Global Trade Trends: Challenges and Opportunities for Florida's Ports

Contract No. C8A91, Task 03

final

report

prepared for

Florida Department of Transportation

prepared by

Cambridge Systematics, Inc.

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The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

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The research study was managed Meredith Dahlrose, Intermodal Systems Specialist, and Lorenzo Alexander, Manager of the Seaport Office.

Preface

Over the last few decades, the importance of global trade has grown dramatically. The safe, secure, and efficient movement of cargo across international borders impacts every consumer and our seaports function as one of the primary gateways for international trade. Unlike other states that have one or two major seaports, Florida is home to 14 deepwater seaports. As a result, changes in international trade patterns will likely have a greater potential impact in Florida. This research project was initiated to explore the challenges and opportunities facing Florida's seaports as a result of international trade trends and characteristics.

Executive Summary

■ Purpose

The objective of this research project was to evaluate current trends in the movements of global trade, especially waterborne shipments, and how they effect Florida's trade markets regarding national and/or international competitors, thus challenging Florida's economic future and position as the "Gateway to the Americas." This research is intended to help Florida refine and delineate its competitive trade issues with respect to seaports.

■ Approach

The research concept was to review existing studies (by FDOT, Florida Ports Council, and others), collect new data (from databases and interviews), and summarize key findings. Key findings address trade and logistics trends, competitiveness for on for seaport trade activity, logistics and technology issues, shifts in global trading partners, and other factors. The synthesis of research leads to high-level statewide policy recommendations for seaport initiatives.

■ Findings

This study has examined a wide-range of global trade trends, in terms of the challenges and opportunities presented for Florida's ports. Key findings can be summarized as follows:

- Global trade opportunities have created different market niches for different Florida ports. Each port is providing a different range of transportation services, for a different mix of trading partners and commodities.
- Global trade opportunities have made Florida's ports among the nation's most successful and competitive. Over the past 20 years, they have been among the national and regional leaders in container, auto, and other trades. Despite recent softening in their growth rates compared to other container and auto ports, Florida's ports continue to offer competitive strengths, particularly for waterborne cargo with a Florida origin or destination.

- Global trade through Florida seaports has generated significant benefits for Florida's economy and transportation system. On the economic side, trade generates direct, indirect, and induced benefits. On the transportation side, Florida's ports reduce the need for Florida shippers and receivers to utilize out-of-state ports for international trade, and also the need to utilize truck or rail for domestic trade.
- Global trade is forecast to grow substantially, increasing demand through Florida's ports, but the nature of that trade is likely to shift. Containers are the fastest growing segment of the global trade market, and continued trade expansion through Florida's ports is anticipated. However, trade trends favor an increasing role for Asian trade, and Florida's historic strength with respect to traditional trading partners – the Caribbean, Central and South America – is an open question. Noncontainer trades are likely to experience slower growth.
- Global trade is being driven by a combination of political, economic, technological and environmental trends and forces.
  - **International factors –** planned widening of the Panama Canal; growth in China markets; potential growth in Mexico markets; potential opening of Cuba markets; impact of DR-CAFTA and other trade agreements.
  - **Business factors –** impacts of the global logistics model pioneered by Wal-Mart and others; shipper requirements from international transportation services; carrier strategies to meet shipper needs via larger ships, hub and spoke/transshipment strategies, landside intermodal transportation service integration, port diversification, short sea shipping, private financing, and terminal efficiency improvements; railroad service strategies; and trucking industry pressures.

In response, Florida must choose how to approach its: market service and port competitiveness; waterside improvements; landside improvements; terminal improvements; landside access; land development and land use compatibility; environmental effects; port security; risk and change; and ports funding.

Implications

Current FDOT planning efforts impacting seaports – including the SIS, the Florida Rail Plan, the Florida Seaport Economic Impacts Report, and Florida's Seaports: Conditions, Competitiveness, and Statewide Policies – should utilize these findings as appropriate. Findings should be shared and discussed with Florida's ports and the Florida Ports Council to ensure that the appropriate issues have been identified and addressed. Upcoming FDOT planning efforts impacting seaports – including the South Florida Inland Port Study and the Florida Seaport Strategic Planning Framework – should utilize these findings as appropriate.

Table of Contents

List of Tables

List of Tables (continued)

List of Figures

List of Figures (continued)

1.0 About this Report

■ 1.1 Purpose

The Southern Hemisphere – The Americas – is a growth engine for increasing Florida's trade. It also is a growth engine for other competitor states and nations who seek to undo Florida's competitive edge. Understanding the current demands on trade movement and the logistics of moving trade to its destinations is essential to Florida's economy. Understanding these trends is critical for allowing Florida to take advantage of market opportunities in trade between the U.S. and its global trading partners.

The objective of this research project was to evaluate current trends in the movements of global trade, especially waterborne shipments, and how they effect Florida's trade markets regarding national and/or international competitors, thus challenging Florida's economic future and position as the "Gateway to the Americas." This research is intended to help Florida refine and delineate its competitive trade issues with respect to seaports.

■ 1.2 Approach

The research concept was to review existing studies (by FDOT, Florida Ports Council, and others), collect new data (from databases and interviews), and summarize key findings. Key findings address trade and logistics trends, competitiveness for seaport trade activity, logistics and technology issues, shifts in global trading partners, and other factors. The synthesis of research leads to high-level statewide policy recommendations for seaport initiatives. Initially, it was envisioned that the research would include separate assessments of existing studies and new data; however, given the wide-range of sources that were used, it has proven more useful to present the findings using a thematic approach, which emphasizes the key findings in five major topic areas, rather than the nature of the sources.

A word of introduction concerning data sources is in order. Port statistics are available from many different sources, including the American Association of Port Authorities (AAPA), the U.S. Army Corps of Engineers (ACOE), the Port Import Export Reporting Service (PIERS), the Florida Ports Council, and Florida's seaports themselves. For time-series comparisons, we relied primarily on AAPA data (which is the best source of annualized statistics reaching back 15 to 20 years). For trading partner and commodity comparisons we relied on the ACOE's Waterborne Databank, which is a comprehensive trade dataset; we obtained the most recent available year (2003) plus the earliest available year

(1990). For the most up-to-date port statistics, we relied on the Florida Ports Council's Seaport Mission Plan. We also obtained supplemental data on domestic waterborne traffic (2004 only) from the TRANSEARCH database purchased separately by FDOT. Data from these sources may differ in some respects from data published in the Florida Seaport Transportation and Economic Development Council (FSTED) Seaport Mission Plan, and/or from data published by each of Florida's ports, due to differences in timeframes and counting/reporting procedures.

■ 1.3 Organization

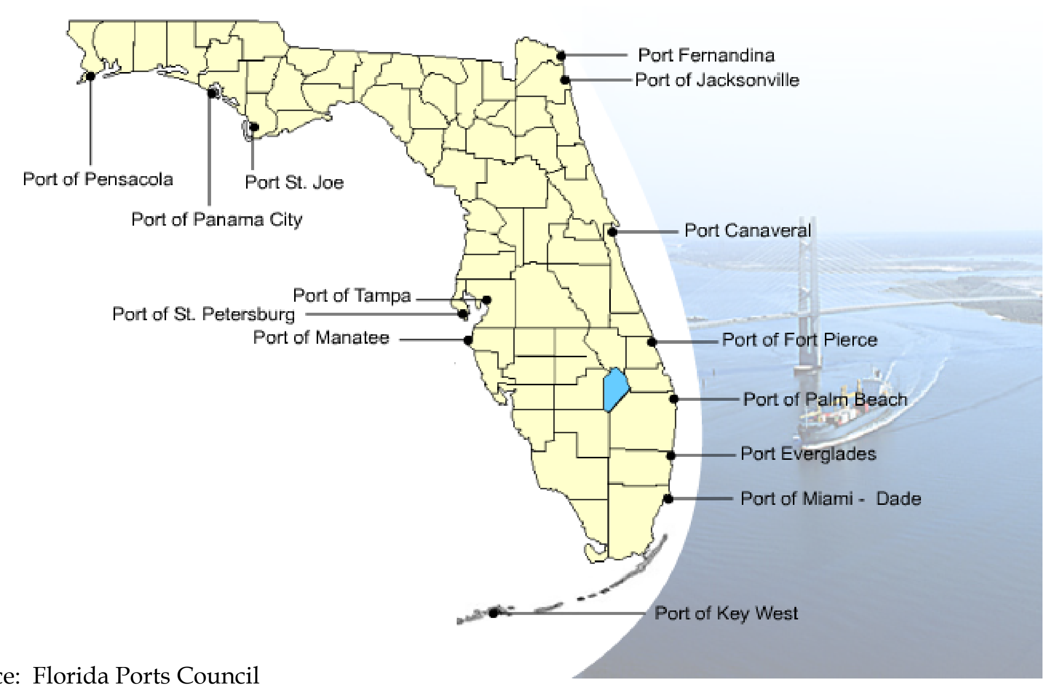
This report is organized as follows:

- Section 1 – About This Report
- Section 2 – Global Trade Trends – Key Findings
- Section 3 – Conclusions

2.0 Global Trade Trends – Key Findings

2.1 Global Trade Opportunities Have Created Different Market Niches For Different Florida Ports

There are fourteen deepwater ports in Florida, as shown in Figure 2.1 below.



Source: Florida Ports Council

Figure 2.1 Florida's Deepwater Ports

Why does Florida need more than one port? The general answer is that multiple ports are a better strategy for the port industry to serve Florida's diverse waterborne trade needs. Multiple ports offer several benefits:

- They serve to minimize the distance between ports and Florida's major centers of production and consumption, allowing more efficient and lower cost transportation to and from ports, while promoting economic activity in and around their host regions.
- Collectively, they can offer greater capacity for Florida's shippers and receivers than any individual port facility could, even if it was "maxed out."

- They can specialize in particular waterborne trade routes – Atlantic, Caribbean, Gulf, and Panama Canal – and in certain types of cargo and cargo-handling technologies.

Florida's ports move different types of commodities in different ways. Broadly speaking, cargo can be classed as either "general cargo" or "bulk cargo," and is handled as follows:

- Containers. Containerized general cargo is any commodity moved in an intermodal shipping container. Containers come in different lengths, between 20' and 45' (for international trades) and up to 53' for U.S. domestic trades.
- Roll On-Roll Off (Ro-ro). Ro-ro general cargo is driven onto and off of vessels, and can include automobiles, construction equipment, boats on trailers, etc.
- Breakbulk and Neobulk. Breakbulk general cargo is typically packaged in relatively small units (pallets, bags, etc.) that can be handled by conventional stevedoring equipment. Neobulk cargo consists of larger or heavier units – such as coiled steel, or large machinery – that requires special handling equipment.
- Liquid Bulk. Liquid bulk is any liquid product that is shipped without packaging into smaller units, such as petroleum in the hold of a tanker.
- Dry Bulk. Dry bulk is any dry product that is shipped without packaging into smaller units, such as coal on an open barge.

Florida's ports also provide different types of passenger services – multi-day cruises, one-day cruises, and ferry services.

Each of Florida's ports has a characteristic profile, in terms of the amount of cargo and number of passengers they handle. As shown in Table 2.1 and Figures 2.2, 2.3 and 2.4 on the following pages, Florida's ports show significant diversity in terms of their traffic volumes and mixes. Three measures are shown – total tonnage, container volumes (measured in 20-foot equivalent units, or TEUs), and passengers, all moving "across the wharf" (so that loading and unloading each count separately).

Florida's leading tonnage port is Tampa, followed by Everglades and Jacksonville; its leading container port is Miami, followed by Everglades, Jacksonville, and Palm Beach; and its leading cruise ports are Canaveral, Everglades, and Miami. Collectively, these ports provided Florida with the ability to handle over 127 million tons, nearly 3 million TEUs, and around 14.5 million passengers per year.

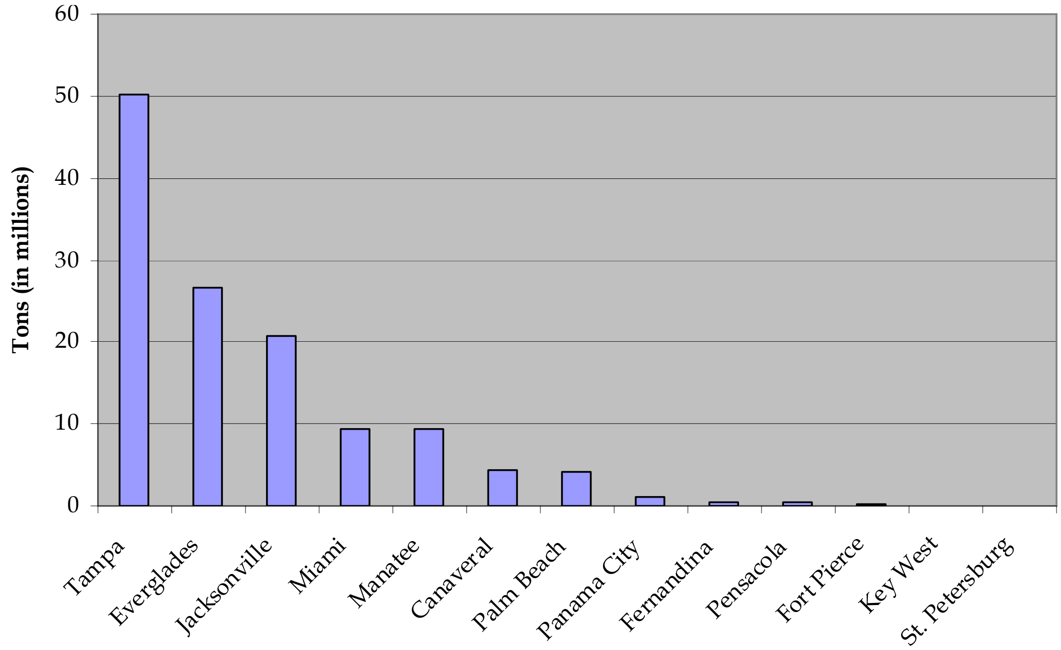
Table 2.1 Cargo and Passenger Volumes for Florida's Ports
FY04/05

Port	Total Tonnage	TEUs	One-day Cruise	Multi-day Cruise	Total Cruise
Canaveral	4,467,088	2,086	1,859,108	2,529,743	4,388,851
Everglades	26,513,293	797,238	1,113,686	2,687,778	3,801,464
Fernandina**	509,038	28,881	0	220	220
Fort Pierce	245,500	10,570	0	0	0
Jacksonville	20,728,430	777,318	0	275,123	275,123
Key West**	0	0	0	1,012,978	1,012,978
Manatee	9,433,076	6,236	0	0	0
Miami	9,472,268	1,054,462	0	3,605,201	3,605,201
Palm Beach	4,223,545	248,206	553,692	0	553,692
Panama City	1,137,457	18,372	0	0	0
Pensacola	494,006	530	0	0	0
St. Petersburg	0	0	120,000	0	120,000
Tampa	50,194,552	26,646	0	771,227	771,227
Total	**127,418,253**	**2,970,545**	**3,646,486**	**10,882,270**	**14,528,756**

*Cruise passengers are counted twice, once when embarking and once when disembarking.

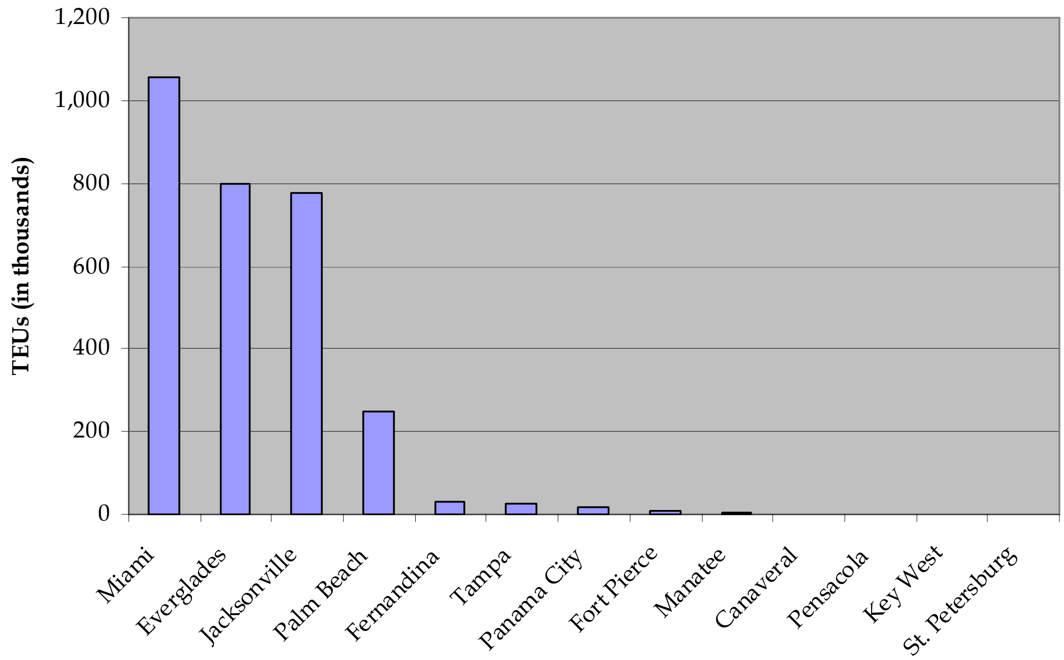
**Port of call for passengers on multi-day cruises. The Key West figure included 83,188 ferry passengers.

Source: FDOT analysis of Draft Seaport Mission Plan.



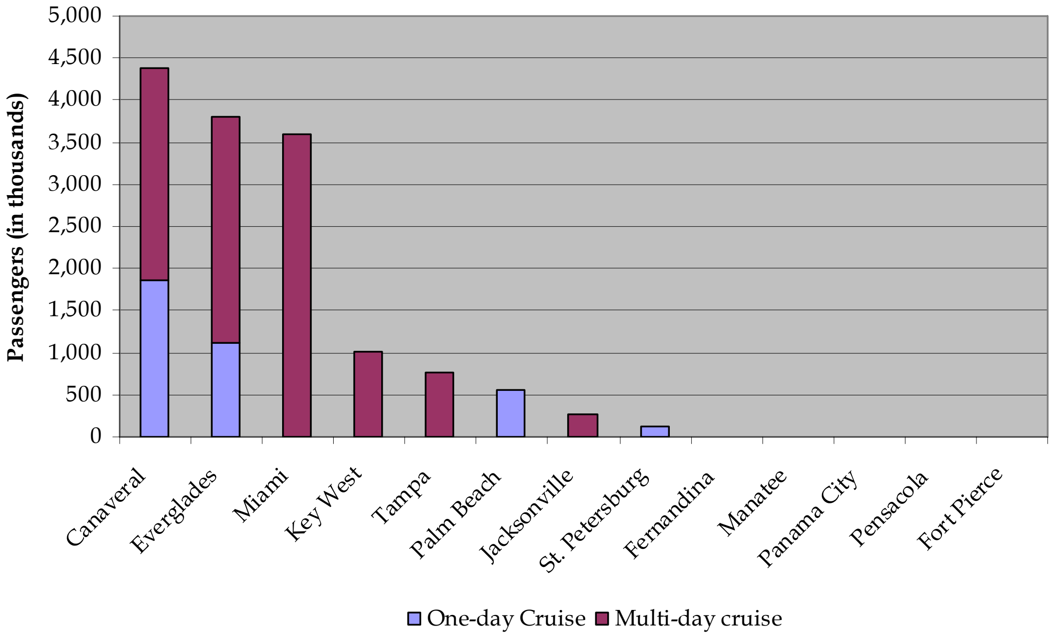
Source: FDOT analysis of Draft Seaport Mission Plan.

