



Competition in the Noncontiguous Domestic Maritime Trades

**U.S. Department of Transportation
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Table of Contents

Executive Summary	iii
Chapter I. Introduction.....	1
Chapter II. Demand and Supply of Liner Services.....	3
A. Demand for Liner Services	4
B. Supply of Liner Services.....	4
C. Concentration and Competition	5
Chapter III. Market Conditions.....	7
A. Hawaii Trade.....	7
1. Economy and Trade.....	7
2. Domestic Trade	8
3. Foreign Trade.....	13
4. Liner Services.....	15
5. Concentration and Competition	17
6. Rates in the Hawaii Trade.....	20
B. Guam Trade	23
1. Economy and Trade.....	23
2. Domestic Trade	25
3. Liner Services.....	26
4. Concentration and Competition	28
5. Rates in the Guam Trade	31
C. Puerto Rico Trade.....	34
1. Economy and Trade.....	34
2. Domestic Trade	35
3. Foreign Trade.....	41
4. Liner Services.....	43
5. Concentration and Competition	46
6. Rates in the Puerto Rico Trade	48
D. Alaska Trade	50
1. Economy and Trade.....	50
2. Domestic Trade	51
3. Liner Services.....	57
4. Concentration and Competition	59
5. Rates in the Alaska Trade	63
Chapter IV. Conclusions.....	66

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Executive Summary

The Interstate Commerce Commission Termination Act of 1995 (ICCTA) required the Department of Transportation (DOT) to study the state of competition in the noncontiguous domestic maritime trades. The study, “Competition in the Noncontiguous Domestic Maritime Trades,” was released by DOT in March 1997. In order to examine changes and trends in the domestic waterborne liner trade market that have occurred since the prior analysis, the Maritime Administration (MARAD) has prepared this new study. As in the prior analysis, the noncontiguous domestic maritime trades are those between the Mainland of the United States and Alaska, Guam, Hawaii, and Puerto Rico.¹ This analysis discusses the economic factors affecting the demand and supply of liner services in the domestic offshore markets, the extent of concentration and competition in each of these trades, and trends in liner shipping rates based on a detailed examination of data available to MARAD.

Data and Data Analysis Methodology

U.S. Army Corps of Engineers (USACE) domestic trade data and information from “Competitiveness in the United States Domestic Noncontiguous Liner Shipping Markets, June 2004” by Reeve & Associates were used to analyze the markets.² Because of USACE data limitations, their data were not used for the analysis of Guam in this study.

Demand and Supply of Liner Services in the Domestic Offshore Maritime Trades

There are a number of market-specific, shipper-specific, and carrier-specific economic and competitive factors that influence the level and structure of ocean freight carriage in the noncontiguous domestic trades. Although each of the domestic offshore trades has distinct competitive and economic characteristics, there are four important features common to each market:

1. Volume of Trade

In 1994 and 2003, the volume of liner trade moving between the U.S. Mainland and the four major domestic offshore markets comprised about one percent of total U.S. domestic waterborne trade of about one billion short tons. For the offshore markets, the relatively small volume of cargo and high fixed costs limit the number of liner companies that can cost-effectively participate in each trade since smaller operators are less able to take advantage of economies of scale. This principle of economics holds that as more goods are transported, the companies’ average cost per unit of cargo carried decreases since fixed costs are shared over an increased number of goods.

¹ In this study, the terms “noncontiguous domestic maritime trades” and “domestic offshore maritime trades” are synonymous.

² The study, “Competitiveness in the United States Domestic Noncontiguous Liner Shipping Markets, June 2004” by Reeve & Associates was prepared for the Maritime Cabotage Task Force. Information from this report was used with their permission.

2. Trade Imbalance

In each of the four markets, the volume of trade *from* the Mainland is much larger than the volume of trade *to* the Mainland. The directional imbalance in trade implies that companies must make use of the extra space by transporting cargoes to/from other destinations, fill unused space with low revenue empty containers, or leave space unutilized. In all modes of transportation, directional imbalance is likely to increase the cost of transportation and may be passed on to the consumer.

3. Market Concentration

The level of market concentration refers to the number of firms operating in the market. A low number of firms operating in the market indicate a high level of market concentration. Each of the four noncontiguous domestic trade markets is highly concentrated.

4. Market Entries and Exits

Domestic water carriers are free to enter and exit markets and raise and lower rates in response to market conditions. Domestic carriers are protected from competition from foreign operators by section 27 of the Merchant Marine Act of 1920 (Jones Act). The Jones Act requires that merchandise transported entirely or partly by water between U.S. points -- either directly or via a foreign point -- must travel in U.S.-built, U.S. citizen owned vessels that are U.S.-documented by the Coast Guard for such carriage. Entry and exit activity in all four of the U.S. noncontiguous trades appears to be moderate.

Demand and Supply for Liner Services

The demand for ocean freight transportation services is derived from the demand for the final product or commodity purchased by the consumer. An increase in consumer demand increases the supply produced, which generates increased demand for shipping services. This increase is generally provided in the form of more frequent service and more capacity to transport goods to consumers.

The price (rate) paid for ocean shipping services (or freight transportation) represents only a small share of a product's final price; accordingly, a major change in ocean freight rates may have only a small effect on the final price of a product. Most analysts believe that the demand for ocean freight shipping services is price inelastic, especially when high-valued goods or commodities are being shipped.³

³ The price elasticity of demand is a measure of the responsiveness of the demand for a good or service relative to a change in its price. Formally, it is the percentage change in the quantity demanded divided by the percentage change in price. A good or service is judged to be price elastic or price inelastic depending on whether the absolute value of the appropriate computation is greater or less than one. For a discussion of the elasticity of demand for international ocean freight transportation service, see J.O. Jansson and D. Shneerson, **Liner Shipping Economics**, (London: Chapman and Hall, 1987), pages 94-109.

While the price elasticity of demand for ocean freight transportation may be quite low, particularly to serve the transportation needs of populations located in remote locations, the elasticity of demand for the shipping services of an individual ocean carrier may be quite high. Ocean liner companies provide similar services, and thus are viewed by shippers as close substitutes for each other, which makes competition more likely to occur.

Concentration and Competition

The level of market concentration often affects the nature and degree of competition in a market. A high level of carrier concentration in one market versus another does not mean that the more concentrated market is necessarily less competitive than the other. Though high market concentration (resulting from high market shares) is a necessary requirement to provide carriers the potential opportunity to gain market power and affect freight rates, competitive downward pressure on freight rates may result from overcapacity, or from a shipper that has sufficient market power to depress prices.

The domestic offshore markets are highly concentrated in terms of liner services because only a few liner carriers may cost-effectively serve local shipping needs. Liner services in the domestic offshore trades are dominated by very large units of production -- i.e., vessels that may be capable of carrying thousands of containers. In general, faster self-propelled vessels generally incur higher operating costs per unit of service provided; accordingly, high-value commodities, such as consumer goods, tend to travel on containerhips and roll-on/roll-off vessels, and lower-valued shipments are more likely to be transported by barge. Because of the relatively short distance from the U.S. mainland to Puerto Rico and Alaska, barge operators may compete with self-propelled operators in these markets. Generally, there have been few new competitors to the domestic offshore trades, primarily due to the low volume of cargo moving in these trades, existing excess capacity, and the primarily one-way nature of the cargo flows.

Another indication of the extent to which incumbent firms are able to take advantage of their market power is whether the market is considered to be subject to potential competition, conceptualized by some economists as “contestability.”⁴ In broad terms, contestability exists if firms can enter a market and exit without incurring substantial sunk costs.⁵ In a contestable market, incumbent firms will be forced to act as if they faced substantial competitive pressure. Consumers are thus protected from exploitation by a credible threat that new firms can enter the industry if established firms set prices above competitive levels and, as a result, earn above-normal profits. Carriers actively entering and exiting each of the noncontiguous liner markets indicate that these trades are contestable.

⁴ Elizabeth E. Bailey and William J. Baumol, “Deregulation and the Theory of Contestable Markets,” *Yale Journal on Regulation*, 1:2 (1984): pp. 111-138.

⁵ William J. Baumol, John C. Panzar, and Robert D. Willig, **Contestable Markets and the Theory of Industry Structure** (New York City: Harcourt Brace, Jovanovich, 1982).

Market Conditions

The following section summarizes traffic levels and market conditions in each of the four major domestic offshore maritime trades, discusses the types of liner services offered, analyzes market concentration in each trade, and discusses the trend of ocean freight rates.

Market Summaries

Hawaii

Hawaii is the largest, in terms of tonnage, of the domestic offshore liner trades. In terms of forty-foot equivalent unit (FEU) containers⁶ moved, it ranks second to Puerto Rico. Although the tonnage carried on liner vessels has declined by 6 percent since 1994, the number of FEUs has increased. This increase may be due to the shift from heavier unfinished goods to more lightweight manufactured products. There are currently five liner carriers serving the Hawaiian noncontiguous domestic trade. Since the 1997 USDOT study, there has been one new entry and one carrier was acquired. The trend in real revenue per FEU has declined by approximately 1.3 percent annually since 1991.

Guam

Due to data limitations, tonnage data for Guam shipments were not available, therefore, only FEU shipments were used. Between 1991 and 2003, in terms of FEUs, volume of traffic in the Guam domestic liner trade grew at an annual rate of 2.2 percent. However, volume declined after peaking in 1997, then began a recovery in 2002 with increased shipments from the mainland to Guam. At any given time, there have generally only been two U.S.-flag liner carriers offering service to Guam from the U.S. Mainland. Liner service from the U.S. Mainland is economically viable only if it is offered as part of a foreign service to the Far East or as a part of liner service to Hawaii. It is estimated that only about 25 percent of available westbound capacity from the Mainland is used for Guam cargoes; the remainder is allocated to cargoes destined for Hawaii or the Far East, or remains unused. Over the 1991-2003 period, average freight revenue per FEU in the Guam trade declined an average annual rate of 2.2 percent, after taking general inflation into account.

Puerto Rico

Since the 1997 USDOT study, in terms of tonnage, the Puerto Rico trade has dropped to being the second largest of the domestic offshore liner trades, after the Hawaii trade. When volume is measured in terms of FEUs, the Puerto Rico trade remains the largest. There has also been a shift in cargo from unfinished goods to manufactured products. The trade is currently served by four liner carriers. Since the earlier study, Sea Star entered the trade in 1998 with its own vessels and purchased the existing carrier, Sea

⁶ The FEU is a measurement of volume equivalent to a standard 8x8x40 foot shipping container.

Barge. In 2002, Sea Star acquired Navieras de Puerto Rico. Unlike the Hawaii and Guam liner trades, barge carriers are effective competitors to self-propelled vessels for much of the liner traffic between the U.S. Mainland and Puerto Rico. Over the 1991-2003 period, after adjusting for inflation, average revenue per FEU in the Puerto Rico trade declined by nearly 39 percent.

Alaska

In 2003, Alaska received almost four times the volume of liner cargoes from the U.S. Mainland than the State shipped to the U.S. Mainland. The directional imbalance in the trade has greatly increased, with southbound trade comprising 25 percent of northbound trade in 2003, compared to 51 percent in 1994. From 1994 to 2003, liner tonnage transported between the U.S. Mainland and Alaska grew at an average annual rate of less than one percent, while FEUs in the trade increased at an average annual rate of 2.3 percent over the 1991-2003 period. Currently, the trade is served by nine liner carriers. Since the 1997 USDOT study, Northland Services acquired Alaska Cargo Transport and merged part of its operation with Boyer Alaska Barge Lines in 2002. Unlike the Hawaii and Guam liner trades, barge carriers are effective competitors to self-propelled vessels for much of the liner traffic between the U.S. Mainland and Alaska. Available data suggest that real rates in this trade have declined nearly 23 percent from 1991 to 2003.

Conclusions

There have been a number of changes in the four noncontiguous markets since 1994. Carriers in the domestic noncontiguous liner shipping markets have made major investments, purchasing new vessels, containers, and other equipment. Investments have also been made in port infrastructure to meet the requirements of the expanding economies. There have been mergers and acquisitions, and a number of entries and exits. Freight rates have declined in real terms in all markets.

The offshore domestic trades continue to exhibit high levels of market concentration. A simple tabulation of the number of ocean carriers serving a market and their respective market shares, however, does not take into account the type of service provided, the nature and vigor of competition among established firms, or the pressure that the threat of entry may have on the pricing practices of ocean carriers now serving the trade. In all four of the trades, moreover, entry and exit appear to be moderate. These conditions may attract new carriers as well as compel incumbent carriers to compete aggressively with one another and to operate in an efficient manner.

One of the most notable trends over the 1994 to 2003 period is the shift in the mix of liner commodities transported in the trades from raw materials, such as chemicals, lumber, and metals, to manufactured goods, which tend to be containerized. As such, in all four trades the volume of trade has increased in terms of FEU containers, but when measured in tonnage has not increased as much, or in some cases has even declined. In fact, Puerto Rico, which has long been the largest of the domestic offshore liner trades, has dropped to being second when volume of trade

is measured in terms of tonnage. However, in terms of FEUs, the Puerto Rico trade remains the largest.

Together these trends suggest that carriers in the domestic offshore trades have confidence in these markets, anticipate growth ahead, recognize the need to improve service and keep rates low in order to improve their competitive positions. These conditions may also attract new carriers and compel incumbent carriers to compete aggressively with one another. Though the barriers to market entry are not insurmountable, the small volume of trade and the economies of scale needed to sustain a shipping operation will support only a small number of carriers in the U.S. noncontiguous domestic maritime trades.

Chapter I. Introduction

The Interstate Commerce Commission Termination Act of 1995 (ICCTA) required the Department of Transportation (DOT) to study the state of competition in the noncontiguous domestic maritime trades. The study, “Competition in the Noncontiguous Domestic Maritime Trades,” was released by DOT in March 1997. In order to examine changes and trends in the domestic waterborne liner trade market that have occurred since the prior analysis, the Maritime Administration (MARAD) has prepared this new study. As in the prior analysis, the noncontiguous domestic trades are those between the Mainland of the United States and Alaska, Guam, Hawaii, and Puerto Rico.⁷ This analysis discusses the economic factors affecting the demand and supply of liner services in the domestic offshore markets, the extent of concentration and competition in each of these trades, and trends in liner shipping rates based on a detailed examination of data available to MARAD.

This study evaluates the market for ocean liner services -- scheduled services on fixed routes -- in the domestic offshore trades provided by self-propelled container and trailer-carrying vessels and by ocean-going barges.⁸ The analysis includes discussions of the economic factors affecting the demand and supply of liner services in each of the domestic offshore markets, the extent of concentration and competition in each of these trades, and recent trends in liner shipping rates in each of these markets.

Data and Data Analysis Methodology

U.S. Army Corps of Engineers (USACE) domestic trade data for the years 1994 and 2003 were used to analyze all markets except Guam.⁹ USACE data used include names of operators, names of vessels, types of vessels, commodities carried, tonnages carried, states from which shipments are sent, and states that received shipments. These data elements were chosen in order to identify liner carriers operating in the domestic offshore trade and determine the tonnage and types of commodities shipped domestically, excluding intra-state or intra-island trade.

The USACE domestic trade data do not indicate if dry cargo shipments were carried via liner or non-liner vessels. Therefore, it was necessary to determine which vessels in each trade were in direct competition for liner-type cargoes. To analyze competitive services, commodities carried in known liner services were identified and matched to vessels to determine other carriers that

⁷ In this study, the terms “noncontiguous domestic maritime trades” and “domestic offshore maritime trades” are synonymous.

⁸ The study is not concerned with rates charged in these trades for the private charter of ships or barges moving full or partial vessel-load quantities of such bulk cargoes as crude oil, petroleum products, sugar, and logs, or cargoes moving to a single or limited number of receivers, such as equipment being carried to oil company drilling locations. There is no government rate regulation for such services.

⁹ Vessels en route to Guam generally stop at other non-U.S. ports in the Pacific; therefore, Guam data are not collected by USACE. Instead, data for Guam used in this study come from “Competitiveness in the United States’ Domestic Noncontiguous Liner Shipping Markets, June 2004” by Reeve & Associates.

moved similar cargoes in each market. Vessels moving a single or a few commodities were assumed to be non-liner. Vessels identified in USACE data as tankers and tank barges, and dry bulk carriers were classified as tanker and non-liner, respectively.

Because of the number and type of vessels in each trade, it was not possible to check the actual operation of each vessel to determine if it was in fact engaged in carriage of general cargo in a regularly scheduled service. Therefore, it was assumed that all vessels operated by carriers moving general cargo in the domestic noncontiguous trades were “liner” operators except where individual vessels, regardless of the operator, could be identified as a tanker or dry bulk carrier. Liner tonnage figures may include a small amount (<1 percent) of trade between the noncontiguous trades.

USACE data were used to measure volume of trade in terms of tonnage. However, because the general-cargo physical volume limit of the vessel may be reached before the weight limitations of the vessel, the industry generally measures volume as the number of forty-foot equivalent unit (FEU) containers moved.¹⁰ USACE data do not include this measure. Therefore, FEU data were taken from the 2004 Reeve & Associates study.¹¹

Because foreign trade data from USACE are underreported, U.S. Census Bureau (Census) foreign trade data are provided for the Hawaii and Puerto Rico markets to indicate possible import substitution. In Hawaii and Puerto Rico, volumes of trade in terms of tonnage have declined, but when measured in terms of FEUs, have increased. This may be due to a shift in cargo transported domestically from unfinished goods to finished goods, with unfinished goods possibly being shifted to foreign markets. Census data identify the type of service for each vessel as liner, non-liner, and tanker.

Using the methodology outlined above, MARAD was able to measure, compare, and analyze liner competition in each market.

¹⁰ The FEU is a measurement of volume equivalent to a standard 8x8x40 foot shipping container.

¹¹ The study, “Competitiveness in the United States Domestic Noncontiguous Liner Shipping Markets, June 2004” by Reeve & Associates was prepared for the Maritime Cabotage Task Force. Information from this report was used with their permission.

Chapter II. Demand and Supply of Liner Services

There are a number of market-specific, shipper-specific, and carrier-specific economic and competitive factors that influence the level and structure of ocean freight carriage in the noncontiguous domestic trades. Although each of the domestic offshore trades has distinct competitive and economic characteristics, there are four important features common to each market:

(1) Extremely low cargo volumes relative to overall U.S. waterborne trade

In 1994 and 2003, the volume of liner trade moving between the U.S. Mainland and the four major domestic offshore markets comprised only about one percent of total U.S. domestic waterborne trade of about one billion short tons. For the offshore markets, the relatively small volume of cargo limit the number of liner companies that can cost-effectively participate in each trade since smaller companies are less able to take advantage of economies of scale. This principle of economics holds that as more goods are transported, the companies' average cost per unit of cargo carried decreases since fixed costs are shared over an increased number of goods.

(2) Significant directional imbalance in the volume of trade

In each of the four markets, the volume of trade *from* the Mainland is much larger than the volume of trade *to* the Mainland. This traffic imbalance means that ships deployed in the trade would be significantly underutilized if committed entirely to the trade. The directional imbalance in trade implies that companies must make use of the extra space by transporting cargoes to/from other destinations, fill unused space with low revenue empty containers, or leave space unutilized. In all modes of transportation, directional imbalance is likely to increase the cost of transportation and may be passed on to the consumer.

(3) Small number of operators that provide liner services

The level of market concentration refers to the number of firms operating in the market. A low number of firms operating in the market indicate a high the level of market concentration. Each of the four noncontiguous domestic trade markets is highly concentrated.

(4) Operating environment that permits ocean carriers to enter and exit these markets as economic conditions and business opportunities warrant

Unlike other modes of transportation, domestic water carriers have never been protected from competition through restrictions on carrier entry and exit. Carriers are free to enter and exit markets and raise and lower rates in response to market conditions. However, domestic carriers are protected from competition from foreign operators, who are ineligible to participate in domestic trade. Under the Jones Act, merchandise transported entirely or partly by water between U.S. points -- either directly or via a foreign point -- must travel in U.S.-built, U.S. citizen owned vessels that are U.S.-documented by the Coast Guard for such carriage.

A. Demand for Liner Services

The demand for ocean freight transportation services is a derived demand -- that is, it is derived from the demand for the final product or commodity purchased by the consumer. An increase in consumer demand increases the supply produced, which generates increased demand for shipping services. This increase is generally provided in the form of more frequent service and more capacity to transport goods to consumers.

The price (rate) paid for ocean shipping services (or freight transportation) is only one component of the price the consumer ultimately pays for a product. In general, the cost of transportation represents only a small share of a product's final price; accordingly, a major change in ocean freight rates may have only a small effect on the final price of a product. Most analysts believe that the demand for ocean freight shipping services is price inelastic, especially when high-valued goods or commodities are being shipped.¹²

While the price elasticity of demand for ocean freight transportation may be quite low, particularly to serve the transportation needs of populations located in remote locations, the elasticity of demand for the shipping services of an individual ocean carrier may be quite high. Ocean liner companies provide similar services, and thus are viewed by shippers as close substitutes for each other, which makes competition more likely to occur. Moreover, once a carrier has decided to provide regularly scheduled service in a trade (with a vessel of fixed size), the incremental cost of providing capacity (and basic shipping services) that otherwise would not be utilized is often quite low, further encouraging competition among carriers.

