Economic Impact and Competitiveness of the West Coast Ports and Factors that Could Threaten Growth

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April 30, 2014

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The West Coast port range is a major gateway of international waterborne trade between the United States and Asia. The ports located in California, Oregon and Washington provide the key linkage between the United States consumer, industrial and agricultural sectors and Asia. As the economies of Asia have developed, the importance of the West Coast ports becoming an economic catalyst has continued to increase. Not only does the growing international Trans-Pacific trade provide jobs and economic stimulus in the West Coast region, but these port gateways and the cargo they handle support the industrial, retail and agricultural sectors throughout the United States. The continued success of these ports is essential to the stability and growth of the entire United States economy.

It is the purpose of this discussion paper to highlight the economic importance of the West Coast port range, both regionally and nationally, to provide an overall analysis of the U.S. containerized cargo market, and to document the structural logistics changes that have occurred in this industry since the West Coast shutdown in September, 2002. In light of the dynamics that have occurred in the U.S. container market since the 2002 shutdown, an assessment of the potential impacts of a work stoppage related to the 2014 contract negotiations is also provided.

As demonstrated in this white paper, the West Coast ports are a critical economic engine for the U.S. economy. Furthermore, the port activity at the West Coast ports represents a significant economic impact to the states in which they are located in terms of job creation and economic value. Any disruption in the operation of these ports would have a significant impact, not only nationally, but on the individual states in which they are located. Furthermore, should terminal charges at the West Coast ports increase as the result of the contract negotiations in 2014, the competitive logistics position of the West Coast ports will be eroded, further resulting in potential job loss, and/or reduced job growth at West Coast ports. Because of the importance of the ports of Los Angeles and Long Beach to the Southern California economy, work stoppages and/or the loss in competitive logistics pricing to reach inland consumption and production markets will have a magnified impact on this region.

The Ports as an Economic Engine

Martin Associates has conducted over 500 seaport economic impact studies throughout the United States and Canada, including economic impact studies for the majority of the ports in California, Oregon and Washington. In total, to quantify the economic impacts of the cargo handled at the terminals operated by the International Longshore and Warehouse Union, Martin Associates developed 27

individual seaport models for the West Coast ports.[1] These models are based on more than 4,200 interviews with terminal operators, freight consolidators, trucking firms, freight forwarders/customshouse brokers, ocean carriers, as well as with railroads, trucking firms, steamship agents and government agencies. For this updated analysis, Martin Associates interviewed more than 175 terminal operators, and used data collected from past interviews that were to develop recent economic impact models for selected West Coast ports. These impact models were modified to reflect containerized cargo, break bulk, and bulk cargo moving via the West Coast port terminals operated by the ILWU. The impacts are estimated for the year 2013, and for 27 specific ports, as follows:

- San Diego
- Long Beach
- Los Angeles
- Port Hueneme
- San Francisco
- Redwood City
- Oakland
- Richmond
- Crockett
- Benicia
- Port Chicago
- Stockton
- West Sacramento
- Eureka
- North Bend/Coos Bay
- Portland
- Vancouver
- Kalama
- Rainier
- Longview
- Aberdeen/Grays Harbor
- Olympia
- Tacoma
- Seattle
- Everett
- Port Angeles
- Anacortes

In 2013, it is estimated that cargo handled at the West Coast ports at ILWU terminals supported nearly 9.2 million jobs throughout the United States. Of these jobs, 401,319 were created directly and indirectly by the handling of the cargo at the West Coast ports, as follows:

- As a result of the cargo and associated vessel activity, 128,842 jobs were created directly at the individual ports, and held by members of the ILWU, terminal operators, steamship agents, freight forwarders, consolidators, CFS and warehouse operators, truckers and railroads. These 128,842 workers earned $7.1 billion of wages and salaries.
- Because these 128,842 workers spend a portion of their wages and salaries for food, clothing, housing, transportation, education and health care, another 198,302 induced jobs are created throughout United States.
- The national purchases by the firms employing the 128,842 employees supported an additional 74,175 indirect jobs in supplying industries.

[1]Cargo at marine terminals on the West Coast, and the associated impacts, that are not under the ILWU jurisdiction were not included in this impact analysis. This excludes primarily liquid bulk petroleum products.

In total, about $35.2 billion of direct, induced/consumption expenditures and indirect personal income was created locally by the handling of cargo at West Coast ports. The businesses providing the cargo handling and vessel services at the West Coast ports (including railroads, terminal operators and stevedores, freight forwarders and customshouse brokers, cargo consolidators, etc.) received $30.9 billion of sales from serving the West Coast cargo and vessel operations. Finally, $9.9 billion of federal, state and local taxes were created directly and indirectly by the port operations.

Economic impacts are also generated throughout the national economy by those firms producing the exports and consuming the imports moving via the West Coast ports. This impact occurs not only in the firms producing the exports or using the imports, but also in the firms providing the goods and services to export producers and the firms providing services to those businesses importing the cargo. By those measures, it is estimated that 8.7 million U.S. jobs are supported by the cargo handled at these ports. These jobs are with manufacturers producing the Asian exports, retailers importing consumer items such as apparel, shoes, furniture and toys and manufacturers using imported parts and materials for further production, such as auto parts and computer components, as well as with the U.S. agricultural community exporting grains, vegetables and meat and poultry; and the mining community exporting dry bulk cargoes such as coal, fertilizers and iron ore. These 8.7 million workers employed with exporters and importers of the cargo moving via the West Coast ports earn $347.9 billion of personal income and pay $96 billion of federal, state and local taxes.

In total, nearly 9.2 million workers throughout the United States were supported by the cargo handled at the West Coast ports at ILWU terminals, and they received $383.1 billion of wages and salaries and paid $106.3 billion of federal, state and local taxes. Finally, the total cargo moving via ILWU terminals at the West Coast ports created a total economic value of $2.1 trillion throughout the United States. This impact represents about 12.5% of the total U.S. $17 trillion Gross Domestic Product in 2013. These impacts are summarized in Exhibit 1.

The importance of containerized cargo handled at the West Coast ports is underscored by the fact that in 2013, the containerized cargo handled at these ports accounted for 8.7 of the 9.2 million jobs, more than 94% of the total jobs, and 97% of the value of the output generated by all cargo moving via the West Coast ports via the ILWU facilities. Exhibit 2 compares the economic impacts generated by all cargo moving via ILWU facilities with the impacts generated by containerized cargo moving via the West Coast ports.

Exhibit 1: Total Annual Economic Impact of Cargo Activity at West Coast Ports, 2013

Impact Categories	Total Impacts of ILWU Facilities on the US Economy
JOBS	
Port Sector	
Direct	128,842
Induced	198,302
Indirect	74,175
Subtotal	401,319
Importes/Exporters	
Direct/Induced/Indirect	8,745,239
TOTAL	**9,146,559**
WAGES/SALARIES (1,000)	
Port Sector	
Direct	$7,094,612
Re-spending/Consumption	$24,357,222
Indirect	$3,701,646
Subtotal	$35,153,481
Importers/Exporters	
Direct/Induced/Indirect	$347,934,117
TOTAL	**$383,087,598**
BUSINESS REVENUE AND ECONOMIC OUTPUT (1,000)	
Port Sector	
Direct	$30,861,349
Importers/Exporters	
Value of Output	$2,076,918,520
TOTAL	**$2,107,779,869**
TAXES (1,000)	
Port Sector	
Direct	$1,997,497
Re-spending/Consumption/Indirect	$7,900,010
Subtotal	$9,897,507
Importers/Exporters	
Direct/Induced/Indirect	$96,377,750
TOTAL	**$106,275,257**
TOTAL ECONOMIC VALUE (1,000)	
Port Sector	
Direct Business Revenue	$30,861,349
Induced Income and Personal Consumption	$24,357,222
Subtotal	$55,218,571
Importer/Exporters	
Economic Value to the Importers/Exporters	$2,076,918,520
TOTAL	**$2,132,137,091**

Exhibit 2: Annual Economic Impact of All Cargo Activity at West Coast Ports Compared to the Economic Impacts Generated by Containerized Cargo at West Coast Ports, 2013

Impact Categories	Total Impacts of ILWU Facilities on the US Economy	Total Impacts of ILWU Container Operations on the US Economy
JOBS		
Port Sector		
Direct	128,842	94,528
Inducd	198,302	145,288
Indirect	74,175	45,870
Subtotal	401,319	285,686
Importes/Exporters		
Direct/Induced/Indirect	8,745,239	8,387,658
TOTAL	**9,146,559**	**8,673,344**
WAGES/SALARIES (1,000)		
Port Sector		
Direct	$7,094,612	$5,179,066
Re-spending/Consumption	$24,357,222	$17,600,770
Indirect	$3,701,646	$2,489,299
Subtotal	$35,153,481	$25,269,135
Exporters/importers		
Direct/Induced/Indirect	$347,934,117	$334,794,482
TOTAL	**$383,087,598**	**$360,063,617**
BUSINESS REVENUE AND ECONOMIC OUTPUT (1,000)		
Port Sector		
Direct	$30,861,349	$24,367,575
Importers/Exporters		
Value of Output	$2,076,918,520	$2,042,293,688
TOTAL	**$2,107,779,869**	**$2,066,661,263**
TAXES (1,000)		
Port Sector		
Direct	$1,997,497	$1,458,172
Re-spending/Consumption/Indirect	$7,900,010	$5,656,384
Subtotal	$9,897,507	$7,114,557
Importers/Exporters		
Direct/Induced/Indirect	$96,377,750	$92,738,072
TOTAL	**$106,275,257**	**$99,852,628**
TOTAL ECONOMIC VALUE (1,000)		
Port Sector		
Direct Business Revenue	$30,861,349	$24,367,575
Induced Income and Personal Consumption	$24,357,222	$17,600,770
Subtotal	**$55,218,571**	**$41,968,345**
Importer/Exporters		
Economic Value to the Importers/Exporters	$2,076,918,520	$2,042,293,688
TOTAL	**$2,132,137,091**	**$2,084,262,033**

In addition to the economic importance of the West Coast ports to the U.S. economy, the activity generated by the cargo activity handled at the ILWU terminals on the West Coast is of particular importance to the states in which these ports are located. Martin Associates developed separate state-wide impact models for California, Washington and Oregon to underscore the importance of port activity in each of these states to the state-wide economies. Exhibit 3 presents the economic impacts created in each state by the ports located in that state. The last line on the chart shows, for each state, the share of the total state gross domestic product in 2013 that was related to the movement of cargo through the ILWU marine terminals located in that state. For the state of California, port activity at the state's ILWU marine terminals supported nearly 3.7 million jobs, and contributed $742.8 billion to the state's economy. This represents about 37% of the California Gross State Product in 2013.

Activity at the ILWU operated terminals in Oregon generated 68,600 jobs in 2013, and contributed $9.6 billion to the Oregon economy. This represents about 4.7% of the Oregon State Gross Product.

Finally, the economic importance of port and maritime activity to the state of Washington is underscored by the fact that the economic impact associated with the cargo and vessel activity at the ILWU facilities in the state generated 524,736 jobs, while the economic value of the cargo activity at the ILWU facilities accounted for more than 60% of the Washington Gross State Product in 2013.