Figure 2.2 Florida's Ports Ranked by Total Tonnage
FY 04/05



Source: FDOT analysis of Draft Seaport Mission Plan.

Figure 2.3 Florida's Ports Ranked by TEUs
FY 04/05



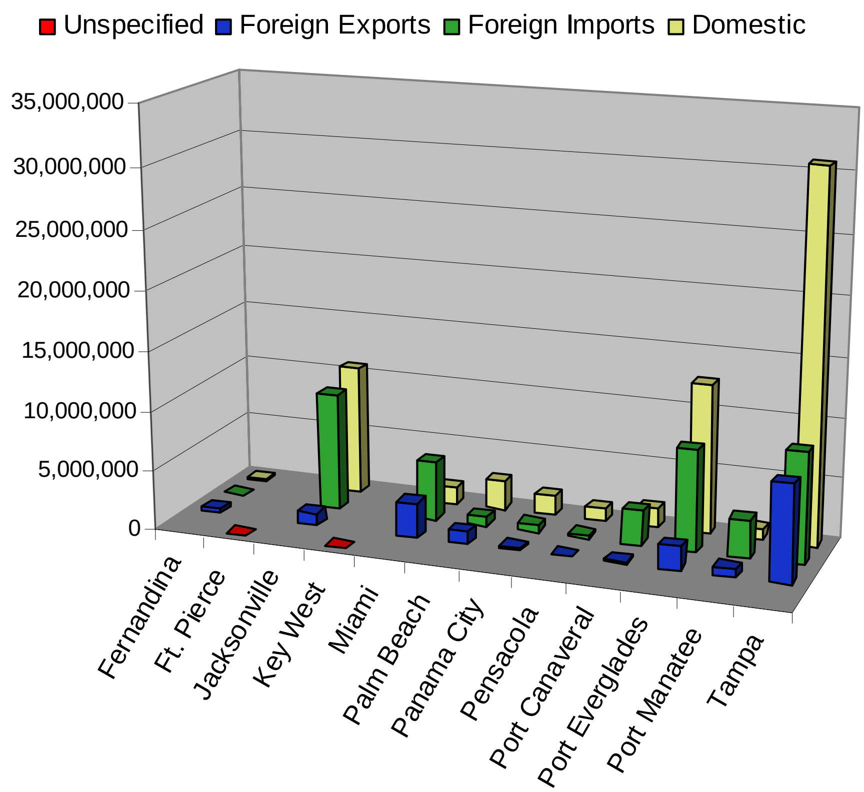
Source: FDOT analysis of Draft Seaport Mission Plan.

Figure 2.4 Florida's Ports Ranked by Passengers
FY 04/05

Globally and nationally, the general trend is for container handling ports to increasingly specialize in containers. The "cost of entry" to container handling – in terms of the investments needed in navigation channels, highway and rail connections, terminal equipment, and market development – is substantial. Once these sunk costs have served to develop a robust container market, ports generally look to expand their container acreage via land acquisition, landfill, and/or conversion and redevelopment of existing port lands.

Conversely, noncontainer ports are evolving in different ways. Some are focusing on maintaining and growing their traditional noncontainer businesses, while others are looking to expand into container markets. The appropriate growth strategy depends on the nature of the local and regional markets, the ability of ports to meet the primary development needs of container terminals (waterside access, terminal development, landside access, and market service), and the comparative costs of different investment strategies. In California, ports such as San Diego and Hueneme benefited from new business when the ports of Los Angeles and Long Beach focused on container development and "exported" other uses; similarly, the ports of Philadelphia and Wilmington, Delaware have attracted noncontainer businesses that left the Port of New York and New Jersey.

Each of Florida's ports has a characteristic balance of traffic between international import flows, international export flows, and domestic traffic (among and between U.S. states and territories, including Puerto Rico). These balances are illustrated in Figure 2.5.



Source: Cambridge Systematics analysis of USACOE data.

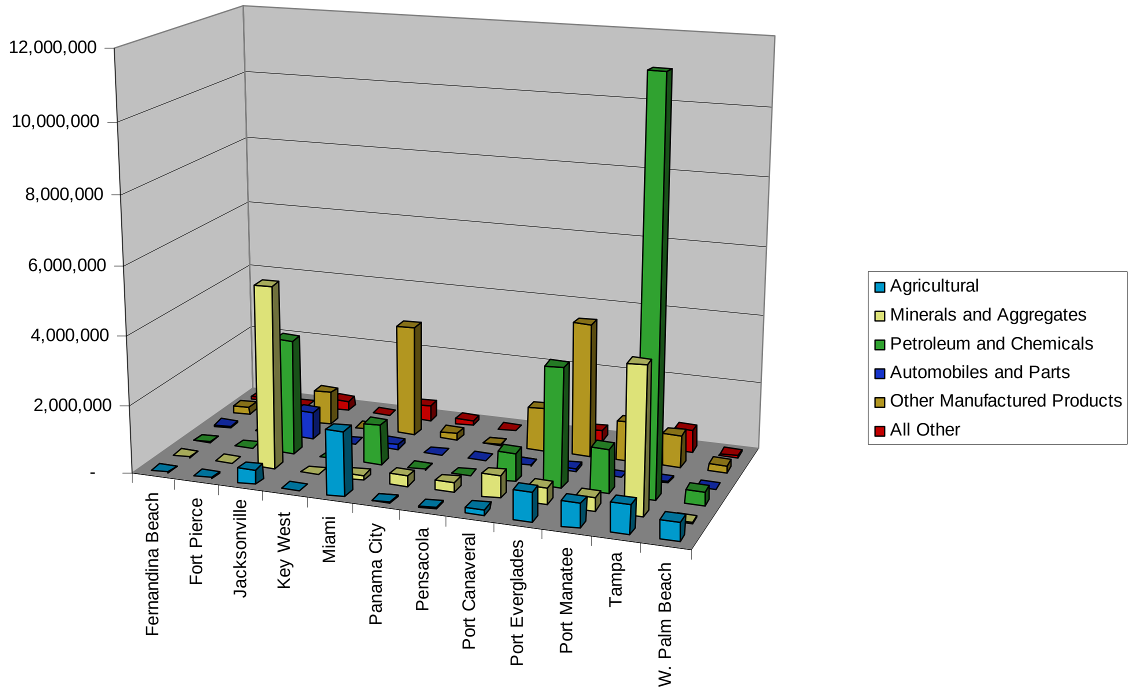
Figure 2.5 Florida's Ports Tonnage by Type
2003

Each of Florida's ports also has a characteristic profile of commodities that it handles. For purposes of this study, we have grouped the various commodities generally into:

- Agricultural Goods and Products
- Minerals and Aggregates
- Petroleum and Chemicals
- Automobiles and Parts
- Other Manufactured Products (excluding Automobiles)
- All Other

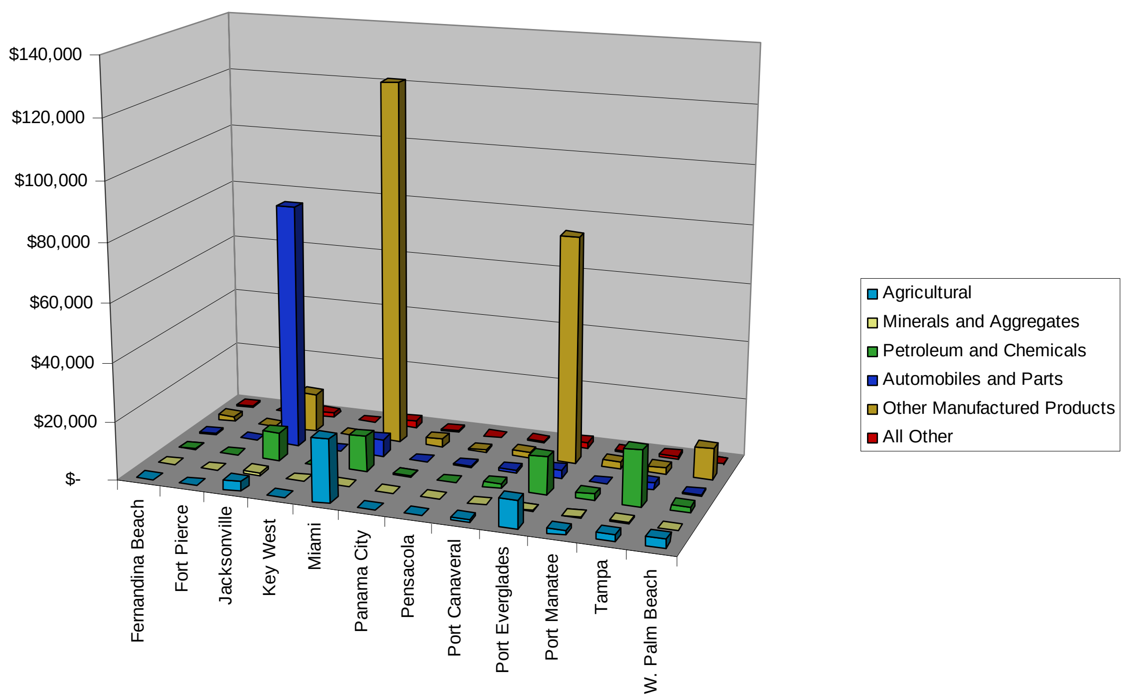
International commodity profiles are shown in Figures 2.6 (by tonnage) and 2.7 (by value) on the following page.

Similarly, each of Florida's ports has a characteristic profile of trade lanes that it serves. International trade-lane profiles are shown in Figures 2.8 (by tonnage) and 2.9 (by value) following. Trade with Puerto Rico and U.S. territories is not included in the international data.



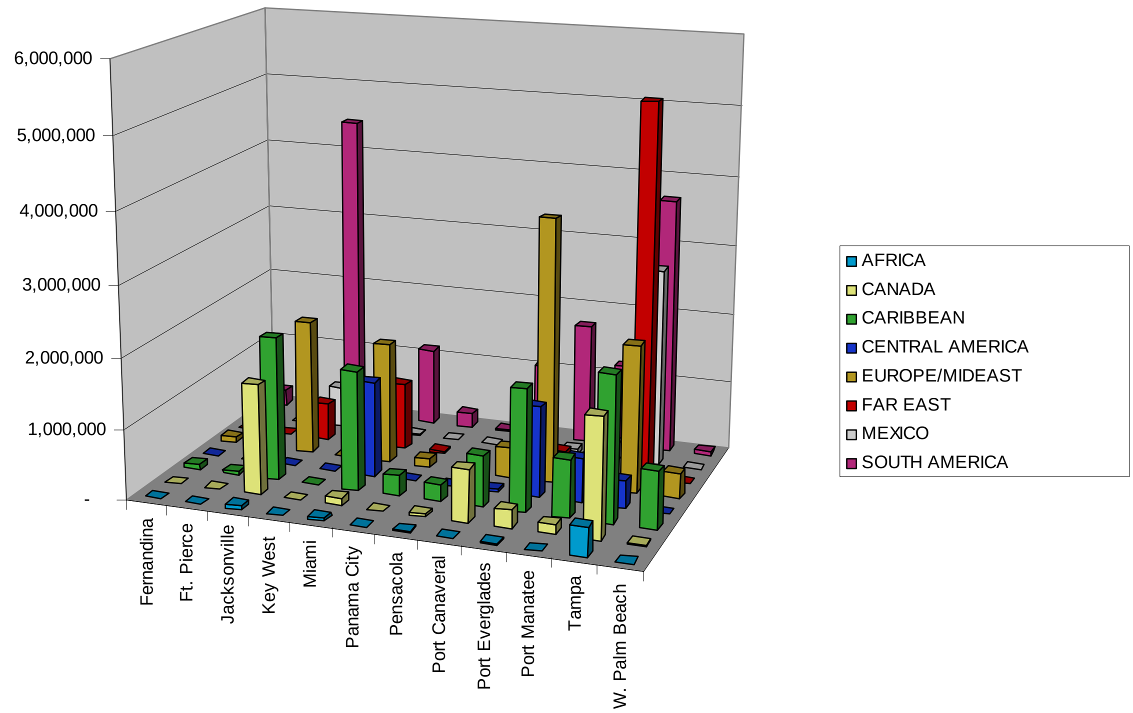
Source: Cambridge Systematics analysis of USACOE data.

Figure 2.6 Florida's Ports International Commodities by Tonnage
2003



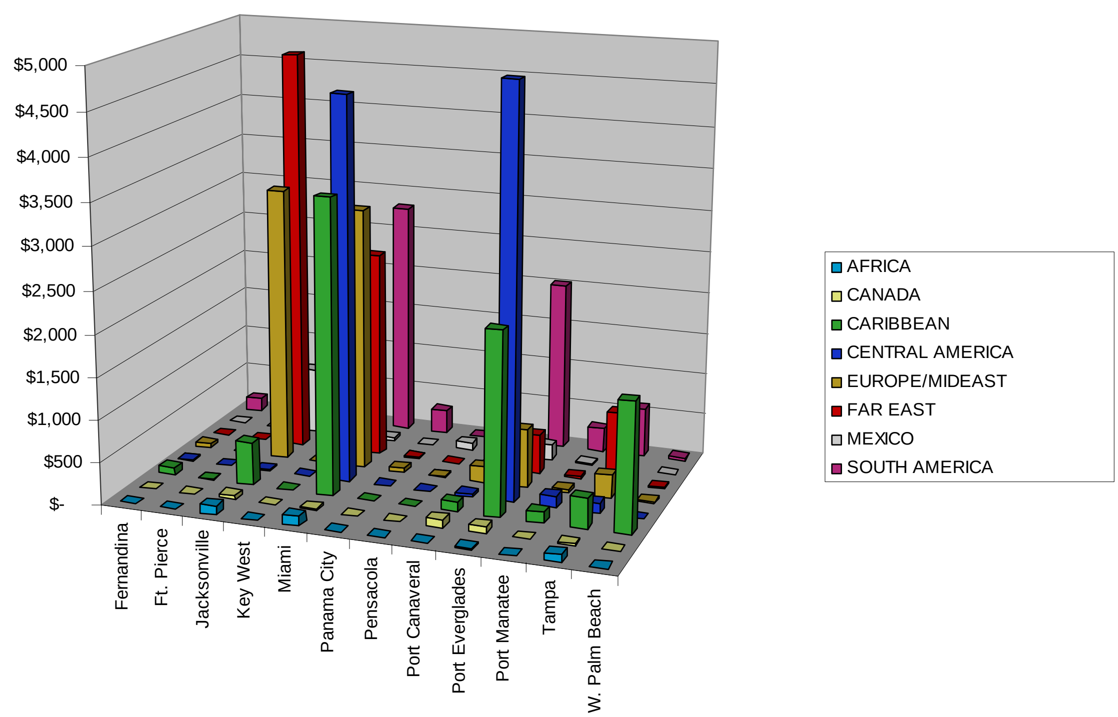
Source: Cambridge Systematics analysis of USACOE data.

Figure 2.7 Florida's Ports International Commodities by Value (Millions of Dollars)
2003



Source: Cambridge Systematics analysis of USACOE data.

Figure 2.8 Florida's Ports International Trade Lanes by Tonnage
2003



Source: Cambridge Systematics analysis of USACOE data.

Figure 2.9 Florida's Ports International Trade Lanes by Value (Millions of Dollars)
2003

■ 2.2 Global Trade Opportunities Have Made Florida's Ports Among the Nation's Most Successful and Competitive

To evaluate competitive cargo-handling performance, we believe the most useful measures are:

- Containers handled (in 20-foot equivalent units, or TEUs)
- Automobiles handled (in number of units)
- Total tonnage of cargo (representing all handling types)

For this analysis, we have used throughput statistics from the American Association of Port Authorities (AAPA) and the U.S. Army Corps of Engineers (ACOE), which are available for all ports for recent and past years. These numbers are not as up-to-date as the Seaport Mission Plan numbers, and may not agree in all cases due to differences in counting (CY versus FY, etc.)

Containers

As shown in Table 2.2 on the following page, among all states, Florida ranked fourth in the number of TEUs handled by its seaports in year 2004, with nearly 2.7 million TEUs and 6.9 percent of the national market. Among South and Gulf states (shaded in gray in Table 2.2, Florida ranked first in the number of TEUs, with 26.2 percent of the market.

Florida has held a similar market position for the last 20 years. In 1984, Florida ranked fifth among all states; in 1989, 1994, and 1999 it ranked fourth. In 1984, Florida ranked second among South and Gulf states; in 1989, 1994, and 1999 it ranked first.

Table 2.2 Container Traffic (TEUs) by State
1984 to 2004

State	1984	1989	1994	1999	2004
CA	3,357,006	4,838,081	6,658,838	9,958,170	15,288,756
NJ	2,235,000	1,988,318	2,033,879	2,828,878	4,478,480
WA	1,206,623	1,969,305	2,447,821	2,775,714	3,580,182
FL	471,531	875,352	1,709,499	2,512,454	2,668,736
SC	520,149	795,385	897,480	1,482,995	1,863,917
VA	339,860	711,296	936,555	1,348,487	1,852,494
GA	355,078	376,295	562,291	793,747	1,662,083
PR	461,616	711,006	1,586,065	2,150,461	1,629,109
TX	439,382	593,667	696,888	1,164,728	1,516,444
HI	427,921	470,166	556,948	544,873	1,355,969
AK	184,331	256,078	333,138	367,810	543,831
MD	774,200	540,771	530,643	498,108	528,899
LA	358,817	145,396	388,002	290,726	276,053
OR	125,762	186,027	317,961	293,262	274,609
MS	–	50,347	93,255	125,874	213,108
PA	142,695	123,041	141,570	216,991	178,046
MA	126,776	140,039	169,595	154,175	175,679
DE	35,908	78,284	157,416	199,168	160,914
Guam	83,223	104,495	144,154	145,191	136,164
NC	94,422	99,031	98,667	133,926	104,122
AL	30,291	15,452	23,499	16,993	37,375
NY	–	–	–	–	6,565
ME	–	–	4,200	4,601	1,000
NH	–	2,266	–	–	–
Grand Total, U.S.	11,770,591	15,070,098	20,488,364	28,007,332	38,532,535
FL Share of U.S.	4.0%	5.8%	8.3%	9.0%	6.9%
FL Rank in U.S.	5th	4th	4th	4th	4th
Total, South/Gulf	2,609,530	3,662,221	5,406,136	7,869,930	10,194,332
FL Share of South/Gulf	18.1%	23.9%	31.6%	31.9%	26.2%
FL Rank in South/Gulf	2nd	1st	1st	1st	1st

Source: American Association of Port Authorities.