B. Supply of Liner Services

Liner service in the domestic offshore trades is dominated by very large units of production -- i.e., vessels that may be capable of carrying thousands of containers. Such service is provided on a regular schedule to all shippers. The carriers also offer intermodal services, such as truck, rail, and even air transport operations to provide "shelf-to-shelf" service. Liner service is provided by carriers operating fast self-propelled containerships, trailer-carrying, roll-on/roll-off (Ro/Ro) vessels, and ocean-going barges. In general, faster vessels generally incur higher operating costs per unit of service provided; accordingly, shippers of high-value, time sensitive commodities, such as consumer goods, prefer containerships and Ro/Ro vessels; correspondingly lower-valued shipments are more likely to be transported by barge.

Numerous cost factors (e.g., vessel capital costs, labor, intermodal services, bunker fuel, insurance, and port and terminal fees) influence the total cost of providing ocean freight services. An ocean carrier's costs also will vary, perhaps significantly, depending on whether there is a

¹² The price elasticity of demand is a measure of the responsiveness of the demand for a good or service relative to a change in its price. Formally, it is the percentage change in the quantity demanded divided by the percentage change in price. A good or service is judged to be price elastic or price inelastic depending on whether the absolute value of the appropriate computation is greater or less than one. For a discussion of the elasticity of demand for international ocean freight transportation service, see J.O. Jansson and D. Shneerson, **Liner Shipping Economics**, (London: Chapman and Hall, 1987), pages 94-109.

significant traffic imbalance in the trade; whether special services are provided; whether there is a large differential between peak and off-peak period demands for service; and the overall speed, frequency, and reliability of the service provided.

Unit production costs for liner services are affected by the degree to which firms experience economies of scale (e.g., fixed costs, such as capital, are lower per container slot on large containerships and on routes with frequent service); economies of scope¹³ (e.g., spreading the fixed costs of a small, essentially one-way, domestic trade over a round-trip voyage that consists of a domestic leg and a high-volume international leg); and economies of network (e.g., the advantage of negotiating a single contract for door-to-door intermodal transportation across state as well as national boundaries). In these types of markets, consumers may prefer a single producer (e.g., electrical, gas, and intermodal transportation networks) or a single standard (computer and telecommunications hardware and software) in order to reduce transaction costs and increase convenience.¹⁴

C. Concentration and Competition

The level of market concentration often affects the nature and degree of competition in a market -- that is, a highly concentrated market may indicate a market where there is little effective price competition among incumbent firms, a market where firms are able to raise and maintain prices above competitive levels. Each of the four trades included in this report is highly concentrated. A high level of carrier concentration in one market versus another, however, does not mean that the more concentrated market is necessarily less competitive than the other. Though high market concentration (resulting from high market shares) is a necessary requirement to provide carriers the potential opportunity to gain market power and affect freight rates, competitive downward pressure on freight rates may result from overcapacity, or from a shipper that has sufficient market power to depress prices.

The domestic offshore markets are highly concentrated in terms of liner services because only a few carriers may cost-effectively serve local shipping needs. Generally, there have been few new competitors to the domestic offshore trades, primarily due to the low volume of cargo moving in these trades, existing excess capacity, the primarily one-way nature of the cargo flows, as well as distance from the Mainland.

Another indication of the extent to which incumbent firms are able to take advantage of their market power is whether the market is considered to be subject to potential competition, now

¹³ This concept refers to situations in which the aggregate cost of producing two commodities is less than the total cost of producing each commodity separately. This concept was first discussed by J.C. Panzar and R.D. Willig in "Economies of Scale and Economies of Scope in Multi-Output Production," **Bell Laboratories Economic Discussion Paper**, No. 33, 1975.

¹⁴ For further discussion of how international liner "carriers with large networks -- including frequent and global sailings, intermodal links, and computer systems to manage logistical problems -- can have significant advantages over smaller rivals," see: David A. Butz (and comments by James D. Reitzes), "Ocean Shipping Economies: Free Trade and Anti-trust Implications -- Comment/Reply," **Contemporary Policy Issues**, 11:3 (July 1993), pp. 69-90.

conceptualized by some economists as “contestability.”¹⁵ In broad terms, contestability exists if firms can enter a market and exit without incurring substantial sunk costs.¹⁶ In a contestable market, incumbent firms will be forced to act as if they faced substantial competitive pressure. Consumers are thus protected from exploitation by a credible threat that new firms can enter the industry if established firms set prices above competitive levels and, as a result, earn above-normal profits. Carriers actively entering and exiting each of the noncontiguous liner markets indicate that these trades are contestable.

¹⁵ Elizabeth E. Bailey and William J. Baumol, “Deregulation and the Theory of Contestable Markets,” *Yale Journal on Regulation*, 1:2 (1984): pp. 111-138.

¹⁶ William J. Baumol, John C. Panzar, and Robert D. Willig, **Contestable Markets and the Theory of Industry Structure** (New York City: Harcourt Brace, Jovanovich, 1982).

Chapter III. Market Conditions

The following sections describe traffic levels and market conditions in each of the four major domestic offshore maritime trades, discuss the types of liner services offered, analyze market concentration in each trade, and discuss the trend of ocean freight rates.

A. Hawaii Trade

Summary:

- In terms of volume of traffic measured by tonnage, since the 1997 USDOT study the Hawaii trade has surpassed the Puerto Rico trade as the largest of the domestic offshore liner trades. However, in terms of FEUs, the trade remains ranked second to Puerto Rico, as in the 1997 study.
- In the Hawaii trade, volume of liner traffic in terms of tonnage has declined by 6 percent since the 1997 USDOT study, but has increased in terms of FEUs. This may be due to the shift in cargo from heavier unfinished goods to more lightweight manufactured products.
- Currently, the trade is served by five liner carriers. Since the 1997 USDOT study, Aloha Cargo Transport was acquired by Northland Services 2002. A new entrant, Pasha Hawaii Transport, began service in March 2005.
- After adjusting for inflation, average revenue per FEU in 2003 was about 85.5 percent of the 1991 level, a decline of approximately 1.3 percent annually.

1. Economy and Trade

The state of Hawaii is a chain of islands located near the middle of the Pacific Ocean, approximately 2,000 nautical miles west of San Francisco and 3,400 nautical miles east of Japan. The eight main islands of Hawaii are Oahu, Hawaii, Maui, Kauai, Lanai, Molokai, Niihau, and Kahoolawe. These eight islands account for more than 99 percent of the state's land area and most of its population. The population of Hawaii in 1990 was 1,108,229, and in 2004, was estimated to be 1,262,840, an increase of 14.0 percent.¹⁷

Ocean shipping services between the U.S. Mainland and Hawaii serve the needs of both Hawaii's permanent residents as well as its large tourist industry. The Gross State Product (GSP) of Hawaii was \$47.1 billion in 2003. Major industries exporting from the Islands were: visitor expenditures (2003): \$10.1 billion; Federal defense spending (2003): \$4.5 billion; sugar and pineapple (2002): \$244.3 million.¹⁸

¹⁷ Source: Population Division, U.S. Census Bureau.

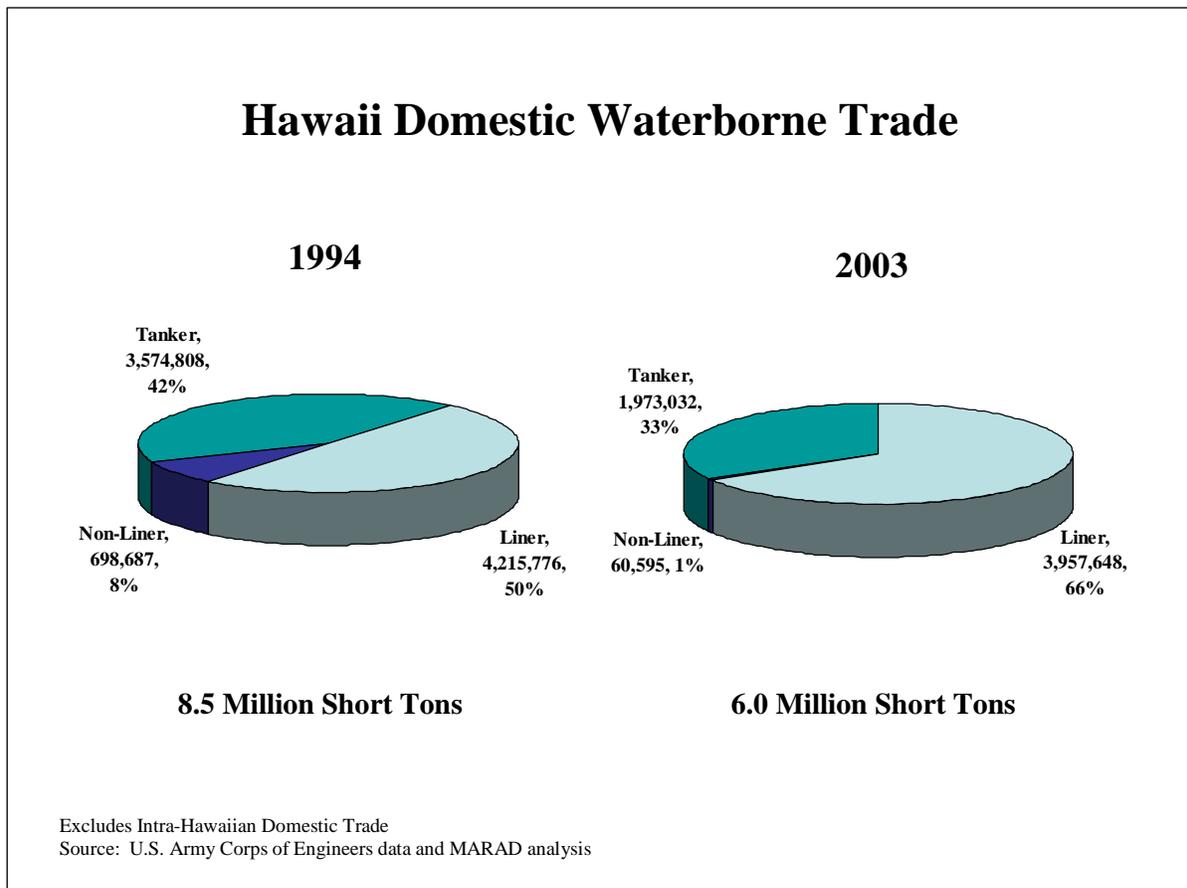
¹⁸ Source: State of Hawaii Facts and Figures (<http://www3.hawaii.gov/dbedt/index.cfm>).

2. Domestic Trade

In 2003, Hawaii's total domestic non inter-island waterborne trade was 2.5 million short tons (MSTs) lower than in 1994. Of the total volume in 2003, the liner trade accounted for a higher percentage, but lower tonnage than in 1994 (Figure 1). The directional imbalance in the trade has increased slightly, with eastbound trade comprising only 19 percent of westbound trade in 2003, compared to about 21 percent in 1994. The State received more than five times as much liner cargo than it transported to the U.S. Mainland from Hawaii (Table 1).

The State's economy expanded rapidly between 1985 and 1990, leading to increased waterborne trade; however, economic growth slowed from the early to mid 1990s, resulting in a decline in waterborne traffic over this period. Between 1994 and 2003, while the economy has grown, there has been an overall decline of 29 percent in cargo tonnage in the Hawaii domestic trade. Most of this drop has been in the tanker and non-liner sectors.

Figure 1



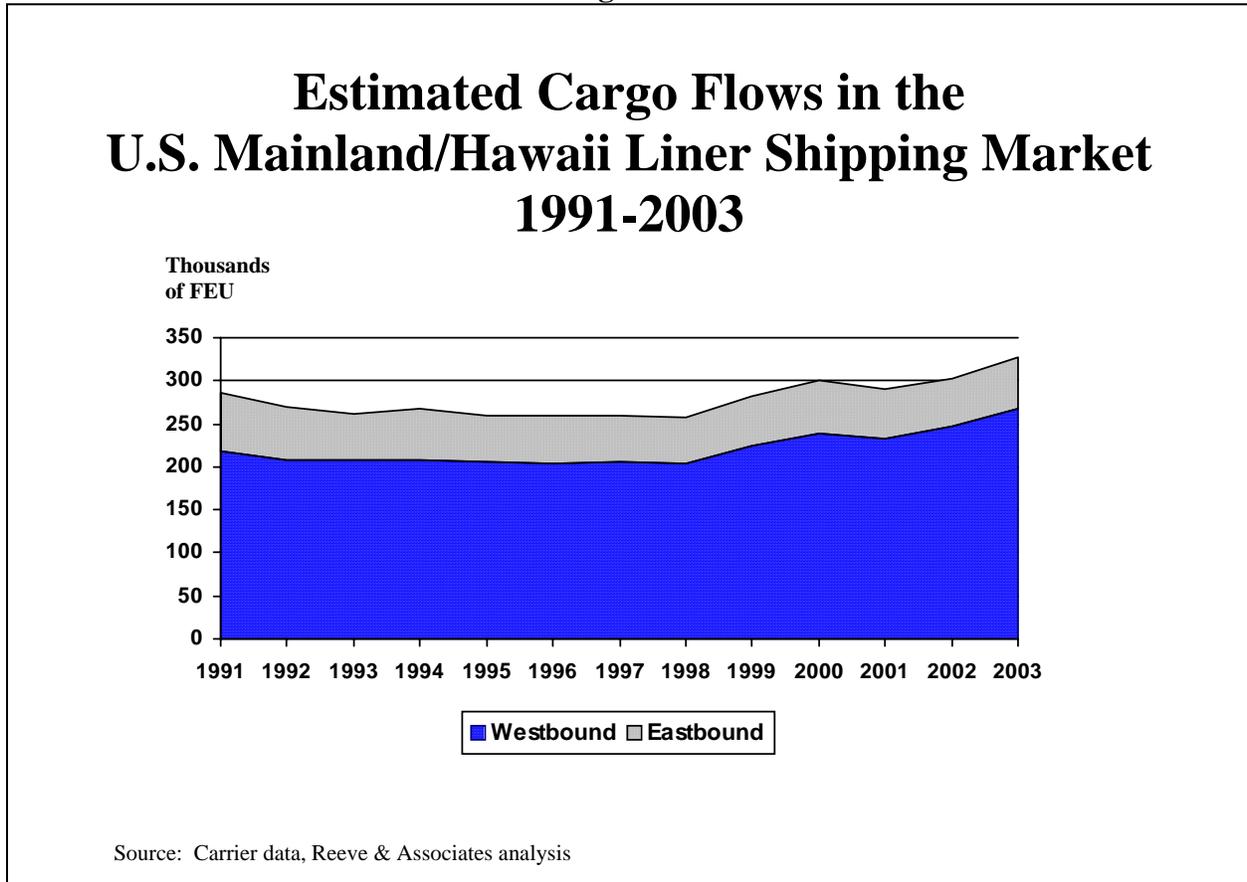
Between 1994 and 2003, total cargo tonnage in the liner sector dropped by 6 percent (Table 1); however, Reeve & Associates' 2004 report states that volume in terms of FEUs has increased. Between 1991 and 1998, FEUs in the Hawaii liner trade remained stagnant, declining slightly, but increased at a rate of 5 percent annually between 1998 and 2003 (Figure 2). The only commodity group to post an increase over the period was manufactured goods, where shipments from the mainland grew by 63 percent, while shipments from Hawaii to the mainland rose by 23 percent.

Table 1

1994 and 2003 Hawaii Domestic Liner Trade			
Total Liner	1994 Total Liner	2003 Total Liner	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	145,502	76,750	-47%
Food	1,739,518	1,145,803	-34%
Lumber and Wood	75,852	39,368	-48%
Manufactured Goods	1,296,359	2,012,424	55%
Metal Products	222,249	139,646	-37%
Non-Metal Products	191,449	87,764	-54%
Other	544,847	455,893	-16%
Total	4,215,776	3,957,648	-6%
From Mainland	1994 From Mainland	2003 From Mainland	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	135,087	69,401	-49%
Food	1,350,127	861,984	-36%
Lumber and Wood	75,196	39,344	-48%
Manufactured Goods	1,040,844	1,698,093	63%
Metal Products	170,754	124,679	-27%
Non-Metal Products	190,668	81,206	-57%
Other	534,993	446,072	-17%
Total	3,497,669	3,320,779	-5%
From Hawaii	1994 From Hawaii	2003 From Hawaii	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	10,415	7,349	-29%
Food	389,391	283,819	-27%
Lumber and Wood	656	24	-96%
Manufactured Goods	255,515	314,331	23%
Metal Products	51,495	14,967	-71%
Non-Metal Products	781	6,558	740%
Other	9,854	9,821	0%
Total	718,107	636,869	-11%
Source: U.S. Army Corps of Engineers data and MARAD analysis			

For the entire 1991 to 2003 period, in terms of FEUs, the volume of trade grew at a rate of 1.1 percent annually (Figure 2).¹⁹

Figure 2



¹⁹ “Competitiveness in the United States’ Domestic Noncontiguous Liner Shipping Markets, June 2004,” Reeve & Associates, pp. 37-38.

During the 1994 to 2003 period, the mix of liner commodities has shifted a great deal, from unfinished goods such as chemicals, lumber, and metals, to manufactured goods (Table 1; Figures 3a and 3b). Goods such as chemicals, lumber and wood, and metal products tend to be dense, heavy, and of low value, while manufactured products are generally less bulky, lighter, of higher value, and tend to be containerized. Therefore, the decline of tonnage, but increase in FEUs, in the Hawaii domestic liner trade could be explained by the shift in cargo from the bulky, heavy, low-valued raw materials and unfinished products to the less heavy, but higher-valued manufactured goods being transported in the trade.

Figure 3a

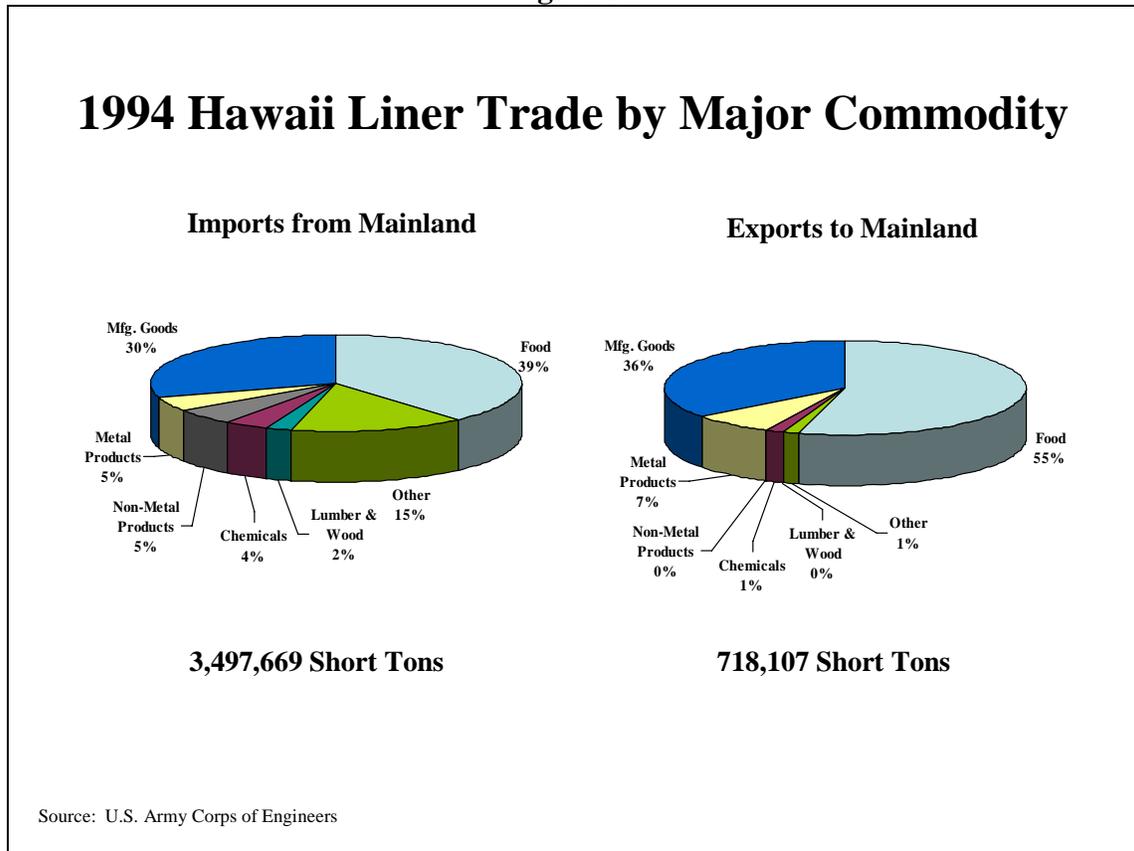
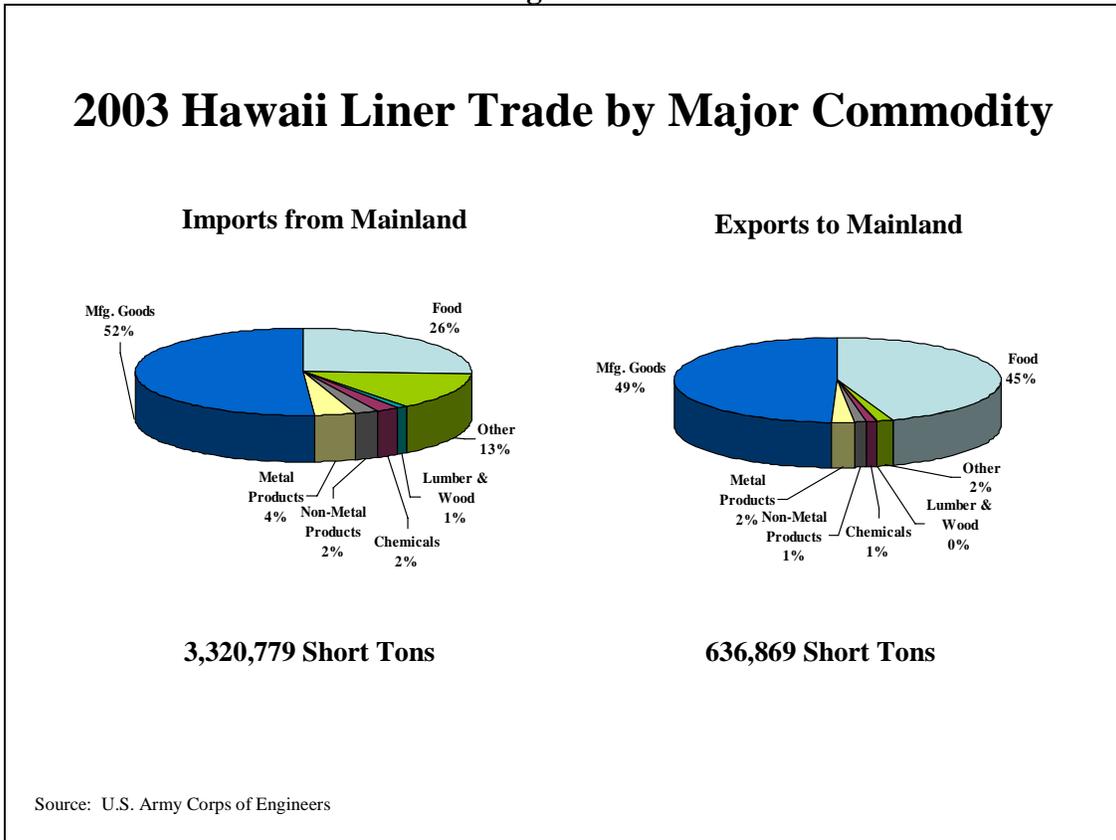


Figure 3b



Food, another major commodity in the trade, has also declined in both imports from the Mainland, as well as in exports to the Mainland. While the specific basis for this change is beyond the scope of this study, two plausible explanations are: the State may be increasing consumption of domestic production, or the State may be trading more food products with foreign countries (Table 1 above).

