports.

Figure 14-5: Waterborne agricultural container trade



Source: Port Import Export Reporting Service (PIERS)

Agricultural shippers regularly take advantage of container benefits in the market place. Containers have opened many doors previously not available to U.S. agricultural exporters, allowing all types of products, both perishable and non-perishable, to move around the world. In 2007, 19 percent of U.S. waterborne agricultural exports on a tonnage basis were moved in containers—up from 8 percent in the early 1990s[357]. Technological advances in the design and construction of refrigerated containers minimize loss in commodity quality by slowing deterioration of fresh, perishable commodities and, in some instances, assist in the ripening process during transit. These specialized refrigerated containers also can maintain a constant temperature to ensure frozen products do not thaw.

Table 14-7: Waterborne agricultural exports

Top 20 Waterborne containerized agricultural exports, 2007			
Commodities	**Metric Tons**	**TEUs**	**Share**
Animal feed, hay	3,766,581	324,580	14%
Soybeans	2,935,241	227,828	11%
Grocery items, food preparations	2,563,637	280,851	9%
Bulk grains	2,190,469	161,748	8%
Cotton	1,857,352	188,740	7%
Poultry	1,702,918	140,646	6%
Vegetables	1,537,960	127,821	6%
Meat	1,243,791	118,253	4%
Grain products, bread, cereals, flour	946,114	79,055	3%
Hides and skins	934,754	56,518	3%
Non-alcoholic beverages	852,654	81,407	3%
Fruit	814,416	84,116	3%
Dairy products	605,415	53,791	2%
Frozen fish	562,059	49,316	2%
Edible nuts	559,898	52,611	2%
Bulbs and seeds	507,314	44,648	2%
Wine	490,713	32,757	2%
Beer, ale	354,443	31,076	1%
Rice, crackers, pasta	295,638	20,762	1%
Oranges	232,819	24,053	1%
Other	2,908,201	275,307	10%
Total	**27,862,387**	**2,455,885**	**100%**

Source: Port Import Export Reporting Service (PIERS)

In terms of volume, nearly 20 percent of waterborne agricultural exports in 2007 were moved in containers[358]. Grains and grain products made up 35 percent of waterborne containerized agricultural exports[359] (see later discussion of containerized grain). Other agricultural products, such as food preparations, cotton, and frozen poultry, also use containers extensively to reach export markets. Containers provide the protection, temperature controls, traceability, and convenience needed to serve the foreign demand for U.S. agricultural products.

U.S. agricultural exporters moved nearly 2.5 million TEUs in 2007. Table 14-8 lists the top 20 shipping lines used to move these containers. It is not surprising that the largest container ocean carrier in the world, Maersk, ranks first on the list of carriers for agricultural products as well.

Agricultural Shippers Use of Containers

U.S. agricultural exporters use marine shipping containers for several reasons:

- To reduce handling, which provides a higher quality product at destination
- To preserve the identity of the product based on buyer specifications
- To service small niche markets
- To supply relatively small amounts of the product, compared to bulk shipping, to buyers hoping to reduce inventory costs
- To take advantage of cost benefits when container freight rates are competitive with bulk freight rates. Grain exporters, in particular, monitor ocean rate fluctuations of container and bulk movements, hoping to realize the most competitive rates

Table 14-8: Container shipping lines for agricultural exports

Top 20 Container Shipping Lines Used to Move Agricultural Exports, 2007			
Shipping Lines	**Metric Tons**	**TEUs**	**Share**
Maersk	3,504,108	298,026	13%
APL	2,667,248	225,939	10%
Hanjin Shipping	2,408,795	202,429	9%
Evergreen	2,353,867	191,297	8%
Yang Ming	1,806,822	158,300	6%
OOCL	1,580,748	143,897	6%
Hapag Lloyd	1,577,274	132,967	6%
MSC	1,427,158	123,907	5%
Hyundai	1,423,504	119,921	5%
NYK Line	1,355,820	110,189	5%
MOL	828,052	78,126	3%
K Line	780,396	60,821	3%
Crowley	749,595	87,250	3%
Horizon Lines	602,976	65,752	2%
COSCO	553,097	46,304	2%
Tropical Shipping	504,574	54,574	2%
CMA-CGM	402,915	37,693	1%
Seaboard Marine	329,644	34,297	1%
Sea Star Line	327,586	34,762	1%
Hamburg Sud	296,156	24,002	1%
Other	2,382,052	225,432	9%
Total	**27,862,387**	**2,455,885**	100%

Source: Port Import Export Reporting Service (PIERS)

Ocean Ports

U.S. ports and the maritime industry offer agricultural shippers and exporters access to a vast global marketplace. Ports are the fixed infrastructure by which exports, imports, and domestic movements of waterborne commerce are loaded onto or discharged from maritime vessels. The maritime industry is the dominant mode for the transport of commerce to all international markets except Canada and Mexico. Approximately 90 percent of America's overseas foreign trade tonnage is moved by ship.

The goods our country consumes and the economic growth it enjoys are connected to the ability of the ocean ports to deliver goods. As our economy has become interdependent with the global economy, the U.S. Gross Domestic Product (GDP) has grown exponentially. This global interdependence among trade nations has brought prosperity, but also has placed additional demands on our ports and the end-to-end delivery system of imports and exports.[360]

Although foreign trade accounted for only 13 percent of U.S. GDP in 1990, it had grown to nearly 22 percent by 2006. Recent projections indicate that foreign trade will be 35 percent of GDP by 2020 and may grow to 60 percent in 2030.[361] As foreign trade continues to grow, marine transportation will become even more important to our economy.

According to the MARAD, 6,867 ocean-going vessels made 63,804 calls at U.S. ports during 2007, up 13 percent for 5 years earlier. Of these calls, 34 percent were tankers, 31 percent container ships, 17 percents were dry bulk vessels, and 10 percent were Roll on-Roll offs (a type of ship designed to permit cargo to be driven on at origin and off at destination[362]). About one-third (20,203) of the vessel calls were made at the U.S. Gulf ports.[363] About one-quarter (4,988) of the U.S. Gulf vessel calls were made by dry bulk vessels. Usually, close to 54 percent of the U.S. grain exports are shipped through the U.S Gulf.

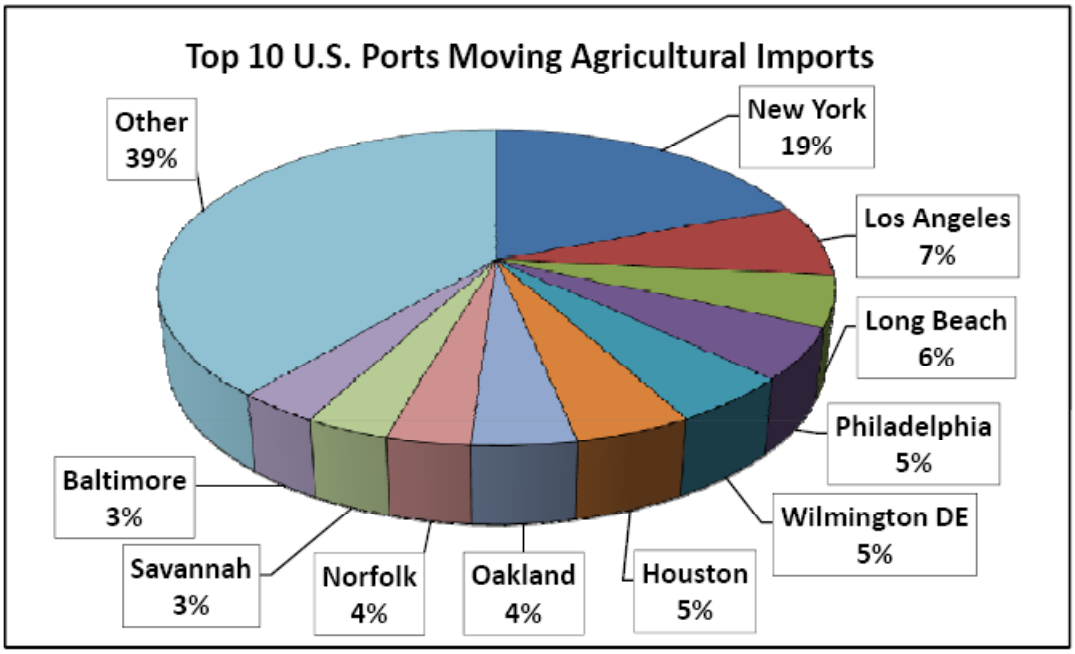
At ocean ports today, practically every mode of transportation, equipment, handling service and inspection service is used to meet shippers' needs. However, most agricultural products are not produced near these centers of transportation and trade. Unfortunately, all the benefits of business done close to the ports are not available to most of the agricultural community without extra transportation costs. For example, grain, cotton, and meat products are produced primarily in the nation's heartland, and require substantial transportation to reach export ports on the West, East, and Gulf Coasts. Even those shippers within States that contain major transportation and trade hubs need to reposition equipment to get transportation service and must bear the additional costs associated with that repositioning.

Importance of Ocean Ports to Agricultural Movements

U.S. ocean ports provide the gateway for an estimated 70 percent of U.S. agricultural exports and 60 percent of agricultural imports. Approximately 49 percent of U.S. waterborne agricultural exports move through the U.S. Gulf Region, which moves substantial amounts of grain and frozen poultry. More than 45 percent of U.S. agricultural imports move through the East Coast ports. Imports of fruit, vegetables, and canned products move through New

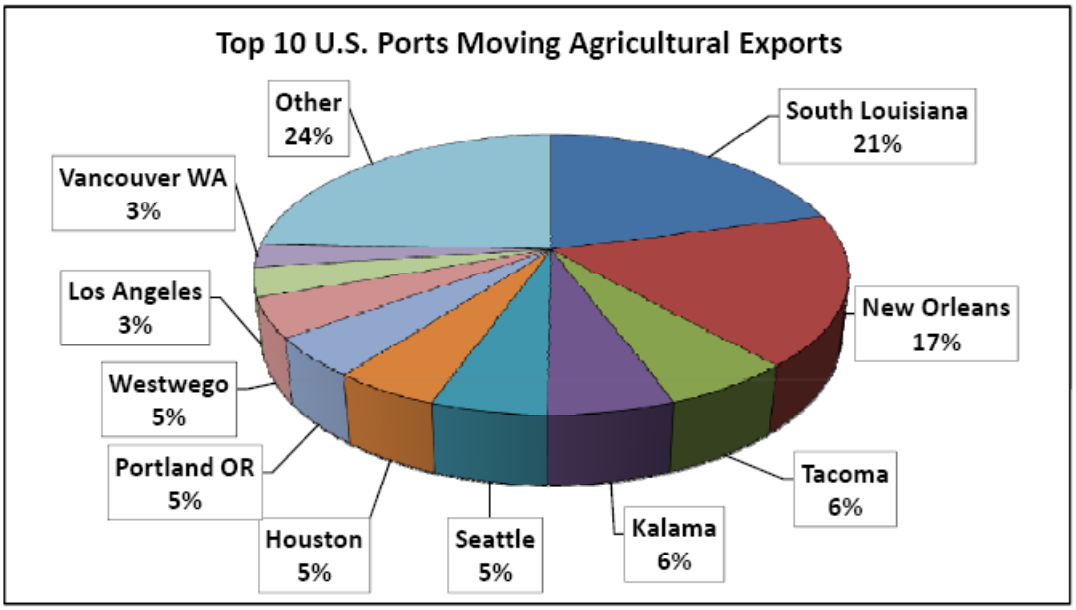
York/New Jersey, Philadelphia, and Wilmington, DE. The top 10 import and export ports for U.S. waterborne agricultural trade are shown in Figures 14-6 and 14-7.