As shown in Table 2.3 below, Florida ranked fourth among all states and first among South and Gulf states in the number of TEUs added between 1984 and 2004. Between 1984 and 2004, Florida's ports actually had the highest Compound Annual Growth Rate (CAGR) for containers of any state, at 9.1 percent annually. (This is taken from a 1984 base, which was a "down" year for Florida's ports.)

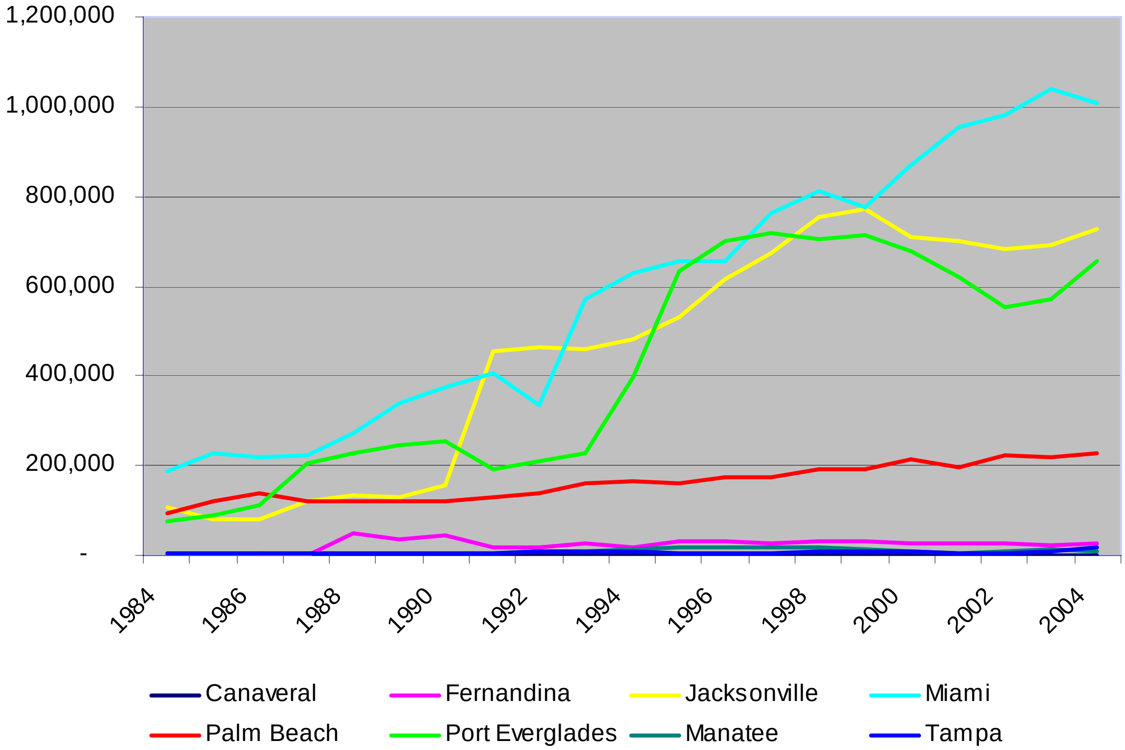
However, since 1999, Florida's container growth has been more modest, at just 156,282 TEUs, representing an annual growth rate of 1.2 percent. This is consistent with Table 2.2, which shows Florida's market share of U.S. container traffic rising steadily from 1984 to 1999, then dropping off. Between 1999 and 2004, Savannah saw record growth and other South and Gulf ports grew faster than Florida.

Table 2.3 Container Growth (TEUs) by State
1984-2004

	20-Year Growth (1984-2004)		5-Year Growth (1999-2004)	
State	**TEUs Added**	**CAGR**	**TEUs Added**	**CAGR**
CA	11,931,750	7.9%	5,330,586	9.0%
NJ	2,243,480	3.5%	1,649,602	9.6%
WA	2,373,559	5.6%	804,468	5.2%
FL	2,197,205	9.1%	156,282	1.2%
SC	1,343,768	6.6%	380,922	4.7%
VA	1,512,634	8.8%	504,007	6.6%
GA	1,307,005	8.0%	868,336	15.9%
PR	1,167,493	6.5%	(521,352)	-5.4%
TX	1,077,062	6.4%	351,716	5.4%
HI	928,048	5.9%	811,096	20.0%
AK	359,500	5.6%	176,021	8.1%
MD	(245,301)	-1.9%	30,791	1.2%
LA	(82,764)	-1.3%	(14,673)	-1.0%
OR	148,847	4.0%	(18,653)	-1.3%
MS	213,108	–	87,234	11.1%
PA	35,351	1.1%	(38,945)	-3.9%
MA	48,903	1.6%	21,504	2.6%
DE	125,006	7.8%	(38,254)	-4.2%
Guam	52,941	2.5%	(9,027)	-1.3%
NC	9,700	0.5%	(29,804)	-4.9%
AL	7,084	1.1%	20,382	17.1%
NY	6,565	–	6,565	–
ME	1,000	–	(3,601)	-26.3%
NH	–	–	–	–
Grand Total, U.S.	**26,761,944**	**6.1%**	**10,525,203**	**6.6%**
FL Rank in U.S.	4th	1st	10th	9th
Total, South/Gulf	**7,584,802**	**7.1%**	**2,324,402**	**5.3%**
FL Rank in South/Gulf	1st	1st	5th	7th

Source: American Association of Port Authorities.

Overall, Florida remains one of the nation's most important container-handling states, with a history of extremely strong and sustained growth. Figure 2.10 below illustrates that most of Florida's container traffic is handled by Miami, Everglades and Jacksonville, with Palm Beach also making a significant contribution. Canaveral, Fernandina, Manatee, and Tampa currently handle relatively few containers, although this could change significantly in the future.



Source: American Association of Port Authorities.

Figure 2.10 Florida Ports TEUs
1984 to 2004

Figure 2.10 shows that port growth is not constant – it has peaks, plateaus, and in some cases valleys. One reason for the relatively slow growth in Florida's TEU volumes over the last five years is that Jacksonville and Everglades both showed slightly declining traffic over this period, which offset strong gains by Miami and continued growth at Palm Beach. Jacksonville saw the loss of a Puerto Rican carrier (which went out of business) and lackluster economic performance from key trading partners (Russia, South America). Everglades saw the loss of a major carrier (due to changes in carrier alliances and service deployments), combined with lack of growth in trading partner economies. Both ports are poised to recover from these losses – Jacksonville with the addition of a major Asia-direct service, and Everglades with ongoing redevelopment and optimization of its terminal assets. The Seaport Mission Plan quotes 2,970,545 TEUs for Florida ports in FY 04/05 – up 11.1 percent over 2004 – which suggests that the flat growth of the last five years may be ending, and we may see a return to higher growth rates that have been more typical for Florida's ports.

When examining these numbers, it is important to differentiate between different types of container markets. For us the most critical distinction is between nondiscretionary (or "captive") cargo, and discretionary (or "contestable") cargo.

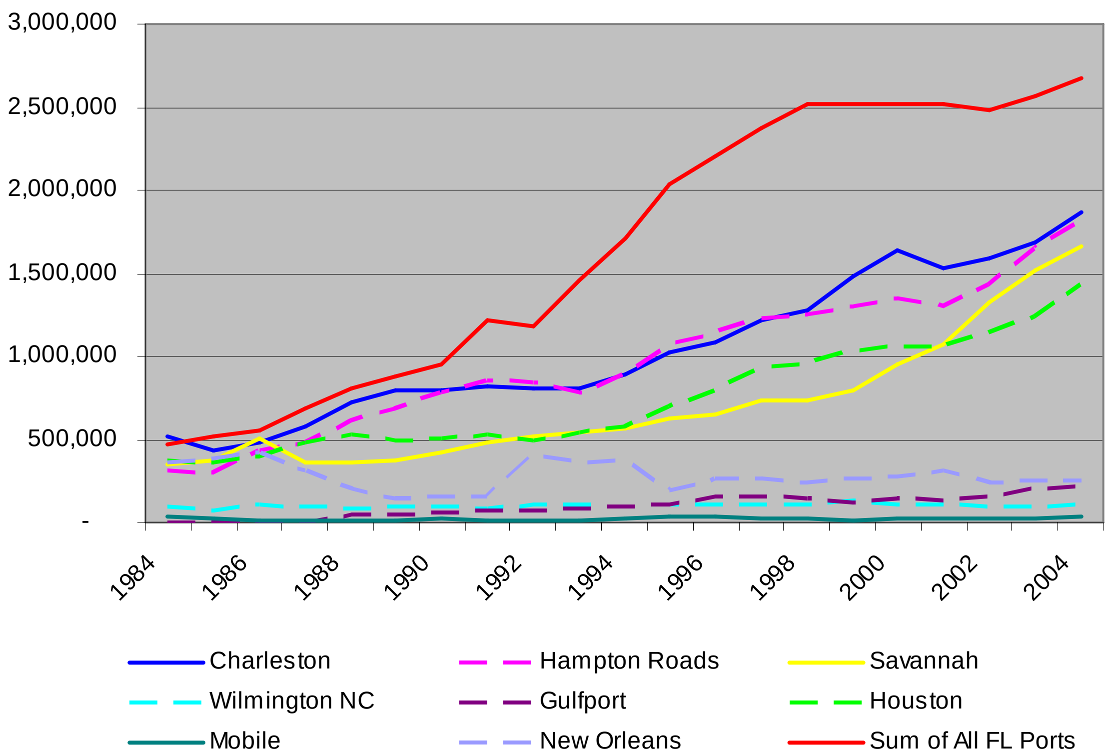
- Captive cargo shows a strong preference for a specific port. If you are bringing containers of imported beer to distributors in New York/Northern New Jersey, it's very easy to get there via the Port of New York and New Jersey, and much harder through Boston or Baltimore. Coastal and near-coastal populations generally show a strong affinity for a specific port. Besides geography, another factor that can make cargo captive is the ability of a port to provide a specific, uniquely needed service – such as inland transportation connections, or warehouse/distribution capability, or linkage to a particular manufacturing supply chain, or provision of a special service such as transloading. (One example of transloading is cargo that is imported through Miami and subsequently exported via Palm Beach to the Caribbean on smaller vessels.)
- Discretionary traffic has the opportunity to "shop" from among different potential ports. Usually, discretionary traffic is originating or terminating somewhere inland (sometimes called the "hinterland"), rather than on the coasts. For example, you can serve Ohio about equally well (in terms of cost, speed, reliability, visibility, and security) from the Port of New York and New Jersey and Hampton Roads, Virginia. You can serve Atlanta most efficiently from Savannah, but Charleston and Jacksonville can also be competitive. You can serve Illinois and Michigan from either the west coast or the east coast. Discretionary cargo is generally routed to provide the best combination of end-to-end service for the price.

CS analyzed a PIERS (Port Import Export Reporting Service) dataset and found some container traffic moving through Florida ports to/from other states (primarily Georgia, North Carolina, and Tennessee), but the percentages were small compared to Florida traffic, indicating that the majority of Florida's container trade is serving local markets.

There are logical reasons why Florida does not capture a larger share of out-of-state discretionary markets. First, Florida's major container ports – except Jacksonville – are on a peninsula, and further from inland markets than major container ports in other states. Second, Florida's major container ports – again, except Jacksonville – do not enjoy particularly good connections with the national intermodal rail system, which limits their effective reach into hinterland markets. Third, while Florida's ports and their surrounding regions offer some warehouse/distribution capability to attract major importers, they pale in comparison to ports like Savannah.

We would argue that the strong 20-year growth in Florida's container ports has been driven primarily by its expanding population and its economy, while the more recent – and more rapid – growth of competing container ports in other states has been driven primarily by their success in capturing the enormous discretionary cargo demand created by Wal-Mart, Home Depot, Target, and other major U.S. retailers who have "globalized" their manufacturing supply chains over the last decade.

We can define Florida's immediate competitors (capable of serving captive Florida markets and preventing discretionary cargo from reaching Florida) as: Savannah, GA; Charleston, SC; and Mobile, AL. These are shown as solid lines in Figure 2.11 below. We can also define other competitors (capable of preventing discretionary cargo from reaching Florida ports) as: Wilmington, NC; Hampton Roads, VA; New Orleans, LA; Houston, TX; and Gulfport, MS. These are shown as dashed lines in Figure 2.11 below. The combined total for all of Florida's ports is shown as the red line.



Source: American Association of Port Authorities.

Figure 2.11 Florida and Competing Ports TEUs
1984 to 2004

Looking at Figure 2.11, we can see that Florida maintained a slight lead on competing ports through the 1980s, then grew more rapidly through the 1990s, has surrendered some of that advantage in the current decade. Since 1984, Charleston and Hampton Roads have battled to the role of leading container port in the South Atlantic, and this battle continues as a near dead-heat. Houston has grown steadily, as had Gulfport prior to Katrina; New Orleans, Wilmington, and Mobile have been relatively flat. But the biggest story on Figure 2.11 is Savannah, which lagged its competitors through the 1980s and most of the 1990s, then started a tremendous growth surge in the late 1990s to overtake Houston and nearly overtake Charleston and Hampton Roads. Savannah's success has been based primarily on capturing discretionary cargo associated with major shippers like Wal-Mart, Home Depot and K-Mart, by providing excellent intermodal connections to hinterland markets and major on-dock and near-dock warehouse/distribution facilities.

Florida's captive cargo is a relatively safe market that has fueled high-rates of port growth in the past, and should continue to do so in the future for all of Florida's ports. We would expect demand to keep pace with, or outpace, growth in Florida's population and gross state product. Just as it is harder for Florida ports to send international containers to other states, other states incur time and cost penalties in sending international containers to Florida. But this does happen, and if Florida fails to make needed improvements in its container ports, a greater share of this traffic will be lost to other states, and will have to come to Florida by rail or by truck from other ports. Monies saved by not investing in ports will probably be lost – and then some – because of additional investments needed on Florida's highways and railroads. The cost-benefit of port improvements to serve Florida's captive container market should be quite substantial.

Florida also has opportunities to attract and grow discretionary cargo that has a Florida origin/destination, but for whatever reason is using out of state ports. For example, some (unknown) share of Wal-Mart traffic bound for Florida is probably moving through distribution centers in Savannah, then being trucked to Florida. It would be highly desirable for Florida ports to capture this traffic, because it would not only generate port-related economic benefits, but also reduce truck moves on Florida's highways. Strategies to accomplish this may include: channel deepening; rail service improvements; and warehouse/distribution/inland port development. More detailed market studies of these opportunities may be warranted.

Attracting new discretionary cargo that has an origin or destination in other states is an opportunity for some of Florida's ports, such as Jacksonville which is geographically close to other states and well connected by highways and rail. It may not be as good an opportunity for South Florida ports, which are geographically disadvantaged and rail-challenged with respect to reaching out-of-state markets.

Autos

Among all states, Florida ranked fourth in the number of import/export autos handled by its seaports in year 2004, with over 486,000 units and 11.7 percent of the national market. Among South and Gulf states (shaded in gray in Table 2.4 on the following page), Florida ranked first in the number of autos, with 43.2 percent of the market. Florida's market position, while very strong, has been declining since 1994 due to the significant strengthening of established centers (Southern California, NY/NJ, Baltimore, and Brunswick GA) and new operations in Charleston, SC.

Table 2.4 Automobile Import/Export Traffic (Units) by State
1994 to 2004

State	1994	1999	2004
CA	667,634	971,490	1,138,193
NJ	424,000	519,214	728,720
MD	314,265	286,114	527,531
FL	429,137	369,928	486,167
OR	294,145	308,813	358,682
GA	109,324	185,288	353,874
WA	167,468	219,246	209,813
SC	–	–	160,000
DE	109,398	135,261	78,369
TX	55,866	69,336	72,127
AL	–	–	26,432
VA	27,488	–	26,364
MA	33,350	80,540	–
PA	15,455	704	
RI	25,809	–	
Grand Total, U.S.	**2,673,339**	**3,145,934**	**4,166,272**
FL Share of U.S.	16.1%	11.8%	11.7%
FL Rank in U.S.	2nd	3rd	4th
Total, South/Gulf	**621,815**	**624,552**	**1,124,964**
FL Share of South/Gulf	69.0%	59.2%	43.2%
FL Rank in South/Gulf	1st	1st	1st

Source: American Association of Port Authorities.

As shown in Table 2.5 on the following page, Florida grew its auto traffic at an average rate of just 1.3 percent annually between 1994 and 2004. However, 1999 saw a decline in traffic, followed by relatively strong growth (at 5.6 percent annually) and a rebound in business. Preliminary figures suggest growth of around 4 percent for 2005. Between 1994 and 2004, and particularly 1999 to 2004, Florida trailed South Carolina and Georgia in the number of units added.