As these findings demonstrate, not only are the West Coast ports a major catalyst to economic health in the U.S., but these ports are major economic drivers in the economies of the states in which they are located. Any disruption of service levels such as a work shutdown or slowdown would have a devastating impact on the national economy, but also on the economies of the states in which these ports are located. The 2002 work shutdown at the West Coast ports had a major impact on the logistics supply chain decisions of key importers and exporters, as will be discussed in the next chapter, and any disruptions of service at these ports in the future will likely have a similar structural impact, in turn eroding the economic importance of these ports to the states in which they are located, as well as to the national economy.

Exhibit 3: Annual Economic Impact of Cargo Handled at ILWU Facilities by State, 2013

IMPACT CATEGORIES	Total Impacts of ILWU Facilities on the California Economy	Total Impacts of ILWU Facilities on the Oregon Economy	Total Impacts of ILWU Facilities on the Washington Economy
JOBS			
Port Sector			
Direct	85,738	5,836	37,268
Induced	88,931	6,181	39,858
Indirect	31,872	4,424	15,868
Subtotal	206,541	16,441	92,994
Importes/Exporters			
Direct/Induced/Indirect	3,463,827	52,196	431,742
TOTAL	**3,670,368**	**68,637**	**524,736**
WAGES/SALARIES (1,000)			
Port Sector			
Direct	$4,266,351	$308,527	$2,519,734
Re-Spending/Consumption	$10,376,619	$752,498	$5,538,375
Indirect	$1,745,396	$185,034	$871,535
Subtotal	$16,388,365	$1,246,060	$8,929,644
Importers/Exporters			
Direct/Induced/Indirect	$137,949,915	$2,329,554	$16,266,972
TOTAL	**$154,338,281**	**$3,575,614**	**$25,196,615**
BUSINESS REVENUE AND ECONOMIC OUTPUT (1,000)			
Port Sector			
Direct	$18,962,658	$1,200,275	$10,698,417
Importers/Exporters			
Value of Output	$713,473,163	$7,631,245	$220,433,995
TOTAL	**$732,435,821**	**$8,831,520**	**$231,132,411**
TAXES (1,000)			
Port Sector			
Direct	$1,236,292	$84,584	$676,680
Re-spending/Consumption/Indirect	$3,512,684	$257,027	$1,721,394
Subtotal	$4,748,976	$341,611	$2,398,074
Importers/Exporters			
Direct/Induced/Indirect	$39,974,751	$638,653	$4,368,528
TOTAL	**$44,723,727**	**$980,264**	**$6,766,602**
TOTAL ECONOMIC VALUE (1,000)			
Port Sector			
Direct Business Revenue	$18,962,658	$1,200,275	$10,698,417
Re-spending and Personal Consumption	$10,376,619	$752,498	$5,538,375
Subtotal	$29,339,276	$1,952,773	$16,236,791
Importer/Exporters			
Economic Value to the Importers/Exporters	$713,473,163	$7,631,245	$220,433,995
TOTAL	**$742,812,439**	**$9,584,018**	**$236,670,786**
SHARE OF STATE GROSS PRODUCT	**37.00%**	**4.65%**	**60.68%**

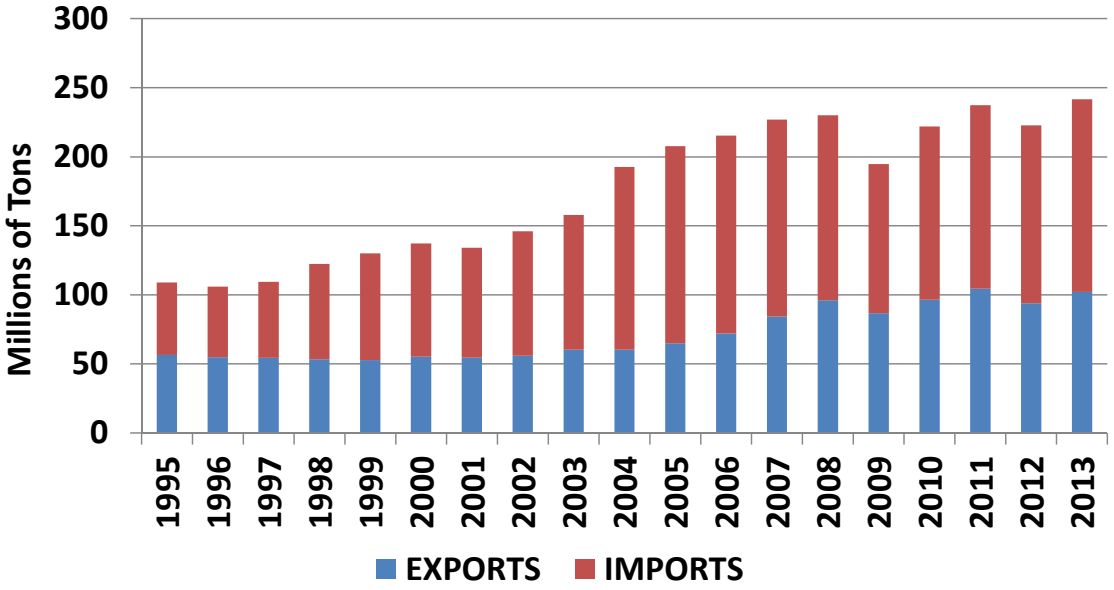
THE DYNAMICS OF THE U.S. CONTAINER MARKET IN THE AFTERMATH OF THE 2002 PORT SHUTDOWN

Because of the demonstrated economic importance of containerized cargo handled at the West Coast ports, an overview of the U.S. container market is presented in this chapter. An understanding of the dynamics of this market is critical in order to further analyze the potential impacts of a disruption in service at the West Coast ports. The impacts of the 2002 port shutdown on the logistics supply chain of beneficial cargo owners (BCO's), and the resulting growth in all-water services between Asia and the U.S. Atlantic and Gulf Coasts are documented in this chapter.

Historical Overview of the U.S. Container Market

International container traffic to and from the U.S. (import and export tonnage) has grown steadily from 1995 to 2007, as shown in Exhibit 4. The exhibit shows there was a significant decline from 2007 through 2009 due to the economic downturn in the U.S. and worldwide economies. Volume increased through 2011, but then declined in 2012, only to rebound in 2013.

Exhibit 4: Historical Volume of U.S. Containerized Imports and Exports

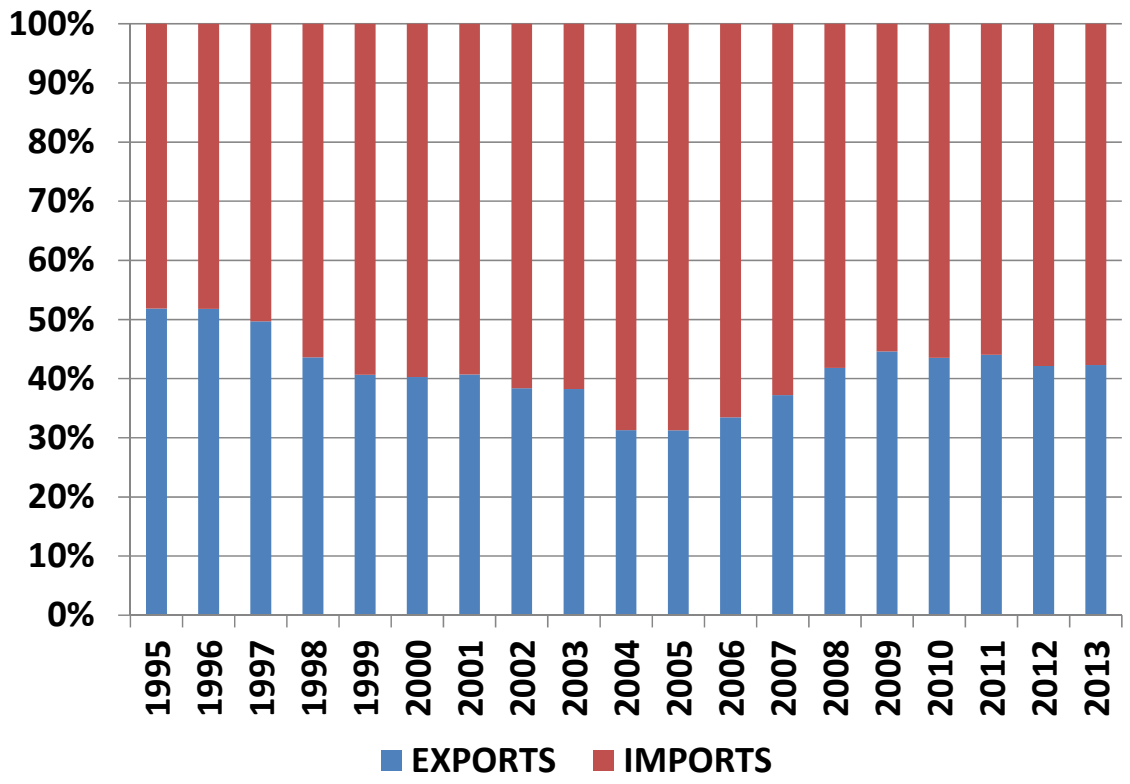


Source: U.S.A Trade On-Line

Over the historical period shown above, containerized imports grew at an average annual rate of 5.6%, while exports grew at an average annual rate of about 3.3%. However, since 2005, the growth of export containerized cargo outpaced the import growth, resulting in a significant gain in the market share of export vs. import containerized cargo. For example, in 2005, export tonnage represented

about 30% of the total container market, and by 2009, exports accounted for 45% of the containerized cargo moving via all U.S. ports. The share of exports has actually fallen in the last two years as exported containerized cargo from the U.S. has slowed compared to import growth. Exhibit 5 shows the shift in the composition of containerized cargo that occurred over the period 1995 to 2013.