Figure 14-6: Ports moving agricultural imports, 2007



Note: Chart depicts all waterborne agricultural imports, bulk and container combined, based on tonnage moved.
Source: Port Import Export Reporting Service (PIERS)

Figure 14-7: Ports moving agricultural exports, 2007



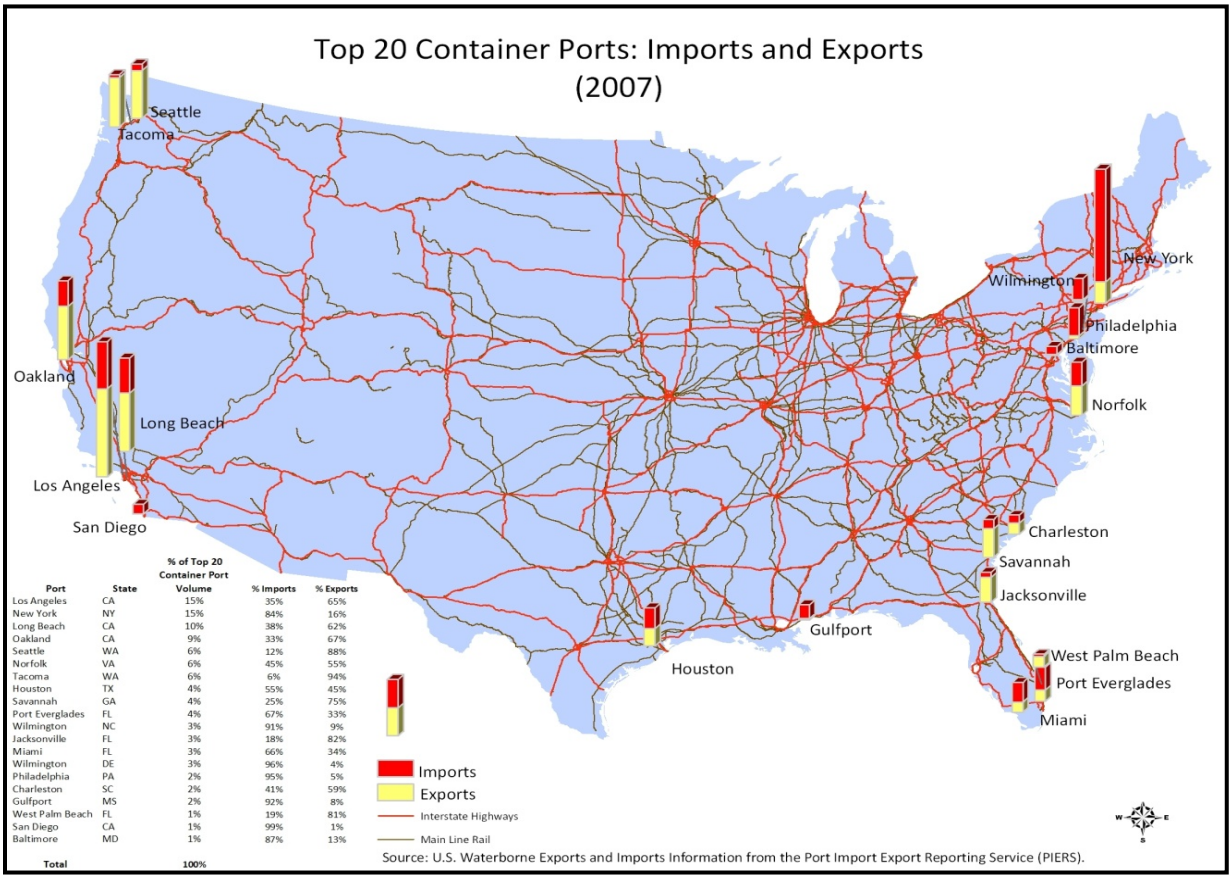
Note: Chart depicts all waterborne agricultural exports, bulk and container combined, based on tonnage moved.
Source: Port Import Export Reporting Service (PIERS)

Containerized Agricultural Movements

The top ocean ports used to move U.S. containerized agricultural commodities (both imports and exports) were the Los Angeles/Long Beach port complex, New York, Oakland, Seattle and Tacoma, and Norfolk. Approximately 38 percent of waterborne containerized agricultural trade moves through the two busiest port complexes in the country, Los Angeles/Long Beach and New York/New Jersey.

Figure 14-8 displays the top 20 U.S. ports used to move container agricultural imports and exports. It's clear that waterborne agricultural import traffic is concentrated on the East Coast and export movements are concentrated on the West Coast.

Figure 14-8: Top 20 container ports for exports and imports



Port	State	% of Top 20 Container Port Volume	% Imports	% Exports
Los Angeles	CA	15%	35%	65%
New York	NY	15%	84%	16%
Long Beach	CA	10%	38%	62%
Oakland	CA	9%	33%	67%
Seattle	WA	6%	12%	88%
Norfolk	VA	6%	45%	55%
Tacoma	WA	6%	6%	94%
Houston	TX	4%	55%	45%
Savannah	GA	4%	25%	75%
Port Everglades	FL	4%	67%	33%
Wilmington	NC	3%	91%	9%
Jacksonville	FL	3%	18%	82%
Miami	FL	3%	66%	34%
Wilmington	DE	3%	96%	4%
Philadelphia	PA	2%	95%	5%
Charleston	SC	2%	41%	59%
Gulfport	MS	2%	92%	8%
West Palm Beach	FL	1%	19%	81%
San Diego	CA	1%	99%	1%
Baltimore	MD	1%	87%	13%
Total		100%		

Port specialization differs with commodities. For example, waterborne containerized poultry exports are moved mostly through East Coast ports due to the dense production of poultry in the southeastern portion of the country. Nearly 75 percent were moved through East Coast ports in 2007. More than 80 percent of the waterborne containerized grain exports moved through the West Coast ports of Los Angeles/Long Beach and Seattle/Tacoma.

Bulk Agricultural Movements

Grain and soybean exports make up about 86 percent by volume of waterborne bulk agricultural exports. Other agricultural commodities, such as poultry, oils, and some fruit and vegetables, are moved in bulk as well. The United States exports approximately one-quarter of the grain it produces. This includes nearly 45 percent of its wheat, 35 percent of its soybeans, and 20 percent of its corn.

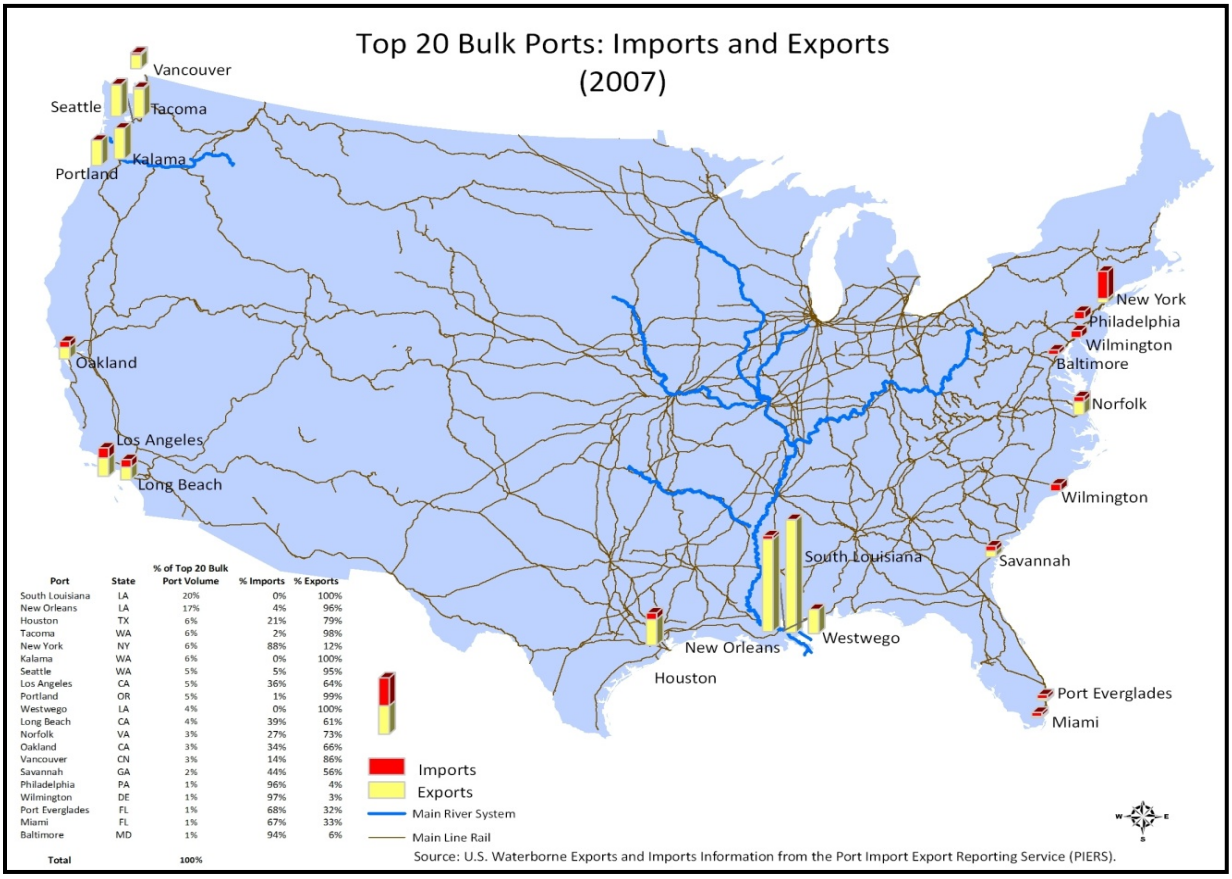
Table 14-9: Bulk waterborne agricultural exports

Top 10 U.S. Bulk Waterborne Agricultural Exports, 2007		
Commodities	**Metric Tons**	**Share**
Bulk grains	74,823,151	63%
Soybeans	27,227,285	23%
Grain products, flour	5,946,118	5%
Animal feed	2,966,875	3%
Rice	2,144,429	2%
Vegetables	1,207,970	1%
Poultry	1,177,329	1%
Tallow, grease	751,112	1%
Soybean oil	542,265	0%
Corn oil	286,363	0%
Grocery items, canned foodstuffs	282,565	0%
Fish	182,326	0%
Fungus, moss	176,334	0%
Molasses, treacle	170,022	0%
Vegetable oil & shortening	127,553	0%
Beverages	74,054	0%
Frozen fish	69,871	0%
Oranges	46,594	0%
Citrus fruit juices	45,781	0%
Millet seed	37,119	0%
Other	280,235	0%
Total	**118,565,352**	**100%**

Source: Port Import Export Reporting Service (PIERS)

Figure 14-9 displays the top 20 ports for imports and exports of U.S. bulk agricultural commodities.

Figure 14-9: Top 20 bulk ports for imports and exports



Port	State	% of Top 20 Bulk Port Volume	% Imports	% Exports
South Louisiana	LA	20%	0%	100%
New Orleans	LA	17%	4%	96%
Houston	TX	6%	21%	79%
Tacoma	WA	6%	2%	98%
New York	NY	6%	88%	12%
Kalama	WA	6%	0%	100%
Seattle	WA	5%	5%	95%
Los Angeles	CA	5%	36%	64%
Portland	OR	5%	1%	99%
Westwego	LA	4%	0%	100%
Long Beach	CA	4%	39%	61%
Norfolk	VA	3%	27%	73%
Oakland	CA	3%	34%	66%
Vancouver	CN	3%	14%	86%
Savannah	GA	2%	44%	56%
Philadelphia	PA	1%	96%	4%
Wilmington	DE	1%	97%	3%
Port Everglades	FL	1%	68%	32%
Miami	FL	1%	67%	33%
Baltimore	MD	1%	94%	6%
Total		100%		

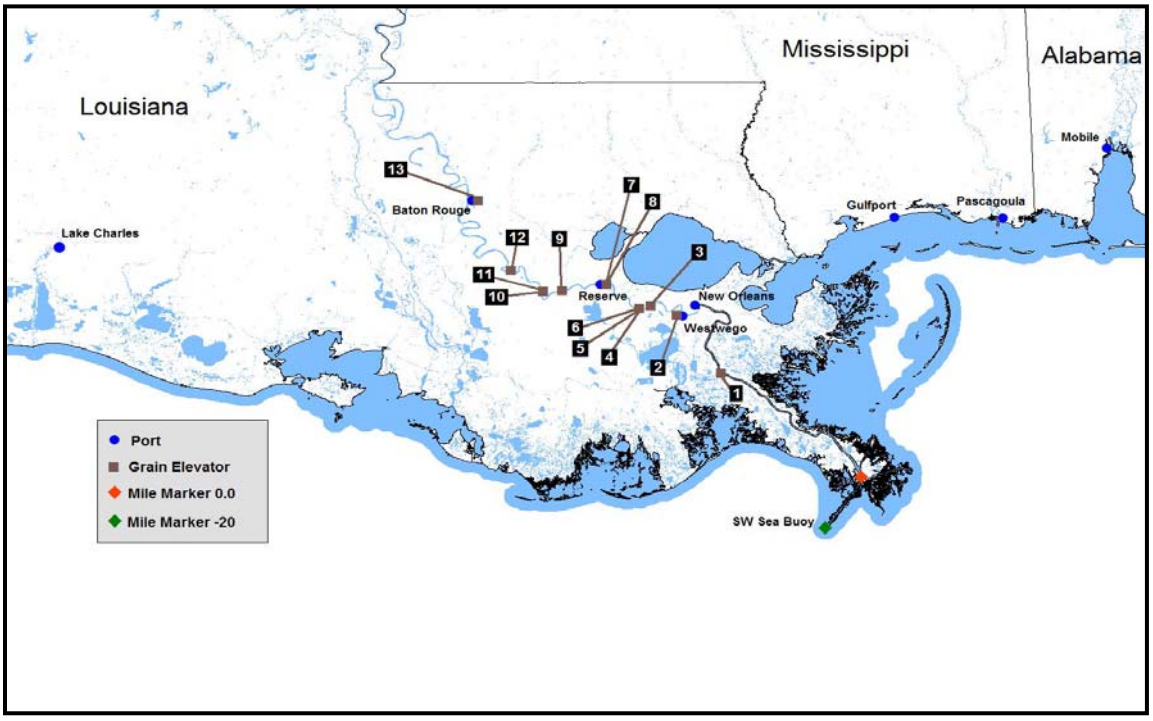
The importance of exports to the U.S. global grain trade underscores the significance of grain export elevators with the ship-loading and storage capacities to keep up with export requirements (Table 14-10). The majority of export elevators are located in the Louisiana port region. According to USDA's Grain Inspection, Packers and Stockyard Administration data, 57 percent of the U.S. export grain shipments departed through the U.S. Gulf region in 2008. Figures 14-10 and 14-11 show major grain export elevators in the Mississippi and Texas Gulf ports.