Table 2.5 Automobile Import/Export Growth (Units) by State, 1994-2004

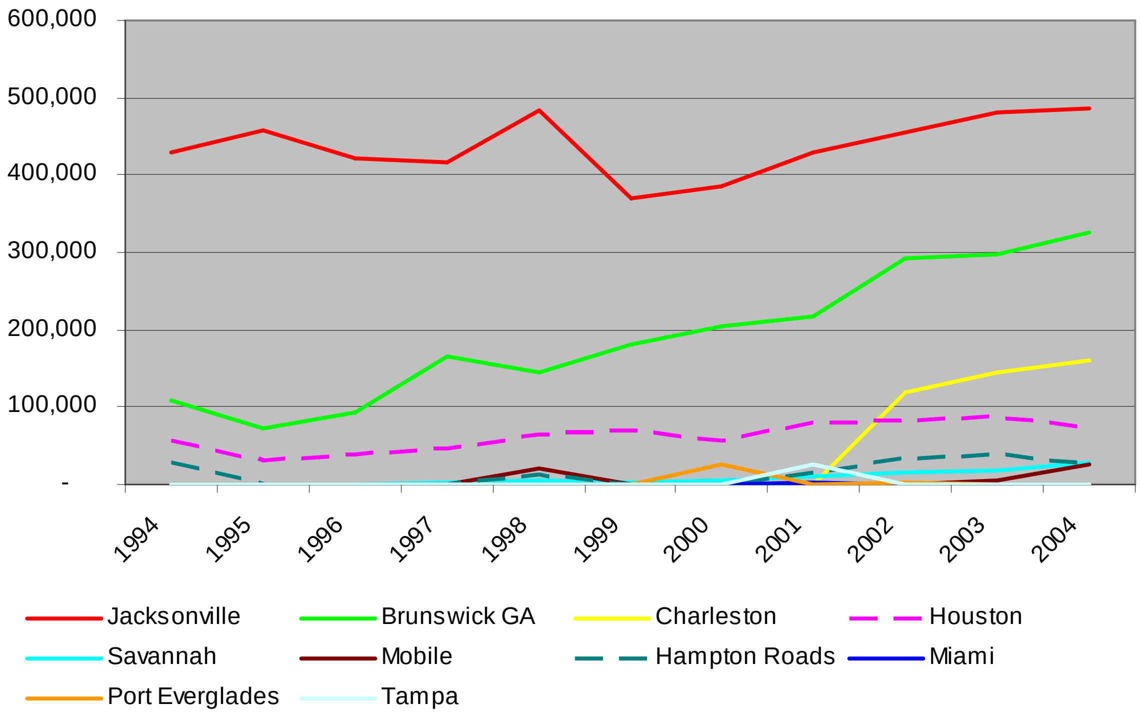
	10-Year Growth (1994-2004)		5-Year Growth (1999-2004)	
State	**Units Added**	**CAGR**	**Units Added**	**CAGR**
CA	470,559	5.5%	166,703	3.2%
NJ	304,720	5.6%	209,506	7.0%
GA	244,550	12.5%	168,586	13.8%
MD	213,266	5.3%	241,417	13.0%
SC	160,000	>>	160,000	>>
OR	64,537	2.0%	49,869	3.0%
FL	57,030	1.3%	116,239	5.6%
WA	42,345	2.3%	(9,433)	-0.9%
AL	26,432	>>	26,432	>>
TX	16,261	2.6%	2,791	0.8%
VA	(1,124)	-0.4%	26,364	>>
PA	(15,455)	-100.0%	(704)	-100.0%
RI	(25,809)	-100.0%	0	0.0%
DE	(31,029)	-3.3%	(56,892)	-10.3%
MA	(33,350)	-100.0%	(80,540)	-100.0%
Grand Total, U.S.	**1,492,933**	**4.5%**	**1,020,338**	**5.8%**
FL Rank in U.S.	7th	8th	6th	3rd
Total, South/Gulf	**503,149**	**6.1%**	**500,412**	**12.5%**
FL Rank in South/Gulf	3rd	3rd	3rd	3rd

Source: American Association of Port Authorities.

Overall, Florida remains one of the nation's leading auto import/export states, with a history of consistent performance, but faces strong competitive challenges from other ports.

Autos are an attractive market in many respects – they provide significant economic benefits (jobs, taxes, and revenues) from facilities that are relatively easy to develop – but they can also come with certain downsides. One is that autos are fairly mobile – they can jump from port to port very easily, seeking the best deal. Ports are notorious for trying to steal auto business from each other, often with publicly-funded incentives. There are some auto operations that can be considered captive, such as BMW and the Port of Charleston. BMW manufactures roadsters in Greer, SC and exports them through Charleston, then brings import BMWs back to Charleston on the same ships. The port and the manufacturing facility are part of a single logistics link. Another downside is that the terminal can end up getting used for long-term parking and storage, more than import/export activities. Another downside is that import/export demand can fluctuate significantly from year to year, which – as one port director put it – is good if you are handling Toyota, and bad if you are handling Daewoo. But despite these downsides, autos are a very important business line for ports.

Figure 2.12 below illustrates some of the volatility in the auto market. Florida auto ports (Jacksonville, Miami, Everglades, and Tampa) and their immediate competitors (Brunswick, Savannah, Charleston, and Mobile) are shown in solid lines, while other major southern and gulf auto ports (Houston, Hampton Roads) are shown in dashed lines.



Source: American Association of Port Authorities.

Figure 2.12 Florida and Competing Ports Auto Units
1994 to 2004

Figure 2.12 shows that Jacksonville is the leading auto port in the south and gulf states, and is the dominant auto port in Florida. Miami, Everglades, and Tampa show very low levels of traffic. Figure 2.12 also shows that Jacksonville's traffic, while up and down, has seen only modest growth in the last decade. By contrast, Brunswick GA has more than tripled its business, while Charleston has built a significant new business from scratch thanks to BMW and its Greer SC manufacturing plant. Houston has done a steady business, while other competing ports are not handling significant volumes. Autos should continue to be a highly contested cargo. For Florida, one of the key factors is how much different states and ports will try to "buy" the business through manufacturing and transportation incentives.

Total Tonnage

Among all states, Florida ranked sixth in total tonnage handled by its seaports in year 2003, with over 120 million tons. Among southern and gulf states, Florida ranked third, behind only Texas and Louisiana. Figuring containers at around seven tons per TEU and autos at around 1.5 tons per unit, containers and autos account for around 20 million tons. The other 100 million tons is made up primarily of liquid bulk (particularly petroleum and chemical products), dry bulk (phosphate, cement, etc.), breakbulk (lumber, plywood, etc.) and neobulk (copper, steel, etc.). Just over 50 percent of this tonnage is domestic (moving to/from other states, as opposed to other countries). Florida's market share and rank has been relatively stable.

Table 2.6 Total Port Tonnage by State (thousands, short tons)
1985 to 2003

State	1985	1989	1994	1999	2003
TX	236,606	323,981	372,094	424,881	498,506
LA	198,274	232,999	457,525	478,640	453,217
NJ	156,627	152,753	131,770	166,276	179,991
CA	117,816	149,173	145,807	147,225	167,370
MI	109,813	139,881	148,861	157,974	137,598
FL	7,204	100,756	109,267	116,208	120,840
WA	98,153	123,633	111,940	121,513	112,070
PA	33,656	36,794	41,725	59,668	60,533
AK	105,606	104,702	92,218	60,473	55,277
OH	66,634	70,989	69,028	73,005	54,438
AL	43,704	45,642	44,997	45,439	50,214
VA	72,166	80,770	64,796	57,275	43,614
MD	36,425	44,884	41,450	37,287	40,183
IN	29,468	32,988	32,945	42,908	39,363
MS	39,425	32,437	31,891	30,083	33,535
HI	19,034	23,352	26,404	28,618	32,915
ME	9,191	10,357	16,613	22,225	30,635
MA	23,231	25,588	24,876	27,675	29,420
SC	9,474	10,800	11,536	21,186	27,745

Table 2.6 Total Port Tonnage by State (thousands, short tons)
1985 to 2003 (continued)

State	1985	1989	1994	1999	2003
GA	13,055	15,076	17,531	20,527	25,360
PR	12,710	15,292	17,683	20,714	19,403
CT	12,788	13,863	14,200	14,575	16,616
MN	11,623	14,747	15,397	18,715	10,990
NY	8,034	10,216	8,266	9,282	9,886
RI	6,742	7,857	6,567	8,627	9,214
NC	9,258	12,941	12,108	11,138	9,108
WI	4,786	3,926	4,929	5,864	5,086
DE	2,362	3,738	4,503	5,369	5,056
NH	2,780	3,476	3,479	4,556	4,971
OR	9,306	8,110	5,098	2,919	1,925
VI	721	1,888	2,105	565	683
IL	405	470	604	560	641
Grand Total, U.S.	**1,587,077**	**1,854,079**	**2,088,213**	**2,241,970**	**2,286,407**
FL Share of U.S.	5.5%	5.4%	5.2%	5.2%	5.3%
FL Rank in U.S.	8th	8th	7th	7th	6th
Total, South/Gulf	**709,166**	**855,402**	**1,121,745**	**1,205,378**	**1,262,140**
FL Share of South/Gulf	12.3%	11.8%	9.7%	9.6%	9.6%
FL Rank in South/Gulf	3rd	3rd	3rd	3rd	3rd

Source: American Association of Port Authorities.

As shown in Table 2.7 on the following page, Florida growth on a volume basis has been generally consistent with its overall market position – in other words, Florida is basically keeping pace.

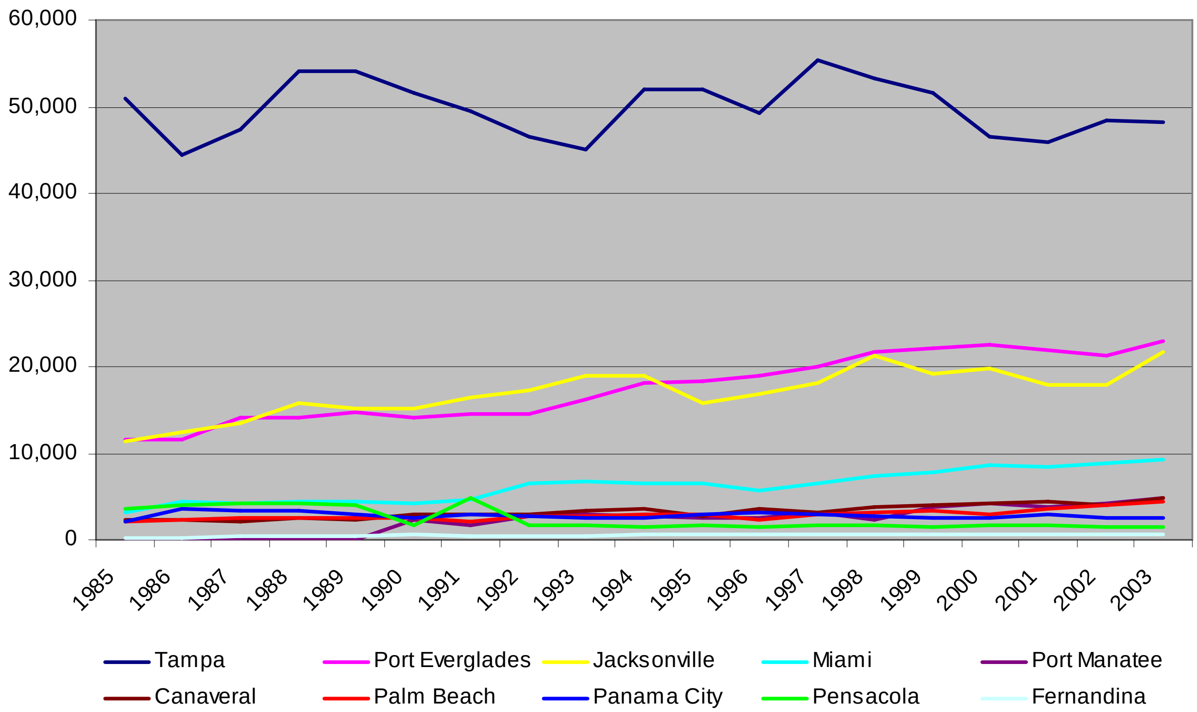
Table 2.7 Total Port Tonnage Growth (thousands, short tons)
1985-2003

	18-Year Growth		4-Year Growth	
State	**Tons Added**	**CAGR**	**Tons Added**	**CAGR**
TX	261,900	4.2%	73,626	4.1%
LA	254,943	4.7%	(25,423)	-1.4%
CA	49,554	2.0%	20,145	3.3%
FL	33,636	1.8%	4,632	1.0%
MI	27,785	1.3%	(20,376)	-3.4%
PA	26,877	3.3%	865	0.4%
NJ	23,364	0.8%	13,716	2.0%
ME	21,444	6.9%	8,410	8.4%
SC	18,271	6.2%	6,559	7.0%
WA	13,917	0.7%	(9,443)	-2.0%
HI	13,881	3.1%	4,298	3.6%
GA	12,305	3.8%	4,833	5.4%
IN	9,895	1.6%	(3,546)	-2.1%
PR	6,693	2.4%	(1,311)	-1.6%
AL	6,510	0.8%	4,775	2.5%
MA	6,189	1.3%	1,745	1.5%
CT	3,828	1.5%	2,041	3.3%
MD	3,758	0.5%	2,896	1.9%
DE	2,694	4.3%	(313)	-1.5%
RI	2,472	1.8%	587	1.7%
NH	2,191	3.3%	416	2.2%
NY	1,852	1.2%	604	1.6%
WI	300	0.3%	(778)	-3.5%
IL	236	2.6%	81	3.4%
VI	(38)	-0.3%	118	4.9%
NC	(150)	-0.1%	(2,030)	-4.9%
MN	(633)	-0.3%	(7,725)	-12.5%
MS	(5,890)	-0.9%	3,452	2.8%
OR	(7,381)	-8.4%	(994)	-9.9%
OH	(12,196)	-1.1%	(18,566)	-7.1%
VA	(28,552)	-2.8%	(13,661)	-6.6%
AK	(50,329)	-3.5%	(5,196)	-2.2%
Grand Total, U.S.	**699,330**	**2.0%**	**44,436**	**0.5%**
FL Rank in U.S.	4th	13th	8th	18th
Total, South/Gulf	**552,974**	**3.3%**	**56,762**	**1.2%**
FL Rank in South/Gulf	3rd	5th	5th	6th

Source: American Association of Port Authorities.

As we did with containers, we can distinguish between captive and discretionary bulk markets. But while containers generally carry relatively light, high-value, time-sensitive cargo, and pay premium prices for transportation, bulk cargo generally is heavy, low value, and less time-sensitive, and wants to pay as little for landside transportation as possible. Because water is the least expensive method of transport on a per unit basis, most bulk cargo wants to get as close to its producing or consuming areas as it can by water. For significant moves inland, barge, rail and pipeline are preferred.

Most of the bulk cargo being handled through Florida ports is associated with local (port area) or regional in-state production and consumption. This is especially true for commodities like petroleum, which rely on Tampa and Everglades as their gateways to Florida consumers. For higher value bulk cargo, such as copper, there may be more of an out-of-state market because the higher value supports a higher landside transportation cost. Similarly, we do not view surrounding states as competitors for most of Florida's bulk tonnage, except for higher-value bulk goods that may be contested with nearby ports such as Gulfport, Mobile, Brunswick GA, and/or Savannah.



Source: American Association of Port Authorities.

Figure 2.13 Florida Ports Total Tonnage (thousands, short tons)
1985 to 2003

As shown in Figure 2.13, Tampa is Florida's leading port in terms of tonnage, and has been a relatively consistent performer. Jacksonville and Everglades are the next leading tonnage ports, and both have been growing steadily. Miami is next, followed by Manatee, Canaveral, Palm Beach, Panama City, Pensacola, and Fernandina.

While containers and autos tend to get more of the attention in port discussions due to their high-visibility and high-value, it's worth mentioning that bulk cargos are incredibly important to Florida's economy and its residents. Bulk handling through Florida's ports allow for the receipt of petroleum, building materials, and other essential products, as well as the shipment of phosphate, agricultural products, and other commodities to out of state markets. Many of these commodities are vital to local industries and employment. Bulk is the reason Florida's ports were built, and bulk ports in turn helped build the state – and keep it functioning. Preserving and expanding bulk handling capacity is a critical issue, especially in the face of urban land pressures that see these functions as standing in the way of developing "higher and better" uses.

Competing Ports

The preceding discussion has identified some of the key competitor ports for container and auto traffic. Bulk traffic was, for the most part, considered not to be contested with other ports. Generally, suitable auto handling facilities are not excessively difficult to develop – many ports that cannot get into the "container game" focus instead on autos – and factors such as pricing, incentives, and industrial linkages tend to be key competitive factors. But for containers, the physical, operational, and locational characteristics of the terminal facilities tend to be key determinants of a port's competitiveness.

Tables 2.8, 2.9, and 2.10 on the following pages show Florida's current and potentially emerging container ports, along with their key major and secondary competitors. For each functional area (water, terminals, landside access, and market connections), particular strengths are listed in green, weaknesses are in red, and areas in between are in gray. The key message, again, is that Florida's ports are good performers, and are most competitive for Florida origin and destination cargo (where geography works in their favor) and least competitive for hinterland discretionary cargo (where geography and the strength of other ports such as Charleston and Savannah works against them).

To overcome these disadvantages, in our view, Florida ports would have to offer a full package of significant offsets – including fast and reliable intermodal rail service corridors, efficient and direct truck connections, availability of extensive warehouse/distribution lands, the potential for significant physical expansion in the future, and deeper channels. Having one of these elements but not the others is likely to be insufficient. Today, Jacksonville appears to be the best positioned port to compete successfully for hinterland discretionary cargo.

However, as we have argued, the greatest value offered by Florida's ports is that they handle Florida cargo, minimizing the need for transportation to and from out of state ports. As Florida's economy grows, business through all of Florida's container ports should continue to expand. We will need to ensure that public investments and public policy decisions act to preserve and increase port capacity at a statewide level to keep pace with this growing demand.

Table 2.8 Strengths and Weaknesses – Container Ports, Major Competitors

Name and 2004 TEUs	Water	Terminals	Landside Access	Markets
Charleston, SC 1,863,917 TEUs	• 45' to all terminals • 150' air draft limit to N. Charleston terminal	• Three separate facilities; 194 storage acres and 3 berths at Wando Welch, 123 storage acres and 3 berths at N. Charleston; 78 storage acres and 2 berths at Columbus Street • New terminal being developed at Charleston Navy Base, 280 acres and 3 berths • SCSPA attempting to acquire 1800 acres in Jasper Co., GA, on Savannah River Channel across from Port of Savannah	• All terminals relatively close to interstates, some conflict with local traffic • No on-dock rail to Wando Welch, limited on-dock to other terminals, relies on drayage to near dock yards	• Excellent service to hinterland markets • Moderate support from regional warehouse and distribution centers • Competitive to some FL markets
Savannah, GA 1,662,021 TEUs	• 42' channel; 48' project under study, in question	• One very large facility, 1200 contiguous acres, 9600' of berthing, untapped capacity	• Relatively close to interstates, some traffic conflicts • Very close to local warehouse and distribution centers • New on-dock ICTF, expandable to 160 acres	• Excellent service to hinterland markets • 14.7 million sf of warehouse and distribution space in Savannah area alone, more in Atlanta reachable by overnight rail • Competitive to many FL markets
Mobile, AL 37,375 TEUs	• 45' to container terminal	• Low throughput, limited capacity today • New 800,000 TEU capacity terminal being developed as joint venture with Maersk	• New terminal will have on-dock ICTF	• Excellent connections to hinterland markets • Potentially competitive to some FL markets

Source: Ports web sites and CS analysis.