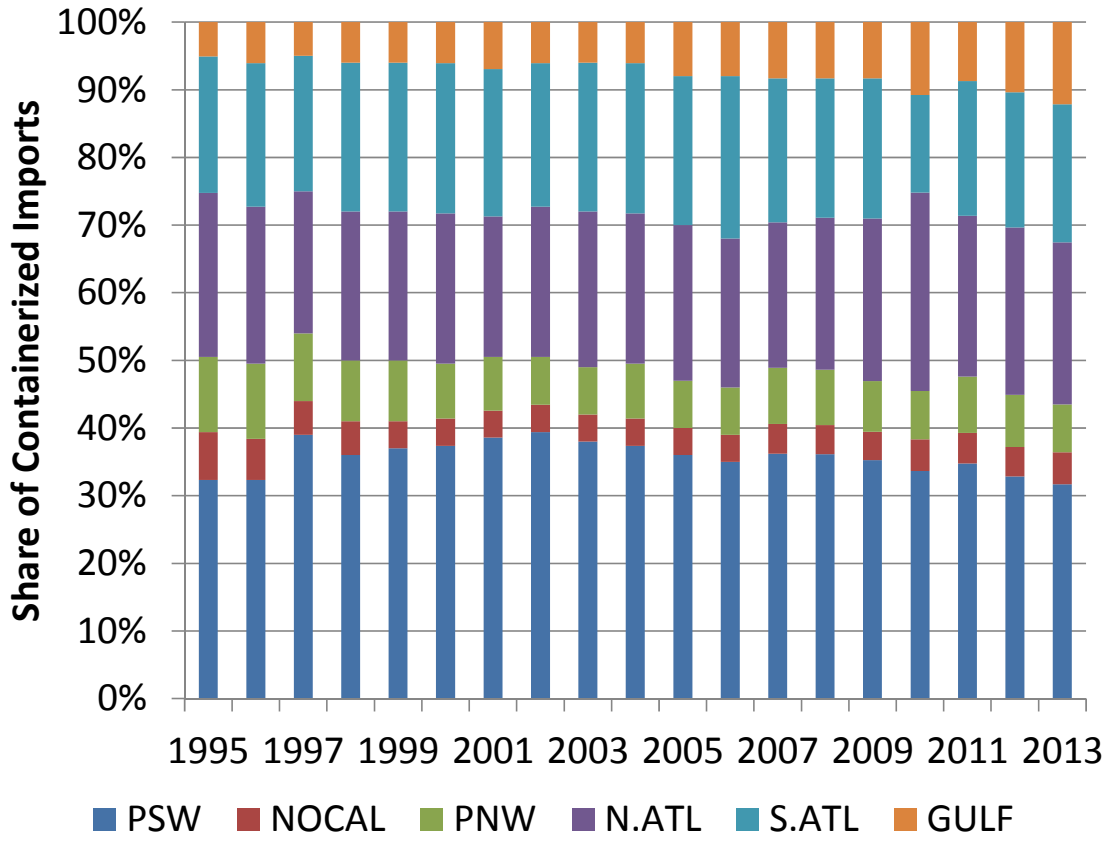
Exhibit 5: Historical Share of U.S. Containerized Imports and Exports Source



Source: U.S.A Trade On-Line

Exhibit 6 shows that Pacific Coast ports (Southern California, Northern California and the Pacific Northwest) have historically handled half of the U.S. import container volume. In 2002, the West Coast ports handled about 50% of the total U.S. imported containerized cargo. By 2013, the West Coast ports share had fallen to 43.5%. It is important to note that the decline in market share at the West Coast ports was driven by the loss in market share at the Southern California ports. The exhibit shows that Southern California ports' market share peaked in 2002 at about 40%, and has been declining since, reaching a 33% share in 2013. The exhibit also shows South Atlantic ports have maintained share in the last several years; with the Gulf and North Atlantic ports actually increasing their share over the last several years.

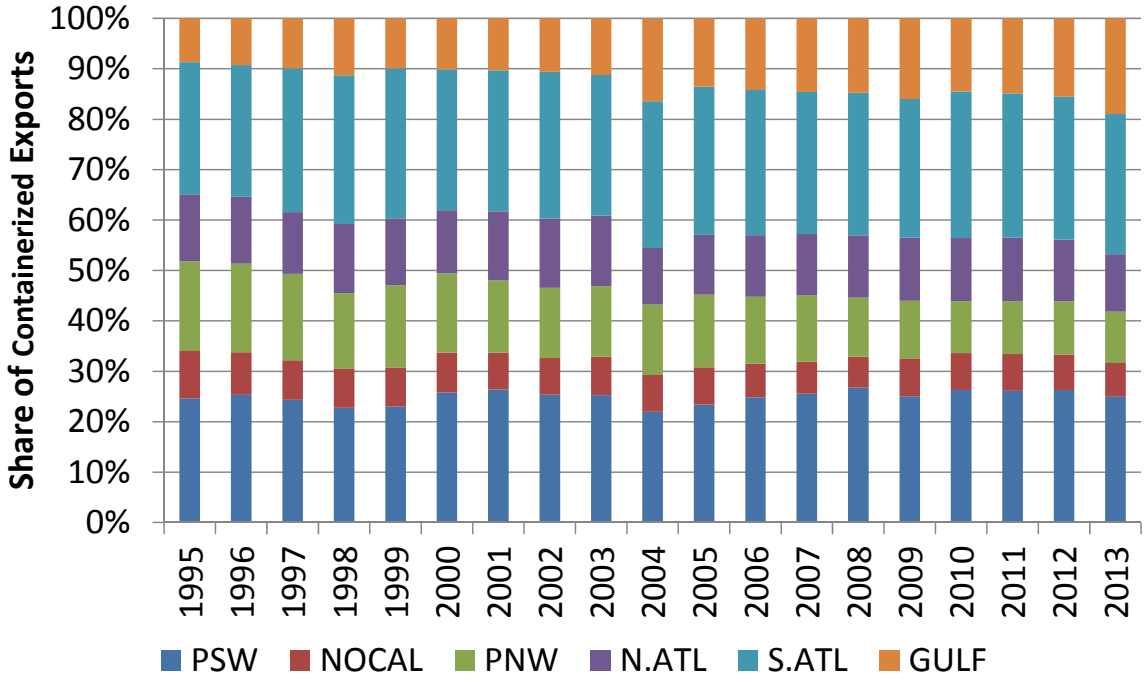
Exhibit 6: Historical Port Range Share in the U.S. Import Container Market (Tons)



Source: U.S.A Trade On-Line

A similar decline in market share for the West Coast ports has also occurred in the container export market. The West Coast ports' share of containerized exports fell from about 50% in 1995, to 40% in 2012. However, unlike the loss of import market share driven by the Southern California ports (shown above as Pacific Southwest), the loss of market share of West Coast ports exports was driven by the loss in export market share in the Pacific Northwest ports. Exhibit 7 illustrates the loss in West Coast market share; the South Atlantic and Gulf Coast ports increased their share of the container export market overtime, which is most likely the result of the increased vessel capacity and equipment associated with the growing import markets from Asia on the Atlantic and Gulf Coasts after 2002.

Exhibit 7: Historical Port Range Share in the U.S. Export Container Market (Tons)



Source: U.S.A Trade On-Line

Dynamics of the U.S. Containerized Cargo Market

This dominance of the containerized trade by the West Coast ports, and in particular the concentration of container activity at the Ports of Los Angeles and Long Beach in the late 1990's through 2002, was driven by the fact that importers viewed these ports as the major port linkage in the supply chain of imported cargo. Prior to the mid to late 1990's, the steamship lines determined the port routings and importers were essentially "port blind" as they selected an ocean carrier, and the carrier decided which port the cargo would be discharged at and how the cargo would be delivered to the customer.

However, as the concentration of large importers such as Wal*Mart, Target, Cost Plus, etc. increased in the late 1990's, these importers invested in large distribution centers in the Los Angeles/Long Beach area to serve as points in the importers' logistic supply chains. As these importers gained bargaining power in terms of contract negotiations with the ocean carriers, they were able to "demand" a San Pedro Bay port (Los Angeles/Long Beach) routing from the carriers. Hence, with the development of the distribution centers and cross dock operations[2] in the

[2] Cross-dock or trans-load operations refer to the activity whereby marine containers are stripped and the contents are loaded into larger 45 and 53 foot domestic trailers as the Asian cargo tends to cube out rather than weight out. The use of the domestic containers reduces the effective surface transportation cost per ton or unit, as more cargo can be placed into these large trailers without causing the trucks to be in an overweight situation.

San Pedro Bay region, the concentration of imported Asian containers at the Ports of Los Angeles and Long Beach increased. Furthermore, the railroads providing intermodal services at the San Pedro Bay ports further increased investment in rail track and intermodal yards to facilitate the flow of containers from the Los Angeles area to the key Midwestern and Eastern consumption centers such as Chicago, Memphis, St. Louis, New York, Atlanta, Columbus, etc. This concentration of containerized cargo import activity continued to increase until several events occurred.

These events are:

- The impact of 9/11 on the distribution supply chain[3];
- The 2002 West Coast port shutdown; and
- Congestion issues in 2004 due to rail meltdowns at the San Pedro Bay ports.

As a result of these events, there has been an increased focus on diversification of containerized cargo through various U.S. ports. This is evident by the growth in container volume at the North Atlantic, South Atlantic and Gulf Coast ports. The growth of all-water service from Asia to the East Coast and Gulf Coast ports has been increasing significantly since 2002.

There are two all-water routings that are available for all-water services – the use of the Panama Canal and the use of the Suez Canal. Each of the routings provides advantages and disadvantages to the use of the intermodal cargo (railed from the West Coast ports). For example, the current dimensions of the Panama Canal limit the size (width and depth) of the vessels that can transit the Canal, and also the transit time using an all-water service to an East Coast port and then a rail move to a Midwestern consumption point is longer than using an intermodal move via a West Coast port. This longer transit time from Asia results in increased inventory carrying costs, and is more pronounced for higher value cargo than for lower value cargo. In addition, ocean carriers prefer to internalize the revenue for the entire trip from Asia to the East Coast rather than sharing the revenue with a rail carrier from the West Coast to an East Coast consumption point.

However, changes are in play to improve the current negatives of using the Panama Canal. The expansion of the Canal to be completed in late 2015 (or early 2016) will allow for the transit of much larger container and non-container vessels, which in turn tend to have a lower per-unit operating cost than smaller vessels. In addition, the ocean carriers are introducing more direct all-water services that are improving the transit times using all-water routings from Asia to the East Coast and the nation's midlands. In addition, with the increased fuel prices since 2010, vessels are operated under a slow steaming service to minimize fuel cost increases, in turn reducing the importance of faster transit time for Trans-Pacific routings compared

[3] The events of 9/11 underscored the potential impact of similar acts of terrorism at seaports, and resulted in recognition of the need to diversify ports of import.

to lower rates via all-water services. The increased transit times are also a contributing factor to the growth in near market sourcing in Mexico and Central America.

With respect to the Suez Canal, the dimensions of this canal do not limit the size of the container ships that can transit, but there is some concern over political instability in the region. The Suez routing from Asia to the East Coast is longer than via the Panama Canal, but as production centers shift to South Asia and India, this routing can in some cases provide very competitive transit times in comparison to the use of the Trans-Pacific routings and the use of intermodal moves from the West Coast to the East Coast. In addition, ocean carriers are increasing India-Europe express services, with the use of Mediterranean ports for transshipment centers for cargo destined further to the U.S. and Europe. The Suez routing is becoming particularly attractive as the production centers are shifting into India and Vietnam.

On-going investment in rail infrastructure in the U.S. will enhance all-water Panama Canal service to the East and Gulf Coasts' ports. Two rail projects will reduce transit times from Atlantic Coast ports into the Midwest. The Heartland Corridor Project will provide significant rail improvements for Norfolk Southern between Norfolk and the Midwest. The Crescent Corridor will provide improved service between the Gulf and North Atlantic. The National Gateway Project will provide significant transit time improvements for the CSX service connecting New York and Baltimore to key Midwestern points, with a focus on the North Baltimore/Toledo (OH) Intermodal Container Transfer Facility (ICTF).