3. Foreign Trade

Between 1994 and 2003, on a tonnage basis, Hawaii's total foreign waterborne trade has increased by 13 percent. Overall, total exports from the State decreased more than 50 percent, while total imports to the State increased 25 percent. (Figures 4a and 4b)

Figure 4a

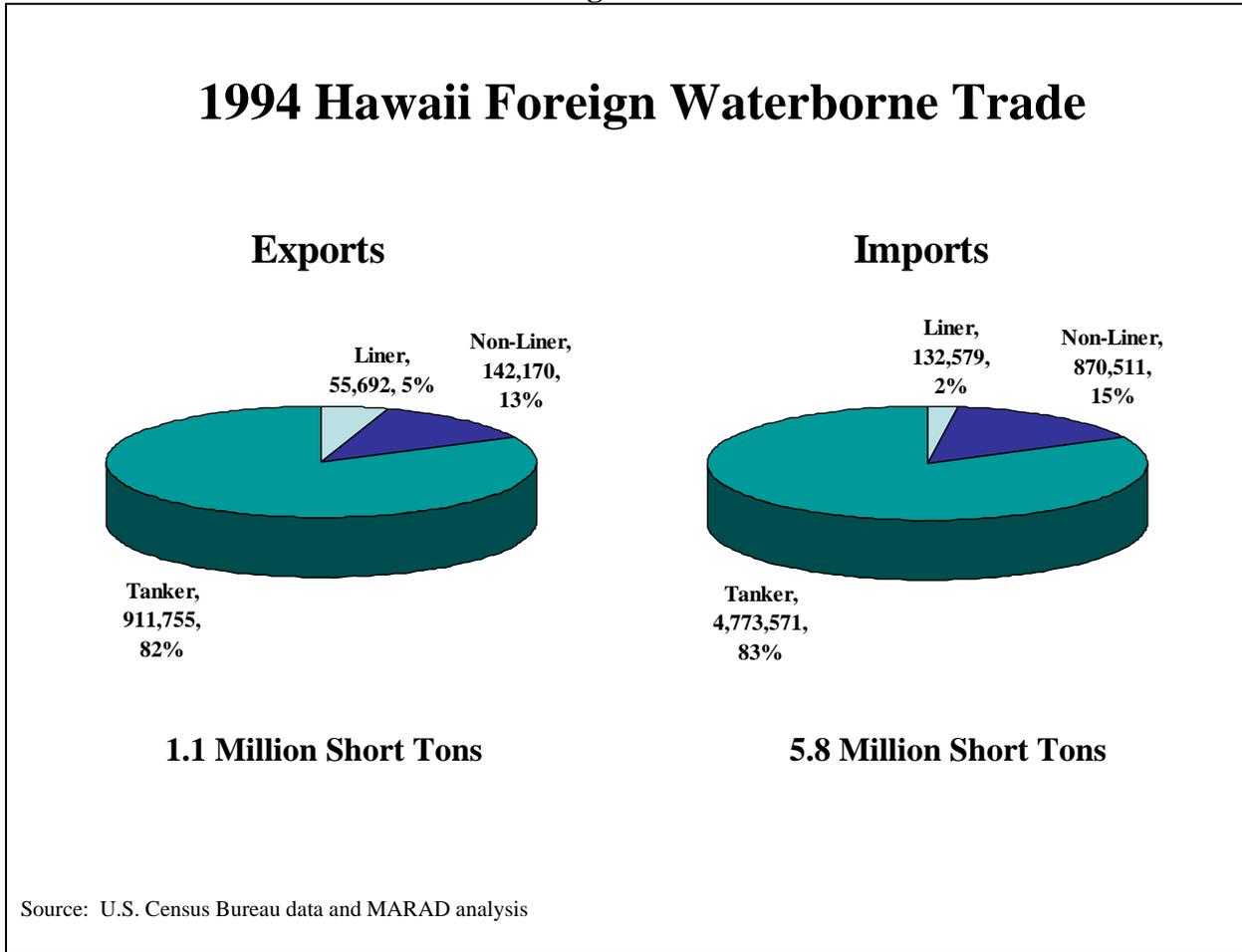
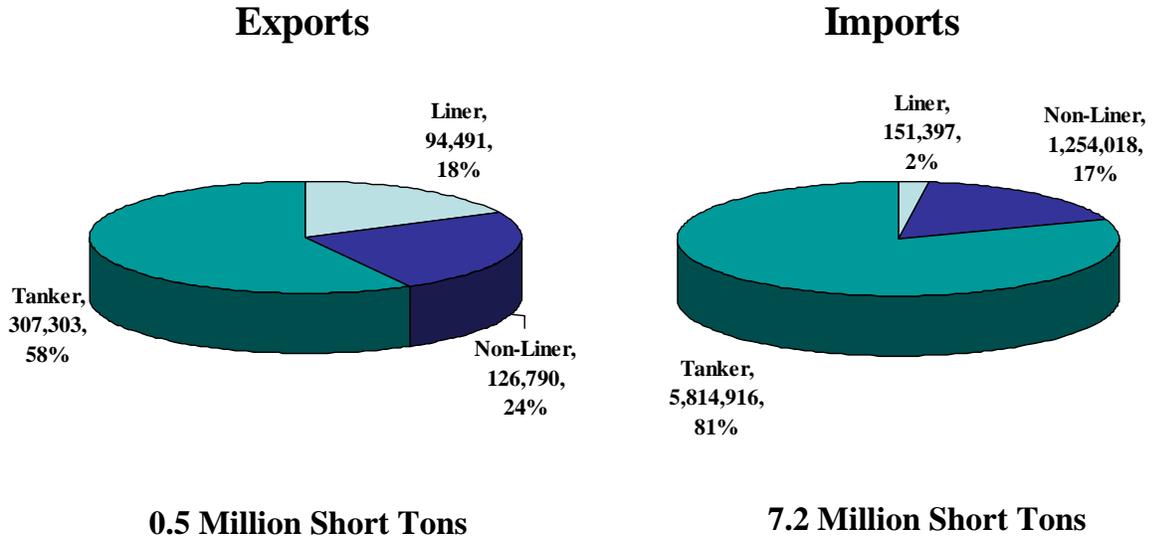


Figure 4b

2003 Hawaii Foreign Waterborne Trade



Source: U.S. Census Bureau data and MARAD analysis

In the liner segment, the total tonnage transported in the State's foreign trade has increased by 31 percent, with increases in both exports and imports (Table 2). This suggests that the transport of food products and the denser, heavier, lower-valued raw materials and unfinished products may have shifted from the domestic liner trade to the foreign liner market.

Table 2

**1994 and 2003 Hawaii Foreign Trade
Tons**

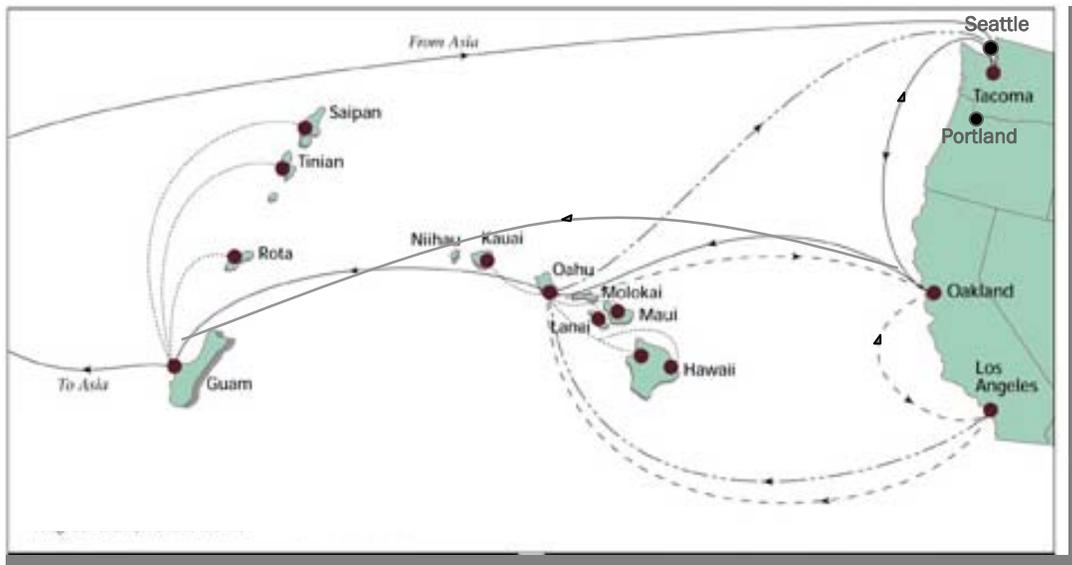
Sector	1994		2003		Percent Change		
	Export	Import	Export	Import	Export	Import	Total
Liner	55,692	132,579	94,491	151,397	70%	14%	31%
Tanker	911,755	4,773,571	307,303	5,814,916	-66%	22%	8%
Non-Liner	142,170	870,511	126,790	1,254,018	-11%	44%	36%
Total	1,109,617	5,776,661	528,584	7,220,330	-52%	25%	13%

Source: U.S. Census Bureau data and MARAD analysis

4. Liner Services

Five U.S.-flag operators provide seven sailings per week from the U.S. Mainland to Hawaii, using 19 containerships, Ro/Ro vessels, and barges (Table 3). Figure 5 shows a map of liner shipping services between the U.S. Mainland and Hawaii.

**Figure 5
Liner Shipping Services between the Continental U.S. and Hawaii and Guam**



Source: Reeve & Associates

Table 3

Profile of Liner Shipping Services in U.S. Mainland/Hawaii Trade, 2004				
Carrier	Type of Vessels Operated	Number of Vessels in Service	Weekly Capacity (FEUs)	Weekly Service Frequency
Horizon Lines	Containerships	7	2,182	2
Matson Navigation	Containerships Container/Ro/Ro	5 3	3,884	4
Northland Services	Tug and Deck Barges	1	140	0.3
Sause Brothers	Tug and Covered Deck Barges	2	300	0.5
Pasha Hawaii Transport	Ro/Ro	1		0.5
Total		19	6,506 +	7.3

Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates and MARAD analysis of publicly available information

Since Hawaii is over 2,000 nautical miles from the U.S. Mainland, most shippers prefer to move time-sensitive cargoes by faster self-propelled containerships and Ro/Ros rather than by barge. Barges and towboats take approximately two weeks to make the voyage one-way, as contrasted with four or five days for self-propelled vessels. As a result, self-propelled vessels carry 96 percent of the total volume of cargo. There is considerable market differentiation between the services available.

Matson Navigation Company, Inc. (Matson) has long been the dominant liner operator in the Hawaii trade, serving the trade since 1882. Currently using eight containerships and container-Ro/Ro vessels, Matson offers twice weekly service from Oakland to Honolulu and twice weekly service from Long Beach to Honolulu. These ships provide eight arrivals from the West Coast to Hawaii every 14 days.

Recent investments in vessels by Matson include two new containerships. These new containerships, the MANUKAI and the MAUNAWILI, entered service in 2003 and 2004 respectively, replacing existing vessels in the weekly West Coast-Hawaii-Guam-Far East trade. These vessels were the first new-builds to enter the Matson fleet since the R.J. PFEIFFER in

1992. Matson has also contracted for two additional replacement containerships to be operated in the same service by mid-2006.

Horizon Lines, LLC (Horizon), the domestic successor to Sea-Land Service/CSX Lines, is the second largest carrier in the Hawaii domestic trade. Horizon currently offers a weekly roundtrip sailing between Oakland, Los Angeles, and Honolulu using two containerships. Horizon also offers a weekly “pass-by” service, which consists of five vessels, operating between Tacoma, Oakland, Honolulu, and Guam as a part of its Far East service.

A new entrant, Pasha Hawaii Transport Lines, LLC (Pasha) began operations in March 2005. The company’s one Ro/Ro vessel is designed to accommodate up to 3,000 vehicles and sails once every two weeks from San Diego to Hilo, Kahului, and Honolulu. Pasha has a long-term contract to carry Chrysler automobiles to Hawaii and is expected to compete in the vehicle niche of the liner trade, as well as in the carriage of boats and other oversized equipment.

Sause Brothers Ocean Towing (Sause) offers non-container barge service between Hawaii and Oregon and Washington; its sailing frequency is once every two weeks. Lumber and newsprint are the major items transported.

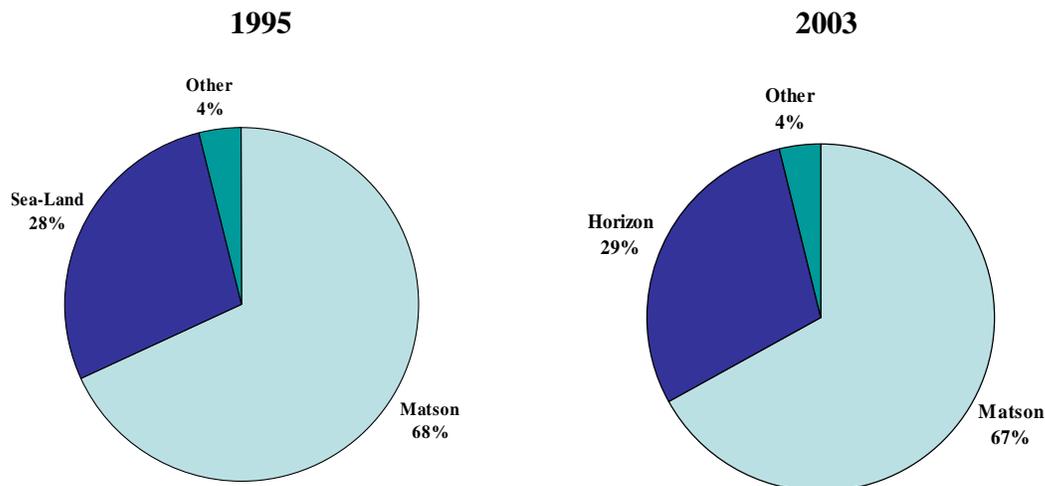
Northland Services’ Aloha Cargo Transport division (Aloha) offers both container and non-container barge service to and from Honolulu, departing from Seattle every two weeks, recently increased from once every three weeks. Aloha, which has served the Hawaii market since 1987, was acquired by Northland Services, Inc. in 2002. The company moves a wide mix of commodities, including heavy equipment and vehicles, construction materials, commercial and pleasure boats, and other merchandise.

5. Concentration and Competition

In 1995, Matson had 68 percent of the market share in the Hawaii westbound trade, while Sea-Land had a 28 percent share. Sause, Aloha, and other barge operators accounted for the remainder of the traffic. In 2003, Matson had 67 percent share of that market, and Horizon had 29 percent share, the remainder accounted for by Sause, Northland, and other barge operators (Figure 6). Therefore, in terms of FEUs, market share has changed little, and Matson and Horizon remain strong competitors in the trade.

Figure 6

Carriers by Market Share in the Westbound Hawaiian Trade



Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates

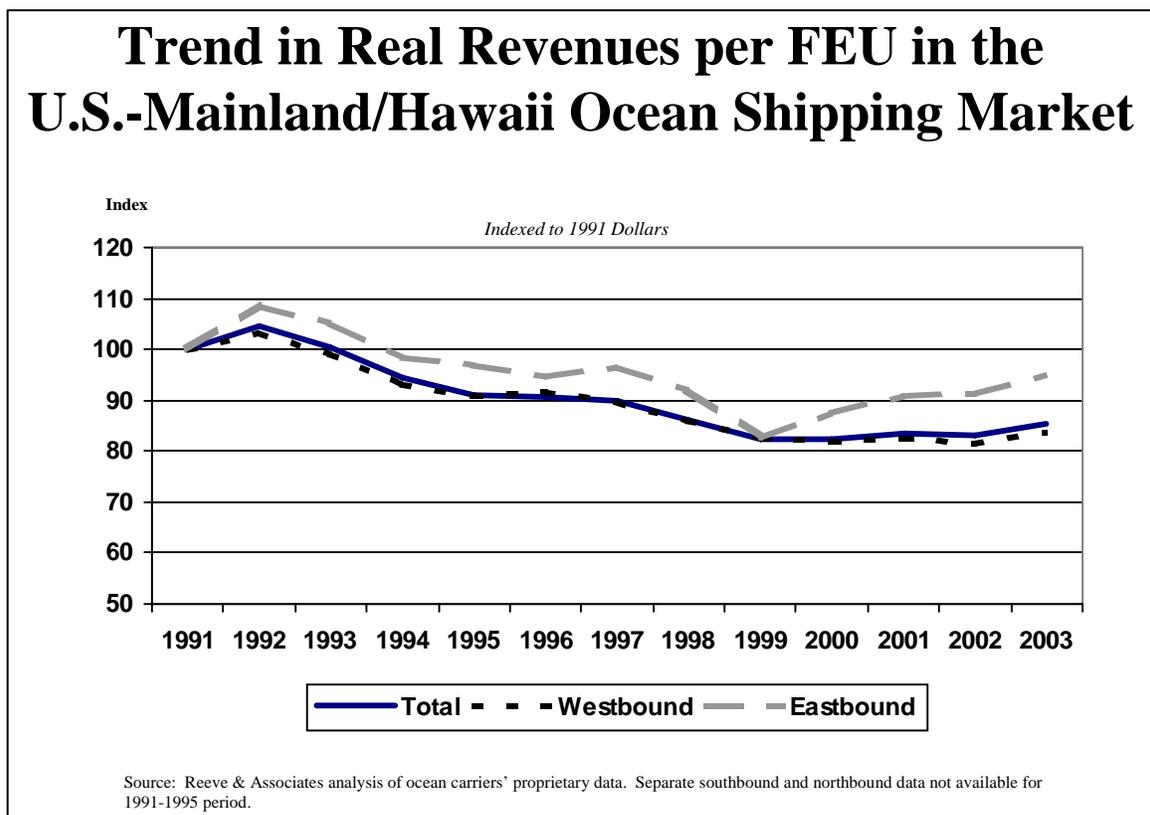
Although the market is highly concentrated, there is evidence to indicate that it is relatively easy to enter and exit the trade. Further indication of competition in the market is the activity in the automotive segment. For example:

- Horizon and Matson's entry into each other's principal market (turnaround versus pass-by) in 1995 suggests that entry and exit barriers are not perceived as substantial, at least for the largest carriers in the trade.
- Northland's acquisition of Alaska Cargo, the increase in service and continued presence in the trade also reflects a vigorous interest in the Hawaiian liner trade.
- Matson acquired U.S.-built ships from other domestic operators, converted ships, and built new containerships for the market. In 1995, Matson purchased six American President Lines, Ltd. (APL) containerships; it deployed four of the vessels on the Hawaii route as part of continuing service to the Far East. Since 2003, the company has added three new containerships to its fleet, and will add one more in mid-2006.
- The service launched by Pasha Hawaii Transport focused on the automobile/heavy equipment segment of the liner trade. Pasha's acquisition of the former Matson contract

6. Rates in the Hawaii Trade

Since recent data on liner shipping rates were unavailable to MARAD, information was obtained from the Reeve & Associates report. According to Reeve & Associates, rates have continued to decline over the 1991-2003 period. In real terms, average freight revenue per FEU in the total Hawaii trade declined at an average annual rate of 1.3 percent. In 2003, average total trade freight revenue per FEU was only 85.5 percent of the 1991 level, after adjusting for inflation. Rates in the westbound trade segment declined at an average annual rate of 1.5 percent. For the eastbound segment, the average annual rate of decline was 0.4 percent (Figure 8).²⁰

Figure 8

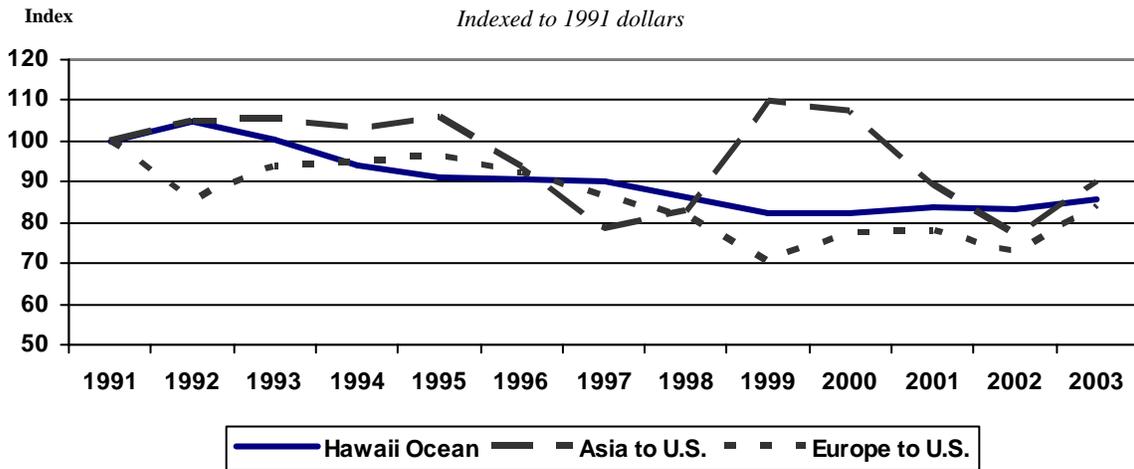


²⁰ "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, p. 44.