Table 14-10: Major U.S. grain export ports

Major U.S. Grain Export Ports				
Port Region	**State**	**No. of Elevators**	**Reported Shiploading Capacity (bushels/hr)**	**Reported Total Grain Storage Capacity (bushels/MT)**
Beaumont	TX	1	50,000 (1,300 MT)	3,500,000 (92,100 MT)
Brownsville	TX	1	50,000 (1,400 MT)	3,000,000 (85,100 MT)
Chesapeake	**VA**	1	60,000 1,524 MT)	5,700,000 (155,129 MT)
Corpus Christi	TX	2	60-150,000 (4,200 MT)	5,000,000 (141,800 MT)
Duluth	MN	2	50-140,000 (1,400-4,000 MT)	4.2-9,800,000 (121,500-283,500 MT)
Gavelston	TX	1	80,000 (3,200 MT)	2,800,000 (73,700 MT)
Galena (Houston)	TX	1	75,000 (2,200 MT)	600,000 (157,800 MT)
Kalama	WA	2	60-100,000 (1,700-2,800 MT)	400,000 - 3,500,000 (56,700 MT)
Longview	TX	1	20,000	1,300,000
Brunswick	GA	1	40,000 (1,100 MT)	2,300,000
Louisiana	LA	20	400-3,200 MT	1,619,400 MT
Mobile	AL	1	120,000 (3,200)MT	1,100,000 (29,937 MT)
Superior	WI	4	75,000 (2,200) MT)	9,000,000 (260,400 MT)
Portland	OR	4	45-75,000 (1,300 -2,000 MT)	1.8-7,500,000 (1,300 -2,000 MT)
Sacramento	CA	1	21,200 (600 MT)	1,250,000 (32,900 MT)
Seattle	WA	1	100,000 (2,800 MT)	4,200,000 (119,100 MT)
Stockton	CA	1	40,000 (1,100 MT)	6,500,000 (184,4000 MT)
Tacoma	WA	1	80,000 (2,300 MT)	3,200,000 (90,800 MT)
Maumee	OH	2	20-35,000 (600-1000 MT)	6.3-17,000,000 (177,600-482,200 MT)
Toledo	OH	2	60-80,000 (1,700 -2,300 MT)	5.9 -9,600,000 (149,900-272,650 MT)
Vancouver	WA	1	80,000 (2,300 MT)	4,700,000 (133,300 MT)

Source: USDA/FGIS

Figure 14-10: Mississippi Gulf ports and export grain elevators



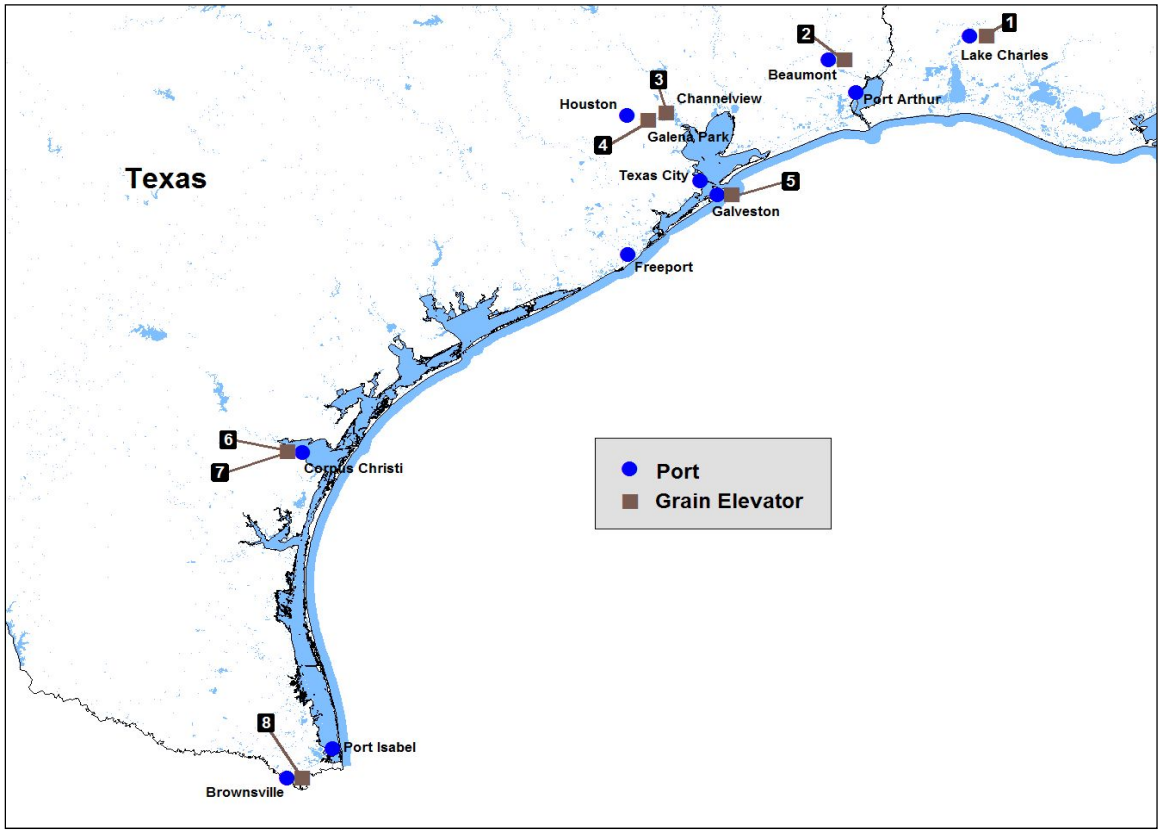
Source: AMS

Table 14-11: Mississippi gulf ports and export grain elevators

Map Reference	Location	Storage Capacity (million bushels)	Load capacity (bushels/hour)
1	Myrtle Grove	6.5	90,000
2	Westwego	4.3	100,000
3	Ama	5.0	80,000
4	Destrehan	6.2	80,000
5	Destrehan	6.3	80,000
6	Destrehan	Floating Rig	30,000
7	Reserve	3.6	80,000
8	Reserve	7.7	100,000
9	Saint Elmo	2.0	60,000
10	Convent	Floating Rig	60,000
11	Convent	4.0	120,000
12	Darrow	Floating Rig	30,000
13	Baton Rouge	7.0	60,000
	Total	**52.6**	**970,000**

Source: USDA/GIPSA

Figure 14-11: Texas gulf ports and export grain elevators



Source: AMS

Table 14-12: Texas gulf ports and export grain elevators

Map Ref. #	Location	Storage Capacity (mil bu)	Load capacity (bu/hour)
1	Lake Charles, LA	.75	25,000
2	Beaumont, TX	3.5	50,000
3	Channelview, TX	6.0	190,000
4	Galena Park, TX	6.0	75,000
5	Galveston, TX	2.8	80,000
6	Corpus Christi, TX	6.3	60,000
7	Corpus Christi, TX	5.0	150,000
8	Brownsville, TX	3.0	50,000
	Total	**33.35**	**680,000**

Source: USDA/GIPSA

Port Capacity Constraints

Until recently, port capacity demands could be met by building another terminal or adding another highway lane. That is no longer the case because the land necessary to build them is no longer available. Today, our Nation's ports and international systems face a growing capacity crunch.[364]

Competing land-use issues adversely impact port expansion efforts. Limited acreage is available for marine development around existing port facilities and port expansion plans face competing development issues and environmental concerns that further limit expansion. Property that may be suitable for port development is subject to constant pressures for non-port uses, such as office, residential, or recreational.[365]

Ports could experience pockets of congestion as space available for increasing amounts of import and export cargo is limited by environmental and community concerns. Congestion also occurs when vessels arrive at the same time rather than spread through the week. Most ports must look to operational improvements to increase capacity and reduce congestion, such as reducing the period of demurrage allowed for containers at terminals; instituting chassis pools, which make chassis available for truckers at the port; and using stacked container operations.[366]

Port Infrastructure Expansion and Environmental Implications

Ports must supply capacity to handle the increasing amounts of cargo coming in and going out of the country while ensuring expansion does not have detrimental effects on their local community. Ports are, more than ever, under pressure to clean up the pollution created by vessels, trucks, cranes, and rail service, and expand only when measures are taken to reduce emissions and protect the air quality in their local community.

Although the Federal Government has paid for much of the transportation infrastructure of the U.S. highways and airports, ocean ports and marine terminals have historically been financed by local taxes or private sector investment. Many container ports in the U.S. continue to develop new terminals and implement projects to reduce port congestion and accommodate bigger ships. However, not all ports and terminal operators are able to do so. A recent report by the American Society of Civil Engineers states**:**

> Although U.S. ports are currently comparable to foreign ports in terms of overall port infrastructure, more effort needs to take place in terms of dockside infrastructure, i.e., larger and more substantial berths, newer and larger cranes, and improved intermodal access to inland transfer areas.[367]

Port development, capital expenditures, and maintenance are financed through port revenues, general obligation bonds, revenue bonds, and public funding at the local, State, and Federal levels. Port revenues are generated through fees charged to vessel owners, stevedore companies, and shipping customers for use of facilities and services. As public support for port

development has diminished, some ports are financing environmental cleanup and congestion programs through per-container fees.

MARAD's recent publication *America's Ports and Intermodal Transportation System* says**:**

> America's Marine Transportation System faces growing congestion challenges. The U.S. Marine Transportation System has managed to accommodate our rising levels of international trade. Trade growth, however, has begun to strain our waterways, ports and key road and rail freight corridors. Our Nation's gateway ports, typically located in some of our most populous urban areas, face serious capacity expansion challenges—such as congestion, community, environmental, and competing land use issues.[368]

Port Infrastructure Funding

Port authorities and marine terminal operators are spending substantial sums to build, improve, and expand terminals to handle the current and anticipated increases in cargo. Billions of dollars have been and are being expended to improve terminals to accept and process cargo. During fiscal years 2006–2010 alone, $8.6 billion is projected to be invested**:** over $3 billion in the U.S. southern Pacific Coast ports, $2 billion in the South Atlantic, and over $1 billion each in the North Atlantic and the Gulf regions.[369] Specific investment plans by port are provided in Appendix 14-2**:** Port Expansion Plans.

Recently opened terminals, such as the Maersk Terminal in Portsmouth, VA, and planned terminals such as the Yusen Terminal in Tacoma, WA; the Coos Bay Terminal in Coos Bay, OR; the Dames Point Terminal in Jacksonville, FL; the Maersk/CMA CGM Terminal in Mobile, AL; the North Carolina International Terminal in Wilmington, NC; and the Craney Island Expansion Project in Norfolk, VA, are responding to the need for expanded berths, newer and larger cranes, and improved intermodal capabilities. These terminals will add approximately 12 million TEUs of capacity to the national port system within the next few years.[370]

Congestion at Southern California Ports in 2004

The Southern California port complex of is the busiest port complex in the United States because of its huge volume of containerized trade. In 2004, the port complex experienced a period of severe congestion when an unexpected rush of import cargo pushed port and rail capacity to its limit. The congestion began in late June and became progressively worse as the peak season approached in the fall. The complex experienced extremely slow cargo handling and a backlog of waiting vessels. This period of severe congestion was blamed on a lack of available longshoremen, an earlier-than-usual peak season, and a significant growth in container volume, particularly import traffic.

Since 2004, these ports have expanded, hired additional labor, and avoided further severe congestion. Nevertheless, some wonder if it is only a matter of time before the future increases in U.S. trade will once again overflow the bounds of the port complex.[*] Since the extreme episode in 2004, shippers have diversified the ports they use instead of relying on just a few ports or one port region. They learned that relying on one major port was potentially costly during times of strong demand and pressed capacity.