In addition to the investment in the Heartland Corridor Project and National Gateway Project, investments by the Kansas City Southern (KCS) and Centerpoint, near Rosenberg, TX, will provide significant intermodal access into the key manufacturing centers and distribution activity of the Monterey and Saltillo areas of Mexico. Union Pacific is developing an ICTF near Rosenberg, TX which will further improve intermodal access into the Midwest from the West Gulf area. In Florida, the design and construction of ICTFs at JAXPORT's Dames Point, Port*Miami* and Port Everglades are underway.

Domestic market factors should also be considered in assessing future implications as to all-water services. The Port of New York serves the country's largest consumer market. Baltimore is located in the Baltimore-Washington corridor, and currently under-serves this market with a less than 50% penetration rate. Savannah serves the Atlanta market, as well as the Florida market. The Midwestern market is open to competition from North Atlantic, South Atlantic and Gulf Coast ports, as well as the West Coast ports.

Container terminal development will also influence shipping and logistics patterns. The Global Container Terminal in New York, which avoids air draft restriction imposed by the Bayonne Bridge, is densifying its operations through

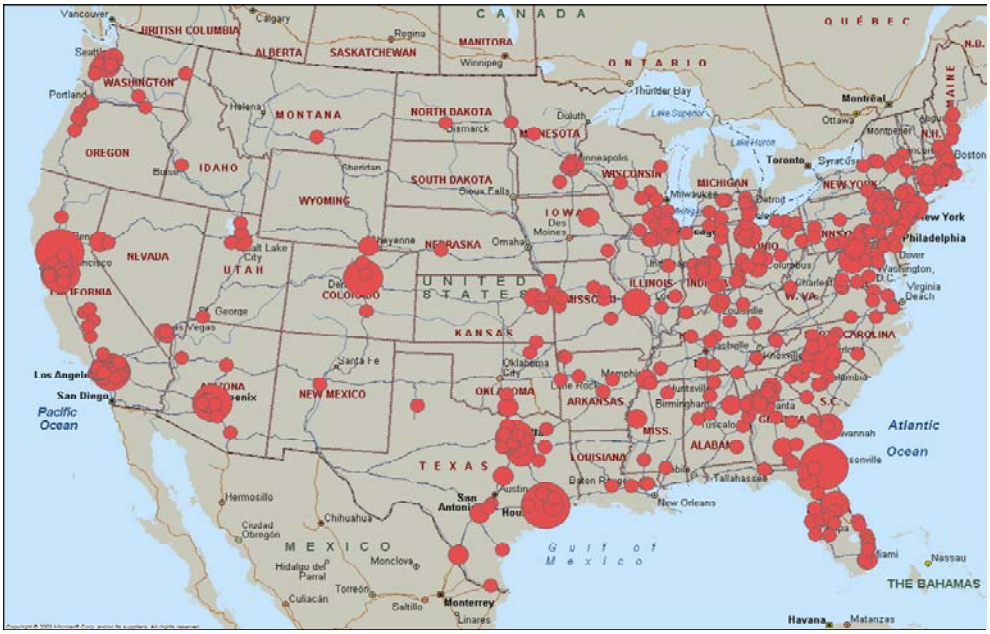
automation, and the Port Newark Container Terminal (PNCT) is undergoing terminal yard expansion, including the purchase of three super post Panamax cranes and the development of on-dock rail.[4] The Port of New York/New Jersey has also announced the intent to address the air draft restriction of the Bayonne Bridge. Baltimore recently entered into a 50-year concession with Ports America Chesapeake for the Seagirt Marine Terminal that has 50 feet of water at the berth. This water depth will allow the Seagirt Marine Terminal the ability to accommodate a fully loaded super post Panamax vessel that requires water depth typically in excess of 47 feet. Four new super post Panamax cranes have just been installed at Seagirt Marine Terminal. Norfolk has expansion capability at Craney Island and Charleston is completing a new terminal at the Charleston Navy Base. JAXPORT has developed the MOL/TraPac Terminal focusing on Asian all-water trade. The ports of Savannah, Charleston and Jacksonville are all pursuing channel depths of 47 feet and deeper.

Along with the growth in port infrastructure on the Atlantic and Gulf Coast ports, distribution centers have also developed since 2002. Exhibit 8 provides a map of the location of the key distribution centers (DCs) in the U.S. The first map indicates the number of DCs by location of the top 25 retailers (the number of DC's in a particular city is reflected by the size of the circle in that location). The second map, shown in Exhibit 9, indicates the location of the DC's associated with the second 26-50 largest retailers in terms of sales volumes. As these maps demonstrate, DC's have developed around the major Atlantic and Gulf Coast ports, as well as inland in such areas as Chicago, Memphis, St. Louis, Columbus and Indianapolis.

The operators of these distribution centers control the cargo and as a result, the steamship line rotation. This has contributed to the growth in all-water Asian services at New York, Norfolk and Savannah as well as Baltimore and Houston.

[4] Super post Panamax refers to the large container vessels in excess of 8,000 TEUS that are currently too large to transit the Panama Canal. These vessels carry containers stacked 22 to 26 rows across the beam of the vessel and require super post Panamax cranes with a 22 to 26 container outreach capacity.

Exhibit 8: Location of Distribution Centers Associated with the Leading 25 Retailers



Source: Chain Store Guide, National Retail Federation

Exhibit 9: Location of Distribution Centers Associated with the 26-50 Leading Retailers

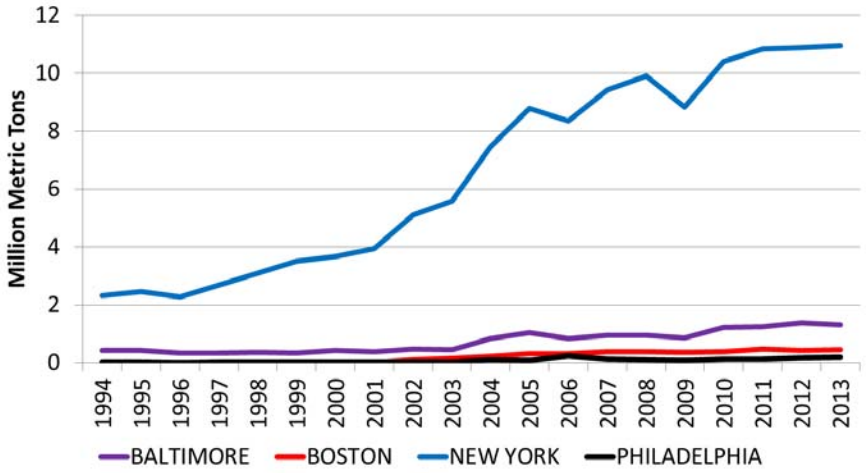
Source: Chain Store Guide, National Retail Federation

Impact of Changing Logistics Patterns on All-Water Services at Atlantic Coast and Gulf Coast Ports

The growth in all-water services (both Panama and Suez Canal routings), driven by the development of distribution centers and terminal development at Atlantic and Gulf Coast ports, is reflected by the growth in Asian imported containerized cargo at these ports.

Exhibit 10 shows the growth in Asian container imports at the North Atlantic ports, and documents the dominance of the Port Authority of New York/New Jersey. The Ports of Baltimore, Philadelphia and Boston have not been key players in the import Asian container market to date. However, with the completion of the 50-foot channel and berths at the Port of Baltimore, the port has experienced a significant growth in imported Asian cargo, and overall containerized cargo at the Port has increased by 9% annually in the past three years, the highest growth rate of any port on the North Atlantic Port range.

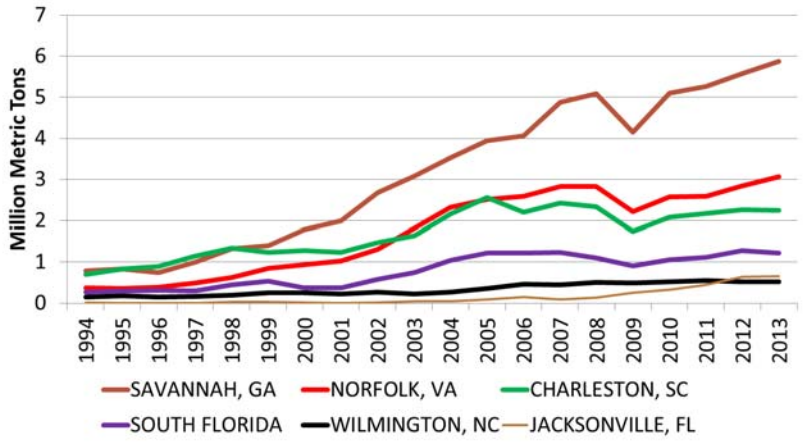
Exhibit 10 Imported Asian Containerized Cargo at North Atlantic Ports



Source: U.S.A. Trade On-Line, U.S. Bureau of Census

The growth in Asian container imported tonnage throughput at key South Atlantic ports is depicted in Exhibit 11. The Port of Savannah has dominated the South Atlantic ports in terms of imported Asian containerized cargo since 1999, reflecting the concentration of distribution centers in the Savannah and Atlanta areas. Since 2005, Norfolk has eclipsed the Port of Charleston in terms of imported Asian containerized cargo. This growth in imported containerized cargo from Asia reflects the change in logistics patterns after 2002, and the accompanying growth in distribution centers at these two ports. South Florida Ports have not shown growth since 2005. The growth in Asian service since the opening in 2009 of the MOL/TraPac Terminal at Dames Point is evident in the Exhibit.

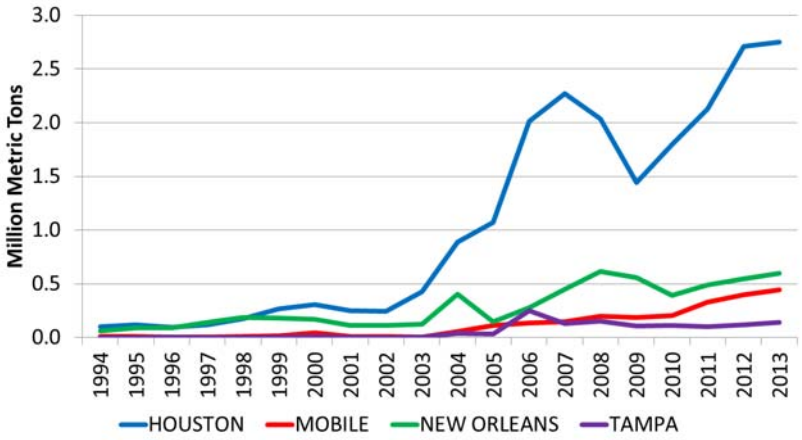
Exhibit 11: Imported Asian Containerized Cargo at South Atlantic Ports



Source: U.S.A Trade On-Line, U.S. Bureau of Census.

Exhibit 12 presents the growth in Asian imported containerized cargo at the Gulf Coast ports, and demonstrates the strong growth in the all-water services at the Port of Houston (and the accompanying growth in distribution center development) as well as the Port of New Orleans, and the recovery of this port from the impact of Hurricane Katrina. The growth in Asian imports at Mobile reflects the growth in operations of the Choctaw Point Container Terminal.