In real terms, U.S.-Mainland/Hawaii freight rates over the 1991-2003 have declined by about 14.5 percent. Rates in the U.S.-Mainland/Hawaii trades have been more stable than rates in the Asia-U.S. and Europe-U.S. trades (Figure 9).

Figure 9

Trend in Real U.S.-Mainland/Hawaii Ocean Rate Levels Compared to Major U.S. International Shipping Markets



Source: Reeve and Associates, based on *Containerisation International* for international trade freight rate trends

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B. Guam Trade

Summary:

- Liner service to Guam is limited by the small volume of commodities being transported, a significant directional imbalance in the flow of traffic, and Guam's distance from the U.S. Mainland.
- Due to data limitations, tonnage data for Guam shipments were not available. Therefore, data were used on FEU shipments based on the Reeve and Associates study. Volume declined after peaking in 1997, then began a recovery in 2002 led by increased shipments from the mainland to Guam.
- At any given time, there have generally only been two U.S.-flag liner carriers offering service to Guam from the U.S. Mainland. Liner service from the U.S. Mainland is economically viable only if it is offered as part of a foreign service to the Far East or as a part of liner service to Hawaii. It is estimated that only about 25 percent of available westbound capacity from the Mainland is used for Guam cargoes; the remainder is allocated to cargoes destined for Hawaii or the Far East, or remains unused.
- Over the 1991-2003 period, average freight revenue per FEU in the Guam trade declined at an average annual rate of 2.2 percent, after taking general inflation into account.

1. Economy and Trade

Guam is the westernmost territory of the United States. The island has a total land area of approximately 209 square miles and a shoreline with a length of 116.5 miles. It is approximately 6,000 miles west of San Francisco, 3,700 miles southwest of Honolulu, 1,500 miles southeast of Tokyo, 2,100 miles southeast of Hong Kong, 1,500 miles east of Manila, and 3,100 miles northwest of Sydney.²¹

In 1990, the population of Guam was 133,152.²² As of July 2004, Guam had an estimated population of 166,090,²³ an increase of 24.7 percent from 1990. The foreign-born population has increased in recent years. Migration to the island increased as a result of the U.S. Compact of Free Association Act of 1985, which authorized unrestricted immigration of people in the Federated States of Micronesia and the Marshall Islands to the United States and its territories. Between 1990 and 2000, the number of noncitizens in Guam rose 36 percent.²⁴

²¹ "Geography of Guam," Government of Guam (<http://ns.gov.gu/geography.html>).

²² Guam Department of Commerce (http://www.admin.gov.gu/commerce/guam_population_tables.htm).

²³ The World Factbook 2004, CIA, last updated on February 10, 2005 (<http://www.cia.gov/cia/publications/factbook/geos/gq.html>).

²⁴ "Guam Grew Younger, Poorer During the 1990s," Population Reference Bureau

Guam's Gross Island Product in 1994 was about \$3.0 billion and approximately \$2.5 billion in 2002, a decrease of 18 percent.²⁵ The economy depends on U.S. military spending, tourism, and the export of fish and handicrafts. Most food and industrial goods are imported. However, the fisheries industry is a major source of revenue for Guam.

Guam is strategically located to serve as an outpost for the U.S. military; it became a major military site for the United States at the end of World War II. After the war, the U.S. military presence in Guam grew dramatically, contributing to rapid population growth and economic development on the island. Although the island continues to have a strong military presence, military personnel and their dependants have declined as a percentage of the total population from 15.4 percent in 1993 to 7.0 percent in 2002.²⁶ Military presence on the island created demand for goods and services and led to substantial U.S. investments in Guam's infrastructure. Military downsizing is cited as a major factor in the recent decline of Guam's economy.

During the 1990s, the tourism industry overshadowed the military as the dominant economic force fueling the economy. Over the past 20 years, the tourism industry has grown rapidly, creating a construction boom for new hotels and the expansion of older ones. More than one million tourists visit Guam each year. However, in recent years, the industry has suffered from a number of events. The industry suffered from the Asian financial crisis in 1997, and after a slow rebound, by the September 11th attack in 2001. The island also experienced two typhoons in 2002. The second one, Pongsona, has been reported to be the costliest natural disaster to hit Guam in more than a century. In 2003, the Severe Acute Respiratory Syndrome (SARS) epidemic had a negative impact on tourism.²⁷ The industry also had recently suffered setbacks from the continuing Japanese economic slowdown; the Japanese normally make up almost 90% of the tourists. Guam faces the problem of building up the civilian economic sector to offset the impact of military downsizing and of a decline in tourism.²⁸

(<http://www.prb.org/AmeristatTemplate.cfm?Section=Fertility&template=/ContentManagement/ContentDisplay.cfm&ContentID=8035>).

²⁵ "Gross Island Product: 1991 to 2002," Government of Guam
(http://www.spc.int/prism/country/gu/stats/statistics/Economics/gross_island_product.htm).

²⁶ "Military Population, Guam: 1993-2002," Office of Insular Affairs, U.S. Department of the Interior
(<http://www.pacificweb.org/cnmi/Demographics/Military%20Pop.-%201993-2002.htm>).

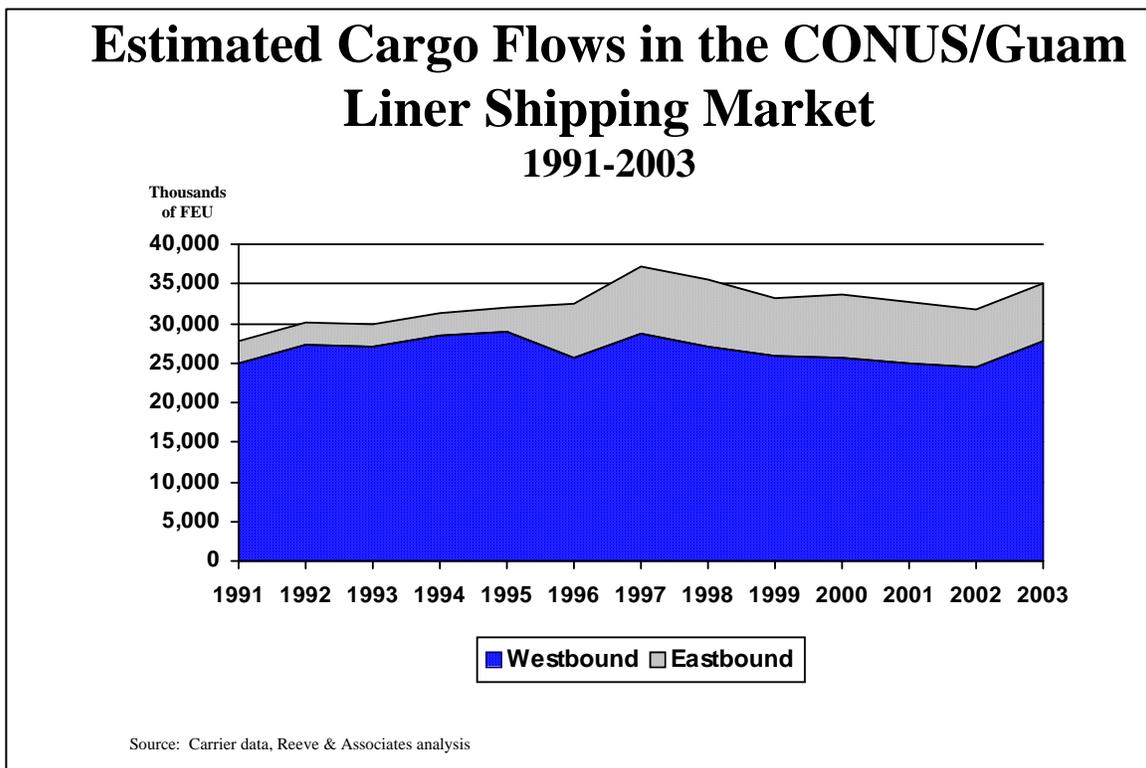
²⁷ "Report: Guam Economy Still Bumpy," *Pacific Business News*, October 29, 2003.

²⁸ The World Factbook 2004, CIA, last updated on February 10, 2005
(<http://www.cia.gov/cia/publications/factbook/geos/gq.html>).

2. Domestic Trade

As the smallest of the United States' domestic noncontiguous shipping markets, liner shipments from the U.S. Mainland to Guam totaled less than 28,000 FEUs in 2003. Guam receives nearly four times as much liner cargo -- mainly consumer goods and U.S. Government and military cargoes²⁹ -- from the U.S. Mainland than is shipped from Guam to the U.S. Mainland. Liner shipments from Guam to the U.S. Mainland accounted for approximately 7,200 FEUs, only 26 percent of the westbound volume.³⁰ Between 1991 and 2003, the growth rate for the entire U.S. Mainland-Guam trade was 2.2 percent. Most of this growth was due to a strong increase in the eastbound trade segment that occurred in the mid 1990s. The total volume of trade during the 1991-2003 period reached its peak in 1997, and was in decline, until a recovery began in 2002 (Figure 10).³¹

Figure 10



²⁹ Under the Cargo Preference Act of 1904 [10 U.S.C. 2631 (2004)], U.S. military cargo must move on U.S.-flag ships if service is available at rates that are not excessive or otherwise unreasonable.

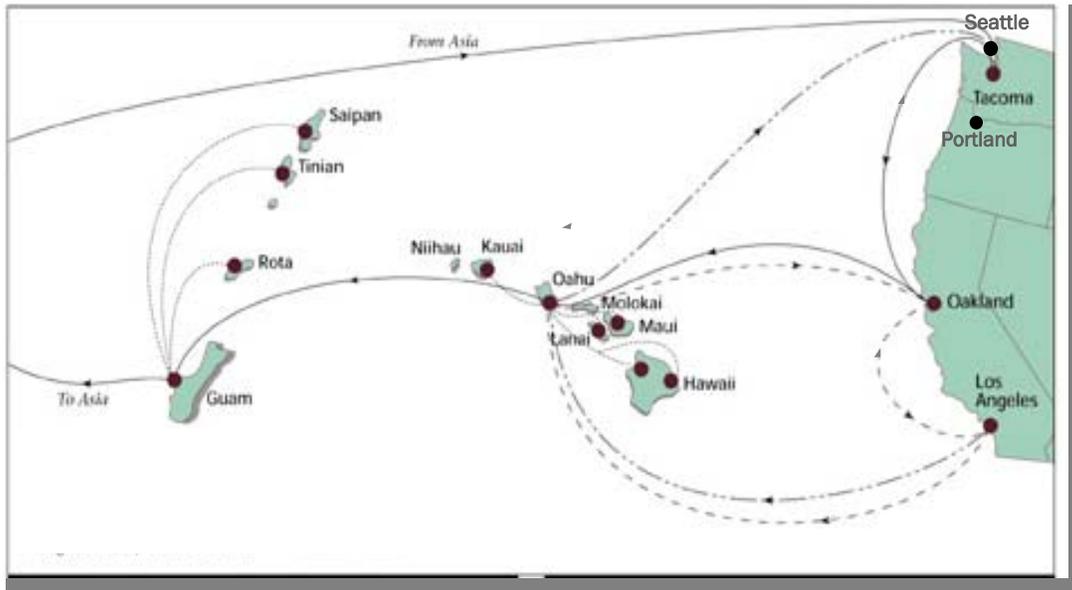
³⁰ "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, p. 22.

³¹ "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, p. 23.

3. Liner Services

The Guam trade is served by two liner carriers, Matson and Horizon. It is estimated that only about 25 percent of available westbound capacity from the Mainland is used for Guam cargoes. (Table 4) The remaining 75 percent of vessel capacity may be used to transport cargoes destined for Hawaii or the Far East, to haul empty containers back to the Far East, or remains unutilized. Figure 11 shows a map of liner shipping services between the U.S. Mainland, Hawaii, and Guam.

Figure 11
Liner Shipping Services between the Continental U.S. and Hawaii and Guam



Source: Reeve & Associates

Table 4

Profile of Liner Shipping Services in U.S. Mainland/Guam Trade, 2004				
Carrier	Type of Vessels Operated	Number of Vessels in Service	Weekly Capacity (FEUs)	Weekly Service Frequency
Horizon Lines	Containerships	5	1,020	1
Matson Navigation	Containerships	5	1,431	1
Total		10	2,451	2

Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates and MARAD analysis of publicly available information

Because the distance between Guam and West Coast ports is approximately 6,000 nautical miles, barge service is not a viable competitive alternative to self-propelled liner service. The volume of U.S. Mainland – Guam trade is about 500 – 600 FEUs per week, with a total capacity available of approximately 2,451 FEUs per week. The volume, distance and directional imbalance of the trade makes it unprofitable for carriers to call at the island on a weekly turn-around basis. Service levels below weekly frequency would disadvantage Guam consumers. As a result both Matson and Horizon provide weekly “pass by” service to Guam.

Matson inaugurated its service in 1996 under a ten-year agreement with American President Lines (APL).³² As an aspect of the agreement, Matson acquired APL’s Guam service and purchased six of its containerships as well as certain APL-owned assets in Guam for \$164 million. In January 1998, the agreement was revised, allowing Matson to establish a direct service from the U.S. Mainland to Guam without first stopping in Hawaii, reducing the transit time from 13 to 10 days. Currently, Matson provides a weekly direct sailing from the U.S. Mainland to Guam and returning to the Mainland after calling at ports in the Far East using a string of five vessels, two of which are APL vessels and three of which are Matson vessels. Upon expiration of the APL-Matson agreement, Matson will deploy its four newest vessels, along with an existing containership delivered in 1992, in a new Long Beach-Hawaii-Guam-China service.

This will enable Matson to continue to serve Guam upon expiration of the agreement. It is estimated that the new service will require a total capital investment of \$365 million. This includes the new vessels and related costs, and additional containers and terminal improvements.

³² U.S. maritime law permits foreign-built vessels to serve Guam, and APL had employed such vessels in the past; however, this option is not possible when the U.S. Mainland-Hawaii and the U.S.-Mainland Guam trades are served on the same sailing.

Matson expects to generate \$100 million in annual revenue from the new eastbound service from China.³³

Horizon Lines entered the Hawaii trade in 1987 as Sea-Land Service, Inc., operating a service from the West Coast. Horizon Lines currently serves Guam with five vessels providing weekly service from Tacoma, Oakland and Honolulu. Their services include weekly direct sailing from Hawaii to Guam.

4. Concentration and Competition

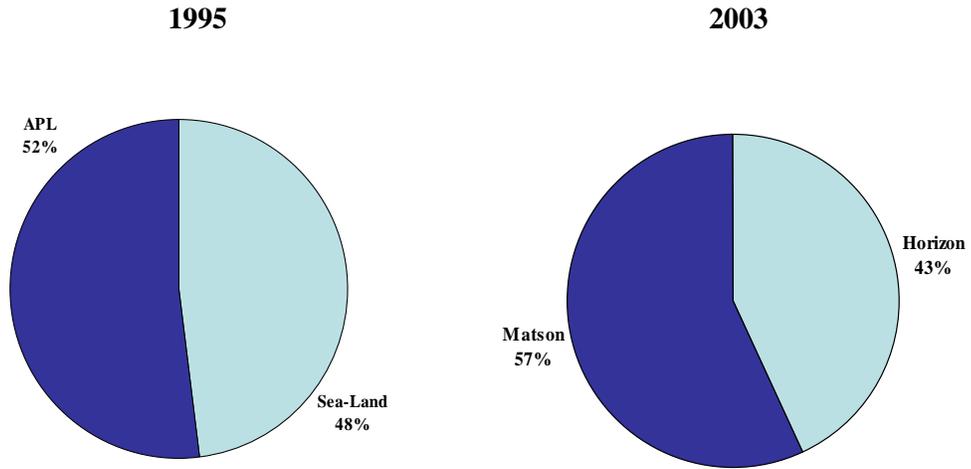
In 1995, APL had a 52 percent market share in the westbound U.S. Mainland to Guam trade, and Sea-Land had a 48 percent share. In 2003, market share estimates for Matson and Horizon in the trade were 57 percent and 43 percent, respectively (Figure 12a). Estimated shares for the small volume of traffic moving eastbound from Guam to the U.S. Mainland were 41 percent for APL and 59 percent for Sea-Land in 1995. Matson had 53 percent market share and Horizon had 47 percent share in the eastbound trade in 2003 (Figure 12b).³⁴ Matson's larger market share in 2003 in the westbound trade may be explained by the company's faster non-stop transit time of 10 days.

³³ Honolulu Star Bulletin, "Matson Sees Gold in China Trade," June 21, 2005.

³⁴ Market share estimates for 1995 from Mercer Management Consulting, **U.S. Domestic Noncontiguous Trades Report**, May 1996, p. III-7; market share estimates for 2003 from "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, p. 27.