[*] America's Ports and Intermodal Transportation System, MARAD, January 2009.

Part of the strategic plans at several ports is to deepen ship channels to make safer navigation conditions and to accommodate the newest and largest container ships in the market. Ports—particularly on the East Coast—are making plans to receive such vessels as the Panama Canal is widened to accommodate them. The maintenance and improvement of Federal coastal harbors and channels is the responsibility of the Army Corps of Engineers

The Corps deepens, widens, or lengthens coastal harbors and channels based on an economic evaluation. It has several significant coastal harbor construction projects underway**:** Mobile Harbor, AL; Los Angeles Harbor Main Channel Deepening, CA; Port of Long Beach, CA; Oakland Harbor (50 Foot Project), CA; Delaware River Mainstem and Channel Deepening, DE, NJ & PA; Jacksonville Harbor, FL; New York and New Jersey Harbor, NJ & NY; Gulfport Harbor, MS; Columbia River Channel Improvements, OR & WA; Houston-Galveston Navigation Channels, TX; and Texas City Channel, TX.

The American Association of Port Authorities asserts:

> As a result of federal underinvestment, the 59 most-utilized federal channels only have authorized depths available for the center half of the channel 30-40% of the time. This limits efficient use of our waterways and increases transportation costs. The annual need for maintenance dredging, which is in the range of $1.3 to $1.6 billion according to the Army Corps of Engineers, is comparable to the funds collected. However, over the past five years, annual expenditures for channel maintenance have averaged less than $800 million, creating a surplus of funds and leaving users with inadequately maintained channels. The net result is increased costs for waterborne transportation users, higher prices to consumers, and reduced competitiveness of U.S. exports in the global marketplace. Jobs and income produced are adversely impacted as well.[371]

The Corps evaluates the competing demands for funding among its programs and strives to make the best use of the available funds from a national perspective. Under its performance-based allocation process, the Corps allocates a significant portion of total operation and maintenance (O&M) funding to coastal harbor maintenance. The 2011 Budget requested $764 million from the Harbor Maintenance Trust Fund for such work.[372] This represents about one-third of the total O&M program for the Corps, which includes the inland waterways, flood and storm damage reduction projects, multi-purpose dams and other programs nationwide.

Within program areas, the Budget allocates funding using objective performance criteria. For example, the Corps is developing an improved methodology to rank dredging needs based on an assessment of its economic return. The Corps gives priority to the maintenance of the 59 coastal harbor projects with 10 million tons or more of commercial cargo per year. It typically dredges a portion of a project in a given year, with emphasis on places where shoals that could affect navigation have formed.

Improvements to gate systems, technology, cranes, equipment, ship channels, management processes and information technology are costly. They do not alleviate all issues associated with cargo movement, but they can improve port viability, distribution of benefits and costs, environmental quality, and the overall effectiveness and efficiency of the national transportation system.

Expansion of the Panama Canal

Recently developed expansion plans at ports along the U.S. Gulf and East Coast are partly in response to the expected increase in vessel traffic from the Panama Canal expansion currently underway.[373]

The Panama Canal is reaching the limits of the number of vessels it can handle. It handles more traffic than its builders forecast and does not have the infrastructure to handle Post-Panamax vessels, which carry 27 percent of the world's containerized maritime shipments.[374] On December 9, 2009, the Panama Canal Authority received financing to begin a Canal expansion program that will increase its cargo capacity and allow for the transit of larger vessels. The project is expected to be finished by 2014.[375]

The U.S. intermodal system* is the main competitor of the Panama Canal, particularly for cargo moving in the Northeast Asia†–East Coast route.[376] The Canal route is less costly and highly reliable but takes longer than the U.S. Intermodal System route.

The major advantage of the U.S. Intermodal System is the opportunity to develop economies of scale in the transpacific maritime route. This route frequently uses Post-Panamax container ships, so only five ships are needed for a weekly service rotation instead of the eight ships required by the Panama Canal route.[377] However, the port and railroad reliabilities have been affected by labor problems (strikes and shortage of labor to handle new cargo) and capacity expansion challenges such as congestion, as well as community and environmental land uses.[378] As trade increases, many of the top ten U.S. container ports‡ are reaching the limits of existing capacity.[379]

The Panama Canal's expansion will allow for the use of Post-Panamax vessels in the trade lanes between Asian and U.S. Gulf and East Coasts, likely increasing container capacity in those trade lanes. A deeper and wider Panama Canal will offer shippers an alternative to West Coast ports for their import and export needs. U.S. Gulf and East Coast ports are preparing to take advantage of the increased demand for port services.

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* Cargo moved by rail from the port to the inland portions of the country or from one coast to the other.

† Northeast Asia includes: China, Hong Kong, Mongolia, Macau, Taiwan, Japan, South Korea, and North Korea.

‡ Top 10 U.S. container ports: LA/LB, New York/New Jersey (NY/NJ), Seattle/Tacoma, Savannah, Houston, Norfolk, Oakland, Charleston, Port Everglades and Miami (DOT 2008).

Southern California Environmental and Infrastructure Initiatives

In addition to port funding sources from port revenues, general obligation bonds, revenue bonds and public funding (local, State and Federal), the ports of Los Angeles and Long Beach have instituted per-container fee programs to mitigate congestion, pollution, and improve infrastructure. For example, these ports, along with the California Air Resources Board, adopted the San Pedro Bay Ports Clean Air Action Plan (CAAP) in November 2006. The plan eliminates older, less-clean diesel trucks by helping to finance a new generation of clean or retrofitted vehicles and equipping all major container cargo and cruise ship terminals with shore-side electricity so that vessels at berth can shut down their diesel-powered auxiliary engines. The plan also calls for reducing ship speeds when entering or leaving the harbor, using low-sulfur fuels, and other emissions-reduction measures and technologies. Some estimates project that implementation of this plan would cut particulate matter pollution by 47 percent, nitrogen oxides (NOx) emissions by more than 45 percent, and sulfur oxides by 52 percent. The port complex currently is responsible for 10 percent of the region's emissions levels.[380]

Several other communities and ports around the country, such as Seattle and Oakland, are considering variations of this plan. In addition, some states, municipalities, and ports are contemplating various fees to finance the cost of this environmental remediation.[381]

The ports of Los Angeles and Long Beach consistently rank among the top three U.S. ports for containerized waterborne movements of agricultural imports and exports. In 2007, the 2 ports combined moved nearly 30 percent of waterborne agricultural exports and 17 percent of waterborne agricultural imports in terms of a TEU calculation. They have established per-container fees on cargo owners to help fund their environmental programs. In the past 5 years, importers and exporters using these ports have been faced with an increasing array of potential container fees to reduce congestion and improve environmental conditions and infrastructure. Some of these fees can be avoided by changing practices, such as moving cargo in off-peak times or using clean trucks.

These fees include:

- Alameda Corridor Fee
- PierPass Mitigation Fee (assessed during peak traffic periods)
- Clean Truck Fee (only on older, higher emission trucks)
- Port Infrastructure Cargo Fee (to be determined)

The Alameda Corridor

The Alameda Corridor is a 20-mile-long rail cargo expressway linking the ports of Long Beach and Los Angeles to the transcontinental rail network near downtown Los Angeles (Figure 14-12). It is a series of bridges, underpasses, overpasses, and street improvements that separate freight trains from street traffic and passenger trains, facilitating a more efficient transportation network. The project's centerpiece is the Mid-Corridor Trench, which carries freight trains in an open trench 10 miles long, 33 feet deep, and 50 feet wide between State Route 91 in Carson and 25th Street in Los Angeles. Construction began in April 1997 and it opened in April 2002.[382]

Figure 14-12: Map of Alameda Corridor

Source: <www.acta.org>

The Corridor is used extensively by the shipping industry. More than 10,000 TEUs move through it daily. A per-container fee of $18 per TEU is assessed to the cargo owner for use of the Corridor.[383]

PierPASS Off-Peak Program

In an effort to reduce congestion at the ports of Los Angeles and Long Beach and improve air quality in the community, the marine terminal operators created an extended gate hours program designed to encourage truck cargo to use non-peak terminal gate hours at night and on weekends. It imposes a Traffic Mitigation fee on the cargo owner for each loaded container moved in or out of the terminals during peak daytime hours (3:00 AM to 6:00 PM). No fee is charged for use during off hours. PierPASS is a non-profit organization created by the marine terminal operators to administer the "off peak" program and collect the fees.

When the PierPASS program began in July 2005, the fees were set at $40 per TEU and $80 per 40-foot container (FEU). Since then, the fee has increased to $50 per TEU, or $100 a FEU. PierPASS does not assess a fee for empty containers and chassis, domestic containers, or transshipment to other ports. Nor does it assess a fee for containers that depart or arrive via on-dock rail or the Alameda Corridor.

The program has diverted nearly 40 percent of the port complex's truck traffic to off-peak gate hours, resulting in a noticeable reduction in congestion on the freeways leading to and from the ports during peak traffic times. Turn times for trucks once inside the gates are now 35–40 minutes for both peak and off-peak, down from more than 45 minutes, creating further flexibility, agility, and efficiency.[384]

Clean Trucks Program

The ports of Los Angeles and Long Beach began the Clean Trucks Program in October 2008. The Clean Trucks Program is part of a larger Clean Air Action Plan, which includes several strategies to reduce emissions and improve the environment. The Clean Trucks Program is designed to ban the use of trucks at the ports that do not meet the more stringent 2007 Environment Protection Agency's (EPA) emissions standards by January 1, 2012. As of February 18, 2009, a per-container fee called the Clean Trucks Fee is being assessed on each container moved in or out of the port complex by a "dirty" truck. The program has come under scrutiny by the American Trucking Associations, shipper organizations, and the Federal Maritime Commission. Even the Department of Justice has weighed in on the competitive implications of the program.

The goal of the program is to have all trucks using the ports meet the EPA's 2007 clean air standards by January 1, 2012, and reduce truck emissions by 80 percent. The initial phase, which began on October 1, 2008, bans trucks built prior to 1989—about 2,000 trucks that previously serviced the ports. More than 16,000 trucks in total will need to be replaced or retrofitted by the deadline.

As part of the Clean Trucks Program, shippers are charged a Clean Trucks Fee on each loaded inbound and outbound container moved by truck that does not meet the 2007 emission standards. The fee will help pay for a port-sponsored grant subsidy to help drivers purchase new "clean" trucks or retrofit older trucks. The cargo owner is responsible for a fee of $35 per TEU and $70 per FEU. These fees are expected to generate revenue of about $1.6 billion, or 72 percent of the total needed for the grant subsidy. The fees are not charged for cargo moved through the ports by rail.

As part of the program, each harbor trucker must sign an agreement with each port. The agreements establish the environmental, operational, and security provisions of the Clean Trucks Program. Cargo moved by trucks that meet the "clean" standards do not have to pay the Clean Trucks Fee, but are still required to enter into an agreement with the ports. The ports have different requirements and it is important that shippers understand these differences when doing business at the respective ports.

The agreements are being challenged. Some requirements are seen as reducing competition by restricting the trucks or drivers that can call at the port, and others as increasing the cost for trucks to do business at the ports. The American Trucking Associations have taken court action to at least temporarily enjoin the program or portions of the agreements deemed unreasonable or illegal by the litigants.

Port Infrastructure Cargo Fee

The Ports of Los Angeles and Long Beach have proposed an Infrastructure Cargo Fee, which was originally scheduled to begin in January 2009. Implementation of the fee has been postponed several times due to the economic slowdown, challenges facing the shipping community, and delays in State funding. The latest deadline was July 2010; however, the ports are currently reassessing this deadline to either postpone implementation again or revisit the idea in a few years after cargo movements have fully recovered from the recession. When implemented the Infrastructure Cargo Fee is proposed to initially be $15 per TEU and will fluctuate over time as port infrastructure projects are approved. This fee will be tied directly to funds needed for projects the ports have identified to improve infrastructure and, as a result, reduce congestions and emissions.

Table 14-13 summarizes the fees mentioned above, which are either currently in place or are expected to be initiated at the Ports of Los Angeles and Long Beach.

Table 14-13: Comparison of port fees at Ports of Los Angeles and Long Beach

Existing Fees	Time frame	Mode	Per 20ft Container	Per 40ft Container
PierPass Mitigation Fee	Currently in force	Truck	$50	$100
Alameda Corridor Fee	Currently in force	Rail	$18	$36
Clean Trucks Fee	Currently in force	Truck	$35	$70
Upcoming Fees				
Port Infrastructure Cargo Fee	To be determined	Truck & Rail	$10-18	$20-36

Source: <www.pierpass.org, www.acta.org>, <http://www.cleanairactionplan.org/strategies/cleantrucks/default.asp> and <www.portoflosangeles.org>

Impact on Agricultural Movements

In 2007, more than 723,000 agricultural export containers and more than 407,000 agricultural import containers moved through the Ports. Based on these numbers, the Clean Trucks Fee alone could cost the agricultural export community more than $20 million per year and the agricultural import community nearly $12 million per year. Per-container fees either reduce profits for agricultural shippers or reduce their ability to remain competitive in the global marketplace.