Table 2.9 Strengths and Weaknesses – Container Ports, Secondary Competitors

Name/2004 TEUs	Water	Terminals	Landside Access	Markets
Hampton Roads, VA 1,808,933 TEUs	• 50' to major container terminals (Norfolk International Terminals, Maersk, Craney Island) • Max. 41' to Portsmouth, Newport News Marine Terminal (lesser container terminals)	• 811 acres and 6600' berthing at NIT, mostly container; 47 container acres at Portsmouth; 43 container acres at Newport News • Maersk developing a private 300-acre container terminal • Craney Island is site of future 600-acre container terminal	• Generally good access to interstates • On-dock service by NS to NIT; beltline rail connections to CSX	• Excellent connections to mid-Atlantic and hinterland markets • Virginia Inland Port at Front Royal • New Heartland Corridor DST to Midwest • Limited FL access
Houston, TX 1,437,585 TEUs	• 40' channels	• 250 container storage acres at Barbours Cut; 45 container storage acres at PHA; two berths at Turning Basin Terminal • Bayport project will add 700 acres, 400 for containers	• Major on-dock ICTF planned for Bayport • Direct rail to other terminals	• Excellent connections to Texas and West Gulf • Limited FL access
New Orleans, LA 258,468 TEUs	• 30-35' channels	• Around 235 acres container storage in five relatively small terminals	• Service by six Class I railroads (only port in U.S.)	• Excellent connections to Gulf/Southeast, Mississippi River
Gulfport, MS 213,108 TEUs	• 36' channels; 42' under study	• 191-acre property, mix of containers and other uses; recovering from Katrina impacts	• Dedicated truckway • 7 miles from interstate, access improvements planned	• Limited FL access • Good service to Gulf/Southeast • Limited FL access
Wilmington, NC 104,122 TEUs	• 42' channels	• Current facilities modest • Plans for 600-acre North Carolina International Port	• Direct access to I-95/I-40 • CSX on dock, NS near dock with, terminal RR	• Two inland ports – Charlotte and Piedmont Triad • Limited FL access

Source: Ports web sites and CS analysis.

Table 2.10 Strengths and Weaknesses – Container Ports, Florida

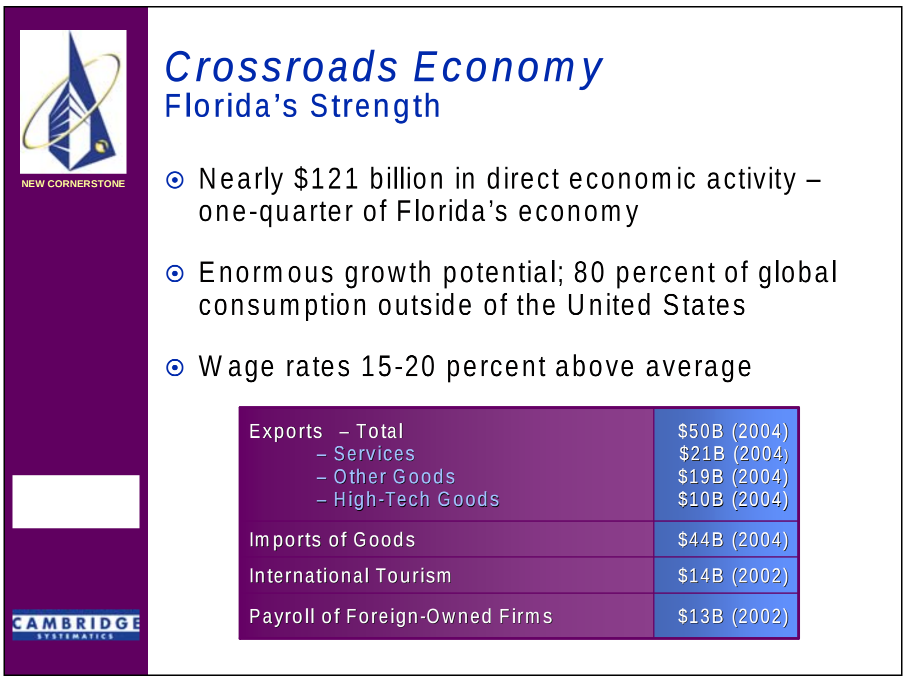
Name/2004 TEUs	Water	Terminals	Landside Access	Markets
Miami 1,009,500 TEUs	• 42' deepening underway, 50' project under study	• Total of 518 acres, majority used for containers, 6100' of berthing • Expansion requires landfill or inland port	• Potential for improved on-dock rail service • Truck access is constrained, tunnel planned	• Excellent access to South Florida market • Limited access to out of state markets
Jacksonville 727,660 TEUs	• Maximum 41' channel; 45' project under study	• Three facilities with around 1500 acres, with containers on around 400 acres • Potential to expand container capacity on existing lands	• Close to interstates, but improvements needed • On and near-dock rail connections via FEC, CSX, NS, Terminal RR	• Excellent access to North and Central Florida markets • Good access to out of state markets; new Asian service with 800,000 TEUs
Everglades 653,628 TEUs	• 42 channels'	• Around 320 container acres • Additional capacity from 270-acre Southport expansion	• Potential for on-dock ICTF at Southport • Direct interstate highway connections	• Excellent access to South Florida market • Limited access to out of state markets
Port of Palm Beach 226,002 TEUs	• 33' channels	• 153-acre main terminal, more than half used for containers • Expansion requires landfill, FP&L property, or inland port	• Direct service by FEC, potential for upgraded railyard • Truck access is constrained, improvements planned	• Excellent access to South Florida market, possibility to improve Central Florida service with inland port • Limited access to out of state markets
Port of Tampa 17,277 TEUs	• 40' channels	• Current facility only 22 acres • Significant expansion capability on existing lands	• Near-dock rail • Truck access is constrained, improvements planned	• Excellent access to Gulf Coast and Central Florida markets • Limited access to out of state markets
Port Manatee 8,414 TEUs	• 40' channels	• Current facility only 20 acres • Some expansion capability on existing lands	• Near-dock rail (CSX) and on-dock (Terminal RR)	• Good access to Gulf Coast and Central Florida markets • Limited access to out of state markets

Source: Ports web sites and CS analysis.

2.3 Global Trade Through Florida Seaports Has Generated Significant Benefits for Florida's Economy and Transportation System

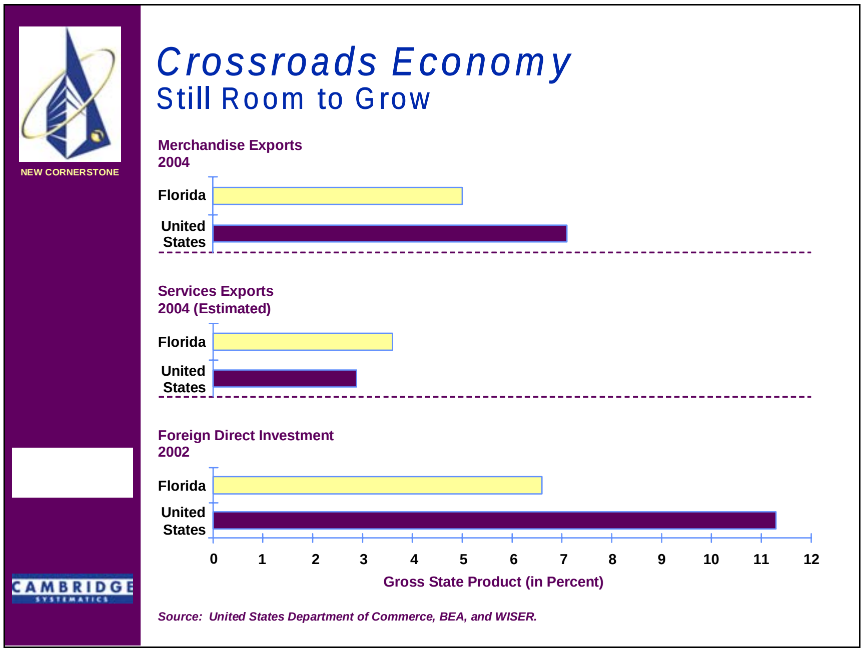
Economic Benefits

Various studies have addressed the significant contribution that global trade makes to Florida's economy. The Florida Chamber Foundation's New Cornerstone study, in characterizing Florida as a "Crossroads Economy," quantified these effects and identified future "upside" in the potential growth of export markets. This work estimates global trade activity as representing around one-quarter of Florida's economic activity.



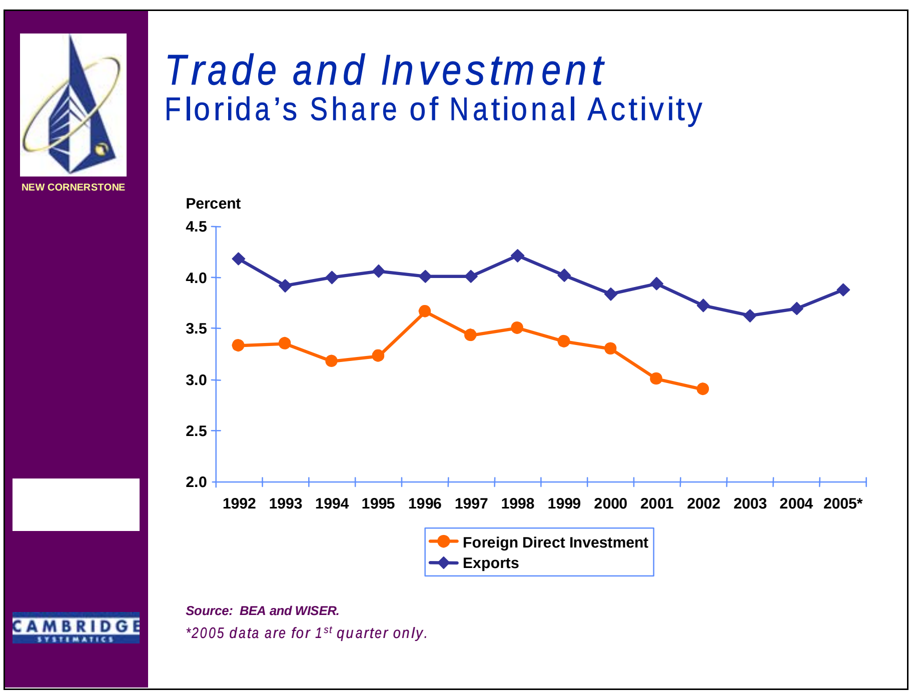
Source: "Florida's Crossroads Economy Progress Report," June 7, 2005.

Figure 2.14 Florida's Strength as a Crossroads Economy



Source: "Florida's Crossroads Economy Progress Report," June 7, 2005.

Figure 2.15 Florida's Exports and Foreign Investment as a Share of FL GSP



Source: "Florida's Crossroads Economy Progress Report," June 7, 2005.

Figure 2.16 Florida Exports and Foreign Investment as a Share of U.S. GDP

Florida's 14 deepwater seaports clearly play an essential role in creating and sustaining a vibrant economy through their function as trade gateways. FSTED commissioned a study by the Washington Economics Group to estimate the economic impact of Florida's seaports. According to their report of November 2003 and a follow up in June 2004, the aggregate direct and indirect benefits of port activity (cargo and passenger) to Florida are in the billions.

Table 2.11 Overall Economic Benefits of Florida's Ports

EXECUTIVE SUMMARY

- **Florida seaports are important economic assets to the State**, and to the economies of the metro areas where they are located. Nearly $44 billion worth of international trade flowed through Florida seaports in 2002, representing approximately two-thirds of all merchandise trade shipped through Florida. The State's manufacturers exported nearly $25 billion worth of goods in 2002, and 56 percent of those exports were shipped via Florida seaports.

- Florida seaports act also as the home port of call to over 9.6 million cruise passengers. Cruise passengers spent an estimated $356 million in Florida prior to- or after their cruise in 2002.

- A recently completed study of Florida seaports concludes that Florida ports **directly** supported 90,000 jobs and $4.1 billion in payroll in 2002 by making possible the international movement of goods across Florida's borders, the export of Florida manufactured goods and ocean cruises.

- Simulations with an input-output model of Florida's economy indicate that Florida seaports in 2002 had a combined economic impact of 290,000 jobs; $11.2 billion in household income; $16.3 billion in Gross State Product; and $1.1 billion in State and local government taxes and fees.

- Florida seaports have an important role to play in positioning the State to capture significant future economic benefits from the potential expansion of Florida's international trade sector and its cruise industry. There are new and growing market opportunities in the Western Hemisphere, Asia, Africa and elsewhere that can profoundly impact the State's economic future.

Source: excerpted from the Executive Summary of "Investing in Florida's Seaports and the Future of the State's Economy," the Washington Economics Group, June 4, 2004.

Table 2.12 Breakdown of Estimated 2002 Economic Benefits of Florida's Ports

	Direct Impact	Indirect Impact	Induced Impact	Total
Total Economic Impact				
Gross Output (million $)	17,216	7,469	10,654	35,339
Gross State Product (million $)	5,904	3,940	6,462	16,306
Employment (jobs)	89,911	71,415	127,370	288,696
Labor Income (million $)	4,094	2,827	4,293	11,214
Capital Income (million $)	1,620	899	1,709	4,228
State and Local Government Taxes and Fees (million $)	NA	NA	NA	1,058

Source: excerpted from "A Forecast of International Trade Flows and the Economic Impact of Florida Seaports," the Washington Economics Group, November 23, 2003.

Return on Investment

FDOT has previously examined the economic impact of transportation investments. In February 2003, FDOT published a study entitled "Macroeconomic Impacts of the Florida Department of Transportation Work Program."[1] That study examined the economic benefits to the State of Florida of the five-year Work Program of investments across modes (also known as the Program and Resource Plan). The study approach linked transportation investments with system performance (e.g., travel time) and economic competitiveness measured in terms of income, jobs, and gross state product (GSP). Given existing data available, modeling tools, and resources, that study focused on highways and bridges, transit, and rail investments. Currently, FDOT is directing new research by Cambridge Systematics to estimate the economic benefits related to FDOT's next five years of investment in the state's seaports.

Draft results have addressed the economic benefits of certain types of economic activities generated by Florida ports, and how those types of economic activities will be affected by FDOT investments. The work does not attempt to quantify the universe of all economic activity, as did the Washington Group's work cited previously in Tables 11 and 12; rather, it is concerned with accurately estimating the causal relationship between increments of transportation investment and increments of benefit.

According to this draft analysis, it is estimated that anticipated state investments in Florida seaports over the next five years will be responsible for a variety of benefits over the next twenty years. These include an additional $1.6 billion in business output and over 15,650 jobs in the Florida economy, and almost $500 million in personal income for Florida residents. These estimates are based on the economic contribution of new seaport investments over the next five years, which will have lasting, long-term effects on the Florida economy, compared to not making those investments. Local fiscal impacts are expected to grow from $22.3 million in 2007 to almost $62 million by 2020. State tax

[1] http://www.dot.state.fl.us/planning/policy/pdfs/macroimpacts.pdf.

revenue collections are estimated to increase by $13.7 million in 2007 and $39.4 million by 2020 (a significant offset of state-level funding). Total benefits discounted to present value are estimated to be almost $4.2 billion over the life of the state-funded seaport projects in the five year Work Program, compared to a present value of $608 million in state investment. This results in a net present value of almost $3.6 billion, indicating that state investments in seaports are expected to return $3.6 billion more in transportation and economic benefits than the costs to fund the investment projects. The resulting benefit/cost ratio is 6.9, meaning that every one dollar of state funds invested in Florida's seaports returns $6.90 dollars back to the state in the form of personal income and travel efficiency gains. Applying somewhat more conservative assumptions as part of sensitivity testing, the analysis found that the benefit/cost ratio might be reduced to 5.6 – a result which is generally consistent with the 5.5 benefit/cost ratio estimated in the earlier Macroeconomic Study addressing highway, rail and transit investments.

State investments are generally supported by seaport investments, which have the combined effect of generating benefit. The Cambridge Systematics analysis attempted to isolate the effect of public investment. For example, if a particular project is anticipated to be 50 percent state-funded and 50 percent port-funded, the analysis claimed only 50 percent of the resulting total benefits as being generated by state participation. A previous analysis by the Washington Group took a slightly different approach, looking at the total benefits generated by the combination of public investment and leveraged seaport investment.

Table 2.13 Estimated Economic Impact of State and Seaport Investments

Economic Impact of State's Share of CIP Funding on:	Multipliers*			Impact Per $10 million of State Funding		
	Direct	Indirect and Induced	Total	Direct	Indirect and Induced	Total
Gross State Product ($)	0.6905	1.0051	1.6956	6,905,034	10,050,590	16,955,624
Labor Income ($)	0.6084	0.6793	1.2877	6,083,769	6,793,245	12,877,014
Employment (jobs per $ million)	12.0833	18.8542	30.9375	121	189	309
Average Annual Compensation to Workers				50,348	36,030	41,623
State and Local Govt Revenues ($)	NA	NA	0.0834	NA	NA	83,368

** Based on characteristics of the "typical" seaport capital improvement project.*

Source: "Investing in Florida's Seaports and the Future of the State's Economy," the Washington Economics Group, June 4, 2004.

Transportation Benefits

Florida's seaports provide efficient transportation access to and from international markets, conferring economic benefits to Florida's producers and consumers in the form of business activity, employment, etc. These benefits are broadly captured by economic benefit analyses, because transportation cost and performance is a critical part of the "business equation" that underlies the economic activity.

A different way to approach the problem is to ask two hypothetical questions: what would happen to Florida's transportation system if it wanted to support this same level of economic activity without its seaports? Or, more realistically, what would happen to

Florida's transportation system if its seaports were "frozen" at current levels of throughput and performance, and could not accommodate anticipated growth in global trade?

For international cargo, the growing needs of Florida's producers and consumers would have to be served through seaports outside the state. To some extent, this already occurs – for example, some share of import consumer goods come through the ports of Savannah, Charleston, Virginia, and New York, and are moved by truck or rail to Florida. Without its seaports, or with its ports "frozen" at current levels, more international cargo would have to move by truck or rail to and from seaports in other states. In practice, the increased cost of landside transportation would tend to reduce trade volumes, while the remaining trade volumes would generate substantially greater impacts on Florida's highway and rail systems. Ignoring for the moment the potential effects of reducing trade volumes, we can look at the international volumes moving through Florida's ports, and see the effect of shifting this traffic to other ports.

As shown in Table 2.14 on the following page, shifting Florida's international waterborne trade traffic to the closest alternative port (Mobile for Pensacola and Panama City, Savannah for all other Florida ports) could generate more than 800 million truck vehicle miles of travel annually over Florida's roads. Table 2.14 starts with the international tonnage data for 2003 from the U.S. Army Corps of Engineers. Next, it applies an estimate of how much of this tonnage has an origin or destination address in Florida, as opposed to other states. To generate this estimate, we analyzed a PIERS (Port Import Export Reporting Service) dataset for container traffic; in the absence of better data, we applied this estimate to all tonnage, and for ports where no data was available we used a default figure of 75 percent. Next, we assumed a general statewide truck share of 90 percent for this tonnage. Next, we assumed that each truck carries an average of 20 tons, and that each loaded truck move has a corresponding empty truck move. Finally, we determined the number of highway miles in the State of Florida that would be required to reach the nearest alternative port (Mobile for Pensacola and Panama City, Savannah for all other ports).