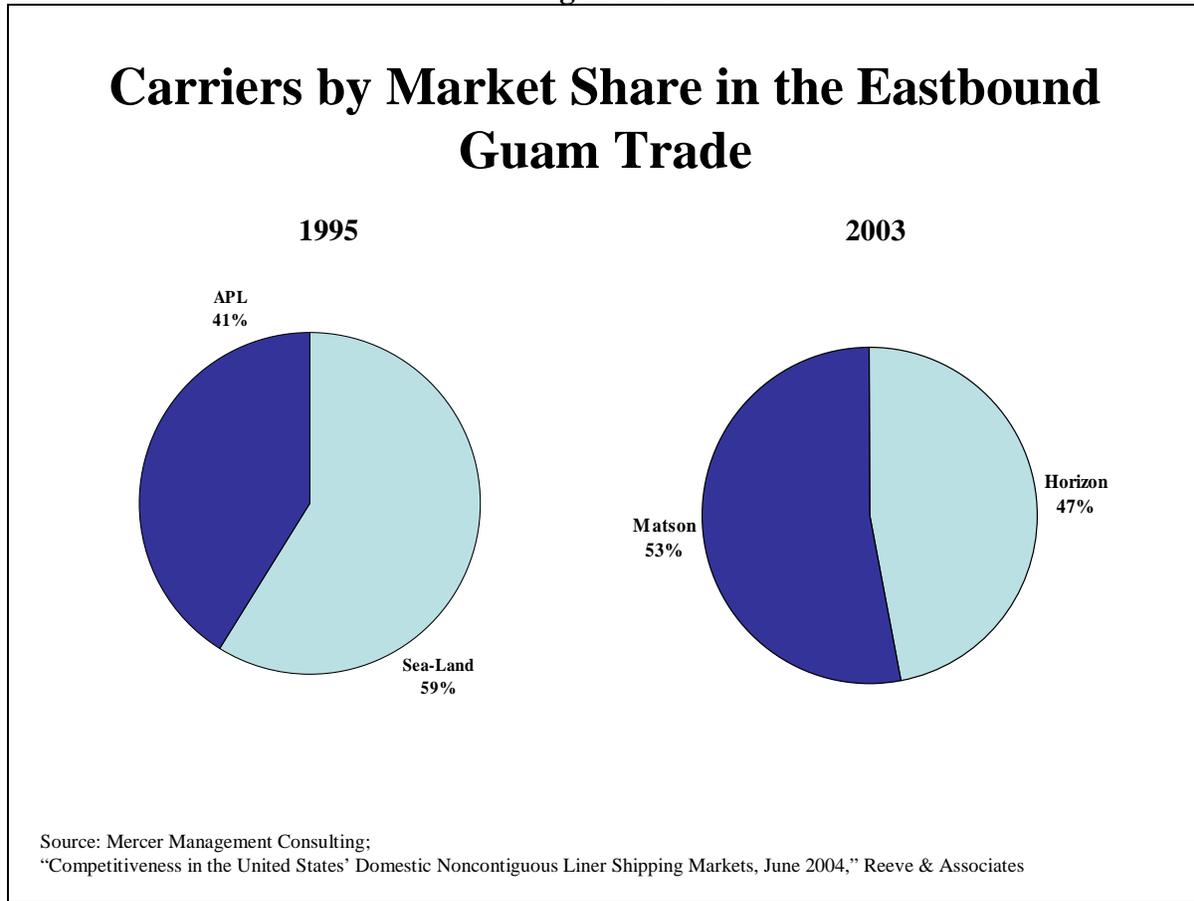
Figure 12a

Carriers by Market Share in the Westbound Guam Trade



Source: Mercer Management Consulting;
"Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates

Figure 12b



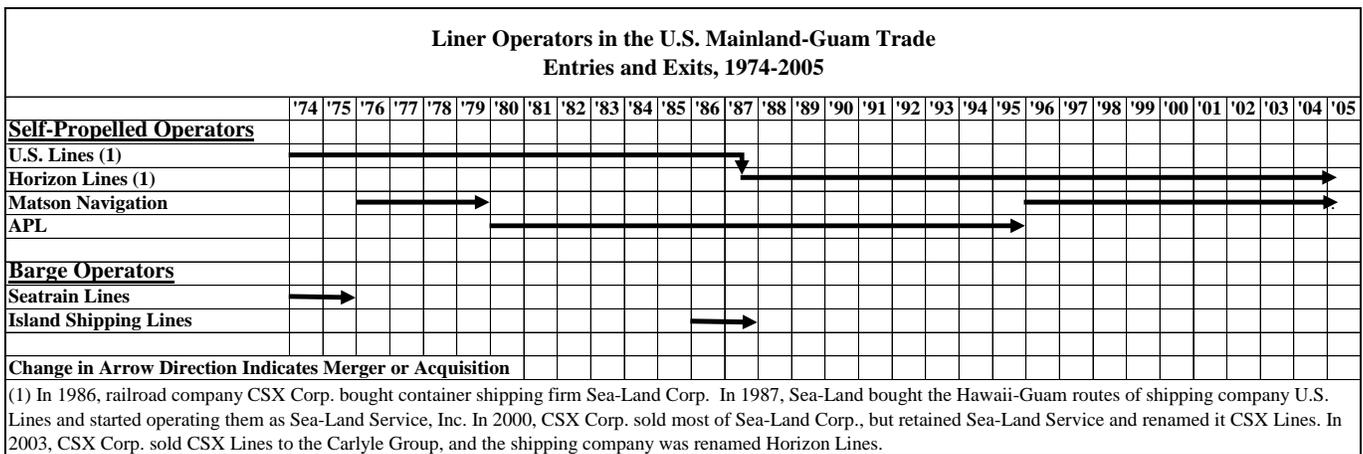
At any given time, there have generally only been two U.S.-flag liner carriers offering service to Guam from the U.S. Mainland. This remains the case today. This indicates that concentration remains high in the U.S. Mainland-Guam trade (Figure 13).

Ocean carriers have been able to acquire vessels, port facilities, and other infrastructure services necessary to provide service, indicating that entry barriers are not insurmountable. Terminal space at Guam's Port of Apra is publicly owned and available to lease. However, port facilities and channel depths at Apra Harbor limit vessels to a draft of 35 feet, which means that the harbor cannot accommodate the larger containerships used by carriers in transpacific service, especially if they are fully loaded. In February 2005, there was a proposal to make modifications to Apra Harbor to improve access and services to the island. An environmental impact statement is being prepared for the project. The harbor is in need of improvements to meet anticipated future demands of the island's commercial port operations. Additional landside cargo container storage is needed, as well as berthing facilities capable of accommodating the newest generation of large deep-draft container vessels and cruise ships. Harbor improvements under consideration include: construction of a new 1,500-foot wharf; construction of cargo container handling facilities; construction of container storage yard facilities; and dredging of submerged lands to

depths of 55 to 60 feet in waters adjacent to the proposed 1,500-foot wharf to accommodate larger deep-draft commercial and military vessels.³⁵

Although entry barriers are not insurmountable, the limited volume of traffic moving in the U.S. Mainland to Guam trade presents a significant market entry barrier as carriers can probably only serve this market in connection with a transpacific voyage. Since the majority of traffic in the transpacific trade moves eastbound from the Far East, the westbound U.S. Mainland to Guam trade provides incremental cargoes (and revenues) for U.S. liner companies that are returning to the Far East. Only large, efficient, and well-capitalized firms have the financial resources necessary to operate in the transpacific market.

Figure 13



5. Rates in the Guam Trade

Until June 1989, there was an authorized liner conference for carriers serving Guam. Under the Guam Rate Agreement, carriers were authorized to discuss and set rates collectively.³⁶ With the demise of the conference, there is no longer any authority for carriers to collectively set rates, and therefore, rates are subject to competitive factors. Excess capacity in the U.S. Mainland to Guam trade may now be the most effective limit on increasing freight rates. While only two U.S.-flag carriers serve the trade, Guam also receives shipping services from foreign-flag carriers based in Asia and Europe, providing a significant source of indirect competition for the two carriers. According to the Federal Maritime Commission (FMC), 40 percent of Guam’s total waterborne commerce is with foreign countries.³⁷

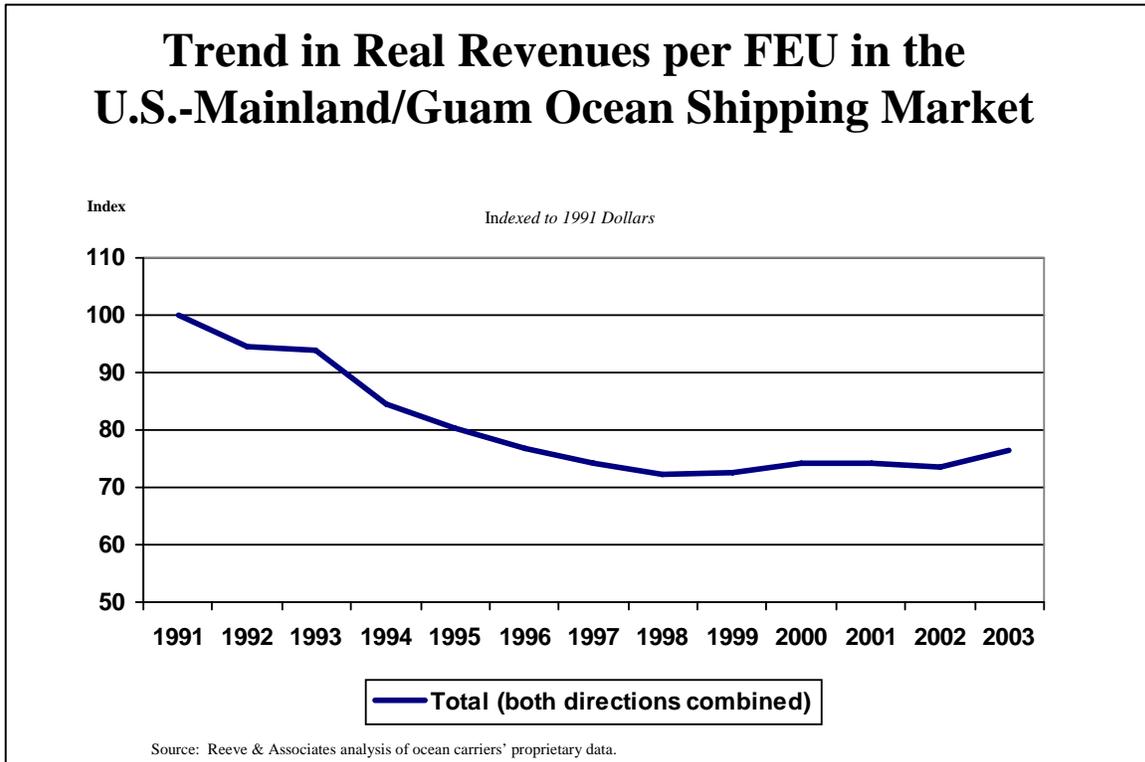
³⁵ [Federal Register: February 2, 2005 (Volume 70, Number 21)][Notices][Page 5420-5421] Department of Defense. Department of the Army; Corps of Engineers Intent to Prepare an Environmental Impact Statement for Proposed Wharf Improvements and Fill at Apra Harbor, Guam.

³⁶ Comments of the Government of Guam, Public Docket OST-96-1066, April 15, 1996, p. 11.

³⁷ The Government of Guam, Et Al. v. Sea-Land Service, Inc. and American President Lines Ltd., Docket No. 89-26, Initial Decision of Administrative Law Judge Dolan, p.28.

According to the 2004 Reeve & Associates report, aggregate freight revenue per FEU for the U.S. Mainland to Guam trade showed a 2003 level of only 76.6 percent of its 1991 level, after adjusting for inflation. Over the 1991-2003 period, in real terms, average freight revenue per FEU in the trade declined significantly, an average annual rate of 2.2 percent (Figure 14).³⁸

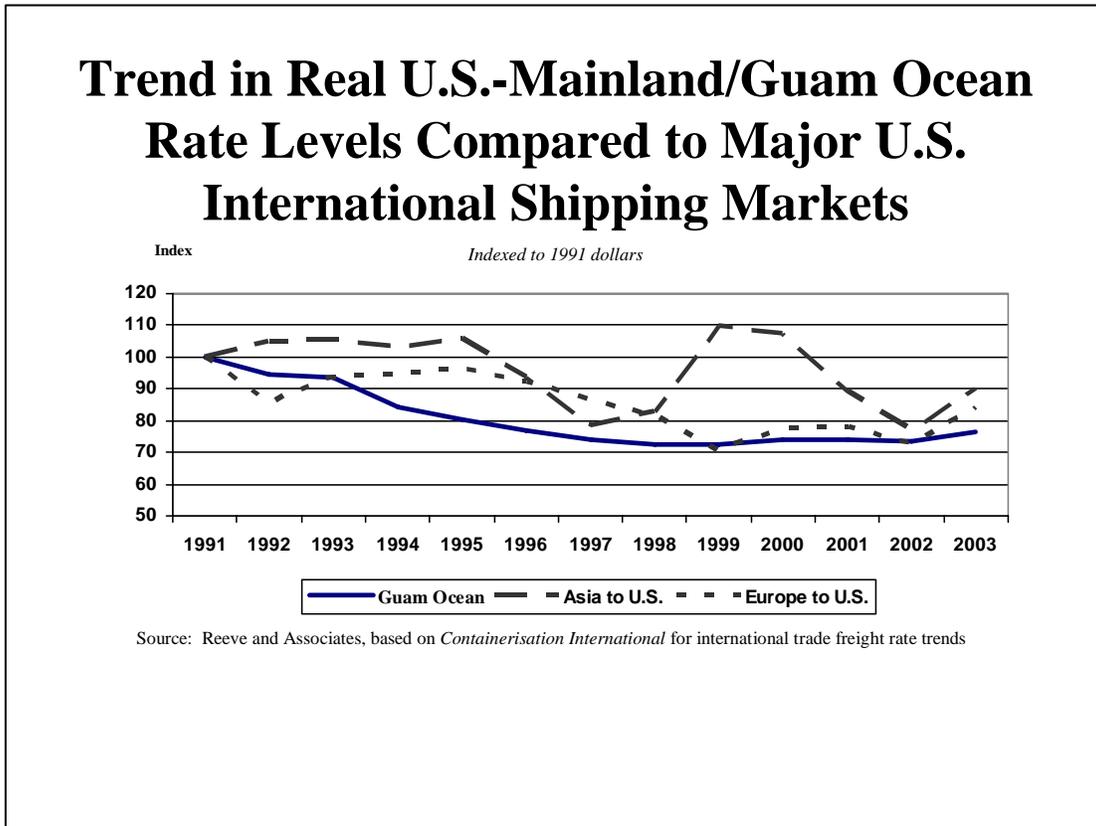
Figure 14



³⁸ “Competitiveness in the United States’ Domestic Noncontiguous Liner Shipping Markets, June 2004,” Reeve & Associates, p. 28.

In real terms, U.S.-Mainland-Guam freight rates over the 1991-2003 have declined by about 25 percent. Rates in the U.S.-Mainland/Guam trade have been more stable than rates in the Asia-U.S. and Europe-U.S. trades (Figure 15).

Figure 15



C. Puerto Rico Trade

Summary:

- Since the 1997 USDOT study, the Puerto Rico trade has dropped to being the second largest of the domestic offshore liner trades, after Hawaii, when measured by tonnage. Puerto Rico remains the largest domestic offshore liner trade in terms of FEUs.
- In the Puerto Rico trade, volume of liner traffic in terms of tonnage has declined by 42 percent since the 1997 USDOT study, but has increased in terms of FEUs. This may be due to the shift in cargo from heavier unfinished goods to more lightweight manufactured products and import substitution.
- The trade is currently served by four liner carriers. Since the 1997 USDOT study, Sea Star entered the trade in 1998 with its own vessels and purchased the existing carrier, Sea Barge. In 2002, Sea Star acquired Navieras de Puerto Rico. Unlike the Hawaii and Guam liner trades, barge carriers are effective competitors to self-propelled vessels for much of the liner traffic between the U.S. Mainland and Puerto Rico.
- Over the 1991-2003 period, after adjusting for inflation, average revenue per FEU in the Puerto Rico trade declined by nearly 39 percent.

1. Economy and Trade

Puerto Rico is a Caribbean island located between the Caribbean Sea and the North Atlantic Ocean. It is east of the Dominican Republic and west of the Virgin Islands. It is about 1,000 miles southeast of Miami, Florida. Of its total area of 3,514 square miles, 3,458 square miles are land, and 56 square miles are inland waterways. As of April 1, 1990, it had a population of 3,522,037. As of July 1, 2004, it had a population of 3,894,855, an increase of 10.6 percent. Puerto Rico is one of the most densely populated islands in the world, with about 1,126 persons per square mile.³⁹

The rate of growth in Puerto Rico's GDP is greater than the island's population growth rate. Puerto Rico's GDP was \$74.4 billion in 2003, and it had an unemployment rate of 12 percent. In 2002, agriculture made up 1 percent of GDP, while industry and services made up 45 percent and 54 percent, respectively. Growth fell in 2001-2003, largely due to the slowdown in the U.S. economy.

Sugar production dominated the island's economy until the late 1940s when the focus shifted to manufacturing. Since the 1950s, with support from the Puerto Rican government, U.S. firms have invested heavily in Puerto Rico. Over the years, its manufacturing sector shifted from more

³⁹ <http://welcome.topuertorico.org/>

labor-intensive industries, such as food, tobacco, leather, and clothing, to more capital-intensive industries, such as pharmaceuticals, chemicals, machinery, and electronics. Industry surpassed agriculture as the primary sector of economic activity and income.

Major exports include chemicals, electronics, apparel, canned tuna, rum, beverage concentrates, and medical equipment. In 2002, major export partners included the U.S. Mainland (90.3 percent), United Kingdom (1.6 percent), Netherlands (1.4 percent), and the Dominican Republic (1.4 percent). The island's major imports include chemicals, machinery and equipment, clothing, food, fish, and petroleum products. Its major import partners in 2002 were the U.S. Mainland (55.0 percent), Ireland (23.7 percent), and Japan (5.4 percent). Puerto Rico's main port, San Juan Harbor, has consistently ranked among the top 17 of the world's ports in terms of container movements.⁴⁰

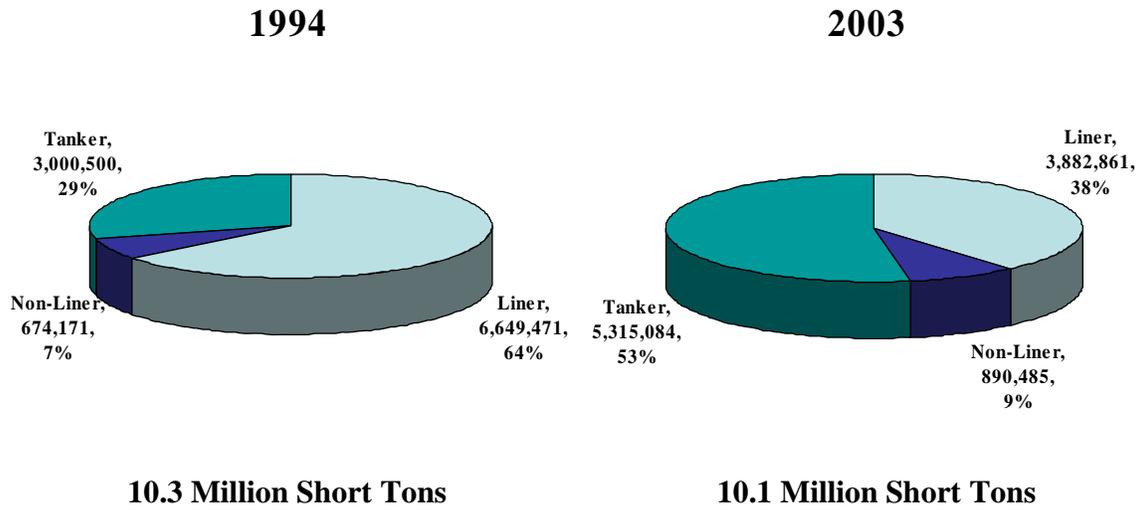
2. Domestic Trade

In 2003, Puerto Rico's domestic waterborne trade totaled 0.2 MSTs lower than in 1994. Of the total, a lower percentage and a lower tonnage moved in liner services with the U.S. Mainland than in 1994 (Figure 16). This drop in tonnage indicates Hawaii has now surpassed Puerto Rico as the largest U.S. offshore liner trade. However, in terms of FEUs, the Puerto Rico trade remains the largest. The directional imbalance in the liner trade has increased, with northbound trade comprising only 25 percent of southbound trade in 2003, compared to 32 percent in 1994 (Table 5, Figures 17a and 17b).

⁴⁰ <http://welcome.topuertorico.org/>

Figure 16

Puerto Rico Domestic Waterborne Trade



Excludes Intra-Puerto Rican Trade

Source: U.S. Army Corps of Engineers data and MARAD analysis

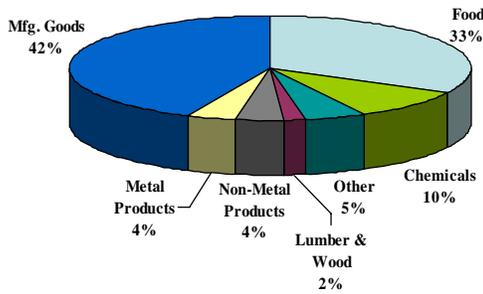
Table 5

1994 and 2003 Puerto Rico Domestic Liner Trade			
Total Liner	1994 Total Liner	2003 Total Liner	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	791,022	182,641	-77%
Food	2,002,287	797,197	-60%
Lumber and Wood	82,345	0	-100%
Manufactured Goods	2,974,925	2,752,958	-7%
Metal Products	250,557	36,196	-86%
Non-Metal Products	217,592	22,320	-90%
Other	330,743	91,549	-72%
Total	6,649,471	3,882,861	-42%
From Mainland	1994 From Mainland	2003 From Mainland	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	482,176	94,983	-80%
Food	1,647,552	647,810	-61%
Lumber and Wood	79,748	0	-100%
Manufactured Goods	2,177,190	2,314,428	6%
Metal Products	201,434	4,485	-98%
Non-Metal Products	192,895	13,715	-93%
Other	253,833	21,369	-92%
Total	5,034,828	3,096,790	-38%
From Puerto Rico	1994 From Puerto Rico	2003 From Puerto Rico	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	308,846	87,658	-72%
Food	354,735	149,387	-58%
Lumber and Wood	2,597	0	-100%
Manufactured Goods	797,735	438,530	-45%
Metal Products	49,123	31,711	-35%
Non-Metal Products	24,697	8,605	-65%
Other	76,910	70,180	-9%
Total	1,614,643	786,071	-51%
Source: U.S. Army Corps of Engineers data and MARAD analysis			

Figure 17a

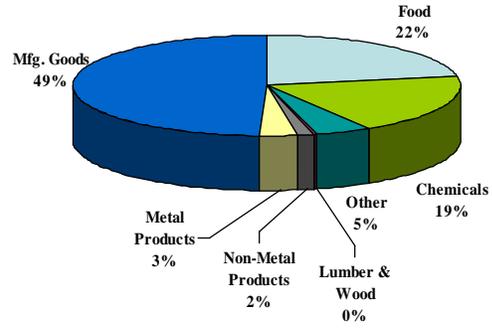
1994 Puerto Rico Liner Trade by Major Commodity

Imports from Mainland



5,034,828 Short Tons

Exports to Mainland



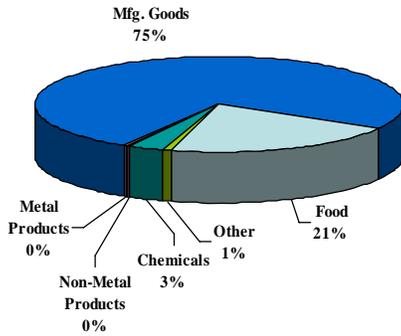
1,614,643 Short Tons

Source: U.S. Army Corps of Engineers

Figure 17b

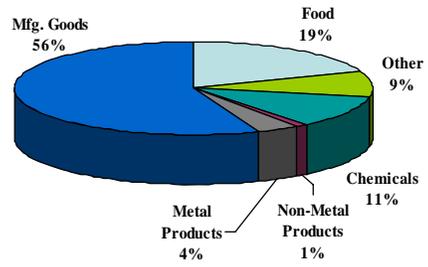
2003 Puerto Rico Liner Trade by Major Commodity