However, flexibility in the transportation network could, over time, allow shippers to adjust to the new system and find ways to avoid the Clean Trucks Fee. Trucks currently classified as "clean" by the Ports are not required to pay the fee. However, agricultural shippers will have to find these clean trucks or increase their use of rail transportation to avoid paying the new fee. As the program progresses, truckers and trucking companies that take advantage of the Ports' grant subsidy by providing clean trucks will become more plentiful.

The agricultural shipper could use any of the scenarios listed in Table 14-14 based on the urgency of the cargo delivery demands. However, making arrangements or changes to established business practices to strive for the Best Case Scenario (Scenario 1) is timely and costly to the agricultural shipper, and in some cases may cost more than the Worst Case Scenario (Scenario 3).

Table 14-14: Fee scenarios for moving containers through Southern California ports

Scenarios	PierPass	Alameda Corridor	Clean Trucks Fee	Port Infrastructure Cargo Fee	Total Fees Per Container	% of the Value of an Average Export Container
Scenario 1: "Clean" truck used. Delivered to the port during off-peak hours.				X	$30	0.2%
Scenario 2: Shipper uses rail to deliver cargo to the Ports.		X		X	$66	0.4%
Scenario 3: "Unclean" truck used. Delivered to the port during peak hours of operation.	X		X	X	$200	1.1%

Source: Table developed by USDA, data sources are: PierPASS, <www.pierpass.org>; Alameda Corridor Transportation Authority, <www.acta.org>; Clean Trucks Program, <http://www.cleanairactionplan.org/strategies/cleantrucks/default.asp>; Port of Los Angeles <www.portoflosangeles.org>, and Port Import Export Reporting Service (PIERS) <www.piers.com>

Rates, Competition, and Service

Ocean freight rates are a determining factor in deciding whether to ship commodities as bulk or in containers. Containerized shipments of agricultural products, particularly grain products, have gained popularity because of the relatively high bulk ocean freight rates over the past 5 years. However, the fundamental market conditions for bulk ocean and container shipping are different. Because of these differences, their respective freight rates are normally determined independently.

Bulk Freight Rates

Bulk ocean freight rates are volatile, at least in the short run, since the total supply of vessel space is relatively inelastic in that time frame. While it may take a long time for a newly built vessel to be delivered, the demand for vessel space can vary greatly. Ocean freight rates for shipping bulk grain and other agricultural products are determined in competition with the shipments of other bulk commodities such as coal, iron ore, steel, cement, fertilizer, sugar, salt,

and forest products. In recent years, ocean freight rates for shipping bulk grain from the United States to export destinations have increased because the global demand for bulk commodities has increased. For instance, world seaborne trade of iron ore increased by almost 50 percent from 2002 to 2006, from 481 million metric tons (mmt) to 721 mmt.[385] Waterborne coal shipment increased by 34 percent to 544 mmt during the same period. Waterborne shipment of grain increased about 8 percent to 292 mmt.

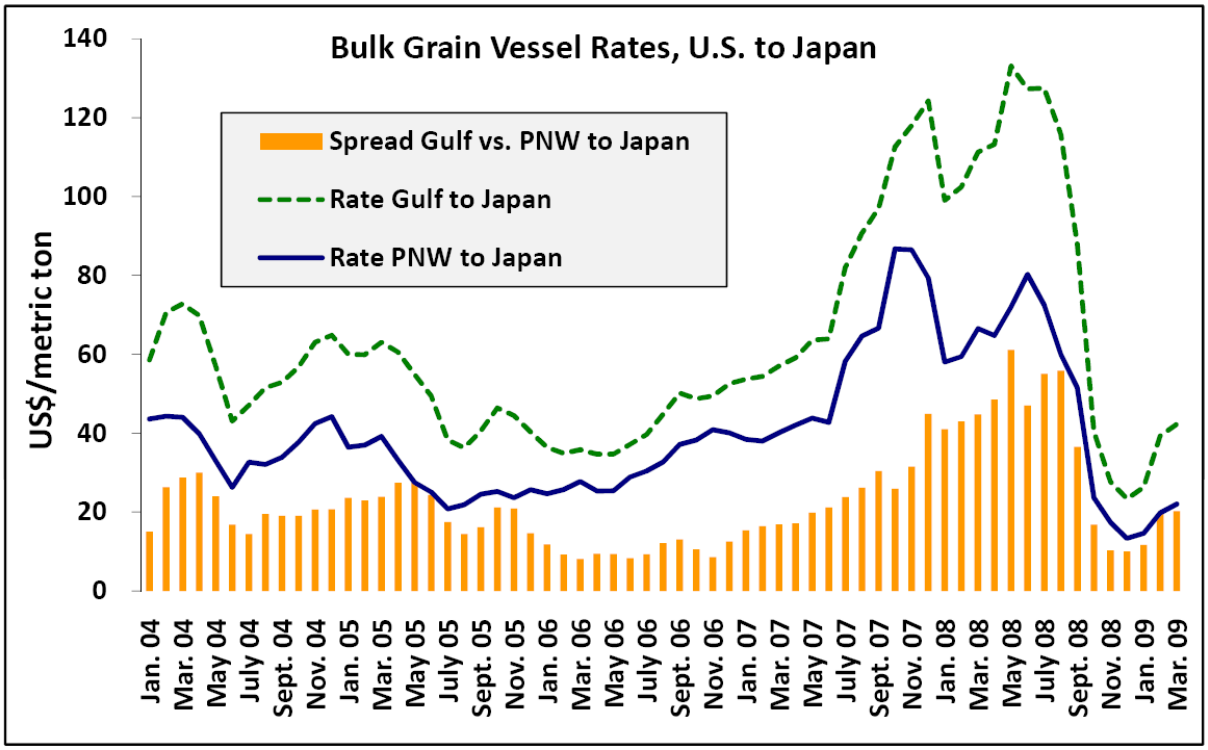
Before the dramatic drop in rates during the later part of 2008, ocean freight rates for shipping grain from the U.S. Gulf and the Pacific Northwest to Japan had been relatively high since 2004. The high ocean freight rates were consistent with increases in global shipments of bulk commodities, especially coal and iron ore during these periods. Prior to 2004, rates were considerably lower than the 5-year average during the period 1999-2003 (Table 14-15 and graph in Figure 14-13). However, the freight market was not immune to the global economic crisis; rates returned to pre-2004 levels and lower.

Table 14-15: Bulk grains ocean freight rates

	U.S. Gulf to Japan							Pacific Northwest to Japan						
	1999 - 2003 Avg	2004	2005	2006	2007	2008	2009	1999 - 2003 Avg	2004	2005	2006	2007	2008	2009
Jan.	20.42	58.56	60.01	36.41	53.70	99.00	26.30	14.50	43.58	36.44	24.64	38.40	58.00	14.60
Feb.	20.51	70.56	59.90	34.91	54.40	102.40	39.25	14.29	44.31	36.99	25.69	38.00	59.40	19.75
Mar.	21.99	72.75	63.04	35.82	57.00	111.25	42.25	14.97	44.05	39.18	27.71	40.15	66.50	22.00
Apr.	22.82	69.83	60.55	34.70	59.15	113.25		14.81	39.88	33.12	25.31	42.05	64.75	
May	24.00	56.88	54.90	34.70	63.60	133.10		15.16	32.94	27.53	25.38	43.80	72.00	
Jun.	22.28	43.05	49.40	37.16	63.90	127.25		15.01	26.25	25.08	28.85	42.75	80.25	
Jul.	22.39	47.05	38.25	39.67	82.00	127.50		15.00	32.66	20.79	30.42	58.25	72.50	
Aug.	22.71	51.52	36.26	44.82	90.75	115.80		13.94	32.07	21.84	32.72	64.60	60.00	
Sep.	24.22	52.92	40.62	50.15	97.00	88.00		14.41	33.85	24.53	37.16	66.45	51.50	
Oct.	26.78	56.78	46.36	48.74	112.60	40.40		18.15	37.72	25.22	38.23	86.70	23.60	
Nov.	26.88	63.06	44.44	49.44	118.00	27.63		19.07	42.44	23.60	40.87	86.50	17.38	
Dec.	26.88	64.82	40.27	52.54	124.20	23.33		20.11	44.17	25.66	40.07	79.35	13.33	
Avg	**23.49**	**58.98**	**49.50**	**41.59**	**81.36**	**92.41**		**15.79**	**37.83**	**28.33**	**31.42**	**57.25**	**53.27**	

Source: Baltic Exchange, Inc/Drewry Shipping Consultants Ltd/O'Neil Commodity Consulting

Figure 14-13: Bulk grain ocean freight rates from U.S. to Japan



Source: Baltic Exchange, Inc/Drewry Shipping Consultants Ltd <www.drewry.co.uk>/O'Neil Commodity Consulting

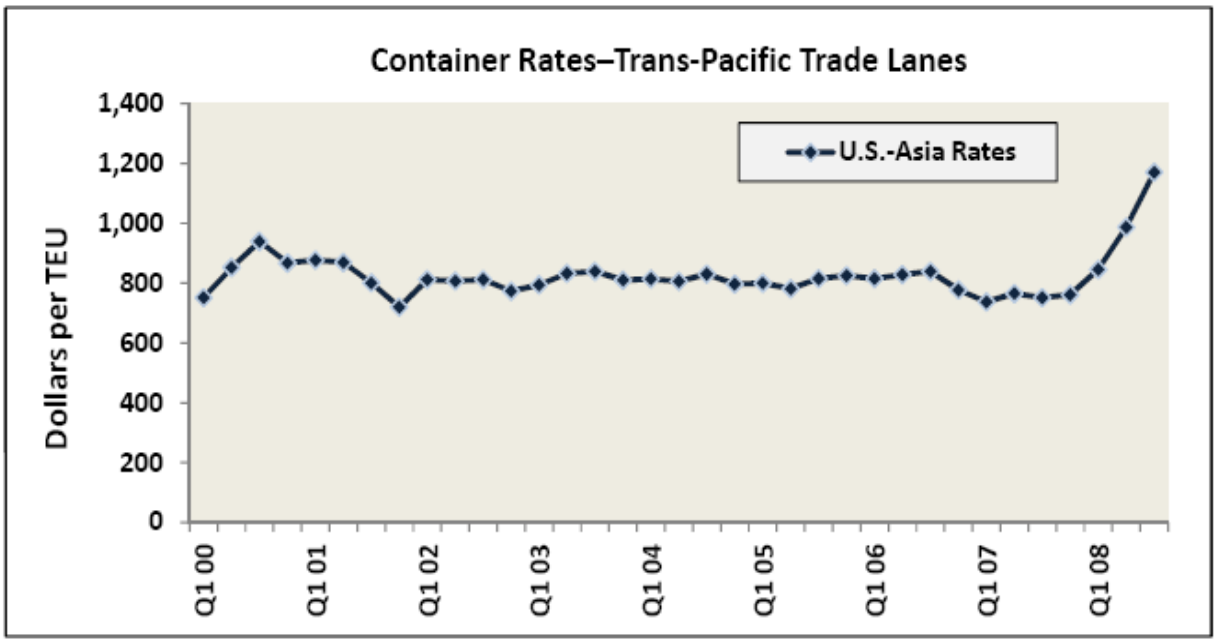
Containerized Freight Rates

The long-term nature of service contracts provide a relatively stable rate structure that protects rates from sharp market flucucations. However, at any point during the term of the contract, the two parties can agree to amend the contract based on current market conditions. In addition, the ocean carriers over the years have added stipulations to the contracts that allow for rates to flucuate within a reasonable and agreed-upon range. Some contracts allow for surcharges, such as a fuel surcharge, to flucuate throughout the life of the contract based on current fuel market conditions. Sharp increases in fuel prices, such as those experienced in 2007 and the first part of 2008, would significantly increase an exporter's or importer's rates if the contract allows.

Since containerized freight rates are kept confidential under the OSRA, it is difficult to analyze rates for specific commodities and trade routes. However, some private consulting firms collect avereage ocean container rates for all commodities and all trade routes. These rates provide an overall trend of container rates, but do not show the specific flucutations or impacts on individual commodities or commodity groups.

Figure 14-14 shows overall average container rates per TEU in the trans-Pacific trade lanes. Overall, rates were stable in the U.S. to Asia trade lane from 2000 until 2008, when rates rose quickly in response to increased demand for U.S. exports.