Exhibit 12: Imported Asian Containerized Cargo at Gulf Coast Ports



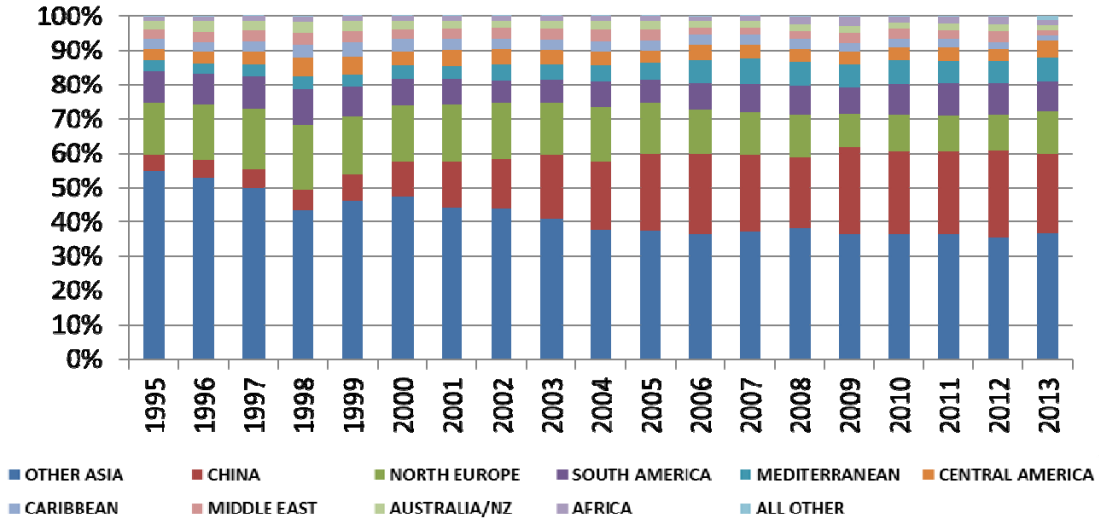
Source: U.S.A Trade On-Line, U.S. Bureau of Census

Supply Sources of Containerized Imports and Implications on All-Water Services

Since 2000, China and other Asian countries have been the source for about 60% of container imports into the United States. During this time, China has steadily been increasing its share of the Far Eastern market to the U.S. However, the growth

in the share of the China sourcing appears to have stabilized beginning in 2009, although the other Asia plus China market still supplies about 60% of all U.S. imported containerized cargo. More recently, the production and manufacturing sources are shifting away from China to other South Asia countries including, India and Vietnam. Exhibit 13 shows the sources of containerized imports over time.

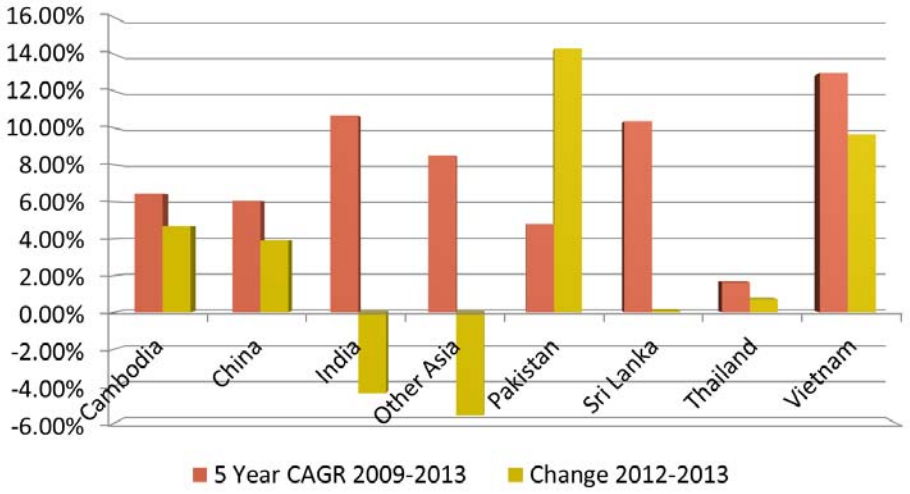
Exhibit 13: Imported Containerized Cargo Tonnage by Overseas Trading Area



Source: U.S.A. Trade On-Line, U.S. Bureau of Census

Exhibit 14 illustrates the growth in imports by key Asian countries from 2009-2013. Over the period, China showed a very modest increase. Vietnam registered the highest compound annual growth rate (CAGR) of more than 12%, followed by India, Sri Lanka, Other Asia and Cambodia. Between 2012 and 2013, Pakistan and Vietnam posted the highest percentage increases.

Exhibit 14: Growth in Key Supply Sources of Asian Imports to the U.S.



Source: U.S.A. Trade On-Line, U.S. Bureau of the Census

The importance of the shifting supply sources is that the Suez Canal becomes the preferred all-water routing (compared to the Panama Canal) for Asian areas west and south of Singapore, and this has implications as to the competitiveness of all-water services with intermodal services from the West Coast ports into the nation's Midwestern consumption points, the subject of the following section.

Exhibit 15: Preferred All-Water Routings by Cargo Production Area

Future Implications on West Coast Market Share

In the previous sections of this chapter various factors that contributed to changes in logistics patterns and the growth in all-water services were identified. Looking forward it is difficult to say with certainty what the future logistics patterns will look like:

- West Coast ports have recognized that demand for these ports has become more elastic; as substitutes, mainly all water services, supporting distribution center networks and Atlantic and Gulf Coast terminal capacity have developed since 2002;
- Truck and rail service at West Coast ports has improved;
- Intermodal rates are more competitive; and
- Growth of environmental policies and infrastructure fees at West Coast ports has stabilized.

Some observers still question whether labor productivity, terminal costs and reliability on the West Coast have improved. These factors will become very important in the summer of 2014, with upcoming ILWU/Pacific Maritime Association contract negotiations.

What is certain is after the projected 2015 opening of the expanded Panama Canal, the composition of the container fleet (especially vessels calling East and Gulf Coast ports) will likely change; as vessels of 8,000 TEUS and greater will be deployed. Actual volume increases through the Panama Canal may be less than anticipated because the factors that have impacted growth in all-water services are now in place, and growth in trade is occurring with areas that are more efficiently served via the Suez Canal. The dynamic changes in all-water vs. intermodal services are slowing. These shifts have occurred since 2002 due to the West Coast port shutdown; changes in distribution center geographic locations and logistics supply chain patterns of importers; development of new container terminals on the Atlantic and Gulf Coast; and intermodal pricing by the railroads that shifted cargo away from West Coast ports.

The West Coast ports have come to realize that the demand for the use of West Coast ports has become much more elastic, and, in fact, substitute port routings via the all-water services are viable. Similarly, the railroads have also found that pricing of intermodal services do impact importers/exporters' port choice decisions, and the higher intermodal rates of the early 2000's actually did impact the West Coast port routings in favor of all-water services. Significant investments in terminal capacity and efficiencies are planned for the Ports of Long Beach and Los Angeles, with the focus on protecting market share after the expansion of the Panama Canal. ***Therefore, in the absence of a disruption of service at the West Coast ports, increases in terminal charges at these ports, and***

increases in intermodal rates, it is not likely that the erosion of West Coast container market share will continue at the same rate since 2002.

East and Gulf Coast ports will have to compete to handle the larger sized vessels that will be deployed on the Suez, as well as on the Panama Canal, based on infrastructure including channel depth to accommodate larger vessels, berth capacity to handle vessels with lengths of over 1,000 feet, and crane outreach capability to handle the wider ships. All of these infrastructure needs require capital investment. East and Gulf Coast ports will also need to compete based on local market and access to discretionary cargo for both truck and rail. In addition to the growth in infrastructure at U.S. East Coast and Gulf Coast ports to accommodate the direct calls of the larger size vessels deployed after the expansion of the Panama Canal, the development of transshipment hubs in the Caribbean will likely continue, such as those in place in the Bahamas, Dominican Republic, Jamaica, Puerto Rico and Panama. Other transshipment hubs designed to handle the larger vessels transiting the Panama Canal after the expansion in 2016 are planned in Cuba and Trinidad. At these transshipment ports, the larger vessels transiting the Panama Canal from Asia will discharge containers at these hubs, and then return to Asia. In addition, these transshipment hubs will also represent an opportunity to mix northbound and southbound cargoes headed to and from Asia and the U.S. without the ability to handle a fully loaded post Panamax vessel (8,000 TEU capacity and greater) by offering a 47 to 50 foot channel. U.S. South Atlantic Ports will have difficulty in competing with these transshipment hubs and attracting direct first in-bound service.

The ability of Atlantic and Gulf Coast ports to handle larger vessels is critical because of the increased deployment of larger vessels via the Panama Canal after 2015, as well as via the Suez Canal. The growth in the size of the container fleet is underscored by Exhibit 16, which indicates that 43% of the container vessels currently on order are in excess of 8,000 TEUS, and will require a channel depth ranging from 47 to 50 feet. Compared to the current fleet composition, approximately 7% of the current world container fleet is in excess of 8,000 TEUS. Therefore the size of the container ships will continue to increase in the future and will require a 47 to 50-foot shipping channel.

Exhibit 16: Size Distribution of Current World Container Fleet and Order Book, as of 2012

TEU Size Class	Current Fleet	Order Book
<999	1,099	32
1000 < 1999	1,286	87
2000 < 3999	1,046	89
4000 < 5999	921	110
6000 < 7999	250	42
8000 < 9999	280	106
> = 10,000	111	165
Total	4,993	631

Source: Institute of Shipping Economic and Logistics, Shipping Statistics and Market Review, 2012

The majority of the ports that will compete for the new services consisting of larger container vessels do not have channel depths in the necessary 47 to 50 foot range. Only three Atlantic Coast ports currently have a 50-foot draft to accommodate a fully-laden 8,000 TEU plus ship: New York, Baltimore and Norfolk. Port*Miami* will join this list in 2015, with the completion of its 50-foot channel. Exhibit 17 shows the current and planned depth at key U.S. ports.