Imports from Mainland



3,096,790 Short Tons

Exports to Mainland

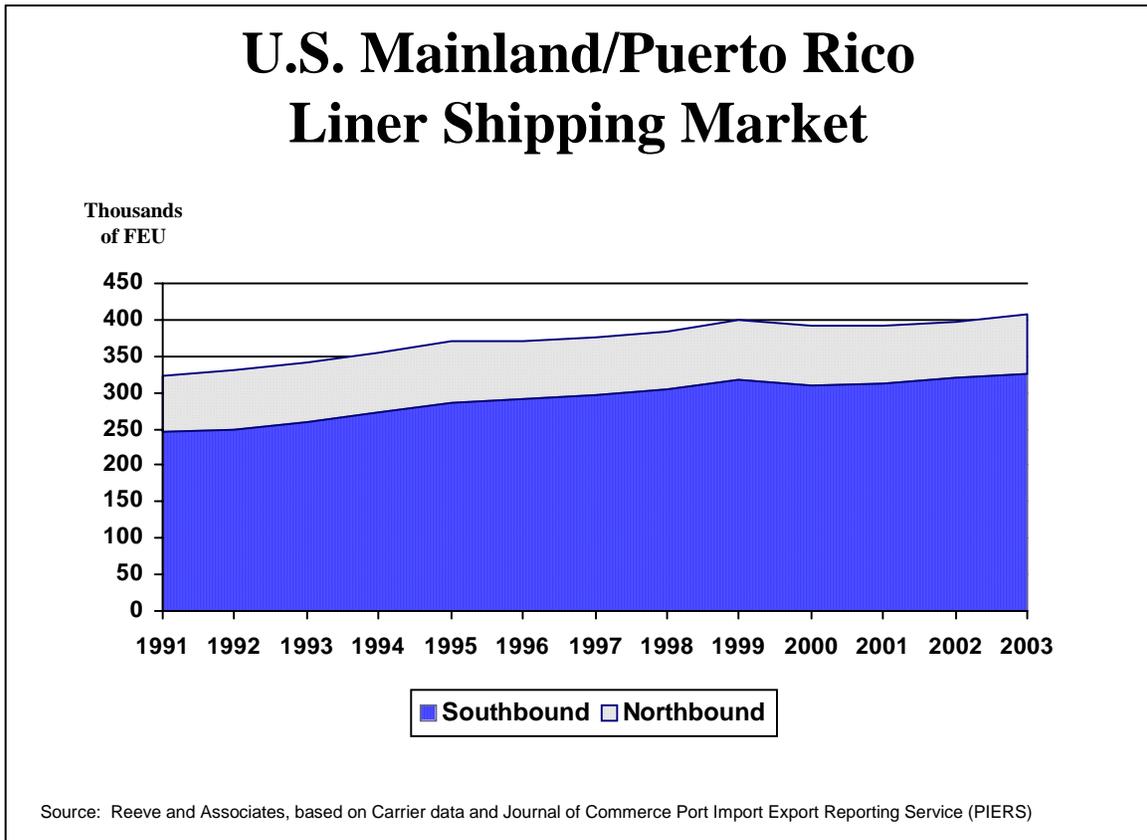


786,071 Short Tons

Source: U.S. Army Corps of Engineers

While Puerto Rico’s domestic liner cargo tonnage has dropped 42 percent between 1994 and 2003, it has increased by about 14 percent in terms of FEUs according to Reeve & Associates (Figure 18). When volume of trade is measured in terms of FEUs, the Puerto Rico trade remains the largest. The decline in tonnage and corresponding increase in FEUs may be explained by the shift in cargo during this same time period from bulky, heavy raw materials and unfinished goods to less bulky, lighter manufactured goods, which are generally containerized. While tonnage in the inbound and outbound trades have declined significantly for every other type of commodity, manufactured goods have declined by only 7 percent (Table 5 above).

Figure 18



3. Foreign Trade

In comparison to domestic trade, Puerto Rico's foreign waterborne trade, excluding transshipments, has increased 6 percent on a tonnage basis between 1994 and 2003. In the foreign liner segment alone, the total tonnage transported has increased by 96 percent (Table 6). The increase in Puerto Rico's foreign liner trade comes from a dramatic increase in imports. In fact, foreign liner imports have more than doubled (Figures 19a and 19b). The data indicate that, as in other noncontiguous trades, the transport of food products, raw materials, and unfinished products may have shifted from the domestic liner trade to the foreign liner market.

Figure 19a

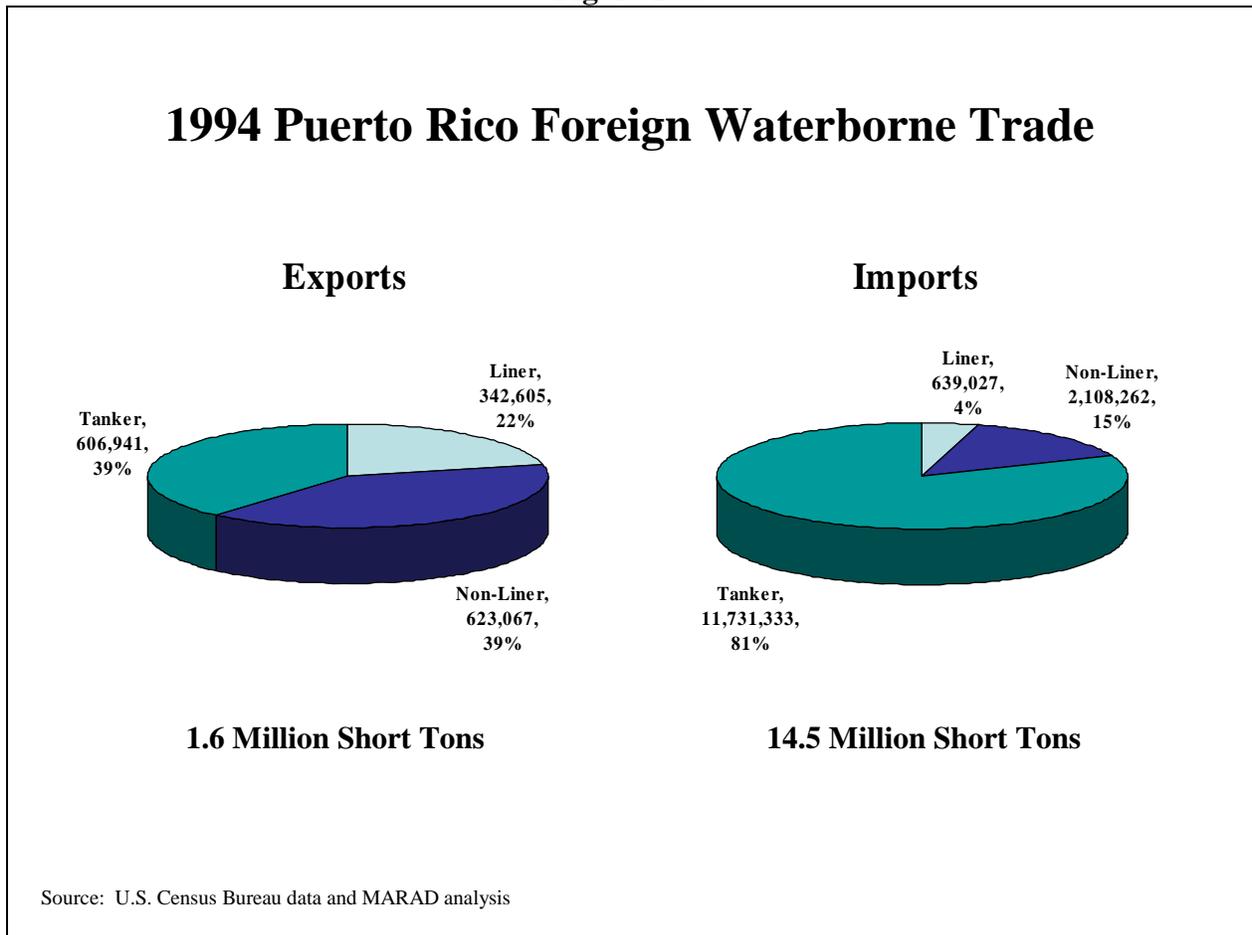


Figure 19b

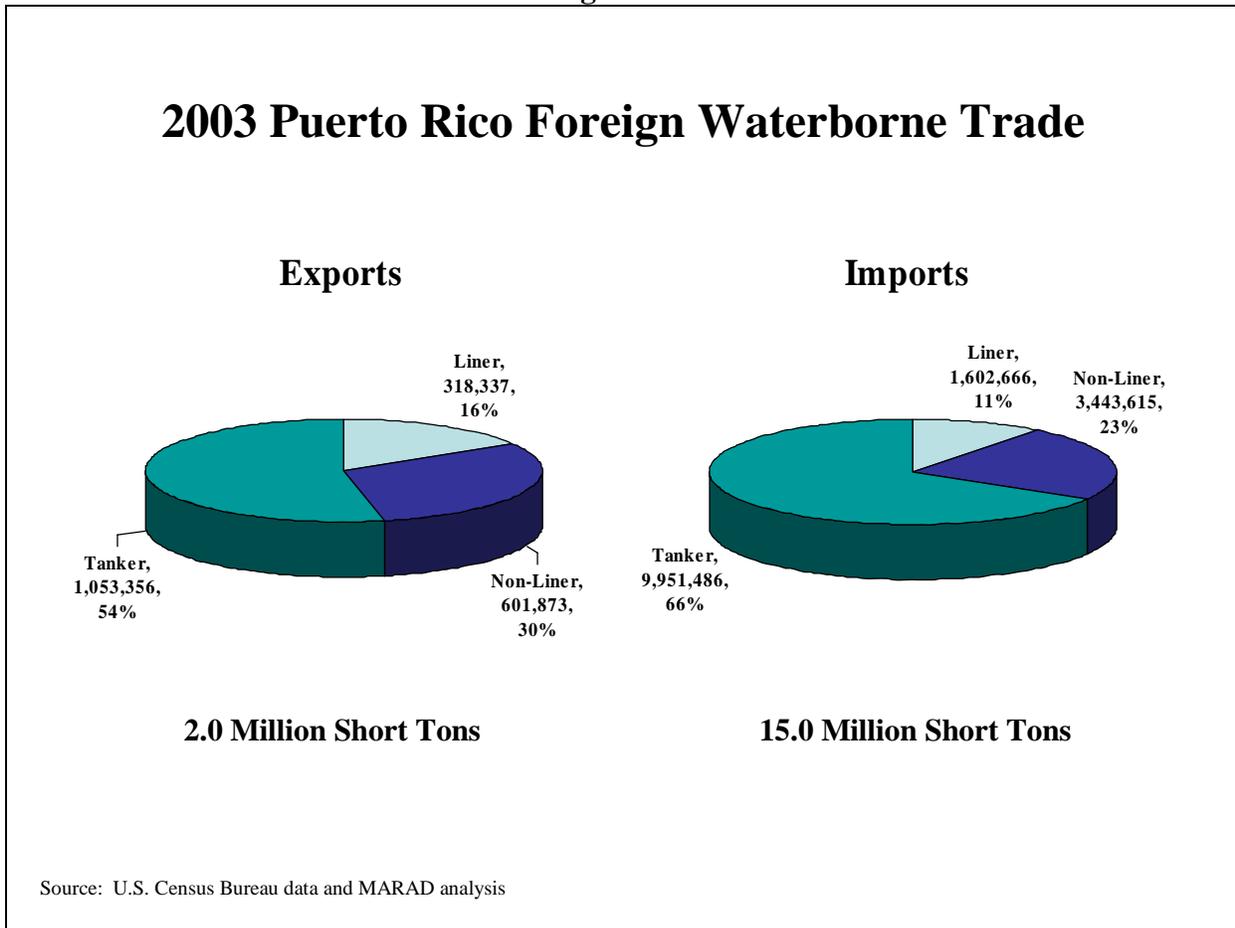


Table 6

1994 and 2003 Puerto Rico Foreign Trade Tons

Sector	1994		2003		Percent Change		
	Export	Import	Export	Import	Export	Import	Total
Liner	342,605	639,027	318,337	1,602,666	-7%	151%	96%
Tanker	606,941	11,731,333	1,053,356	9,951,486	74%	-15%	-11%
Non-Liner	623,067	2,108,262	601,873	3,443,615	-3%	63%	48%
Total	1,572,613	14,478,623	1,973,566	14,997,767	25%	4%	6%

Source: U.S. Census Bureau data and MARAD analysis

4. Liner Services

As of 2004, four major ocean freight carriers provide regularly scheduled service between the U.S. Mainland and Puerto Rico: Horizon Lines, Crowley Liner Services, Inc., Sea Star Line, LLC, and Trailer Bridge, Inc (Table 7). The services provided by the four carriers are differentiated by type of vessel, service frequency, and ports served. Figure 20 shows a map of liner shipping services between the U.S. Mainland and Puerto Rico.

Figure 20
U.S.-Mainland/Puerto Rico Shipping Services



Source: Reeve & Associates

Since Puerto Rico is only about 1,000 miles from the U.S. Mainland, barge operators compete effectively with self-propelled operators. The tugs and barges used in the trade are newer than the self-propelled vessels. Each year for the last decade, the percent of the total liner freight moving on tug/barges has increased, growing from less than one-third to more than one-half today.⁴¹

⁴¹ The Wall Street Transcript interview with Trailerbridge CEO John McCown, 2003, (<http://www.trailerbridge.com/companyinfo/2005interview.htm>).

Crowley operates nine large, multi-deck Ro/Ro barges in service to Puerto Rico three times each week from Jacksonville, Florida, and twice each week from Pennsauken, New Jersey.

Horizon operates five self-propelled containerships, and provides three weekly sailings from Jacksonville, Florida; one weekly sailing from Elizabeth, New Jersey; and one sailing every ten days from Houston, Texas.

Sea Star was formed in 1998 as a joint venture between Matson, Totem Ocean Trailer Express, Inc. (TOTE), and a group of local investors. This joint venture included the purchase of Sea-Barge Line, Inc., and the charter of two Matson vessels. In 2001, Sea Star purchased the two vessels from Matson. In 2002, Sea Star acquired the assets of the Holt Group's Navieras de Puerto Rico, Inc. (NPR). In May 2002, Sea Star retired three of NPR's four vessels from operation and entered into an agreement with CSX Lines to share the use of the remaining ship. In 2004, Sea Star operated two combination Ro/Ro /lift-on, lift-off vessels to offer service twice each week from the Mainland to San Juan. In March 2005, Sea Star acquired the TOTE vessel NORTHERN LIGHTS. The vessel was renamed EL FARO and modified to a configuration similar to Sea Star's other vessels. The modified vessel has a capacity of 600 FEUs.

Trailer Bridge began serving the Puerto Rico market in 1992. It specializes in the movement of 53' trailers, a standard configuration on highways in the United States, but one that cannot readily be carried on vessels designed to transport the typical 40' marine containers. Unlike other companies, Trailer Bridge employs its own drivers and operates its own trucks, trailers, equipment, vessels, and marine facilities to provide integrated trucking and marine freight service. The company's pricing policies are also different from those of other ocean carriers: Its point-to-point freight rates are based on mileage from the consignee plant to its Jacksonville terminal, not on the nature of the commodity being transported, or some other factor typically used by ocean carriers to establish rates. Trailer Bridge operates three Triplestack Box Carriers™ and one Ro/Ro barge, providing service twice each week.

Table 7

Profile of Liner Shipping Services in U.S. Mainland/Puerto Rico Trade, 2004				
Carrier	Type of Vessels Operated	Number of Vessels in Service	Weekly Capacity (FEUs)	Weekly Service Frequency
Crowley Liner Services	Ro/Ro Trailer Barges	9	2,233	5
Horizon Lines	Container	5	2,921	4.7
Sea Star Line	Combination Ro/Ro and Container	2	1,200	2
Trailer Bridge	Container and Ro/Ro Barges	4	888	2
Total		20	7,242	13.7
Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates and MARAD analysis of publicly available information				

5. Concentration and Competition

In 2003, all four carriers serving the Puerto Rico trade had significant shares of the market, and no single carrier dominated. Crowley had the largest share at 36 percent (Table 8).

Table 8

Estimated 1995 and 2003 Market Shares: U.S. Mainland-Puerto Rico								
	1995 Southbound			1995 Northbound			2003 Combined	2003 Southbound
	Source of Estimate			Source of Estimate			Source of Estimate	
	Sea-Land	GPR	Mercer	Sea-Land	Mercer		Reeve	Trailer Bridge
NPR	25%	27%	32%	25%	35%	Sea Star	21%	20%
Sea-Land	25%	26%	22%	30%	24%	Horizon	28%	35%
Crowley	33%	34%	33%	30%	28%	Crowley	36%	32%
Sea-Barge	9%	7%	7%	5%	7%	*	*	*
Trailer Bridge	8%	5%	6%	10%	6%	Trailer Bridge	15%	13%

* Sea Barge was purchased by Sea Star Lines.
Sources: Sea-Land: Comments of Sea-Land Service, Inc., op. cit., Section IV. Comments of the Government of Puerto Rico, op. cit., p. 17; Mercer: Mercer Management Consulting, op. cit., p. V-8. and "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, Trailerbridge Corporate Profile, December 2004. Based on Southbound for six months ending in June 2004.

Although the market remains highly concentrated both northbound and southbound, the number of operators who have entered and exited the Puerto Rico trade suggests that the costs of entering and withdrawing from the market are relatively modest. Since the 1997 USDOT study, Sea Star entered the U.S. Mainland to Puerto Rico liner trade providing barge service when it purchased Sea Barge in 1998. Sea Star also began providing self-propelled containership service when it acquired NPR in 2002. Cuban Caribbean Shipping exited the market (Figure 21). Relatively low entry and exit costs create a market environment where potential entrants can capture market share if established carriers attempt to raise rates above competitive levels.

A factor that makes entry more likely, and thus increases competitive pressure in the domestic offshore trades, is that in response to changing market conditions, ocean carriers can often redeploy vessels from one trade to another. This has been evidenced in Puerto Rico and the other noncontiguous domestic trades. For example, Crowley began service in the Puerto Rico trade with tugs and barges originally used in its Alaska service.⁴² In 2005, Sea Star also acquired another self-propelled vessel formerly used by TOTE in the Alaska trade. Trailer Bridge began its service by acquiring two barges previously operated by Sea-Way Express, a former liner operator in the Alaska trade, a third back-up barge acquired from MARAD, and by chartering two oceangoing tugs from another carrier. In 1998, the company acquired and deployed five

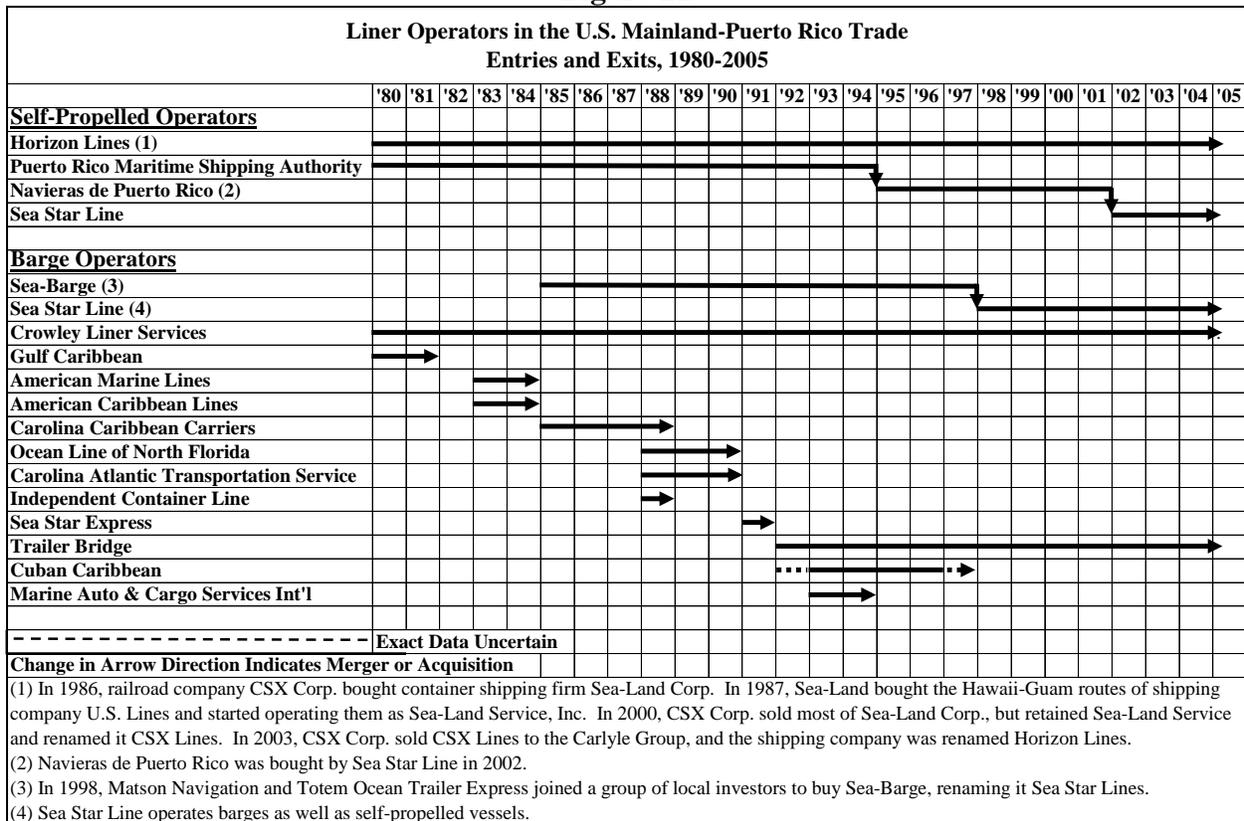
⁴² Jean Gilbertson, *Two Men at the Helm: The First 100 Years of Crowley Maritime Corporation, 1892-1992* (Oakland, CA: Crowley Maritime, 1992), pp. 100 and 188-119.

new vessels called Triplestack Box Carriers, which are specially designed for 53' high-cube containers.