Figure 14-14: Container rates for trans-pacific trade lanes



Source: Containerization International

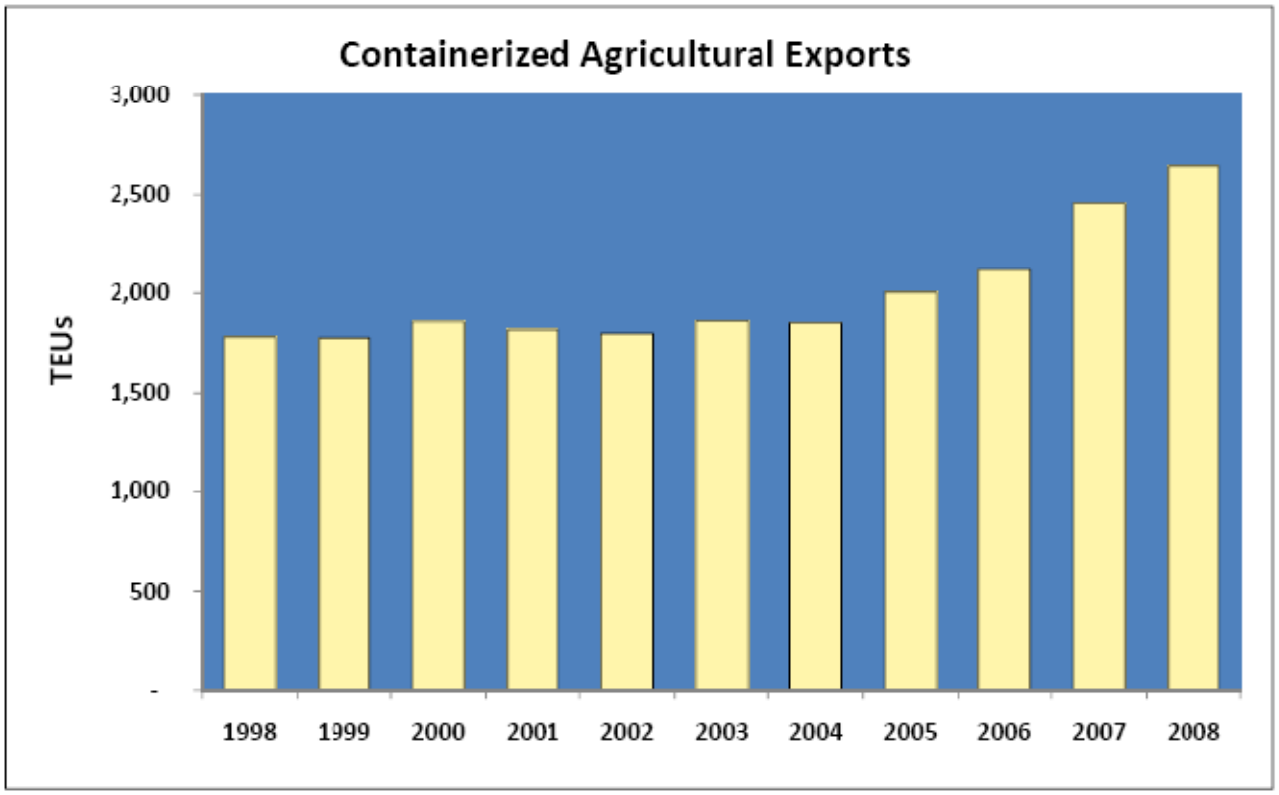
The westbound or export movements to Asia from the U.S. are usually lower-valued goods such as agricultural products, waste paper, and scrap metal. Carriers move fewer export containers than import containers. Over the years, the ocean container carriers have viewed export container movements as backhaul cargo which brought lower revenue, but was preferrable over the absence of revenue associated with moving the container back to Asia empty. However, as the U.S. demand for consumer goods from Asia has increased, carriers have chosen to move containers back to Asia empty to facilitiate a quicker turnaround time for the container's reuse in the eastbound market. This constricts the available container pool for U.S. exporters.

The following section describes the problems exporters face with container availability as well as the rate and capacity impacts of the 2007 export boom.

Container Service Challenges: Container Availability and the 2007 Export Boom

Since 2005, economic growth in developing countries has increased the demand for containerized agricultural products such as meats, fruit, vegetables, and nuts. These increases in demand accelerated sharply in 2007 and to a record level in 2008 (Figure 14-15). The unprecedented demand for export ocean container service caught the ocean carriers by surprise and left the export community with insufficient container equipment to deliver the amount of product demanded. Demand for export container service subsided in early 2009, but returned in late 2009 and early 2010, again straining container supplies for the export community.

Figure 14-15: Containerized agricultural exports



Source: Port Import Export Reporting Service (PIERS)

Impact on Agricultural Exporters

Agricultural exporters took advantage of the weak dollar in 2007, which made U.S. products more competitive in foreign markets. However, the opposite happened to import traffic; the weak dollar made imports more expensive in the United States. This effectively reduced demand for import cargo while demand for export cargo was increasing. Fewer imports resulted in fewer containers supplying the agricultural export container pool.

Increased export sales resulted in an export boom and further strained the available container pool. Exporters who could not find enough containers lost sales in foreign markets and scrambled to locate containers. Shippers reserved vessel slots with multiple ocean carriers, sent trucks to distant rail hubs to obtain empty containers, transloaded cargo from rail to containers at the ports where containers were more plentiful, and used third party logistics providers to improve their chances of finding available equipment. Shippers reported they were provided a fraction of the containers requested from the carriers.

In addition, 2007 brought weak global supplies of grain due to bad weather in other grain-producing countries, increasing the demand for U.S. grain. U.S. bulk grain shipments competed globally with strong demands for other bulk commodities, such as steel and coal, for bulk carrier capacity. This competition for bulk service pushed rates to record levels. In response, many bulk grain exporters started using containers to move their products. Containerized movements offered a cost advantage compared to the rising cost of the bulk ocean transportation.

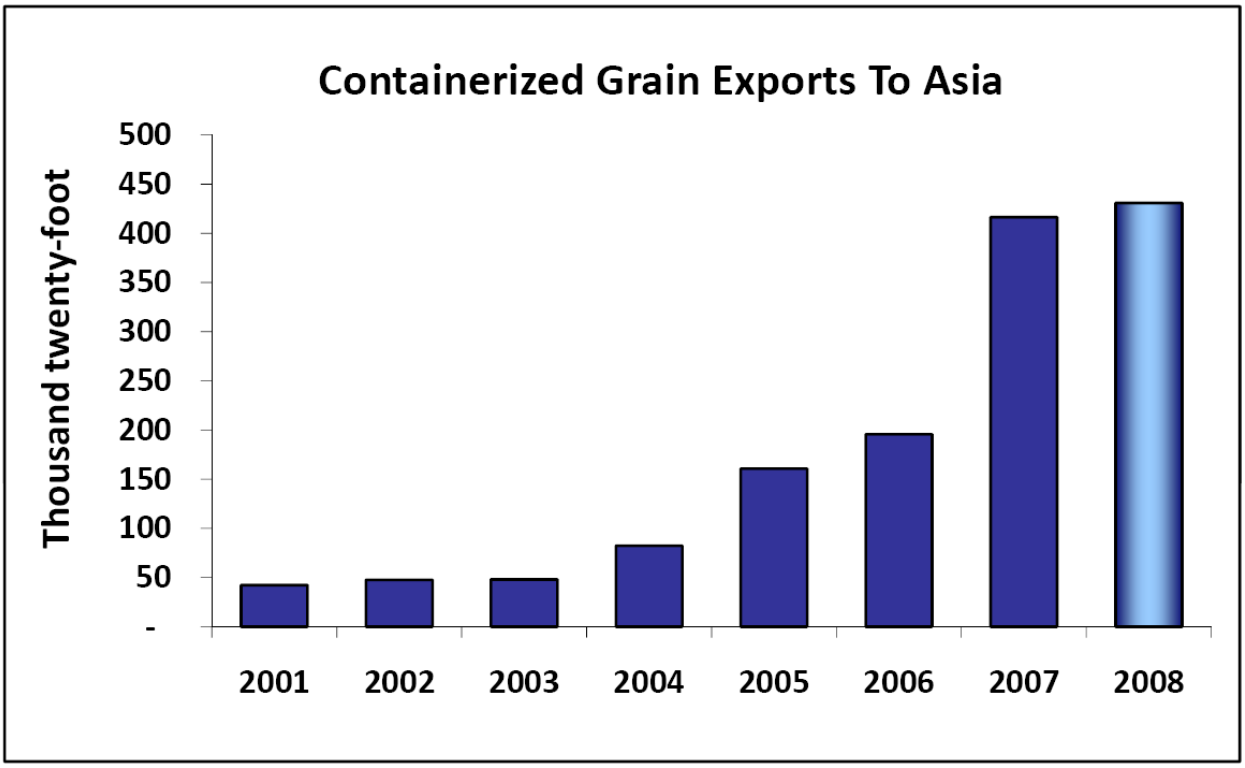
Containers and Agricultural Shipping

- U.S. import containers make up a significant portion of the available container pool for U.S. containerized exports.
- Imports are considered headhaul* cargo in the Trans-Pacific trade lanes. Ocean carriers have traditionally subsidized the export movements, which is used to gain partial cost recovery for the return of container equipment to Asia.
- Marine shipping containers are usually more plentiful at ocean ports, particularly in Southern California.
- The use of near-port distribution centers by major container importing companies has increased.
- The pool of available containers at inland locations is limited.
- Rail transportation is cheaper than trucks for long-distance movements, so containers pass through major rail hubs to access ocean export ports.
- Exporters incur additional transportation costs obtaining containers because they are only available at major rail hubs and ocean ports.

* Headhaul cargo was recently defined by an ocean container carrier as cargo that provides enough revenue to pay for the initial transportation to the buyer and the return transportation of the empty container. In contrast, backhaul cargo is unable to pay for both legs of the transportation.

After several months of using containers to export grain, some traditional bulk shippers decided they liked the product protection and higher quality at the destination that containers delivered. Figure 14-16 shows that containerized grain exports to Asia grew dramatically in 2007; an average of more than 31,000 containers of waterborne grain exports moved each month, 87 percent more than the previous year. The trend continued into 2008; containerized grain exports to Asia reached record levels in February, at nearly 53,000 TEUs. The introduction of bulk grain shipments into the container market combined with the export boom made the export container supply even further strained.

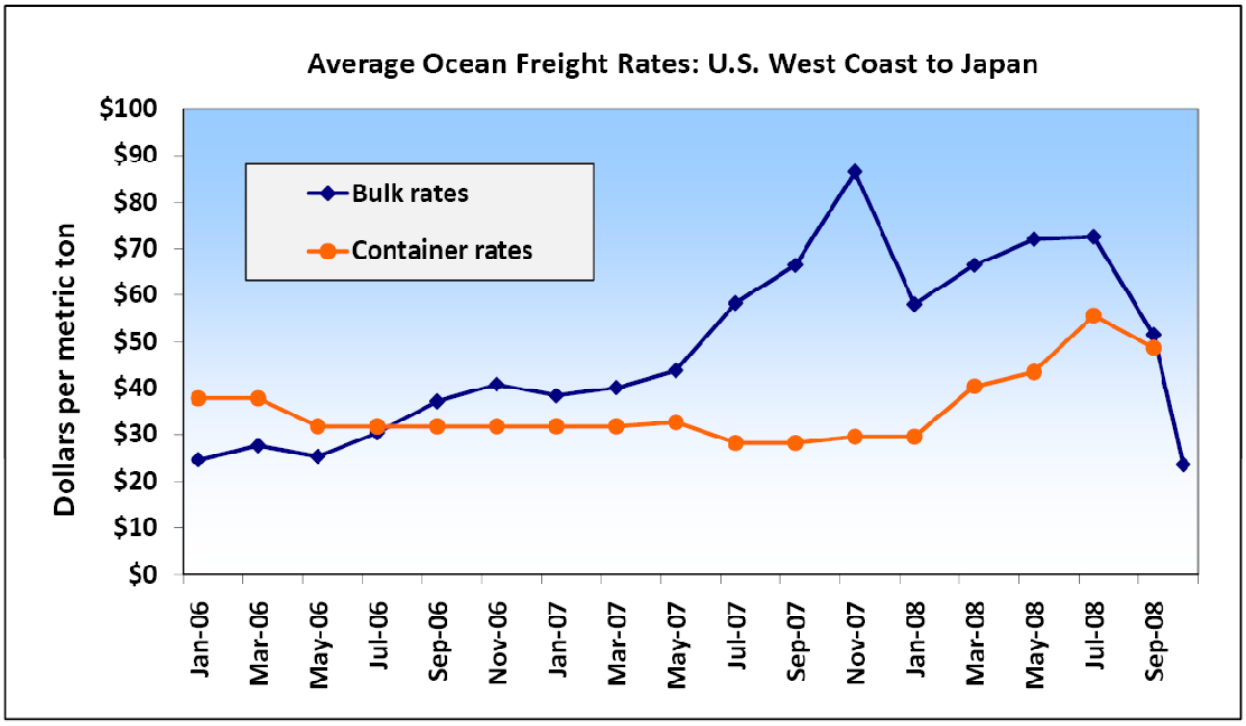
Figure 14-16: Containerized grain exports to Asia



Source: Port Import Export Reporting Service (PIERS)

Figure 14-17 shows that from June 2007 to July 2008, average ocean freight rates for bulk movements increased 73 percent. In late 2007, the peak average rate reached more than $86 per metric ton—more than double the rate just 6 months earlier. Container rates remained low until the first quarter of 2008 then peaked in July at more than $55 per metric ton—88 percent higher than at the beginning of the year but still 23 percent lower than bulk ocean freight rates. Rates for containerized transportation increased in response to the unprecedented demand for U.S. exports in containers that began in late 2007. However, by September 2008, rates for both bulk and container movements responded to the economic slowdown, as container rates fell 13 percent and bulk rates fell 29 percent—and have since continued to fall.