This is obviously a crude order-of-magnitude estimate, with a number of preliminary assumptions that will need significant further investigation, but it does serve to illustrate that we would be talking about a lot of truck VMT to achieve current economic benefits. Each ton of international traffic could generate around 15 truck vehicle miles of travel on Florida's roads if it had to be handled at out of state ports. This excludes impacts on highways outside of Florida.

Table 2.14 Potential Truck VMT Effects of Shifting Florida's 2003 International Waterborne Trade to Out-of-State Seaports

	Int'l Tonnage, 2003	Share with FL Origin/ Destination	Share by Truck	Equivalent Annual Truck Moves	FL Hwy Miles to Alt. Port	Equivalent Truck VMT in FL, 2003
Fernandina Beach	392,128	65%	90%	22,939	24	550,548
Fort Pierce	45,302	75%[a]	90%	3,058	264	807,286
Jacksonville	11,167,858	35%	90%	351,788	34	11,960,775
Key West	11,239	75% [a]	90%	759	539	408,897
Miami	7,023,934	75%	90%	474,116	379	179,689,799
Panama City	666,127	75% [a]	90%	44,964	143	6,429,794
Pensacola	323,757	75% [a]	90%	21,854	18	393,365
Port Canaveral	3,058,477	75% [a]	90%	206,447	184	37,986,281
Port Everglades	9,088,308	75%	90%	613,461	354	217,165,122
Port Manatee	3,641,313	75% [a]	90%	245,789	264	64,888,198
Tampa	18,417,703	75% [a]	90%	1,243,195	229	284,691,644
W. Palm Beach	1,259,681	50%	90%	56,686	314	17,799,293
Total	**55,095,827**			**3,285,053**		**822,771,002**

Source: Cambridge Systematics estimate based on USACE and PIERS data.
[a] = no data available, default assumption applied

A considerable share of Florida port tonnage is domestic – that is, between two points in Florida or between Florida and other states. This traffic has already chosen to use water instead of highway or rail, but if the water option was not available, it would have to shift to land modes. Much of this traffic is inbound nondiscretionary commodities, such as petroleum, that would have to get to Florida even if low-cost waterborne transportation was not available.

As shown in Table 2.15 on the following page, shifting Florida's domestic trade traffic to land modes (truck and rail) could generate more than 1.4 billion truck vehicle miles of travel annually over Florida's roads. Table 2.15 starts with the domestic tonnage data for 2003 from the U.S. Army Corps of Engineers. Next, it applies estimates of what percent of Florida domestic tonnage is associated with different states; these estimates are derived from USACOE data which we have obtained at the state to state (not port to port) level. Next, we assumed a general statewide truck share of 50 percent for this tonnage, which is likely to be relatively "rail friendly" due to its composition (mostly petroleum, petrochemicals, building materials, etc.). Next, we assumed that each truck carries an average of 20 tons, and that each loaded truck move has a corresponding empty truck move.

Finally, we determined the number of highway miles in the State of Florida that would be required to reach the appropriate state, using Tampa as a generic "centroid" for Florida and assuming that Florida-to-Florida waterborne moves averaged around 100 miles. Dividing total VMT by total tonnage, each ton of domestic cargo could generate around 22 truck miles of truck travel on Florida's roads.

Table 2.15 Potential Truck VMT Effects of Shifting Florida's 2003 Domestic Waterborne Trade to Truck

	Domestic Tonnage, 2003	Share To/From	Share by Truck	Annual Truck Moves	FL Hwy Miles to Port/State	Equivalent Truck VMT in FL, 2003
Fernandina Beach	150,000					
Fort Pierce	10,698					
Jacksonville	10,900,053					
Key West	60,761					
Miami	2,498,340					
Panama City	1,768,540					
Pensacola	1,128,517					
Port Canaveral	1,655,606					
Port Everglades	12,632,616					
Port Manatee	986,683					
Tampa	30,882,969					
W. Palm Beach	2,498,340					
Total	**65,173,123**					
Louisiana		43%	50%	1,392,810	500	696,404,974
Texas		23%	50%	752,658	500	376,329,182
Alabama		9%	50%	302,523	500	151,261,729
Mississippi		8%	50%	263,297	500	131,648,677
Puerto Rico		5%	0%	–	0	–
Florida		4%	50%	135,105	100	13,510,518
Virgin Islands		4%	0%	–	0	–
All Other		4%	50%	125,677	500	62,838,322
Total				**2,972,071**		**1,431,993,401**

Source: Cambridge Systematics estimate based on USACOE data.

The analyses presented in Tables 14 and 15 argue that the statewide truck VMT benefits associated with Florida's ports should be obvious. Accommodating 2003 levels of Florida international waterborne trade without in-state ports would require an additional 800 million truck miles of travel on Florida's highways. Accommodating 2003 levels of Florida domestic waterborne trade without in-state ports would require an additional 1.4 billion truck miles of travel on Florida's highways.

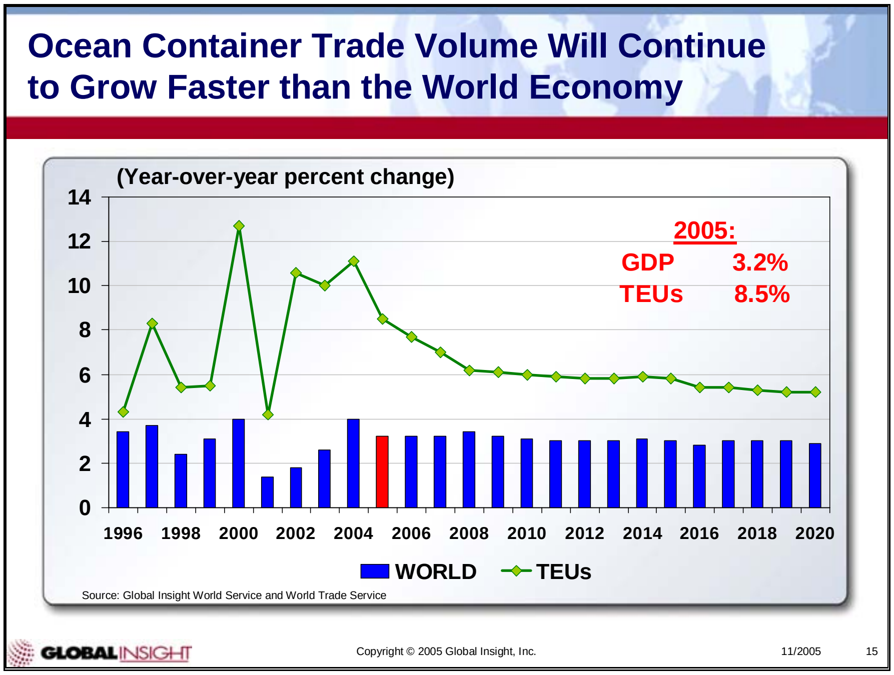
These scenarios, although clearly hypothetical in nature, start to define an approach to quantifying the transportation system "replacement value" for Florida's ports; future studies might take the next step and estimate the cost of providing capacity for – and mitigating the system-level impacts of – an additional 2.2 billion miles of truck travel annually on Florida's highways. It could also examine two future scenarios: one scenario where Florida's ports maintain or grow their current market shares of international trade versus competing ports (reducing reliance on travel to out-of-state ports) and maintain or grow their current modal shares of domestic tonnage (reducing reliance on highway and rail); and one scenario where they fail to do so, losing economic benefit and/or shifting the burden onto highway and rail.

2.4 Global Trade is Forecast to Grow Substantially, Increasing Demand Through Florida's Ports, but the Nature of that Trade is Likely to Shift

World and National Forecasts

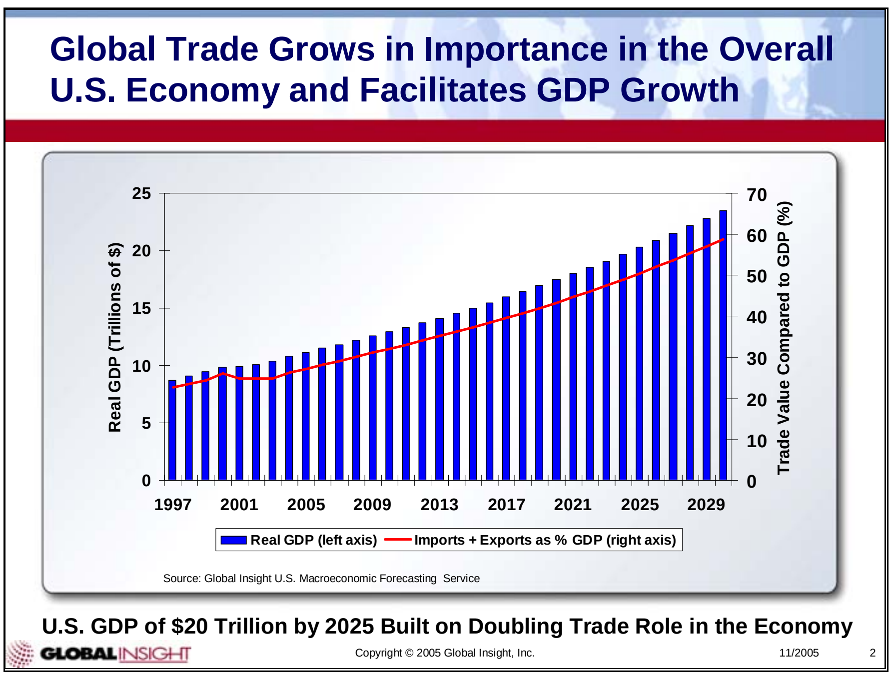
In the year 2005, world container traffic (as measured in TEUs) grew at the rapid pace of 8.5 percent – which was actually a **decline** compared to previous years, where the annual growth rate exceeded 10 percent. World trade in containerized goods has grown substantially faster than world GDP. This reflects the rapid globalization of supply and distribution chains – the movement of raw materials, intermediate products, and finished goods across international borders. The developed and developing world's economies are increasingly linked with global trade.

With respect to the growing importance of global trade, the U.S. economy mirrors the world economy. As shown in Figure 2.18, according the economic forecasting firm Global Insight, Inc., the value of U.S. international trade is equivalent to one-fourth of U.S. GDP; by 2025, this is projected to grow to half of U.S. GDP. Trade growth will be an increasingly important driver of overall GDP growth.



Source: Presentation on "The Global Economy and the Water Transportation Challenge" by Paul Bingham of Global Insight Inc. to AASHTO, November 15, 2005

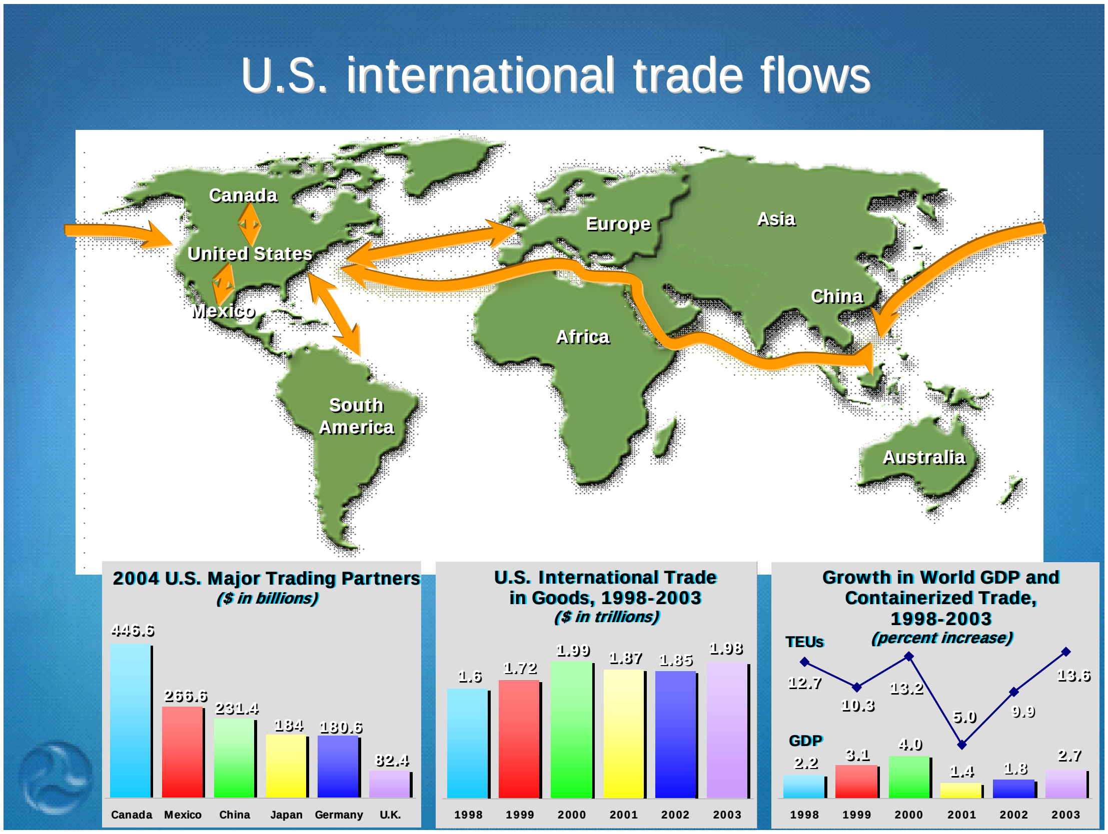
Figure 2.17 Growth in Ocean Container Trade and the World Economy



Source: Presentation on "The Global Economy and the Water Transportation Challenge" by Paul Bingham of Global Insight Inc. to AASHTO, November 15, 2005

Figure 2.18 Growth in U.S. GDP and its Increasing Reliance on Global Trade

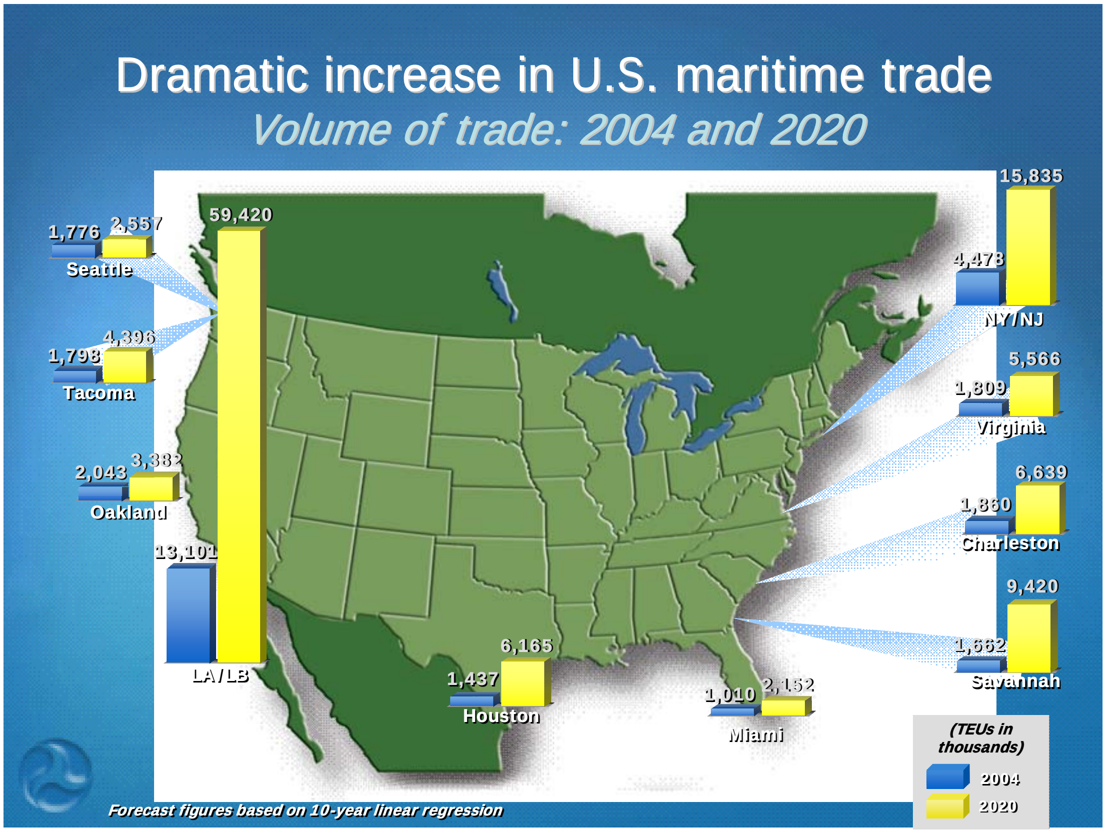
Recent studies by the Federal Highway Administration have noted significant increases in U.S. international trade flows since 1998 (see Figure 2.19) – from 1.6 trillion dollars in 1998 to 1.98 trillion dollars in 2003. In 2004, our major trading partners were Canada, Mexico, China, Japan, Germany, and the UK.



Source: Presentation on "The State of the U.S. Freight System" by Jeffrey Shane, FHWA, June 26, 2006

Figure 2.19 U.S. International Trade Flows

FHWA trendline projections for the largest U.S. container ports are shown in Figure 2.20 on the following page. Being projections, they reflect recent historic activity; they do not consider sustainability of past growth rates, or port handling capacity, or competitive market shifts among existing ports, or the potential development of new ports. Some of the resulting projections seem highly unlikely to be realized – such as a four-fold increase in activity at Los Angeles/Long Beach over the next 16 years. However, it is clear that the overall trend is for continued growth in international waterborne trade, and that the overall need is for U.S. ports to work as a system to somehow accommodate it.