Trailer Bridge has been experiencing losses in the trade over the years. To reduce its losses, the company removed a large portion of its excess capacity by discontinuing its U.S. northeast service at the end of 2001, which, in terms of tonnage, greatly decreased the volume of freight it handled to and from Puerto Rico. As a result of discontinuance of the service, the company's financial position greatly improved.⁴³

Ocean carriers initiating new services in the Puerto Rico trade can successfully gain access to port facilities. The Port of San Juan is publicly owned and provides terminal facilities for smaller liner operators, although larger carriers have obtained long-term leases to operate their own cargo-handling equipment.

Figure 21

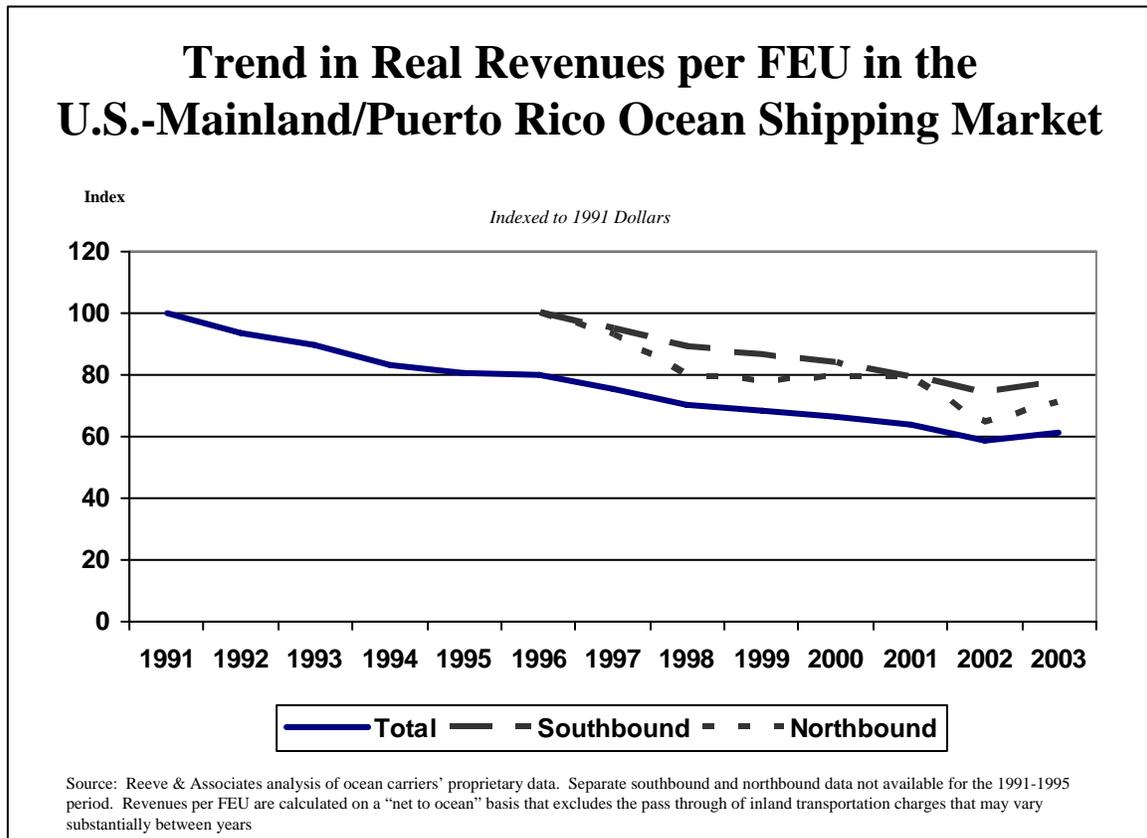


⁴³ Martinez, Marialba, "Shake-up in Shipping," *Puerto Rico Herald*, July 18, 2002.

6. Rates in the Puerto Rico Trade

According to Reeve & Associates, over 85 percent of cargoes in the trade are shipped under confidential contracts. Over the 1991-2003 period, there have been significant declines in real freight rate levels. For the overall Puerto Rico trade, average rates declined at an average annual rate of 4.0 percent, after adjusting for inflation. The average real freight revenue per FEU in 2003 was only 61.5 percent of its level in 1991. Between 1996 and 2003, in real terms, southbound rates declined at an average annual rate of 3.6 percent, and northbound rates declined at an average annual rate of 4.8 percent (Figure 22).⁴⁴

Figure 22

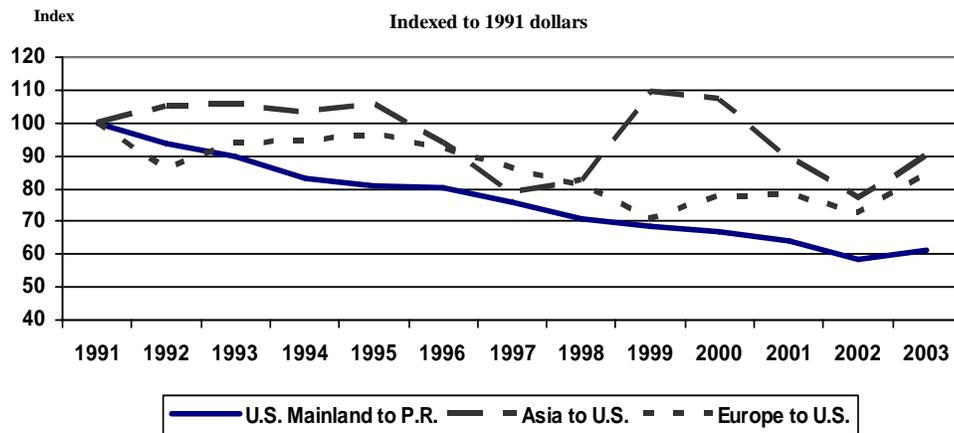


⁴⁴ "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, pp. 59-60.

In real terms, U.S. Mainland-Puerto Rico freight rates over the 1991-2003 have declined by about 30 percent (Figure 23).

Figure 23

Trend in Real U.S.-Mainland/Puerto Rico Ocean Rate Levels Compared to Major U.S. International Shipping Markets



Source: Reeve and Associates, based on *Containerisation International* for international trade freight rate trends

D. Alaska Trade

Summary:

- In 2003, Alaska received almost four times the volume of liner cargoes from the U.S. Mainland than the State shipped to the U.S. Mainland. The directional imbalance in the trade has greatly increased, with southbound trade comprising 25 percent of northbound trade in 2003, compared to 51 percent in 1994.
- From 1994 to 2003, liner tonnage transported between the U.S. Mainland and Alaska grew at an average annual rate of less than one percent, while FEUs in the trade increased at an average annual rate of 2.3 percent over the 1991-2003 period.
- Since the 1997 USDOT study, Northland Services acquired Alaska Cargo Transport and merged part of its operation with Boyer Alaska Barge Lines in 2002. Currently, the trade is served by nine liner carriers. Unlike the Hawaii and Guam liner trades, barge carriers are effective competitors to self-propelled vessels for much of the liner traffic between the U.S. Mainland and Alaska.
- Available data suggest that real rates in this trade have declined by nearly 23 percent from 1991 to 2003.

1. Economy and Trade

Alaska, more than any of the continental United States, depends on water transportation. Access to water has been a critical factor in the development of the state and has often dictated the location of communities. Alaska's 33,900 miles of coastline is far greater than that of the entire Lower 48. Water transportation handles the greatest tonnage of freight coming into the State.

From 1994 to 2004, the population of Alaska grew by 9 percent from 600,622 to 655,435.⁴⁵ Since 1991, Alaska's GSP has increased minimally when adjusted for inflation. In Alaska, oil and gas is the largest component of the GSP, accounting for 45 percent of the business that brings new wealth into the State. The Alaska economy has remained stable despite decreases in oil and gas production, lower salmon prices, and flat trends in non-resident tourism and mining. Japan and Korea are Alaska's largest importers, consuming mostly seafood and crude oil and natural gas products. Alaskan mineral production has increased. Because of the common border, Canada imports and processes a large amount of Alaska's ore.⁴⁶

⁴⁵ Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section. The 2004 population figure is provisional.

⁴⁶ Alaska Economic Performance Report 2003, State of Alaska Department of Community and Economic Development, April 2004.

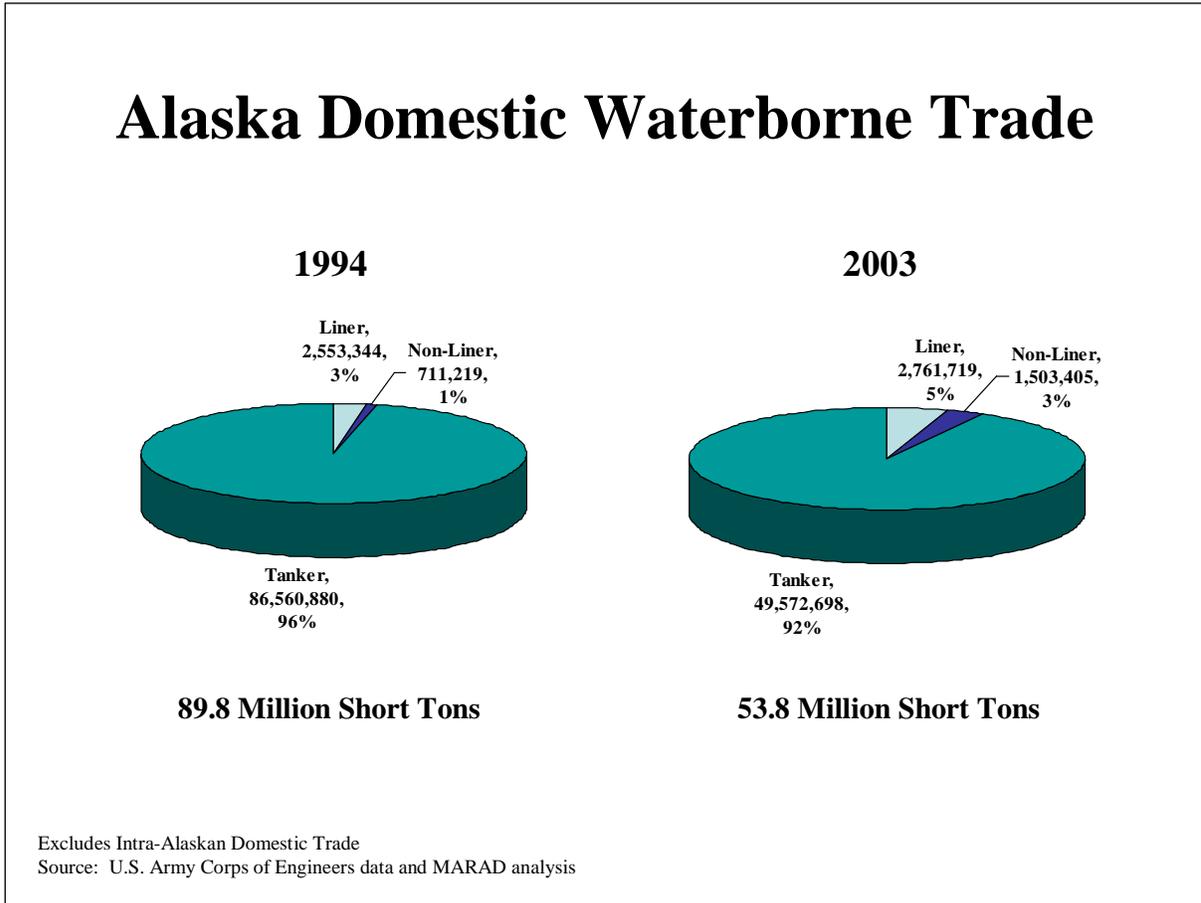
Excluding the Arctic region, which receives virtually no maritime service, Alaska consists of three major regions. The first is the Aleutian Islands and the West Coast, where settlements are small and unconnected by land routes. The second is the Southeast/Inside Passage, which has population centers of modest size connected by land. The third is the South-Central region, which has over 90 percent of the State's population, a more diverse economy, and a more developed surface transportation infrastructure. Because it is served by the Alaska Railroad, this region is often referred to as the "Railbelt."

2. Domestic Trade

Traffic volumes vary substantially by season, with entry into some harbors blocked by ice, poor visibility, and storm surges during the winter months. Most household items, cars, and construction equipment are shipped during the summer months, along with additional supplies to accommodate tourists. Rail, truck, and air transport services offer a viable transportation alternative to liner service for some shippers that require delivery in all seasons.

In 2003, Alaska's total domestic non intra-state waterborne trade was 36 MSTs lower than it was in 1994, mostly due to declining oil and gas production (Figure 24). In both years, over 90 percent of the total traffic was in the tanker sector, primarily shipments of crude oil and petroleum products. Of the total volume of traffic, liner shipments accounted for a slightly higher percentage and tonnage than in 1994. In 2003, Alaska received almost four times the volume of liner cargoes from the U.S. Mainland than the State shipped to the U.S. Mainland. The directional imbalance in the trade has greatly increased, with southbound trade comprising 25 percent of northbound trade in 2003, compared to 51 percent in 1994.

Figure 24



On a tonnage basis for these two years, liner traffic between the U.S. Mainland and Alaska grew at an average annual rate of less than one percent from 1994 to 2003. Manufactured goods in the total Alaska liner trade have more than doubled over the 1994-2003 period (Table 9, and Figures 24a and 24b).

Table 9

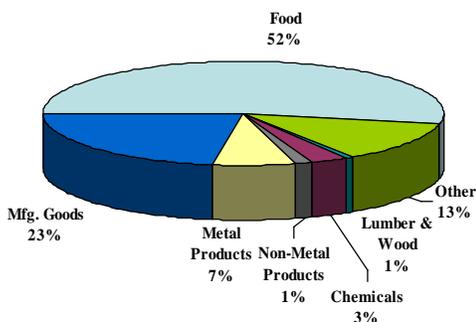
1994 and 2003 Alaskan Domestic Liner Trade

1994 and 2003 Alaskan Domestic Liner Trade			
Total Liner	1994 Total Liner	2003 Total Liner	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	61,848	44,815	-28%
Food	1,084,421	718,454	-34%
Lumber and Wood	11,315	14,796	31%
Manufactured Goods	615,992	1,443,436	134%
Metal Products	130,577	127,215	-3%
Non-Metal Products	26,645	42,167	58%
Other	622,546	370,836	-40%
Total	2,553,344	2,761,719	8%
From Mainland	1994 From Mainland	2003 From Mainland	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	49,740	33,571	-33%
Food	899,765	500,249	-44%
Lumber and Wood	11,309	14,741	30%
Manufactured Goods	379,981	1,194,684	214%
Metal Products	112,400	111,492	-1%
Non-Metal Products	23,372	40,462	73%
Other	211,218	310,845	47%
Total	1,687,785	2,206,044	31%
From Alaska	1994 From Alaska	2003 From Alaska	
Commodity Group	Short Tons	Short Tons	Percent Change
Chemicals	12,108	11,244	-7%
Food	184,656	218,205	18%
Lumber and Wood	6	55	817%
Manufactured Goods	236,011	248,752	5%
Metal Products	18,177	15,723	-14%
Non-Metal Products	3,273	1,705	-48%
Other	411,328	59,991	-85%
Total	865,559	555,675	-36%
U.S. Army Corps of Engineers data and MARAD analysis			

Figure 25a

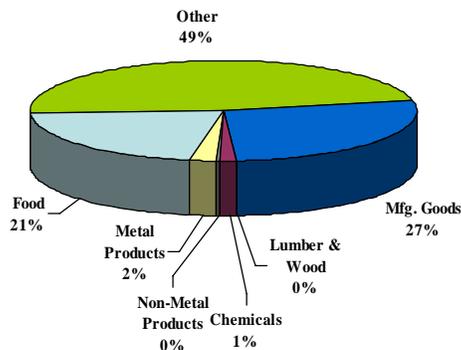
1994 Alaska Liner Trade by Major Commodity

Imports from Mainland



1,687,785 Short Tons

Exports to Mainland



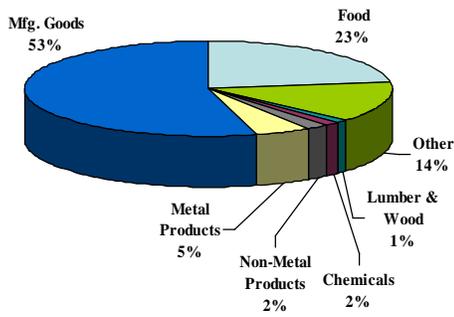
865,559 Short Tons

Source: U.S. Army Corps of Engineers

Figure 25b

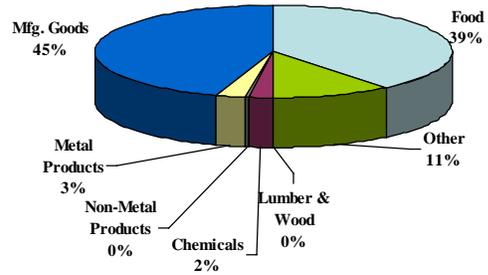
2003 Alaska Liner Trade by Major Commodity

Imports from Mainland



2,206,044 Short Tons

Exports to Mainland

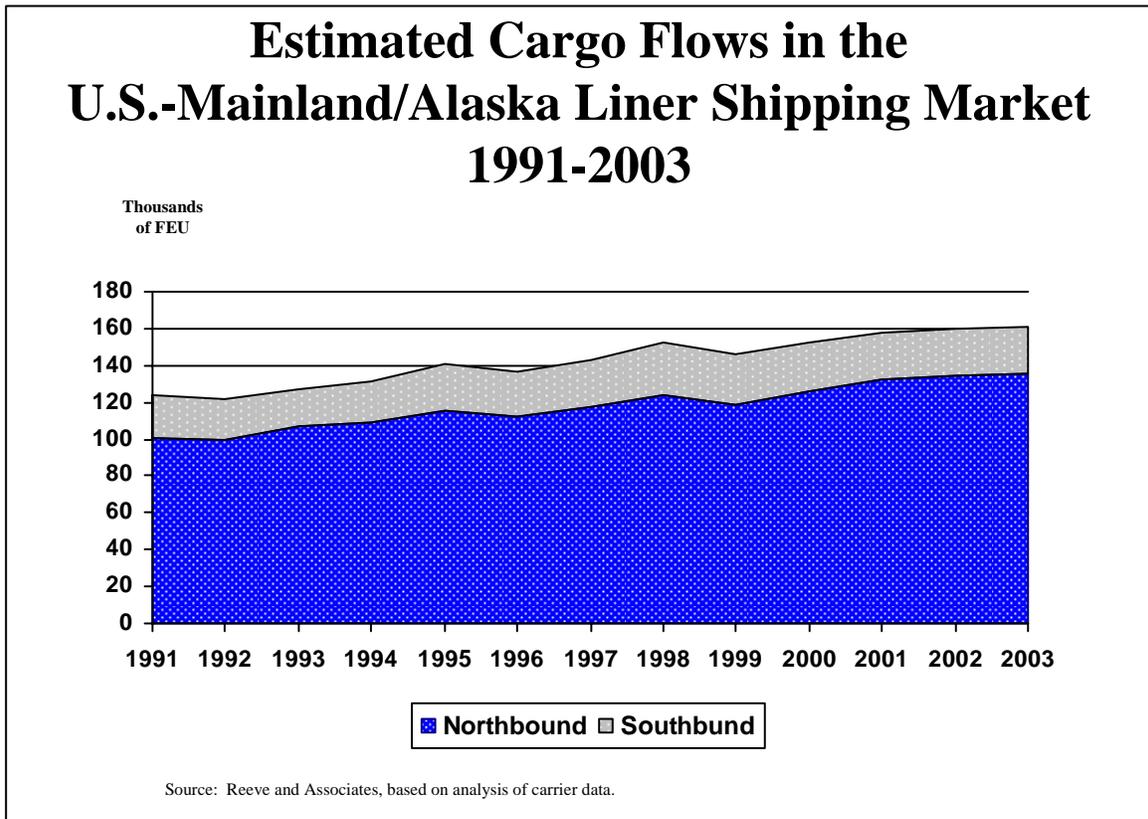


555,675 Short Tons

Source: U.S. Army Corps of Engineers

According to the recent industry study by Reeve & Associates, the volume of liner trade in the northbound segment of the Alaska trade in terms of FEUs was 137,500 in 2003. The volume in 1994 was just over 100,000 FEUs. According to the report, container shipments have increased at a rate of 2.3 percent per year over the 1991-2003 period (Figure 26).⁴⁷ As has been the trend with the other noncontiguous economies, the lower increase in tonnage and higher increase in FEUs in the Alaska domestic liner trade could reflect the shift in cargo over the 1994-2003 period from the bulky, heavy, low-valued raw materials and unfinished products to the less heavy, but higher-valued manufactured goods being transported in the trade as shown in Table 9 above.