Figure 14-17: Average ocean freight rates from U.S. West Coast to Japan



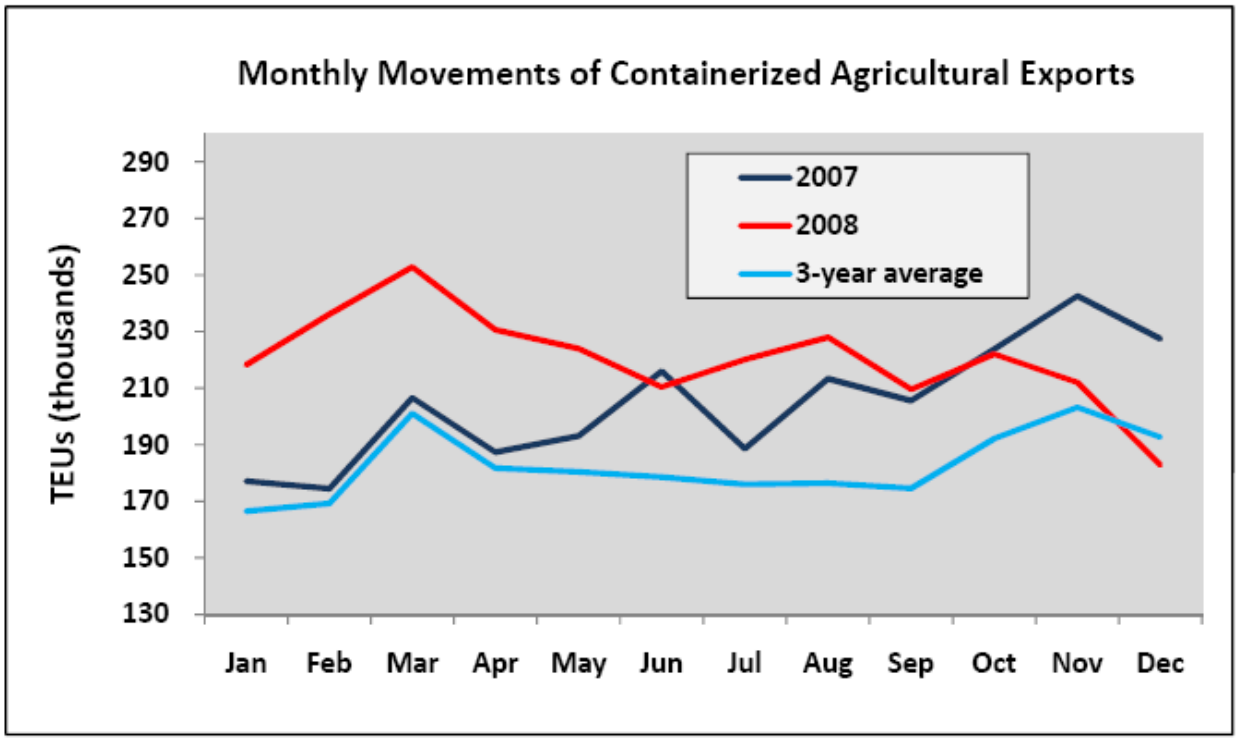
Source: Baltic Exchange, Drewry, and O'Neil Commodity Consulting (bulk rates), Drewery Supply Chain Advisors (container rates)

Rate Competition Between Bulk and Containers

During the 3rd and 4th quarters of 2007, many grain exporters wondered why the container carriers were not reducing rates as quickly as the bulk carriers. Until then, container carriers did not see bulk service as competition. The increased use of containers by traditional bulk shippers such as grain exporters was a reaction to record-high bulk rates and the perceived abundance of containers due to the large amount of containers used for importing consumer goods into the United States. This increased the use of containers and further strained the container pool. This strain on the container pool eventually pushed container rates higher. Rates began to fall in the 3rd and 4th quarters, but tight container supplies kept them high longer than bulk rates.

Exporters faced strong demand and a limited supply of containers through the first 6 months of 2008. By summer, the dollar began to strengthen, the first signs of the global economic slowdown kicked in, and bulk ocean rates began to fall; containerized grain export volumes slowed as well. The question in the containerized shipping industry shifted from: "Where are all the containers?" to "Who wants containers?" By the 4th quarter of 2008, the global economic slowdown had brought U.S. container trade to a slow crawl. U.S. agricultural exports fell 38 percent from the record high in March and even fell below the 3-year average by the end of the year (Figure 14-18).

Figure 14-18: Monthly movements of containerized agricultural exports



Source: Port Import Export Reporting Service (PIERS)

The downward path experienced during the second half of 2008 continued for container trades through the first half of 2009.

Container Shortages

With the emerging economic recovery, the container "shortage" situation, that accompanied the export boom in 2007 and early 2008 has begun to return. As the economy recovers and growing economies overseas continue to demand high-quality food, wastepaper, coal, iron ore, and scrap metals, demand for U.S. containerized exports could return to their former levels and once again strain container availability and affect rates. In fact, even during the recession in 2009 some agricultural exporters (particularly shippers moving non-refrigerated cargo) experienced some container availability challenges because import cargo was lower than it had been for 5 years and ocean carriers continued to reduce vessel capacity.

Foreign Trade Regulations

The new Foreign Trade Regulations (FTR) were put into effect on July 2, 2008; enforcement began October 1, 2008. The new regulations require exporters to file their export documentation with the Census Bureau electronically through the Automated Export System (AES). According to the Census Bureau, more than 95 percent of exporters were using the AES system before the new regulations came into effect (previously, exporters could submit a paper Shippers Export Declaration to the Bureau). The new rules are briefly explained below and the implications for agricultural shippers discussed.

The new regulations brought the Customs and Border Protection (CBP) to the forefront of export filing enforcement. Shippers will be more closely monitored by CBP for accuracy and timely filing of export information to the Census Bureau. Steep fines have been established for noncompliance. Penalties, both civil and criminal, from $1,100 to $10,000 may be imposed per violation of the FTR for delayed filing, failure to file, false filing of export information, or using the AES to further any illegal activity. Also, all AES filers face new filing deadlines by mode of transportation for reporting export information.[386] The table below shows the filing requirements for each mode of transportation.

Table 14-16: Comparisons of filing requirements by mode

Vessel cargo	24 hours prior to loading cargo on the vessel at the U.S. port where the cargo is laden.
Air cargo	2 hours prior to the scheduled departure time of the aircraft.
Truck cargo	1 hour prior to the arrival of the truck at the United States border to go international
Rail cargo	2 hours prior to the time the train arrives at the U.S. border to go international
Mail	2 hours prior departure of exporting carrier
Pipeline	Within 4 calendar days following the end of the month.

In addition, transportation providers are required to report proof that the shipper has submitted an AES filing before they can load cargo onto the vessel (see Appendix 14-3 for regulation language). As a result, many carriers instituted a "No docs, no load" policy that requires shippers to have a completed bill of lading and proof of AES filing or exemption status within a timeframe decided by the ocean carrier. The timeframes are different for each ocean carrier; the regulation requires that carriers submit the shipping documentation, including the proof of AES filing, 24 hours before the vessel sails.

Impact of New Trade Rules on Agricultural Shippers

Some agricultural commodities are still in the field 48 hours before they are scheduled to be on the ship, so it is impossible to meet the carriers' requirements with complete and accurate information such as value or weight required on the documentation. When specific pieces of required information are unavailable at the time of filing, an estimate is used instead; when accurate information is available, the shipper is allowed to file an amendment to the filing. Each amendment requires the shipper to submit the paperwork twice, knowing that any mistakes or delay could result in significant penalty from CBP. Late filing is only permitted for those shippers that have been granted post-departure filing provision.

Post-departure filing—previously called Option 4—is part of the FTR that allows exporters to file documentation up to 10 days after the vessel sails. This provision was put on hold in 2003 when the new regulations were being developed. The Census Bureau and CBP have agreed that the hold placed on post-departure filing in August 2003 will remain in effect pending further review of this option for shippers. However, current Option 4 filers were grandfathered in with the new regulation.

Conclusions

The U.S. marine transportation system is a critical component in the movement of agricultural goods. Each component of the marine transportation system—ocean carriers, ports, intermodal facilities, transload facilities, export elevators, and landside transportation—work together to move agricultural trade effectively and efficiently. The current system is keeping pace with the continual increases in cargo volumes, but as trade continues to increase, the marine transportation system must continue improving to provide globally competitive service.

Recent boom cycles of trade have shown that the system, although currently adequate, is fragile. In 2004, an unexpected increase in import traffic caused severe and prolonged congestion and delays at the ports of Los Angeles and Long Beach. In 2007 and 2008, demand for U.S. exports and competition for ocean service sent freight rates to record highs, caused significant container availability challenges, and resulted in lost sales for many agricultural exporters.

Physical, environmental, and financial considerations constrain ports from growing larger, raising the possibility of congestion, delay, and increases in shipping expenses. Port expansion plans are required to improve air quality and practice environmental stewardship. These requirements, though important, increase costs and delay infrastructure improvements, putting additional pressure on the current system to sustain increasing traffic flows. Some of the busiest ports in the country have instituted per-container fees to pay for environmental and other port improvements. However, per-container fees add cost to the transportation of agricultural products and impact shippers' narrow profit margins.

The expansion and growth of developing countries continues to swell the demand for U.S. agricultural commodities. Shippers believe ocean container carriers need to reassess the strength of the westbound trans-pacific trade lane and allocate enough equipment to serve the demand. Agricultural exports are often seen by the ocean carriers as backhaul cargo, dampening their incentive to provide sufficient equipment. The higher-valued import cargos of retail goods can support a higher freight rate, so carriers in the Transpacific trades cater to the equipment needs for eastbound movements instead of westbound movements. As demand for U.S. agricultural products grows, the issue of carrier equipment adequate to meet the export shipping needs of U.S. agriculture will continue to grow as well.

The recent economic downturn put the ocean transportation industry under heavy stress. Cargo volumes fell sharply worldwide, rates were at all-time lows, and carriers reduced staff, vessel capacity, and service. The U.S. agricultural export community was affected by the economic slowdown, but cargo continued to move. Overall, shippers have to adjust to the conditions of the infrastructure, recent loss of capacity, and volatile rates, all of which increase unpredictability in the transportation system for agricultural shippers and make U.S. agricultural products less competitive in the global market.

Appendix 14-1: FMC Complaint Resolution Process

The Federal Maritime Commission (FMC) is charged with administering the Shipping Act, as revised by OSRA. Under Sections 10 and 11 of this law, FMC provides both formal and informal complaint resolution processes for importers and exporters that believe an ocean common carrier or carriers have violated the Shipping Act.

Local Area Representation

FMC maintains a presence in Houston, Los Angeles, New Orleans, New York, Seattle, and South Florida through Area Representatives, who are based in each of those areas. Besides the ports in the cities where the Area Representatives are located, they serve other major port cities and transportation centers within their respective areas. Area Representatives serve a number of functions:

- Representing FMC within their jurisdictions
- Providing liaison between FMC and the local maritime industry and the shipping public
- Collecting and analyzing information of regulatory significance
- Monitoring and investigating functions
- Assessing industry conditions

Liaison activities involve:

- Cooperating and coordinating with other Federal, State, and local government agencies and departments.
- Providing regulatory information, including educational seminars.
- Relaying FMC policy to the shipping industry and the public.
- Handling informal complaints.