Exhibit 17: Current and Planned Depths at East and Gulf Coast Ports

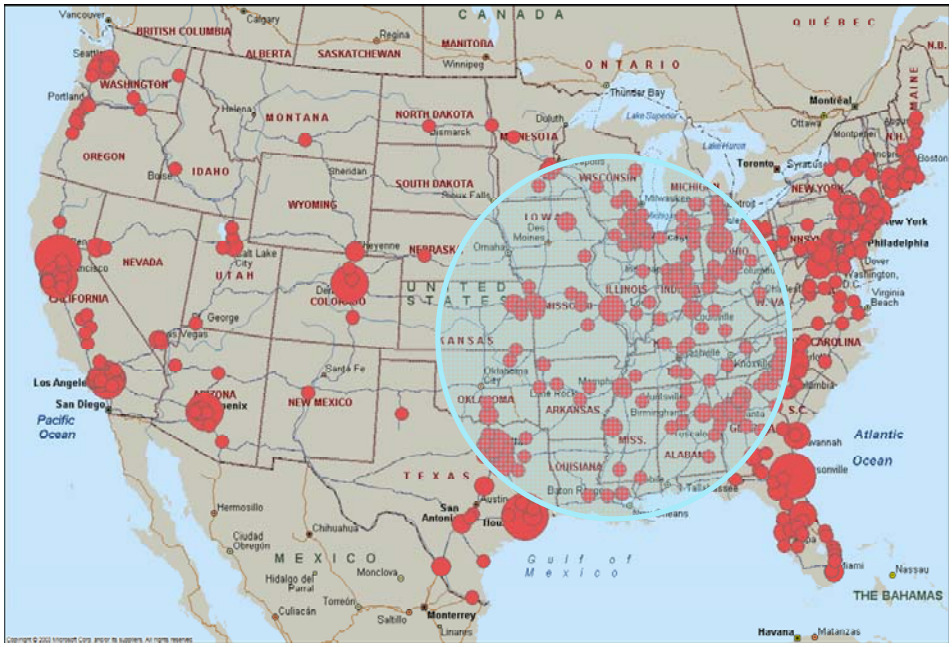
State	Port Name	Current Depth	Planned Depth
Maryland	Baltimore	50	50
Massachusetts	Boston	40	48
South Carolina	Charleston	45	45+
Texas	Corpus Christi (Authorized)	45	55
Delaware River	DE, PA, NJ Ports Portions Underway	40	45
Texas	Freeport (Authorized)	45	55
Texas	Houston-Galveston	45	45
Florida	Jacksonville	40	47
Florida	Manatee	40	40
Florida	Miami (Under Way)	42	50
Alabama	Mobile	45	45
Louisiana	New Orleans	45	45
New York	New York (Underway)	45-50	50
Virginia	Norfolk/Hampton Roads	50	55
Florida	Port Everglades	42	47
Texas	Sabine Naches	40-42	42-48
Georgia	Savannah	42	47
Florida	Tampa	43	43

Source: Martin Associates

Implications and Competitive Logistics Cost Analysis to Serve Containerized Markets

Given the dynamics of the U.S. container market, it is obvious that in order for the West Coast ports to preserve and perhaps grow market share, the ability to compete with the East Coast and Gulf Coast ports from a logistics cost perspective to serve the major areas of distribution center clusters is key. As noted, the battleground for market share will occur in the Chicago, Columbus, Indianapolis, St. Louis, Nashville, Atlanta and Dallas markets. Exhibit 18 shows the locations of the major distribution centers, which also correspond to the key consumption and population markets in the U.S. The transparent oval on the map indicates the competitive battleground between the West, Atlantic and Gulf Coast ports.

Exhibit 18: Location of Distribution Centers Associated with the Leading 25 Retailers

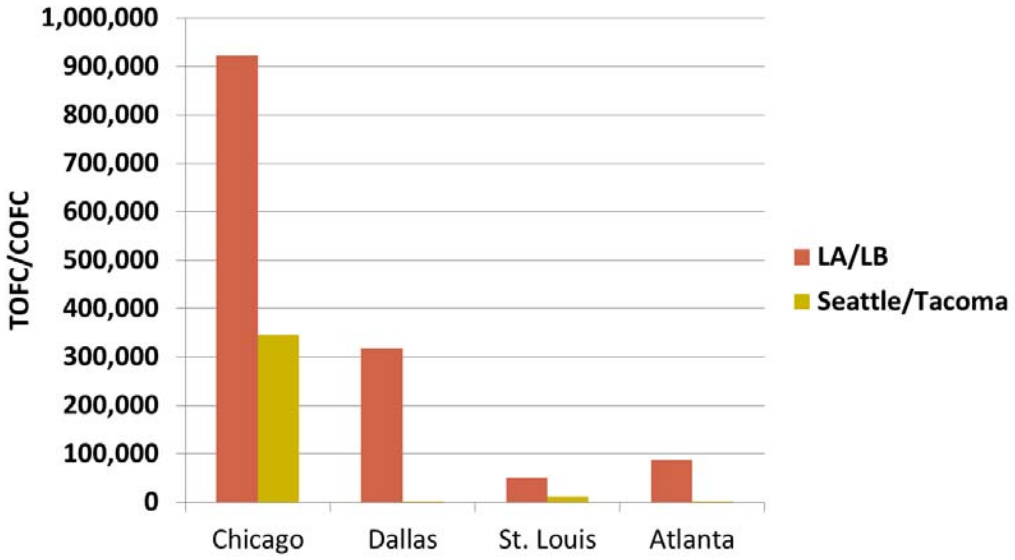


Source: Chain Store Guide, National Retail Federation

Martin Associates developed a logistics costing model to estimate the competitive advantage, by trade route, of the port ranges to serve the specific inland markets. The logistics cost model includes the voyage costs, terminal costs (stevedoring, terminal operations, pilotage, tugs, infrastructure fees, and ILWU and ILA assessments), intermodal rates and direct truck rates. Inventory carrying costs and drayage costs are not included in the model. The logistics costs are developed by trade lane – Hong Kong, Singapore and Nhava Sheva, India. The ports included in the analysis are the San Pedro Bay ports of Los Angeles and Long Beach, the PNW ports, and the Atlantic Coast ports of New York, Baltimore and Savannah. These

Atlantic Coast ports reflect ports with growing all-water Asian services, through both the Suez and Panama canals. The inland points were identified based on the volume of intermodal rail traffic moving from the West Coast port regions into each inland point, as determined from the 1% Waybill Sample Data Base developed by the Surface Transportation Board of the U.S. Department of Transportation. These intermodal rail volumes for the most recent year available, 2011, are shown in Exhibit 19.

Exhibit 19: Intermodal Rail Volume from West Coast Port Regions to Key Inland Destinations, 2011



Source: Surface Transportation Board, 1% Waybill Sample

Exhibits 20-22 demonstrate the logistics costs for each trade route. These costs include the terminal charges, pilotage, towing, stevedoring, infrastructure fees, labor benefit assessments, and port fees; intermodal rail rates and linehaul truck rates; and voyage costs between each coastal port and the three Asian ports of Hong Kong, Singapore and Nhava Sheva (India). It is to be emphasized that the inventory carrying cost per container, about $50 per day, is not included in the logistics costs, nor is the dray from the rail yard to the ultimate destination. The inclusion of inventory carrying costs could add about $350 per container move for use of the Atlantic and Gulf Coast ports, reflecting about a 7-day transit time differential via the all-water service. Truck drayage from the rail yard to a destination could range from $250 to $500 per container. Therefore, for truck moves from the East Coast ports to an inland point, the dray cost would not exist and would likely offset the inventory carrying cost penalty of using the Atlantic or Gulf Coast port. In contrast, for rail moves from the Atlantic and Gulf Coast ports, the inventory carrying cost would add about $350 per container to inland points.

It is the relative cost differentials that are most important, indicating that the West Coast ports currently enjoy a small cost savings to inland points such as Chicago and St. Louis for the Hong Kong trade route, while all-water services are more competitive to serve Columbus, Atlanta and Dallas. It is to be emphasized that currently the West Coast ports serve these inland markets intermodally, even though the logistics costs may be more via this routing. Frequency of service, transit time and seasonality requirements may override the cost advantages. However, as additional all-water services are deployed, the Atlantic and Gulf ports will become increasingly competitive with the West Coast ports to serve the inland markets, as additional vessel capacity will add to the ability to serve these inland points more frequently and with a reduced transit time.

Furthermore, as the exhibits indicate, the Atlantic and Gulf Coast ports are very competitive on the Singapore and Nhava Sheva trade lanes, and as more services are deployed through the Suez Canal, it is likely that trade will move towards all-water routings. In addition, with respect to all-water services, the Suez Canal routing is more competitive than the Panama Canal routing for cargo originating from Singapore and points south and west.

Exhibit 20: Least Cost Routing To Serve Key Inland Points- Hong Kong Routing Cost per Container Move

Port	Hong Kong to:				
	Chicago	Atlanta	Dallas	Columbus	St. Louis
LA	$4,582	$5,477	$4,909	$5,118	$4,578
Seattle	$4,093	$4,779	$5,433	$4,847	$4,478
New York	$4,825	$4,923	$5,836	$4,559	$4,766
Baltimore	$4,529	$4,856	$5,772	$4,242	$4,519
Savannah	$4,858	$4,001	$5,769	$4,791	$5,052
Houston	$4,961	$5,639	$4,497	$5,639	$4,880
Prince Rupert	$5,159	NA	NA	NA	NA

Exhibit 21: Least Cost Routing To Serve Key Inland Points- Singapore Routing Cost Per Container Move

Port	Singapore to:				
	Chicago	Atlanta	Dallas	Columbus	St. Louis
LA	$4,938	$5,833	$5,265	$5,474	$4,934
Seattle	$4,510	$5,196	$5,850	$5,264	$4,895
New York	$4,438	$4,536	$5,449	$4,172	$4,379
Baltimore	$4,215	$4,542	$5,458	$3,928	$4,205
Savannah	$4,669	$3,812	$5,580	$4,602	$4,863
Houston	$5,035	$5,713	$4,571	$5,713	$4,954
Prince Rupert	$5,576	NA	NA	NA	NA

Exhibit 22: Least Cost Routing To Serve Key Inland Points- Nhava Sheva Routing Cost Per Container Move

Port	Nhava Sheva to:				
	Chicago	Atlanta	Dallas	Columbus	St. Louis
LA	$5,627	$6,522	$5,954	$6,163	$5,623
Seattle	$5,198	$5,884	$6,538	$5,952	$5,583
New York	$3,979	$4,077	$4,990	$3,713	$3,920
Baltimore	$3,757	$4,084	$5,000	$3,470	$3,747
Savannah	$4,211	$3,354	$5,122	$4,144	$4,405
Houston	$4,577	$5,255	$4,113	$5,255	$4,496
Prince Rupert	$6,265	NA	NA	NA	NA

It is important to emphasize that within the logistics cost chain, the port sector can only control one element of the cost chain – the port and terminal charges. It is to be emphasized that the terminal charges at the West Coast ports are significantly higher than those on the East and Gulf Coasts. For example, an average West Coast terminal/port charge per container (including infrastructure fees, stevedoring and terminal fees, assessments, port charges, towing and pilotage) averages between $320 and $420 per move compared to an average box rate of $240 for the Atlantic Coast port range. This differential also reflects the fact that an average ship production rate is about 25-28 moves per gang hour on the West Coast compared to 35-42 moves per gang hour on the Atlantic and Gulf Coasts.

As depicted by the logistics cost analysis, the total logistics cost of using West Coast ports versus Atlantic and Gulf Coast ports to serve these inland points is very competitive with the cost of using the all-water services. Any increases in terminal charges would have competitive cost impact, putting at further risk the intermodal cargo moving via the West Coast ports. The impact of increases in terminal charges are more critical on trade moving via the Suez Canal from sources such as India, Vietnam and Cambodia, all areas identified as growing supply sources for the U.S.

ASSESSMENT OF THE ECONOMIC IMPACT OF A WEST COAST PORT SHUTDOWN

Because of the demonstrated importance of the West Coast ports to the United States economy, it is critical that port operations continue uninterrupted. Operational interruptions at the ports will have a magnified impact throughout the United States economy. This magnification of nationwide impacts of a port shutdown became a reality on September 29, 2002 when the West Coast ports were shut down for an 11-day period.