Figure 26



⁴⁷ “Competitiveness in the United States’ Domestic Noncontiguous Liner Shipping Markets, June 2004,” Reeve & Associates, p. 7.

3. Liner Services

The Alaska liner trade is served by two self-propelled operators and seven barge operators providing nearly 10 sailings per week from the U.S. Mainland to Alaska (Table 10). Figure 27 shows a map of Alaskan freight flows by water.

Figure 27



Table 10

Profile of Liner Shipping Services in U.S. Mainland/Alaska Trade, 2004				
Carrier	Type of Vessels Operated	Number of Vessels in Service	Weekly Capacity (FEUs)	Service Frequency
Carriers with One or More Sailings Per Week				
Alaska Marine Lines	Tug and Rail Barges	Space Charter on Alaska Railbelt Marine	125	One Per Week
Alaska Rail Marine	Tug and Rail Barges	4	220	One Per Week
Horizon Lines	Container Vessels	3	1,310	Two Per Week
Northland Services	Tug and Flat Deck Barges	2	280	One Per Week
TOTE	Ro/Ro Vessels	2	1,380	Two Per Week
Western Pioneer		2		One Per Week
Coastal Transportation	Break-Bulk			One Per Week
Carriers with Fewer than One Sailing Per Week				
Alaska Logistics	Tug and Flat Deck Barges	1	50	One Per Month*
Samson Tug and Barge	Tug and Flat Deck Barges	3	90	Two Per Month
Total		17	3,330	9.75 Per Week
Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates and MARAD analysis of publicly available information				
*Between the months of May and September				

Because of Alaska's proximity to the Mainland, barge carriers are effective competitors to self-propelled vessels for much of the liner traffic between the U.S. Mainland and Alaska. Barge operators carry over 20 percent of the cargo to and from Alaska to the mainland, compared to four percent in the U.S.-mainland Hawaii trade.

Alaska Marine Lines provides barge service to and from Southeast and Southcentral Alaska. The service to Southeast Alaska is year-round with twice a week departures from Seattle. Service to South-central Alaska is weekly, with seasonal service to some ports.

Alaska Rail Marine provides a combination of rail and water freight services. Services include a weekly barge service from Seattle to Whittier, Seward, and Fairbanks.

Horizon and TOTE are the principal providers of scheduled, common-carrier service between the U.S. Mainland and the South-Central region. Horizon provides three times a week (twice weekly in the winter months) containership service. TOTE operates Ro/Ro highway trailerships three times a week (twice weekly in the winter months) between Tacoma and Anchorage.

Northland, which acquired Alaska Cargo Transport in 2002, provides scheduled weekly barge service to Central Alaska from Seattle. Additional sailings are scheduled for March through September to handle the seasonal requirements. Northland's service area includes the entire Railbelt.

Western Pioneer offers once a week service between Seattle and Alaska.

Coastal Transportation offers break-bulk cargo service once a week between Seattle and Western Alaska

Samson Tug and Barge operates biweekly service between Seattle and the Aleutians and Kodiak Island, as well as Valdez and Cordova, which are located on the south-central coast but well east of the Railbelt.⁴⁸

Alaska Logistics entered the Alaska liner trade in 2002. The company is an operator of a leased barge, providing scheduled once per month service from Seattle to Western Alaska between the months of May and September.

4. Concentration and Competition

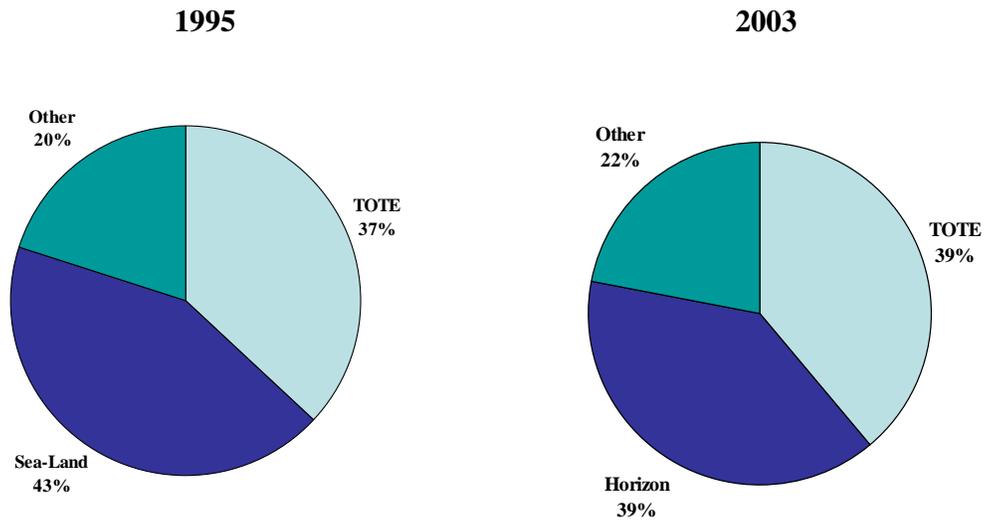
The Alaskan market for liner services remains highly concentrated. According to carrier estimates, in the northbound U.S. Mainland-South Central Alaska trade, Sea-Land had a market share of 43 percent and TOTE had a market share of 37 percent in 1995. Other carriers have a collective market share of approximately 20 percent in both directions.⁴⁹ TOTE and other carriers were able to capture a small amount of market share after the sale of Sea-Land's domestic services and TOTE's purchase of two new Orca Class vessels (Figures 27a and 27b).

⁴⁸ Several other carriers serve the Aleutians or other parts of the State.

⁴⁹ Mercer Management Consulting, **U.S. Domestic Noncontiguous Trades Report**, May 1996, page II-10; Comments of Sea-Land Service, Inc., Public Docket OST-96-1066, April 15, 1996, Section I.

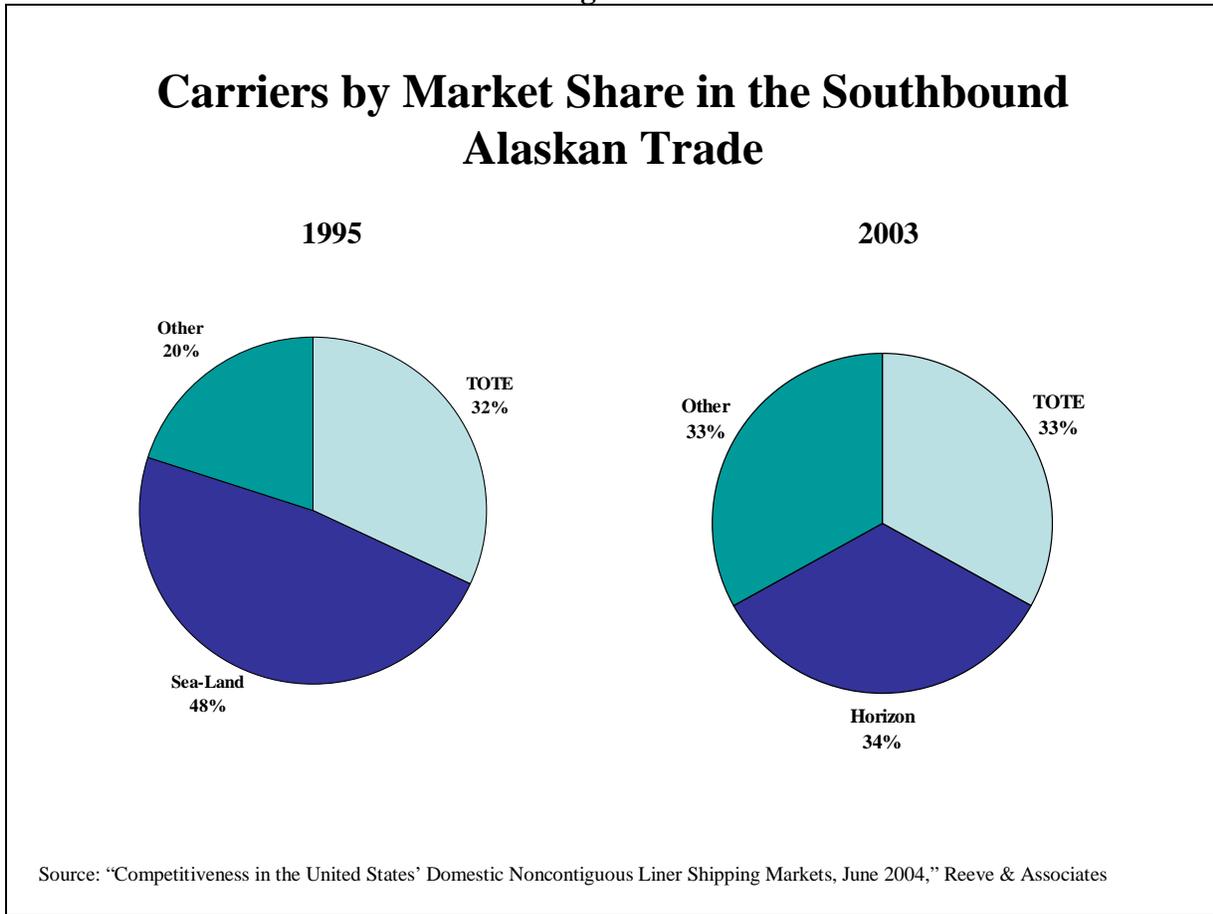
Figure 27a

Carriers by Market Share in the Northbound Alaskan Trade



Source: "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates

Figure 27b

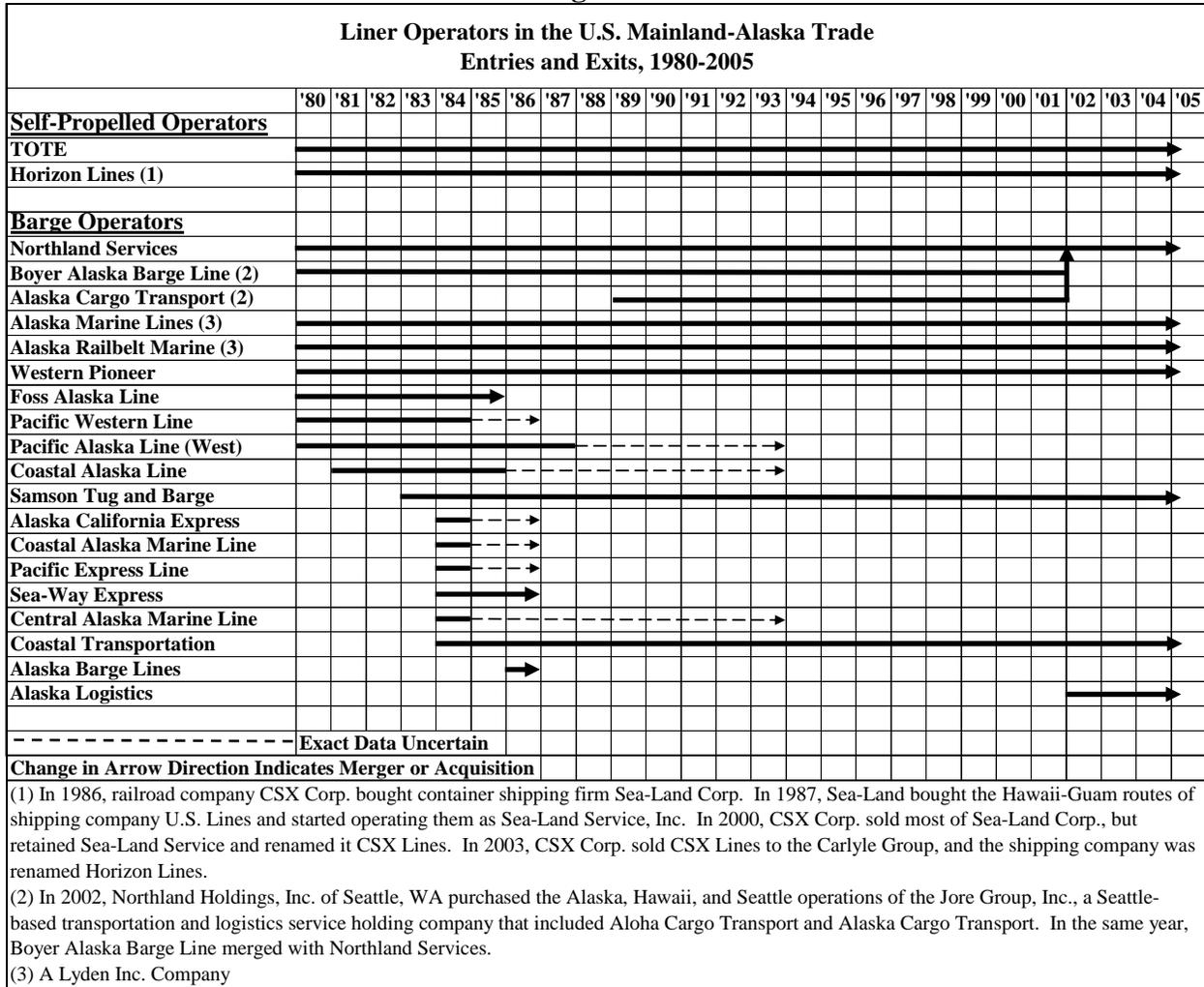


New entrants into the Alaska trade have used various means to acquire vessels, including repositioning vessels from other trades, buying second-hand vessels, chartering ships, and building new ships. Entrants into this trade also have access to critical port infrastructure. The publicly-owned ports of Anchorage, Seattle, and Tacoma provide public terminal facilities. Stevedoring services and containers, trailers, and chassis can be contracted or acquired from third-parties domestically as well as worldwide.

Recently, changing business demands and customer requirements prompted TOTE's decision to build new ships for the Alaska trade. These new Orca Class Ro/Ro vessels, MIDNIGHT SUN and NORTH STAR, were designed for Alaskan trade, and entered service in 2003. The new vessels are 50 feet longer, and have a 24 feet wider beam than TOTE's older vessels. These new vessels are faster than TOTE's existing ships, and have 50 percent more capacity than the ships that Horizon's was using in the trade. The Orca Class vessels were designed to handle cargo more efficiently and improve port turnaround time compared to older ships. TOTE's original vessels, GREAT LAND, WESTWARD VENTURE, and NORTHERN LIGHTS now serve other trades.

Figure 29 shows entries and exits of liner operators in the U.S. Mainland-Alaska trade.

Figure 29



Because Alaska is a part of the North American continent, Alaskan water transportation services face competition from rail, truck, and air transport. Land and air cargo services have the advantage of being available in all seasons. However, these modes are more costly compared to ocean transportation and may only be an option for high-value time-sensitive cargoes.

5. Rates in the Alaska Trade

According to a 1996 Mercer Management Consulting study, as much as 70 percent of ocean freight revenues earned was for services provided under confidential price/service contracts that have been negotiated between shippers and carriers.⁵⁰ The 2004 Reeve & Associates study indicated that approximately 85 percent of the cargoes in the Alaska trade are shipped under confidential price/service contracts. The use of confidential price/service contracts has increased because carriers generally offer lower rates to shippers based on the volume of traffic tendered, which provides economic incentives to large-volume shippers and traffic consolidators. Contracts may also be negotiated by traffic consolidators who in turn offer lower unit rates to small-volume shippers.

In 1995, the inflation-adjusted average revenue per container for northbound shipments was about 60 percent of its level in 1984; for southbound shipments, revenue per container was about 80 percent its 1984 level.⁵¹ The average revenue figure reflects all ocean freight revenues earned by the carriers in the trade -- that is, revenues earned for traffic moving under confidential contracts, time-volume agreements, and public tariffs.⁵² According to the 2004 Reeve & Associates study, domestic container rates in the Alaska trade for northbound and southbound combined have declined in real terms by 77.2 percent from 1991 to 2003. Rates did increase briefly in the 1997-98 timeframe and then dropped rapidly to below 1995 levels (Figure 30).⁵³

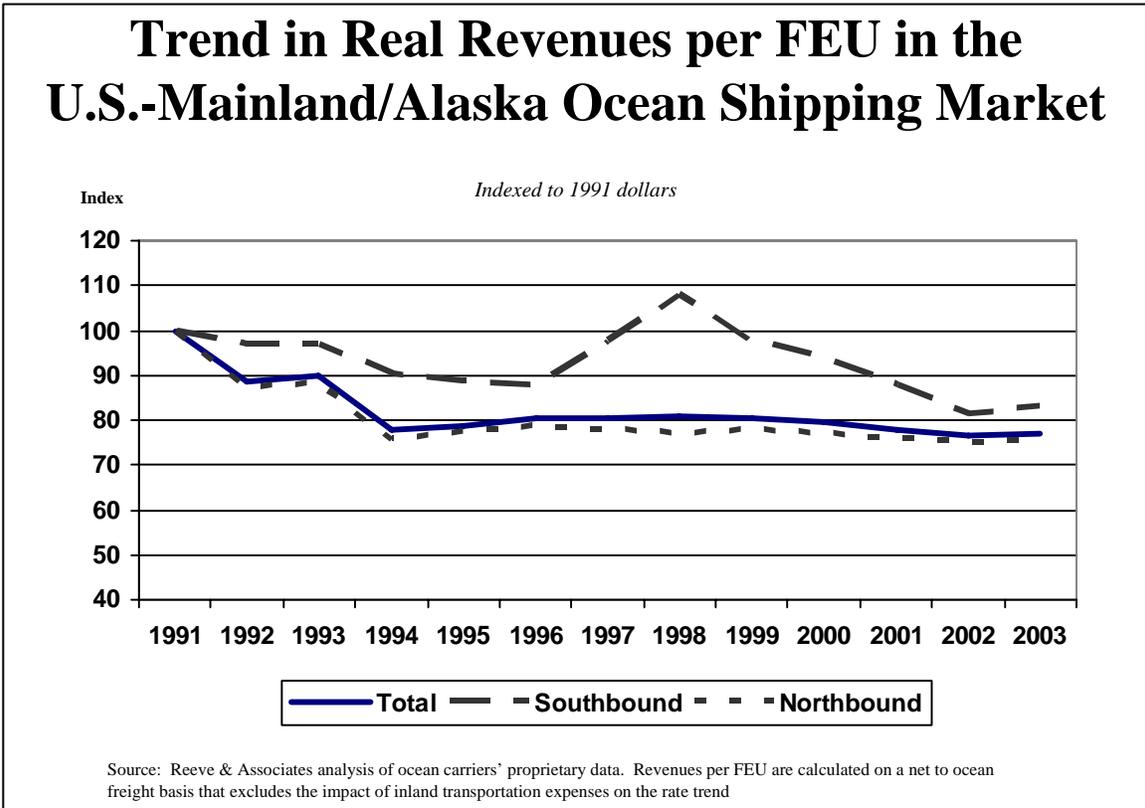
⁵⁰ Mercer Management Consulting, U.S. Domestic Noncontiguous Trades Report, May 1996, page II-11.

⁵¹ Mercer Management Consulting, *op cit.*, page II-14

⁵² Information was collected from the carriers on a confidential basis concerning actual revenue per FEU carried in the trade over the 1996 to 2003 period by Reeve & Associates.

⁵³ "Competitiveness in the United States' Domestic Noncontiguous Liner Shipping Markets, June 2004," Reeve & Associates, p. 13.

Figure 30



In real terms, U.S. Mainland Alaska freight rates over the 1991-2003 have declined by about 24 percent (Figure 31).

Figure 31



Chapter IV. Conclusions

There have been a number of changes in the four noncontiguous markets since 1994. Some carriers in the domestic noncontiguous liner shipping markets have made major investments, purchasing new vessels, containers, and other equipment. Investments have also been made in port infrastructure to meet the requirements of the expanding economies. There have been mergers and acquisitions, and a number of entries and exits. Freight rates have declined in real terms in all markets.

The offshore domestic trades continue to exhibit high levels of market concentration. A simple tabulation of the number of ocean carriers serving a market and their respective market shares, however, does not take into account the type of service provided, the nature and vigor of competition among established firms, or the pressure that the threat of entry may have on the pricing practices of ocean carriers now serving the trade. In all four of the trades, moreover, entry and exit barriers appear to be moderate given the size of the markets. These conditions may attract new carriers as well as compel incumbent carriers to compete aggressively with one another and to operate in an efficient manner.

One of the most notable trends over the 1994 to 2003 period is the shift in the mix of liner commodities transported in the trades from raw materials, such as chemicals, lumber, and metals, to manufactured goods, which tend to be containerized. As such, volume of trade has increased in terms of FEU containers, but when measured in tonnage, has not increased as much, or in some cases, has even declined. In fact, Puerto Rico, which has long been the largest of the domestic offshore liner trades, has dropped to being second when volume of trade is measured in terms of tonnage. However, in terms of FEUs, the Puerto Rico trade remains the largest.

Another trend over the 1994 to 2003 period is the continuance of the decline in real freight rates. After adjusting for inflation, all four trades have experienced declines in average freight revenue per FEU.

Together these trends suggest that carriers in the domestic offshore trades have confidence in these markets, anticipate growth ahead, recognize the need to improve service and keep rates low in order to improve their competitive positions. These conditions may also attract new carriers and compel incumbent carriers to compete aggressively with one another. Though the barriers to market entry are not insurmountable, the small volume of trade and the economies of scale needed to sustain a shipping operation will support only a small number of carriers in the U.S. noncontiguous domestic maritime trades.