FMC's Bureau of Enforcement attorneys work closely with Area Representatives to be sure the industry is in compliance with the Shipping Act.[387]

The Informal Process

Individual importers or exporters can make an informal request to FMC to act as a mediator between the ocean carrier, ocean transportation intermediary (OTI), or other industry entities, and themselves to resolve a dispute. FMC's Office of Consumer Affairs and Dispute Resolution Services (CADRS) is responsible for administering this process. CADRS can:

- Act as an "honest broker" between parties to disputes.
- Provide information relevant to the resolution of particular problems.
- Advise firms and individuals of options that the relevant statutes make available.
- Intercede with carriers and other parties to obtain new examinations of rejected claims.
- Advise passengers how to file claims against cruise operators.
- Assist individuals who have encountered difficulties in moving their personal effects or automobiles.[388]

Some examples of disputes brought before the CADRS include:

- Shipper's inability to learn the location of a particular cargo.
- Shipper's problem with defaulting ocean transportation intermediaries, such as freight forwarders and non-vessel operating common carriers.
- Shipper's difficulty in processing damage and loss claims.
- Freight forwarder's inability to collect rightful compensation from carriers.
- Trucker's dispute with terminal operator's interpretation of equipment detention rule.
- Terminal operator's complaint concerning the interpretation of a lease agreement.
- Carrier's objection to a shipper's or forwarder's document preparation.[389]

FMC Investigations and Private Actions

FMC, upon complaint or upon its own initiative, may investigate any conduct that it believes may be in violation of the Shipping Act.[390] Section 10 of the Shipping Act prohibits ocean common carriers, OTIs and marine terminal operators from engaging in a variety of unreasonable and discriminatory practices.[*] These prohibited acts can be enforced either by FMC investigation or by the filing of a private complaint to FMC.

[*] For example, section 10 (d) (1) of the Shipping Act states that common carriers, ocean transportation intermediaries and marine terminal operators may not fail to establish, observe and enforce just and reasonable rules and regulations relating to or connected with receiving, handling, storing , or delivering property; section 10 (d)(2) prohibits marine terminal operators from unreasonably discriminating in the provision of terminal services to common carriers; section 10(d) (4) prohibits marine terminal operators from giving undue or unreasonable preferences or advantages or unreasonable prejudice or disadvantage with respect to any person; and Section 10 (b)(10) prohibits common carriers from unreasonably refusing to deal or negotiate.

Pursuant to Section 11, any person, including shippers, OTIs, or trade associations may petition FMC to initiate an investigation of an alleged violation. The result of such an investigation could be the assessment of civil penalties if a violation is found. However, under this authority the petitioner would not be eligible to receive reparations as a result of a FMC investigation.

The Bureau of Enforcement represents FMC during formal and informal investigations. Attorneys in the Bureau serve as trial attorneys in formal administrative proceedings instituted before FMC under Section 11 of the Shipping Act. Bureau attorneys work closely with the Area Representatives in investigations of potential violations of the Shipping Act and FMC regulations.

Any person may also file a private complaint (a private lawsuit) with FMC alleging a violation of the Shipping Act. This process can be the lengthiest and most costly of all the available grievance processes. However, if the private complainant is successful in establishing a violation of the Shipping Act, pursuant to Section 11 (g), the complainant could receive reparations amounting to up to two times their actual injuries plus reasonable attorney fees.

Enforcement actions and investigations into alleged violations of the Shipping Act include the prohibited acts in section 10 and the Commission's regulations. Examples of the types of activities that have been investigated in the past include:

- Rebating
- Misdescriptions or misdeclarations of cargo
- Unfilled agreements
- Abuses of antitrust exemptions
- Unlicensed OTI activity
- Untariffed cargo carriage
- Unbonded passenger vessel operations
- Various types of consumer abuses, including failure of carriers or intermediaries to carry out transportation obligations, resulting in cargo delays and financial losses for shippers
- Unfair or unjustly discriminatory practices of ocean carriers and OTIs
- Unreasonable refusals to deal or negotiate[391]

Appendix 14-2: Port Expansion Plans

This information was compiled and published in January 2009 by MARAD in a report called "America's Ports and Intermodal Transportation System." The Gateway (including near-port) and Corridor projects have a national significance because they play a key role in the U.S. Marine Transportation System. Projects are divided into key east/west rail exchanges and corridors that support the seven groups of Gateway Ports as described in the Strategy.

New York/New Jersey

Gateway and Near-Port Projects:*

1. Increase NY/NJ water depth to 50 feet (Completion due 2009)
2. Add new container terminal capacity in NJ area, including Brownfield development and access
3. Construct on-dock/near-dock rail infrastructure at Port of New York/New Jersey
4. Complete North Avenue Corridor Improvement Project (connector ramp and grade separations)
5. Build/improve truck-only highway connectors between NJ turnpike (including exits 12, 14, 14A, and 15) and marine terminals, and on I-78 and north of port area in NJ
6. Construct new Passaic River road crossing
7. Increase vertical clearance of the 75-year-old Bayonne Bridge to accommodate modern ships

Corridor Projects:*

1. Fund and complete four long-term rail route improvements—the River and Chemical Coast Lines to the north (double and triple-track and grade crossings), the Lehigh Line to the west (triple-track) and West Trenton Line to the south.

Hampton Roads

Gateway and Near-Port Projects:

1. Develop the Craney Island Marine Terminal and Rail Corridor
2. Construct Hampton Roads Third Crossing Tunnel
3. Complete State Road 164 Rail Corridor Relocation Project (in progress)
4. Conduct Elizabeth River Southern Branch Navigation Channel Deepening

* Port projects marked with an asterisk were identified by the Department of Defense as rail capacity improvements in individual port master plans that will prove beneficial to military operations. Department of Defense Report to Congress on Projected Requirements for Military Throughput at Strategic Seaports, Under Secretary of Defense (Acquisition, Technology & Logistics), April 2007.

Corridor Projects:

1. Expedite completion of the Heartland rail corridor connecting the Port of Virginia to the Midwest. This will allow high speed, high capacity freight movements and shorten the distance traveled between the rapidly growing port and western destinations.
2. Fund and develop the I-81 Crescent rail corridor, which includes plans for new terminals in Pennsylvania, Western Maryland, and Alabama, and upgrades to Roanoke, VA, and Memphis, TN, intermodal yards.

III. Charleston/Savannah

Gateway and Near-Port Projects**:**

1. Expand the port in the former Charleston Navy Base (including road connectors and 280-acre container terminal, scheduled for completion in 2013)
2. Deepen Savannah Harbor and approach channel from 42 to 48 feet
3. Complete turning basin component of Charleston Harbor Deepening Project (to 45 feet)

Corridor Projects**:**

1. Widen State Road 17 (Savannah Highway) southward to link with I-95.

Houston

Gateway and Near-Port Projects**:**

1. Develop Port of Houston Bayport Terminal
2. Improve connections between the port, State Highway 146, and I-69
3. Improve State Highway 146
4. Improve rail connections between terminals and Class I rail lines at Pasadena, Strang, and Deer Park Yards and double-track main line across Buffalo Bayou
5. Develop Grand Parkway loop around central business district (State Highway 99 to I-45)
6. Develop Pelican Island Terminal (long term project) to increase future container capacity

Corridor Projects**:**

1. Develop I-69 (Designated as a DOT Corridor of the Future) to improve north/south freight movements to Canada and Detroit
2. Improve I-10 between Houston and San Antonio to facilitate freight movements westward. This includes widening a key section from 4 to 10 lanes each direction

IV. Seattle/Tacoma

Gateway and Near-Port Projects**:**

1. Develop additional container terminals along the Blair waterway in Tacoma.
2. Develop Pacific Northwest regional intermodal yard support capacity.
3. Complete Lower Columbia River Navigation Channel and improve Tacoma Harbor Channels
4. Resume maintenance of Snake River Navigation Channel
5. Build Stevedore Services of America (SSA) Terminal in Tacoma
6. Build Tacoma-Olympia South Sound Logistics Center
7. Improve Columbia/Snake River Locks.
8. Extend SR 167 in Tacoma and State Road 509/99 in Seattle
9. Reconfigure/improve Seattle Terminal 30

Corridor Projects:*

1. Add grade separations and track additions for rail service between Seattle and Tacoma, creating unobstructed urban corridor access while improving safety
2. Upgrade Stampede Pass tunnel to accommodate double stack trains
3. Reopen rail line between Ellensburg and Lind, WA
4. Eliminate single-track line between Portland and Troutdale
5. Construct additional track between Seattle and Tacoma
6. Double-track between Seattle and Everett, WA

V. Oakland

Gateway and Near-Port Projects:*

1. Increase Oakland navigation channel to 50-foot depth
2. Develop Outer Harbor Terminal in Oakland
3. Improve access to the Port of Oakland and Union Pacific rail facility
4. Rehabilitate the Oakland–Martinez line to provide a third mainline into Oakland
5. Re-align Maritime Street in Oakland
6. Improve 7th Street grade separation and roadway to relieve road and rail congestion at the port

Corridor Projects:*

1. Upgrade Donner Pass rail tunnels to accommodate double stack containers and double track the line from Reno to Salt Lake City
2. Double track San Joaquin Valley to eliminate freight/passenger competition for the single track
3. Improve the Tehachapi Trade Corridor Rail line; augment rail connections between northern and southern California

VII. Los Angeles/Long Beach

Gateway and Near-Port Projects:*

1. Replace Gerald Desmond Bridge in Long Beach (to allow larger ships and increase lane capacity for truck traffic).
2. Expand TraPac Marine Terminal
3. Construct Port of Los Angeles/BNSF Southern California International Gateway Intermodal Rail Yard
4. Build SR-47 Expressway project
5. Expand capacity of I-710 between Long Beach and I-10
6. Expand UP ICTF rail yard in Wilmington
7. Improve/construct on-dock rail at LA/LB
8. Increase Los Angeles Harbor navigation channel to 55 feet
9. Develop Pier B Rail Yard in Long Beach
10. Develop West Basin Rail Yard in LA

Corridor Projects:*

1. Increase mainline rail capacity (triple track) through Cajon Pass
2. Complete grade separations along "Alameda Corridor East" to establish the Los Angeles–Colton corridor
3. Build Colton Crossing grade separation project
4. Double track between Colton, CA, and El Paso, TX
5. Upgrade Rail connector between Port Hueneme and main line

Major projects approved by the California Transportation Commission include:

- Gerald Desmond Bridge replacement at the Port of Long Beach – $250 million
- SR 47 Expressway and Schuler Heim Bridge Replacement in LA/LB ports – $158 million
- LA/LB ports rail improvements – $175.1 million
- San Gabriel Valley Grade Separations, Alameda Corridor East – $336.6 million
- U.S. 101-Rice Avenue Interchange near Port of Hueneme – $30.4 million
- I-15 widening and Devore Interchange reconstruction – $118.0 million
- Port of Oakland 7th Street Grade Separation – $175 million
- Port of Oakland Outer Harbor Intermodal Terminals – $110.0 million
- Union Pacific track and tunnel improvements at Donner Summit – $43 million
- I-880 freeway reconstruction in Oakland – $73.0 million
- Highway 4 Cross-Town Freeway extension in Stockton – $96.8 million
- I-580 freeway eastbound truck climbing lane – $64.3 million
- Tehachapi trade corridor rail improvements – $54.0 million
- Stockton Ship Channel dredging – $17.5 million
- Sacramento River channel dredging – $10.0 million

- National City Marine Terminal Wharf Extension, Port of San Diego – $15.0 million
- Port of San Diego grade separations – $81.6 million

VIII. Key East/West Rail Exchanges

1. Expedite the Chicago CREATE rail project that facilitates major east/west freight movement and local congestion relief. This project includes 25 new roadway overpasses or underpasses at locations where auto and pedestrian traffic currently cross railroad tracks at grade level, six new rail overpasses or underpasses to separate passenger and freight train tracks, viaduct improvements, grade crossing safety enhancements, and extensive track, switch, and signal system upgrades.
2. Support the New Orleans gateway infrastructure improvement projects that create grade-separated multiple track corridors through this vital chokepoint. This public-private partnership between the Nation's six Class I railroads and State and local government will include replacing track, eliminating one underpass, and several grade crossings and upgrading junction switches.

Appendix 14-3: Foreign Trade Regulations: Carrier Responsibility

The regulation for carriers reads, Section 30.7 (b) ". . . the U.S. Principal Party of Interest (USPPI) or the authorized agent is responsible for annotating the proper proof of filing citation or exemption legend on the first page of the bill of lading, air waybill, export shipping instructions, or other commercial loading documents. The USPPI or the authorized agent must provide the proof-of-filing citation or exemption legend to the exporting carrier. The carrier must annotate the proof-of-filing citation, exemption or exclusion legends on the carrier's outbound manifest when required. The carrier is responsible for presenting the appropriate proof-of-filing citation or exemption legend to CBP Port Director at the port of export as stated in Subpart E of this part."[392]