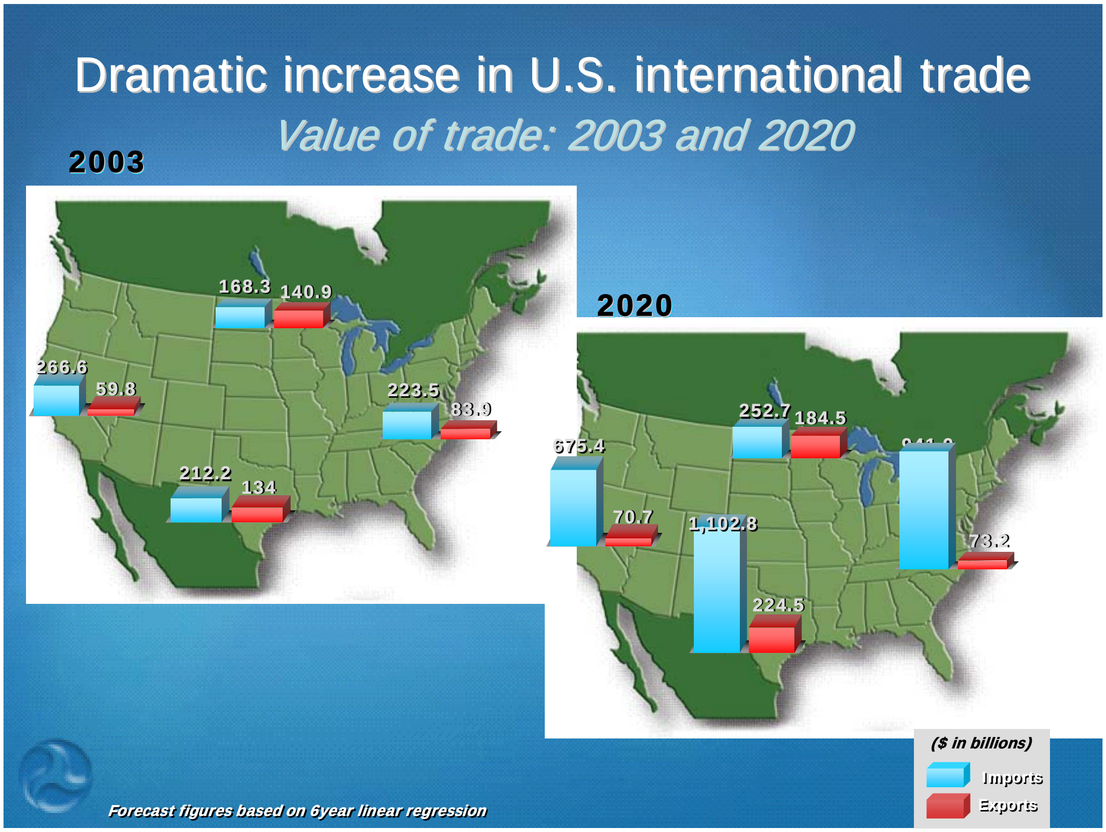


Source: Presentation on "The State of the U.S. Freight System" by Jeffrey Shane, FHWA, June 26, 2006

Figure 2.20 Projected Increases in Waterborne Container Trade, Selected Ports

Regional Forecasts and Florida Forecasts

FHWA, based on recent six-year trendlines, is projecting continued strong growth in international trade value through the year 2020 at the national level (see Figure 2.21 on the following page). For the Atlantic coast, between 2003 and 2025, the value of imports is projected to increase from 223.5 billion dollars to 941.9 billion, although exports are projected to decrease from 83.9 billion to 73.2 billion. This corresponds to a Compound Annual Growth Rate (CAGR) of around 7.3 percent.



Source: Presentation on "The State of the U.S. Freight System" by Jeffrey Shane, FHWA, June 26, 2006

Figure 2.21 U.S. International Trade Value Trendline Projections

Trendline forecasting can be something of a dark art, because it is tremendously sensitive to the choice of starting point and timeframe. Earlier in this report, in Table 2.3, we presented container CAGRs by state, over 5-year and 20-year timeframes. It's worth repeating that while some states showed relatively consistent rates, others – most notably New Jersey, Florida, and Georgia – had radically different growth rates over that 20-year period versus the 5-year period. Recent trendlines are tending to capture "peak performance" in container growth at the national level, and since containers are the largest contributor to the value of international goods, the resulting projection for growth in value is very high. Conversely, recent trendlines capture a relative lull in the performance of Florida's container ports (1.2 percent annual growth over the last five years), which is not consistent with their longer-term performance (9.1 percent annual growth over the past 20 years).

A more conservative – and arguably more realistic – set of regional forecasts has been provided by Global Insight, Inc. for use in this Report. The Global Insight forecasts cover the South Atlantic and Gulf Coast port ranges, and are based on national and world models of trading patterns and their underlying economies.

Table 2.16 Global Insight, Inc. International Trade Tonnage Forecasts

	2005	2010	5-Year CAGR	2020	10-Year CAGR
South Atlantic Ports					
Containers (TEUs)	4,490,707	5,717,623	4.9%	8,764,110	4.4%
Containers (tons)	35,899,620	44,343,135	4.3%	63,684,358	3.7%
Liquid Bulk	52,112,656	55,548,851	1.3%	60,219,572	0.8%
Dry Bulk	57,736,397	60,446,210	0.9%	64,370,461	0.6%
Neo/Break Bulk/Auto	10,892,906	12,306,051	2.5%	15,022,209	2.0%
Gulf Coast Ports					
Containers (TEUs)	4,097,787	5,131,473	4.6%	7,651,529	4.1%
Containers (tons)	36,857,098	44,846,688	4.0%	62,644,011	3.4%
Liquid Bulk	435,842,880	463,076,790	1.2%	494,202,813	0.7%
Dry Bulk	158,147,042	172,959,435	1.8%	194,192,994	1.2%
Neo/Break Bulk/Auto	12,805,726	14,506,476	2.5%	17,592,684	1.9%

Source: Global Insight, Inc.

The fastest growth is for international containerized goods, which comprise very high-value per unit, but represent relatively little tonnage compared to heavy bulk products. Thus, we can see strong projections for growth in container activity (which will drive corresponding strong growth in U.S. trade value), coupled with more modest growth in heavier lower-value commodities (especially liquid and dry bulk). The Global Insight forecasts are more conservative than the FHWA trendline projections; a reasonable approach is to use the two sources together, with the Global Insight figures representing a base case growth scenario, and the FHWA projections representing a more aggressive growth scenario.

These regional forecasts include all Florida ports, along with their South Atlantic and Gulf Coast neighboring ports. Focusing specifically on Florida ports, a set of Florida-specific forecasts was prepared by the Washington Group in 2004. This forecast – shown in Table 2.17 on the following page – anticipates annual value growth rates between 2.5 and 5.5, with an average growth rate of around four percent. This is generally consistent with the Global Insight forecasts for containers, which are the principal drivers of changes in value.

What does it mean to grow at four percent annually? Basically, it means that Florida ports would double their trade over a period of 18 years. A five percent growth rate results in doubling over a period of 15 years; a six percent growth rate results in a doubling over 12 years. While not as spectacular as the recent double-digit growth at Savannah and Los Angeles/Long Beach, this is very solid performance. In our view, the key issue is not "are

Florida ports growing as fast as their neighbors?" As previously noted, the fastest-growing U.S. ports are handling large shares of discretionary hinterland traffic, a service that most Florida ports are not well-suited to provide. Instead, the key issue for us is: are Florida ports capturing all the trade they are appropriately suited for, and are they ready and able to make their optimum contribution to the state's economy and transportation system?

Table 2.17 Washington Group Forecast of Value of International Trade Through Florida's Seaports

Year	Exports (Million $)	Imports (Million $)	Total Trade (Million $)	Exports (Million 1996$)	Imports (Million 1996$)	Total Trade (Million 1996$)	Percent **Real** Growth in Exports	Percent **Real** Growth in Imports	Percent **Real** Growth in Total Trade
2001	17,945	25,509	43,455	19,209	26,290	45,499	-1.36	4.46	1.92
2002	17,861	25,998	43,859	19,209	23,968	43,177	0.00	-8.83	-5.10
2003	17,824	28,227	46,052	19,075	25,766	44,840	-0.70	7.50	3.85
2004	18,713	28,885	47,598	19,926	26,040	45,966	4.46	1.07	2.51
2005	19,826	30,962	50,788	20,800	27,232	48,031	4.38	4.58	4.49
2006	21,079	33,159	54,238	21,680	28,453	50,133	4.23	4.49	4.38
2007	22,506	35,484	57,990	22,583	29,705	52,288	4.16	4.40	4.30
2008	24,014	37,942	61,957	23,509	30,989	54,498	4.10	4.32	4.23
Source: The Washington Economics Group, Inc. Historical data from U.S. Census Bureau. Figures do not include transshipments.									

Source: Excerpted from "A Forecast of International Trade Flows and the Economic Impact of Florida Seaports," the Washington Economics Group, November 23, 2003.

Changes in Trading Partners

The forecasts deal with the issue of how much growth in trade can be expected; an equally important question is: who will this growth in trade be with? Florida's waterborne trading partners in 2003 are summarized in Table 2.18 below.

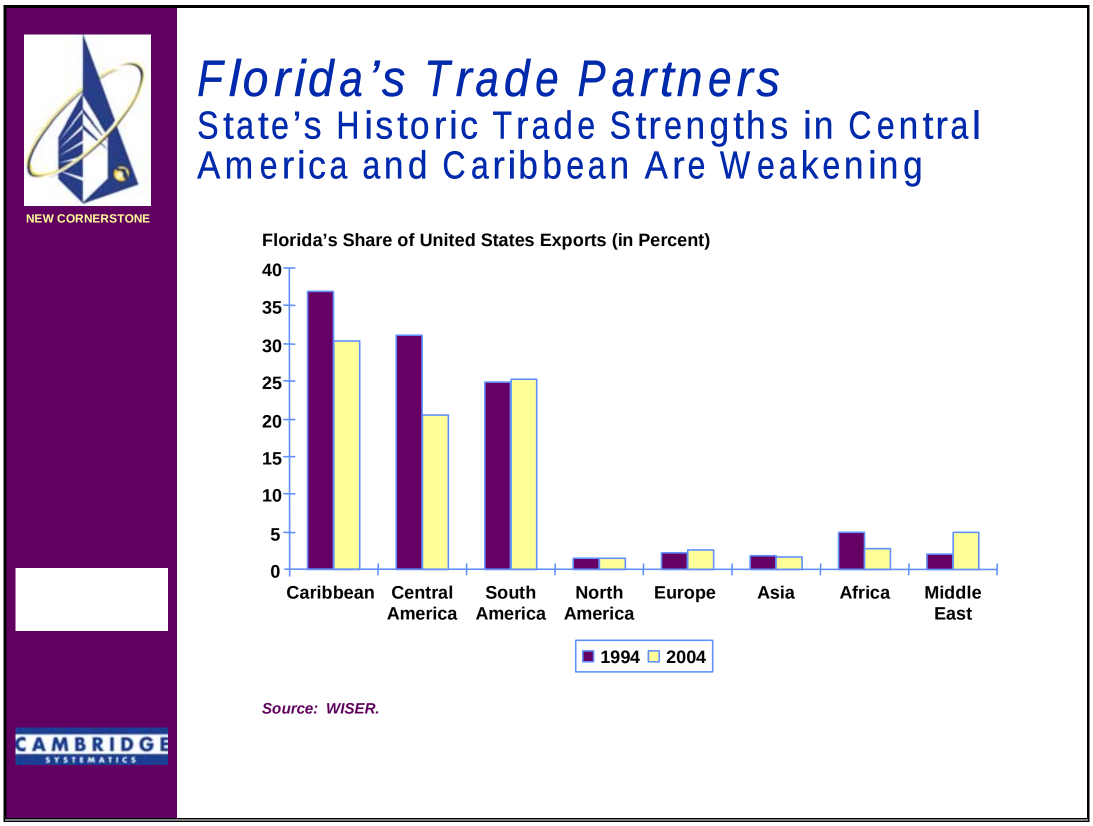
Table 2.18 Florida's International Waterborne Trading Partners, 2003

Region	Trade Tons	Region	Trade Value ($ mil)
South America	13,763,403	Central America	$9,714
Europe/Mideast	10,885,718	Far East	$8,701
Caribbean	10,538,591	Caribbean	$8,412
Far East	7,322,510	South America	$7,968
Canada	4,542,480	Europe/Mideast	$7,741
Mexico	3,760,758	Mexico	$1,513
Central America	3,728,494	Africa	$332
Africa	553,859	Canada	$263
Total	**55,095,815**	**Total**	**$44,643**

Source: Cambridge Systematics analysis of USACOE data.

Historically, Florida has been the market share leader for waterborne trade with the Caribbean, Central America, and South America, due to its physical location and international business and cultural relationships. Florida's market share of Asian and European trade is relatively low, but because these are very high-volume trades, Florida's performance is relatively good in these markets as well.

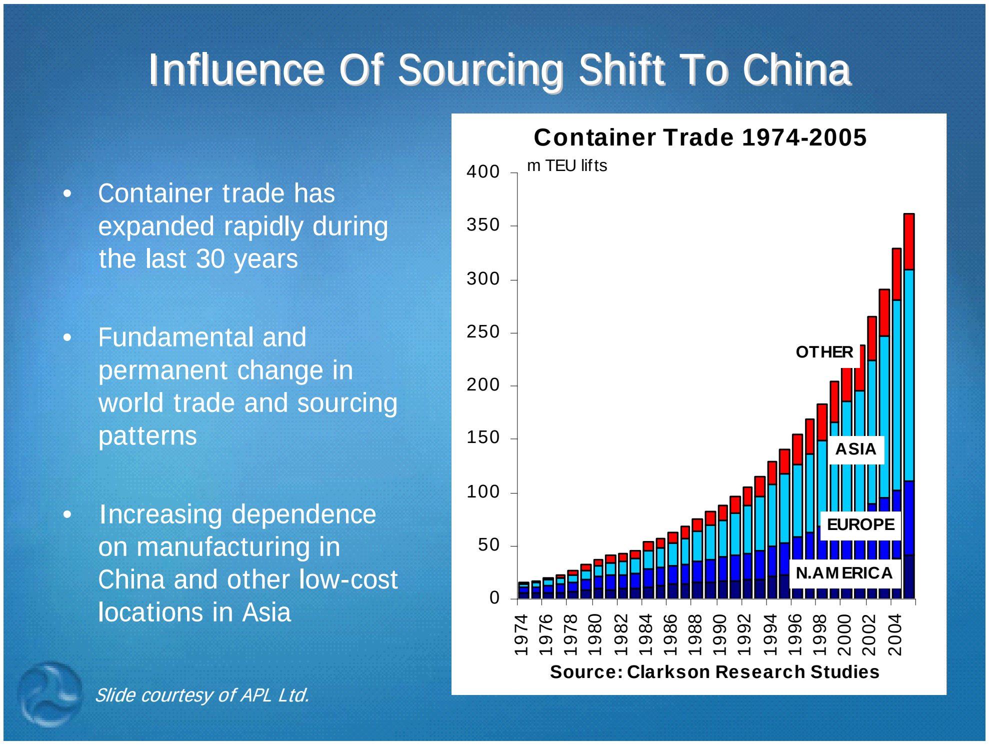
Recent studies have indicated some important trends in Florida's relationship with its key trading partners. The New Cornerstone work sees recent (10-year) declines in Florida's market share of exports to the Caribbean, Central America, South America, and Africa. At the same time, Florida has maintained or expanded its market share of exports to Canada/Mexico, Europe/Middle East, and Asia. Exports account for around 30 percent of Florida's international waterborne tonnage; we do not have access to comparable market share data for imports, and cannot say whether these trends apply to imports as well.



Source: "Florida's Crossroads Economy Progress Report," June 7, 2005.

Figure 2.22 Changes in Florida's Export Partners

The New Cornerstone work also identified Asian trade as a significant opportunity. In the early 1980s, world container trade was relatively balanced among European, North American, and Asian ports. Since then, European and North American container trades have grown substantially, but Asian growth has been spectacular. As shown in Figure 2.23 below, Asian container ports have been by far the fastest growing in the world since 1975, corresponding to the rapid development of industrial production capacity.



Source: Presentation on "The State of the U.S. Freight System" by Jeffrey Shane, FHWA, June 26, 2006

Figure 2.23 Growth in World Container Trade by Region

This trend of preferential growth in Asian trade is likely to continue. As shown in Figure 2.24 on the following page, China was the world's seventh largest economy in the year 2000; by 2020 it is anticipated to rank second, behind the U.S.; and by 2050 it is projected to overtake the U.S. as the world's leading economy. China is already our nation's leading trade partner in Asia, and it is projected to remain so.

China has been an important trading partner for several Florida ports, particularly Tampa, which has a strong trade in bulk products. The effect of growing China trade has already been felt in Florida, with the establishment of Asia-direct container service at Jacksonville.

Growth is Not Uniform: Market Shifts are Coming and Will Affect U.S. Trade and Transportation

(Country GDP Rank in Billions of Real (2003) U.S. Dollars)

2000	2010	2020	2030	2040	2050
U.S.	U.S.	U.S.	U.S.	U.S.	**China**
Japan	Japan	**China**	**China**	**China**	U.S.
Germany	Germany	Japan	Japan	**India**	**India**
U.K.	U.K.	Germany	**India**	Japan	Japan
France	**China**	U.K.	**Russia**	**Russia**	**Brazil**
Italy	France	**India**	U.K.	**Brazil**	**Russia**
China	Italy	France	Germany	U.K.	U.K.
Brazil	**India**	**Russia**	France	Germany	Germany
India	**Russia**	Italy	**Brazil**	France	France
Russia	**Brazil**	**Brazil**	Italy	Italy	Italy

Source: Global Insight World Service

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Source: Presentation on "The Global Economy and the Water Transportation Challenge" by Paul Bingham of Global Insight, Inc. to AASHTO, November 15, 2005

Figure 2.24 Anticipated Growth of China's Economy Through 2050

Changes in Commodities

As shown in Table 2.16, container trade is forecast to grow at more than twice the rate for neo bulk/break bulk/auto traffic, and more than five times the rate for liquid and dry bulk traffic. Thus we can expect to see a continuing shift in favor of containerized commodities. On the import side, containerized commodities tend to be high-value intermediate industrial products and finished consumer goods. Florida's international waterborne commodities are summarized in Table 2.19 on the following page.

Florida's domestic traffic is primarily in bulk, although there are some domestic container services. We generally expect domestic noncontainerized traffic to grow at rates comparable to international noncontainerized traffic. Around 3/4ths of Florida's domestic traffic is inbound petroleum and chemicals; the remainder is split between inbound and outbound dry bulk and general cargo.

Table 2.19 Florida's International Waterborne Commodities, 2003

Commodity Type	FL Tons	Commodity Type	FL Value ($ mil)
Petroleum and Chemicals	22,239,267	Other Manufactured Products	$236,811
Other Manufactured Products	12,175,239	Automobiles and Parts	$96,699
Minerals and Aggregates	11,762,660	Petroleum and Chemicals	$59,275
Agricultural	5,525,574	Agricultural	$42,602
All Other	2,264,585	All Other	$8,860
Automobiles and Parts	1,128,502	Minerals and Aggregates	$2,179
Total	**55,095,827**	**Total**	**$446,426**

Source: Cambridge Systematics analysis of USACOE data.