Impact of the 2002 West Coast Port Shutdown

The 11-day port shutdown demonstrates the importance of the West Coast ports to the U.S. economy. Martin Associates quantified the economic impact of that shutdown in 2002. To quantify the economic impacts of the 11-day lockout, Martin Associates conducted more than 200 interviews with terminal operators, ocean carriers, and importers and exporters using West Coast ports. In addition, Martin Associates conducted extensive literature searches to identify the impacts to key import and export sectors of the Untied States.

The disruption of port operations had a cumulative effect not only on the port industry and its employees, but also on exporters and importers, as well as the entire transportation infrastructure and supply chain of the United States. The impacts spread throughout the nation as follows. Initially, the ocean carriers could not discharge the cargo for the 11-day period the ports were closed. During this time, the ocean carriers incurred operating costs while at anchor, including crew costs, fuel costs and insurance costs. Furthermore, during this time, the carriers could not transport cargo and, hence, did not receive additional revenue. Due to the congestion at the container terminals and the backlogs that occurred during this time, the majority of the container vessels actually missed an entire voyage rotation. After the 11-day delay, the container vessels experienced an average loss of 25 days on their schedule. During this time, daily operating costs continued to be incurred and the vessels lost the additional 25 days of revenue potential. One option for the carriers was to re-route the cargo through alternative ports, including ports in the Pacific Northwest, Mexico, Canada and the U.S. East Coast. As a result of the re-routing, additional charges were incurred by the importers to move their containers back to the ports where the boxes were originally scheduled for discharge from the ship, as well as to move the cargo to the final inland destination. This not only resulted in increased transportation costs, but also in increased transit times that added to the delays experienced by the importers and exporters.

The next wave of impacts occurred at the marine terminals, as daily operations ceased. Wages and revenue earned by the truckers, longshoremen, CFS operators, warehousemen, tugs, pilots, etc. were lost for the 11-days. However, the

fixed operating costs to the terminal operators continued to be incurred, without any offsetting revenue. Interviews with the terminal operators were used to develop a daily cost per container. The container terminal operators experienced growing congestion. Terminal capacity was stretched, as boxes traditionally using chassis were grounded.

After the 11-day shutdown, congestion continued to mount at the terminals, and equipment shortages became acute. Due to yard congestion, overall costs of operations increased per box per day, as productivity was impaired. Ship load and discharge productivity also was reduced due to the yard congestion, falling about 20% from normal vessel operation productivity. These conditions persisted from 5 to 7 weeks after the shutdown.

In addition to the yard costs, the trucking industry was very hard hit. Truck retrieval of containers from the yard was very slow, and truckers' income, which is based on loads moved per day to and from the port, was severely impacted. Truck turn time in the ports more than tripled during the 5 to 7 week recovery period, thereby reducing the number of truck trips per driver to the yard to 1 per day, if that.

A large number of freight consolidators were shut down during the work stoppage. After the ports reopened, consolidators needed to find additional storage capacity for the surge in boxes, which resulted in increased drayage costs to distant container yards, increased storage costs and gate costs, as well as delays in receiving cargo from the terminals. Additional delays were passed on to the importers and exporters, or carried by the consolidators.

The intermodal trains serving the West Coast ports were halted during this time period. Equipment associated with these trains incurred demurrage and locomotives were reassigned to other areas. Domestic users of marine equipment for repositioning moves experienced equipment shortages as the work stoppage continued. Based on discussions with railroad scheduling officials, it was necessary to find rail siding throughout the nation's rail system to store about 150 miles of double stack rail cars. The railroads imposed an embargo on westbound containers and grain in order to minimize congestion at the ports. After the ports reopened, the railroads instituted a quota system to allocate rail cars to ports. One major railroad reported a ***daily cost*** of the shut down at between $4 and $5 million in terms of lost operating revenue and direct costs.

Finally, importers and exporters using the West Coast ports were impacted in several ways. Interviews with the major importers and exporters in key industry sectors were conducted to assess these impacts. The impacts range from lost sales to increased inventory carrying costs, to increased use of air cargo at a much higher freight rate. The magnitudes of the impacts are quite staggering. The importers and exporters indicated that, on average, shipments were delayed from three to four

weeks after the 11-day shutdown. Furthermore, a large number of retailers indicated that inventories were increased during the summer months in anticipation of a port shutdown in the fall. While this stockpiling of inventory minimized the impacts on lost sales during the holidays, it resulted in substantial inventory carrying costs for the retailers. It was estimated that inventory carrying costs represented about 10% of the daily value of the cargo. In general, the research indicated that about 10% of import values were lost during the 11-day period.

Within the retail sector, toys, apparel and electronics were hardest hit. Based on the interviews, many retailers used air freight during this time at rates in excess of 15 times the level of ocean freight. Those retailers that diverted cargo to East Coast ports paid nearly a 50% rate premium to divert to the East Coast. Importers of apparel were especially impacted as contracts were canceled or honored at reduced rates due to the missing of deadlines. On average, it was estimated that about 10% of the key import cargo such as apparel, shoes and electronics used air cargo during the 11-day shutdown. Another 2% of daily imports during the 11-day shutdown were diverted to East Coast ports.

With respect to manufacturing, auto production was particularly impacted. The NUMMI plant (Toyota-GM joint venture facility in Fremont, CA) closed temporarily during the shutdown and this, in turn, lead to the closing of an auto parts manufacturer plant that supports this operation. Other auto plant closings were reported by Honda Motor Company and Mitsubishi Motors Corporation. For example, the Honda plant in Lincoln, AL that produces 650 Odyssey vans and V-6 engines per day stopped operations for three days while the Mitsubishi plant in Illinois halted production for several days.

On the export side, the nation's agricultural sector was most impacted. The West Coast ports are critical for the export of frozen beef, as more than 80% of all U.S. frozen beef exports move via the West Coast ports. The West Coast ports also handle 80% of U.S. hides and skins exports, 80% of frozen French fries exports, and 70% of U.S. pork exports. Grain is the key bulk agricultural export moving from the West Coast ports, particularly the Pacific Northwest ports. The more than 20 million tons of grain that was exported via the West Coast ports in 2002 supported nearly 60,000 direct, indirect and induced jobs in the U.S. economy. Interviews with grain exporters and meat export associations, as well as with producers, identified the impacts in this sector ranged from a 5% loss in market share (a $135 million loss) for U.S. grain exported from the Pacific Rim to increased refrigeration charges due to the delay in the meat exports.

Importers of fresh fruits were likewise impacted, with loss in sales of bananas due to the shutdown estimated in excess of $1 million.

It was very difficult for many importers and exporters to provide precise dollar impacts of the West Coast port shutdown since it was difficult to isolate these

impacts from those generated by the weak economy. Nevertheless, it was possible to develop an estimate of the lost economic impacts as the result of the shutdown. It is to be emphasized that not only did the shutdown impact the importers and exporters directly, but the shutdown also impacted supporting industries in the U.S. economy, as well.

To estimate the impact on the importers and exporters, Martin Associates developed a port user model to translate the value of specific imports and exports by 4-digit commodity code into direct jobs, wage and salary income and revenue. The Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II) was then used to estimate the indirect impacts in supplying firms (to the importers and exporters). Martin Associates next developed a set of impact measures based on the interviews that were then used to estimate the economic impact of the 11-day work shutdown.

Based on the above described analysis, the total cost of the actual shutdown was estimated at $15.6 billion.

Assessment of the Potential Economic Impacts of a 5-Day, 11-Day and a 20-Day Port Shutdown

As noted, since 2002, the demand for West Coast ports has become more elastic, as driven by the increased all-water Asian services at Atlantic and Gulf Coast ports, the growth in distribution centers served by Atlantic and Gulf Coast ports, and the investment in terminal capacity by the Atlantic and Gulf Coast ports.

However, there still remain limited alternatives for the ocean carriers to re-route cargo in the event of an unannounced port shutdown due to size restrictions of the Panama Canal to accommodate the larger container vessels operating on the Trans-Pacific routings, as well as to the uncertainty of the duration of a shutdown and the disruptions on sailing schedules that would occur should vessel re-routings take place. Therefore, should an unannounced shutdown occur, the vessels would most likely remain at anchorage in the ports' harbors, or slow steam in transit to the West Coast (not diverting to another trade lane). While at anchor, the vessels will be incurring operating costs (crew cost, fuel, insurances, etc.), but will not be generating any revenue. At the same time, eastbound cargo will begin to accumulate on the docks in Asia, which can be expected to impact the Asian supply chain, further exacerbating the economic problems in this region. Due to the fact that most vessels are sailing at near capacity on the eastbound leg, it is unlikely that the cargo accumulating in Asia can be accommodated on future vessels, and this cargo could, in fact, be lost from the system. In fact, a work stoppage of a 5-day duration will likely result in the entire loss of one week's vessel capacity in the Trans-Pacific trade. As the duration of the work stoppage increases from 5 to 20 days, it becomes more unlikely that the loss in vessel capacity can be regained throughout the year. Therefore, under a 20- day work stoppage it is estimated that 10 days' worth of

imported cargo will be lost from the system, representing a direct loss in revenue to ocean carriers and a direct loss in sales for importers. For exporters, the westbound capacity is not fully utilized, and it is assumed that Trans-Pacific containerized exports will not be lost from the system, but will only experience delays. However, the cost of these delays will result in increased inventory carrying costs to United States exporters.

At the terminal, daily operations will cease. Wages and revenue earned by the truckers, longshoremen, CFS operators, warehousemen, tugs, pilots, etc. will be lost. However, the fixed operating costs to the terminal operators will continue to be incurred, without any offsetting revenue.

Freight consolidators will be shut down during the work stoppage and the 55 intermodal trains serving the West Coast ports will be halted. Equipment associated with these trains may incur demurrage and locomotives will be reassigned to other areas. To the extent that the international equipment is removed from the rail system, the railroads will lose revenue (since the cars are not employed), and domestic users of marine equipment for repositioning moves could experience equipment shortages as the work stoppage duration increases. Based on discussions with railroad scheduling officials, if the ports close, it will be necessary to find rail siding throughout the nation's rail system to store about 300 miles of double stack rail cars. As the duration of the work stoppage increases, the loss of these cars from the system could result in delays over the entire national railway system, hence, resulting in delay times to domestic rail shippers.

Finally, the importers and exporters will be impacted in terms of the supply chain. For flow freight (cargo that is seasonal or associated with advertised sales), the work stoppage, even for 5 days, could result in a direct loss in sales, or the need to "fire-sell" the seasonal items. For producers working under just-in-time inventory, a work stoppage of more than 10 days could result in plant shut downs, as actually occurred in 2002. For exporters of perishable goods, air service might be the only, albeit costly, alternative.

For those importers of staple stock (commodities with a longer shelf life compared to seasonal items), the work stoppages will result in inventory carrying cost increases, since the importers cannot receive the revenue for the sale of the items, and hence cannot use the sales revenue for other purchases or investments. As the slowdown continues with the importers and exporters, the suppliers of goods and services to the importers and exporters will also become impacted. Under a work stoppage of 10 days, it is assumed that 10 percent of the daily containerized imports will be lost from the system, resulting in a direct loss in sales revenue. With a 20 day work stoppage, it is assumed 20 percent of the daily containerized imports will be lost from the system. The lost sales of the imported commodities will have a ripple effect throughout the nation's retail support sector, creating negative impacts in such support activity as local warehousing and distribution, advertising,

wholesale activity and packaging. Containerized exports will not likely be lost from the system even after a 20- day work stoppage, since the utilization on the westbound leg to Asia is less than 100%, and the empty boxes moving in the westbound direction will be utilized to handle the delayed export cargo. As a result, exporters will experience an increase in inventory carrying costs.