Changes in Import/Export Balance and Domestic/International Balance

For U.S. ports generally, container traffic is predominantly import, with two loads inbound for every load outbound, so we can expect to see a corresponding shift in favor of import traffic. However, this may vary significantly from port to port. Domestic waterborne trade currently represents more than half of Florida's waterborne traffic, and does not comprise fast-growing commodities, so the trendlines would suggest a growing emphasis on international traffic (driven by container growth) absent other factors.

Table 2.20 Florida's Waterborne Trade Balance in Tons
2003

Domestic Inbound	Domestic Outbound	International Inbound	International Outbound
60,327	11,215	40,514	16,430

Source: Cambridge Systematics analysis of USACOE data.

■ 2.5 Global Trade is Being Driven by a Combination of Political, Economic, Technological and Environmental Trends and Forces, and Florida Must Choose How to Respond

There are many different variables that can and will affect the future of Florida's ports. Many are the products of political, economic and technological forces whose effects are imposed; some can be controlled, or at least influenced by, FDOT and Florida's ports. Critical variables and uncertainties, and the trends underlying them, are discussed below. As an organizing concept, we have grouped them into three categories: the international view, the business of trade, and Florida's issues and choices.

The International View

Big Ships and the Panama Canal. Currently, the Panama canal is a bottleneck in the world's container trade system. Its dimensions limit passage to ships generally not more than 3,900 feet in length and 13 containers across – known as "Panamax" dimensions. Historically, this was sufficient, but over the past 10 to 15 years, much of the new containership capacity coming into service has been in "post-Panamax" sizes. The bigger ships can be 20+ containers across and can require up to 50' channels. They have been deployed primarily in Asian Pacific services, and also in Asia-Europe-East Coast North America services utilizing the Suez Canal, which does not pose a constraint. However, the fastest way between Asia and the U.S. Gulf and East coasts is via the Panama Canal. The Panama Canal Commission plans to widen the Canal to accommodate next-generation mega-containerships, possibly before 2015. If so, there is a tremendous opportunity for Florida ports to capture a larger share of the fast-growing Asia-U.S. trade market.

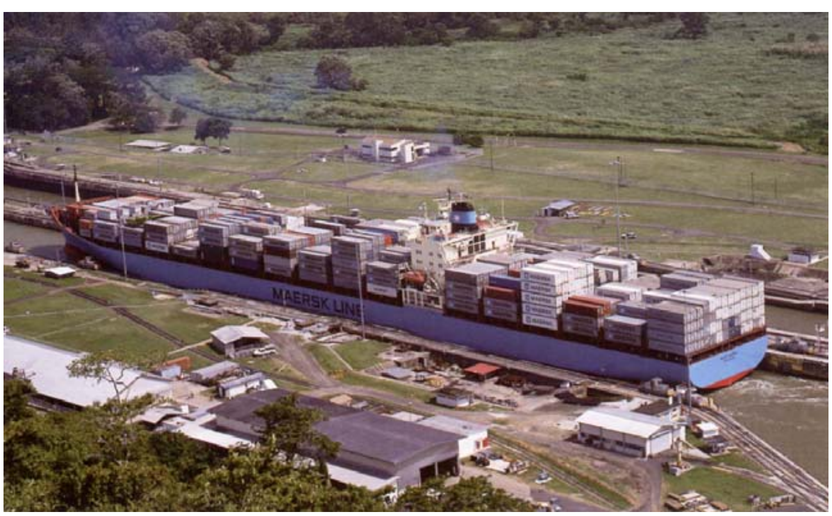

Figure 2.25 Maersk Containership Transiting the Panama Canal

What about China? China, as previously discussed, will continue to be an increasingly dominant force in world trade – not only as a producer of goods for export to the U.S. and other large consuming economies, but also as a consumer of primary materials such as cement, lumber, and petroleum. Without the Panama Canal widening, most of China's trade with the U.S. will continue to be via west coast ports (reaching inland destinations via intermodal rail "landbridge" services) and, to a lesser extent, east coast ports.

What about Mexico? Mexico is the second leading U.S. trade partner, with over $250 billion in annual trade. Florida and Mexico are separated by a relatively small expanse of navigable water. Yet the value of Florida's waterborne trade with Mexico is just $1.5 billion, and Mexico represents just three percent of Florida's waterborne trade value. With growing and well documented congestion problems at the Mexico-U.S. land border, this seems like an excellent opportunity for future growth. The major issues to be overcome are primarily on the Mexico side, where ports and inland access connectors must be upgraded, and where marine border business practices must achieve a level of reliability comparable to the land border.

What about Cuba? This is a much discussed market opportunity among Florida's ports – as well as those in Alabama, Mississippi, and Texas. We believe the opportunity is there and deserves focus, but not to the same extent as Mexico, and certainly not to the same extent as China. For one thing, the Cuba trade, if it opens, will be contested by multiple ports, so the benefits may be diluted. For another, Cuba will not bring much purchasing power to the table, at least not initially. Foreign investment in a more open Cuba would probably generate demand for building materials, which could be a good market for Florida. Florida might also serve as a transload center for rest-of-world traffic to/from Cuba, although other potential transload centers (such as Freeport, Bahamas) offer labor advantages. Cuban tourism should be a fast growing market, and might spur related import-export traffic as well.

What about DR-CAFTA? After much debate, the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA) was finally ratified by the U.S. Congress in July 2005. DR-CAFTA includes the United States, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the Dominican Republic. As of this date, Costa Rica has yet to ratify the agreement, and the Dominican Republic has not implemented it. It aims to foster a freer-trade environment, similar to NAFTA, by reducing trade tariffs on U.S. exports to participating countries. (We understand that most of the goods imported to the U.S. from these countries already enter duty-free under the Caribbean Basin Initiative.) Trade between the U.S. and these countries is valued at $32 billion annually. DR-CAFTA is seen by some as a step toward a Free Trade of the Americas agreement, which would basically cover everyone in North, Central, and South America, as well as the Caribbean, except for Cuba. The hoped-for effect from DR-CAFTA would be to boost trade with the partner countries; although Florida's market share of Central American exports has dropped from around 30% in 1994 to around 20% in 2004, Central America is still Florida's largest trading partner by value, representing around 22% of all international waterborne trade value.

The Business of Trade

Wal-Mart – Always. Wal-Mart helped pioneer what seems to be the dominant retail business model for the 21st century. It is based on a few key premises, including: 1) using information at the point of sale to "tell" the warehouse what to send to the store, which "tells" the manufacturers what to produce; 2) keeping production costs low by offshoring as much as possible; and 3) relying on efficient, reliable, low-cost delivery from manufacturer to warehouse to store via global and domestic intermodal transportation systems. Without efficient and reliable transportation, the system would not work. Critics argue that efficient transportation has been the enabler for U.S. manufacturing jobs to be exported; proponents argue that everyone benefits because trade creates different jobs, and money not being spent on expensive goods is creating benefit elsewhere in the economy. Either way, it doesn't seem to matter to Wal-Mart, because consumers have voted their approval with their wallets, and other major retailers have followed suit. This sea-change in business practice has significantly fueled the growth in containerization, particularly with China.

What shippers want. Repeated surveys of shippers, asking what they want out of the transportation system, generally come up with the same list of factors. Reliability is almost always number 1 – shippers want their goods to arrive when they are supposed to, without being lost or broken. Cost and speed are important, but less so. For high-value, lower-weight, and/or time-sensitive goods, shippers are generally willing to pay more for faster delivery, and are more likely to utilize air cargo, waterborne containerization, intermodal rail, and truck. For lower-value, higher-weight, and/or time-insensitive goods, shippers generally accept slower and less costly transportation by bulk vessel, rail car, and truck. Traditionally, shippers cared more about performance and less about how; but increasingly, major shippers are taking an aggressive role in directing their own transportation logistics,

Carrier strategies. To meet shipper needs, carriers are responding with a variety of technology and service strategies, including:

- Larger ships. As previously mentioned, most of the new containership capacity is in vessels too big to transit the Panama Canal. These larger ships offer greater per-unit efficiency, but can call at fewer ports because of their size; also, they need to minimize the number of port calls so they can maximize the number of trips per year, helping to pay off their enormous cost.
- Hub and spoke/transshipment strategies. To maximize loads on expensive containerships, and to reach markets that larger vessels cannot serve due to channel depth or size of market, carriers have developed hub-and-spoke networks. Small vessels serve smaller markets, large vessels serve major origin-destination points, and the two systems meet at transshipment ports. Some of the world's busiest ports, like Hong Kong and Singapore, are major transshipment centers. Florida historically served as a water-to-water transload center, but much of this function has moved to Freeport, Bahamas; there is still some "land transload" activity, where cargo comes into Florida, is consolidated, then exported through a different Florida port.

- Landside intermodal integration. Carriers partner with railroads to provide generally fast, generally efficient intermodal rail service to the U.S. interior and the opposite coasts. This enables them to offer point-to-point service through a variety of ports.
- Port diversification. Over the past few years, we have seen port strikes on the west coast, temporary meltdowns of the cross-country intermodal rail landbridge, ports closed by hurricanes, and other disruptions. Modern trade logistics absolutely requires reliability, and to minimize risks from unforeseen disruptions, shippers and their carriers are generally trying to spread their risks where possible, by using multiple ports of call on the Atlantic, Pacific, and/or Gulf coasts. Port diversification may lead to increased demand for container activity on the Gulf coast, which could be an opportunity for Florida's ports.
- "Short sea shipping" is a general name for a family of ocean service strategies. One branch involves general coastwise or domestic shipping of noncontainerized commodities, typically on barges or smaller vessels; this type of domestic traffic is relatively common at most U.S. ports. Another branch involves relatively short-distance container moves on water, generally using barges or smaller vessels. This type of operation is extremely common in Europe, but not in the U.S., apart from a few limited services (Galveston-Houston, Norfolk-Baltimore, a recently discontinued Albany-Port of NY and NJ service, etc.). A third branch is basically "trucking on water," the idea being to collect truck trailers at a point near the beginning of their trip, and deposit them at a port near the end of their trip, where a different set of drivers would pick them up. Malcolm McLean, the father of containerization, attempted this with his "Trailer Bridge" service but did not succeed. All of these concepts continue to draw significant interest, particularly from state and local governments, who see these as mitigation strategies for congested highways and urban areas.

Terminal development and financing. Private capitalization and development of ports and terminals has been a key trend over the past 20 years throughout the world, although it is just starting to gain attention in the U.S. with the development of Maersk terminals in Virginia and Mobile. Most of the world's ports, marine vessels, shipping companies, and terminal operating companies are, in fact, not U.S.-owned – and foreign firms already invest in U.S. facilities through their U.S. subsidiaries. Still, there was much concern when Dubai ports announced its plans to purchase P&O Ports, which operates terminals in Miami, Tampa, and elsewhere in the U.S.. aroused considerable concern. Ultimately Dubai Ports agreed that the U.S. holdings would be controlled by a U.S. firm. To effectively access foreign port development capital, the U.S. will need a welcoming approach to foreign investment; but such an approach has to be weighed and balanced against legitimate national concerns regarding security and risk.

Terminal strategies. Worldwide, marine terminals – particularly container terminals – have been asked to do a lot more business without a lot more land. As a result, terminal efficiencies have grown to record levels. Terminals have accomplished this through a variety of mechanisms:

- Deeper channels, where possible, to accommodate next-generation vessels.

- Advanced container cranes and terminal equipment. Some terminals have even automated certain types of functions.
- Dense-stacked storage combined with information systems for planning and tracking the storage of containers.
- Advanced terminal gates. Some are "paperless" while others offer multiple stages.
- Automated security inspection and "weigh-in-motion" systems. U.S. import cargo generally goes through some level of preclearance at its port of origin.
- Incentives to reduce the "dwell time" of containers at the terminal, so that each storage slot can be used more often. These include reduction in "free time," penalties for long-dwelling containers, and provision of on-dock rail to provide fast turnaround.
- Attempts to minimize the effects of empty containers. With, on average, two loaded containers arriving at every U.S. port and only one load going out, the accumulation of empty containers is a big problem for most ports. Some have moved their empties to long-term storage yards off-port; wherever these "container mountains" are visible, there are significant complaints from communities.
- 24-hour operations. Most U.S. ports will load or unload a ship at berth on a 24-hour basis, but most do not operate the gate much outside of normal business hours. The difference is that the ship costs its operator money for every hour it sits at berth, while the container sitting in the terminal at midnight does not. In fact, it would cost many businesses extra to take delivery from a terminal at night, unless that business has a night shift. Many ports have experimented with after-hours gates, with mixed success. Probably the most successful has been the LA/Long Beach "Pier Pass" program, where truckers going through terminal gates at peak periods have to pay a surcharge, which helps offset the costs of after-hours terminal labor. Reports suggest that this operation doesn't really help the terminal operate any more efficiently, but it does shift a significant percentage of truck activity to the off-peak periods, when highway congestion is somewhat reduced. All in all, after-hour gates should be viewed primarily as a potential traffic mitigation strategy.
- "Green Ports." Generally, U.S. ports have recognized that they need to be good neighbors and environmental stewards to survive and grow. Many have attempted to mitigate highway impacts by promoting on-dock intermodal rail, and some have instituted after-hours gates to encourage off-peak trucking. Some have purchased alternative fuels terminal equipment. Ports regularly address a range of other issues, including ballast water management, dredged materials management, marine habitat impact mitigation, vessel emissions, and local land use impacts.
- Inland ports. For at least 20 years, inland ports have been discussed as a way to build more port capacity without expanding port facilities. The idea is to find an inland property and create a transportation umbilical to the port itself, allowing the inland site to function as overflow storage and remote collection/distribution. Today, there are several inland ports in operation, the best known of which is probably the Virginia Inland Port (VIP). The VIP is a 35-acre facility located at Front Royal, VA – several hundred miles from the Virginia Port Authority facilities at Hampton Roads – and is served by NS.

- "Virtual Ports" are systems that allow functions that usually occur on a terminal – dropping off or picking up a chassis, for example – to occur directly between two parties, under the management and control of an information exchange system.
- Chassis pools. This is a relatively simple strategy, but it has taken some time to gain a foothold. Basically, the problem is that in the U.S., container truck chassis are owned by the shipping lines and terminals, not by the trucker. So if a trucker arrives at the terminal to pick up a load, he might also have to stop and swap out his chassis. This wastes the trucker's time and the terminal's space. Some ports, such as VPA, have implemented chassis pools (common ownership of chassis for port-serving trucks) and they report that it is working extremely well.

Railroad strategies. In response to market pressures and opportunities, the U.S. railroad industry has evolved dramatically over the last 30 years.

- Built to haul coal, grain, and other heavy products that were not particularly schedule sensitive, they now offer high-speed, scheduled, premium intermodal services for high-value goods. Intermodal is a major success story for the railroads, and now generates around 1/3rd of rail freight revenues.
- Along the way, the railroads have shed lower volume, less profitable lines through "demarketing" in order to meet their business targets. Their preference has generally been to concentrate resources and traffic on a smaller number of higher volume, higher density lines, leaving local distribution to shortline railroads or trucks. This has not affected ports so much as it has lower volume shippers on lower density lines. Shortlines and, in some cases States, have tried to fill the service gap.
- Intermodal logistics centers (ILC's) are large planned developments combining rail service, highway access, and industrial development opportunities; sometimes these are also referred to as "freight villages." For the railroad, it offers the chance to build a critical mass of demand that will support attractive rail service; for the users, it offers the opportunity for competitive transportation service by two modes (rail and truck). ILC's also offer a logical point to transfer from long-haul through rail service to local "last mile" delivery. Railroads are looking at ILC's throughout the country. The functions of ILC's and inland ports can be complementary.

Trucking strategies. Trucking is critical to ports – most of what moves through U.S. ports gets to or from the port via truck. Truck drivers face a long list of issues which become more unappealing by the day: urban congestion; availability of suitable truck routes, particularly for oversize/overweight or hazardous materials; driver credentialing; in-terminal delays when dropping off or picking up cargo; hours of service requirements; and chronic driver shortages. On the positive side, terminal appointment systems (providing for scheduled delivery) and off-peak gate operations may offer some relief.

Florida's Issues and Choices

In responding to these various trends, Florida's ports and Florida State government face a number of important issues and choices. Many of these are the subject of other studies, or will be. The following discussion is intended primarily as a coordinating framework.

Table 2.21 Florida's Issues and Choices

Issue	Choices
Markets	• How to accommodate growth – a doubling of container demand over 20 years, and continued growth in noncontainerized commodities in the base case • How to accommodating existing markets and trade lanes • How to target and attract new markets – China, Mexico, Cuba • How to provide innovative market service strategies – transshipment, short sea shipping, better integration with warehouse/distribution, ILCs, freight villages, inland ports, etc. • How to compete most effectively with other South Atlantic and Gulf ports for cargo that could and should be handled in Florida
Water Terminals	• How to provide needed improvements to channels, turning basins, and berths • How to provide physical expansion where needed • How to improve efficiency and productivity through technology and operations
Landside Access	• How to provide needed improvements to local access roads and major highways and corridors • How to provide needed on-dock and near-dock rail terminals, along with major north-south and east-west rail corridor connections
Land Use	• How to address encroachment of nonport uses to port fences • How to obtain or preserve land for terminals and port-related industries
Environment	• How to mitigate marine and landside impacts • How to implement needed improvements in timely manner
Security	• How to recover substantially increased costs of equipment and day-to-day operations • How to improve customs inspection procedures and reduce impacts
Risk and Change Funding	• How to provide adequate and flexible capacity to deal with service disruptions • How to provide adequate and flexible funding for "quick response" to challenges and opportunities, through an appropriate combination of Port, state, private, and other resources

3.0 Conclusions

This study has examined a wide-range of global trade trends, in terms of the challenges and opportunities presented for Florida's ports. Generally, the key findings can be summarized as follows:

- Global trade opportunities have created different market niches for different Florida ports.
- Global trade opportunities have made Florida's ports among the nation's most successful and competitive.
- Global trade through Florida seaports has generated significant benefits for Florida's economy and transportation system.
- Global trade is forecast to grow substantially, increasing demand through Florida's ports, but the nature of that trade is likely to shift.
- Global trade is being driven by a combination of political, economic, technological and environmental trends and forces, and Florida must choose how to respond.

These findings are intended as basic research in support of other planning efforts, and from it we can make the following policy recommendations:

- Current FDOT planning efforts impacting seaports – including the SIS, the Florida Rail Plan, the Florida Seaport Economic Impacts Report, and Florida's Seaports: Conditions, Competitiveness, and Statewide Policies – should utilize these findings as appropriate.
- Findings should be shared and discussed with Florida's ports and the Florida Ports Council to ensure that the appropriate issues have been identified and addressed.
- Upcoming FDOT planning efforts impacting seaports – including the South Florida Inland Port Study and the Florida Seaport Strategic Planning Framework – should utilize these findings as appropriate.