The supply system impacts will become even more problematic after the work stoppage is ended, since the ports will be flooded with the cargo previously waiting for discharge. Terminal capacity will be stretched, as boxes traditionally using chassis will require grounding to increase terminal storage capacity; costs will thus be incurred. Truckers delivering and picking-up containers will face delays, which will further increase trucking costs as congestion within the terminal and at the gates will occur. Thus, the initial work stoppages will create additional delays as congestion at the terminal continues.

Consolidators will need to find additional storage capacity for the surge in boxes, which will result in increased drayage costs to distant container yards, increased storage costs and gate costs, as well as delays in receiving cargo from the terminals. Additional delays will be passed on to the importers and exporters. Interviews with terminal operators and consolidators indicated that experience suggests that for every one day of port closure, another day of delay will occur due to the congestion. Thus, a 5- day work stoppage will result in another 5 days of delay to clear out the terminal, and a 20- day work stoppage will create another 20 days of delays in the distribution system.

As this narrative highlights, a work stoppage of only a few days will have magnified impact throughout the entire distribution and production sectors of the economy, and the impact will increase, the longer the duration of the work stoppage.

The West Coast baseline economic impact models developed for 2013 were used to quantify the potential impact of containerized cargo handled at West Coast ports. Using the new baseline impacts, and adjusting the work stoppage model developed by Martin Associates in 2002 and again in 2008, it is possible to quantify the potential impact of various work stoppages under a 5- and 20- day duration, as well as the impacts that would occur should the shutdown reflect the 2002 actual West Coast port shutdown duration of 11 days. As expected due to a more elastic demand for the West Coast ports compared to 2002, the estimated impacts associated with the similar number of shutdown days are lower than was the case in 2002.

Exhibit 23 presents the projected impact under a 5- day, 11- day and 20- day port shutdown. The impact of the work stoppage increases as the duration of the interruption increases. If the work stoppage only lasts 5 days, the impact to the national economy is estimated at $3.4 billion, or about $688 million per day. Under

the 5 day work stoppage scenario, 814,000 person hours will be impacted. If the duration of the work stoppage increases to 11 days as was the situation in 2002, the national economic impact increases to $12.6 billion, or a lost economic impact of about $1.1 billion per day. With a work stoppage of 11 days, 44.4 million person hours are likely to be impacted. By the time the duration of the work stoppage increases to 20 days, the cost to the United States economy is estimated at $40.9 billion, or $2 billion per day. Under a work stoppage of 20 days in duration, nearly 92 million person hours will be impacted.

Exhibit 23: Projected Economic Impacts of a West Coast Port Shutdown Under Varying Duration Scenarios

Impact Duration	5 Days	11 Days	20 Days
Total Economic Impact	**$3,441,947,789**	**$12,558,166,503**	**$40,861,602,810**
Impact Per Day	$688,389,558	$1,141,651,500	$2,043,080,141
Port Service Providers			
Net Port Revenue	$649,105	$1,428,031	$5,192,842
Impacted Wages	$34,615,253	$76,153,556	$276,922,023
Ocean Carriers	$179,789,912	$426,296,274	$858,970,864
Terminal Operators	$32,739,989	$61,671,590	$130,959,957
Truckers/Consolidators	$129,470,879	$183,531,215	$285,593,402
Railroads	$226,655,000	$497,471,000	$903,695,000
Subtotal	***$603,920,139***	***$1,246,551,667***	***$2,461,334,088***
Importers/exporters			
Inventory carrying costs/Lost sales	***$2,834,384,184***	***$11,303,599,208***	***$38,371,120,986***
Tax Impact			
Port Service Sector	$3,643,467	$8,015,627	$29,147,736
Subtotal	***$3,643,467***	***$8,015,627***	***$29,147,736***
Job Impact			
Person hours	**814,008.56**	**44,340,391.32**	**91,611,213.46**

It is to be emphasized that as the duration of the work stoppage approaches and exceeds 30 days, structural shifts will likely begin. For example, Asian consumers of United States exports will likely begin to look for new supply sources, resulting in a loss of exports from the United States, which will have a strong multiplier effect throughout the entire economy. Costs of production for U.S. firms dependent on imported raw materials will increase due to delays, and those firms dependent on a steady flow of imported inventory will now have depleted stockpiles, and production line shutdowns in the United States and Asia will be likely. The spin-off effects of these production line shutdowns in the United States will be magnified throughout the entire national economy, and the impact on the Asian export industries would likely be translated into a negative world financial market reaction.

Equally important is the longer term impact of a West Coast port shutdown on the future cargo throughput and market share of the West Coast ports. As demonstrated in this report, the West Coast ports have lost market share over the past 15 years, and specifically since 2002. More specifically, the loss of market

share of the West Coast ports was concentrated at the San Pedro Bay ports. In 2002, the San Pedro Bay ports handled 39% of the total U.S. imported containerized tonnage. This share had fallen to about 32% in 2013. This loss of market share was not evident for the Northern California nor the Pacific Northwest port ranges, as these port ranges maintained their market share between 2002 and 2013.

Long Term Potential Structural Impact of a 2014 Port Shutdown

The importance of the loss of market share, and further the concentration of this loss in the San Pedro Region, is underscored by the economic importance of the San Pedro Bay ports to the California economy, and further the economic impact of the discretionary cargo that is at risk as the result of a structural change. This discretionary cargo moves out of the Los Angeles/Long Beach region, typically to areas throughout the United States. This cargo moves directly in marine containers by rail to points such as Chicago, Atlanta, St. Louis, Columbus and Memphis, and also in 53 foot domestic trailers by truck and rail. For this latter move of discretionary cargo in domestic 53 foot trailers, the marine containers are stripped at the port facilities and the cargo is transloaded into the 53 foot domestic containers to achieve better shipping economies. Transloading is most prominent for lighter cargo such as apparel, furniture and toys that tend to "cube-out" a marine container rather than "weight-out" the container. Hence, the 53 foot containers allow for a greater utilization of space for the lighter cargo than a 40 foot marine container.

The ports of Los Angeles and Long Beach have a significant economic impact on the California economy. In 2013, it is estimated that the San Pedro Bay ports supported nearly 166,300 direct, induced and indirect jobs and the majority of these jobs are mostly held by residents of the Los Angeles/Long Beach community. The Port activity creates nearly $1.5 billion in state and local taxes and $2.3 million in federal taxes. The economic value of this port complex accounts for nearly 34% of the total $2 trillion Gross State Product for the State of California. In addition nearly, 3 million jobs with California importers and exporters are related to the activity of the ports of Los Angeles and Long Beach in 2013. The annual economic impact of these ports is summarized in Exhibit 24.

Exhibit 24: Annual Economic Impacts of the San Pedro Bay Ports to the California Economy, 2013

Impact Categories	Impact of San Pedro Bay Ports on the California Economy
Jobs	
Direct	69,063
Induced	73,266
Indirect	23,966
Total	166,295
Income (1,000)	$3,406,892
Re-spending/Local Consumption	$8,286,242
Indirect	$1,294,383
Total	$12,987,516
Direct Revenue (1,000)	$15,920,425
Purchases (1,000)	$3,095,973
State/Local Taxes (1,000)	$1,454,602
Federal Taxes	$2,311,778
User Impacts	
Jobs	2,977,315
Income (1,000)	$119,092,601
Output (1,000)	$665,450,285
State/Local Taxes (1,000)	$13,338,371
Federal Taxes (1,000)	$21,198,483

To further underscore the potential long term impact of a work-stoppage, the annual economic impacts on the state of California of only the discretionary containerized cargo handled at the ports of Los Angeles and Long Beach were estimated. It is a portion of this state-wide impact that is at risk should a work stoppage in 2014 occur, and result in further erosion of market share and cargo throughput at the San Pedro Bay ports. In 2014, the discretionary cargo supported nearly 54,000 direct, induced and indirect jobs in the California economy, the majority of which were residents of the Los Angeles/Long Beach area. In addition, the discretionary containerized cargo at the San Pedro Bay ports supported 2.9 million jobs with users of the port complex, and these jobs are held by residents throughout other states (excluding California). These jobs would also be at risk, as the logistics costs of the current out of state users of the San Pedro Bay ports would increase should the discretionary cargo be diverted to other Atlantic and Gulf Coast ports in the longer term.

Exhibit 25: Annual Economic Impact of Discretionary Containerized Cargo at San Pedro Bay Ports, 2013

Impact Categories	Economic Impact of Discretionary Cargo at San Pedro Bay Ports on the California Economy
Jobs	
Direct	22,087
Induced	24,293
Indirect	7,524
Total	53,904
Income (1,000)	
Direct	$1,151,239
Re-spending/Local Consumption	$2,800,044
Indirect	$413,967
Total	$4,365,251
Direct Revenue (1,000)	$10,537,938
Purchases (1,000)	$990,148
State/Local Taxes (1,000)	$488,908
Federal Taxes (1,000)	$87,026
Related Impacts at US Level	
Jobs	2,852,948
Income (1,000)	$114,117,938
Output (1,000)	$737,111,343
State/Local Taxes (1,000)	$12,781,209
Federal Taxes (1,000)	$20,312,993

It is to be emphasized that the impact of discretionary cargo at the West Coast ports is used to demonstrate the economic importance of this type of cargo to the California and Washington state economies. Long term market share loss due to a work shutdown would result in a loss of a portion of the annual impact of discretionary cargo. While it is not possible to predict the potential market share loss due to a potential shutdown, it is possible to estimate the cost of the loss in market share that occurred at the San Pedro Bay ports between 2002 and 2013. In 2002, the San Pedro Bay ports handled about 40% of total imported containerized tonnage, and by 2013, this share fell to 33%. If the San Pedro Bay ports of Los Angeles and Long Beach had maintained that 40% share in 2013, these ports would have handled an additional 566,000 container moves. This market share loss cost the California economy about 12,300 direct, induced and indirect jobs in 2013, along with a loss of $112.5 million in state and local tax impacts.

In addition to the impact of a port shutdown on market share, these impacts, as well as the impacts of all discretionary cargo at West Coast ports, are also at risk due to increases in terminal charges at the West Coast ports that would result in a loss of competitive logistics position with respect to the Atlantic and Gulf Coast ports, as well as the Mexican and Canadian ports.

The importance of discretionary containerized cargo at the Washington and California ports, which is in turn dependent on the ability of the West Coast ports to provide a logistics cost advantage over competing port ranges is presented in Exhibit 26. Should terminal charges be increased as the result of the 2014 contract negotiations, a portion of these impacts of discretionary cargo to the states of California and Washington would be at risk. As demonstrated in this report, other factors are in play to reduce the competitive position of the West Coast ports, and a combination of a shutdown and increases in terminal charges could have long-lasting impacts on the economies in which these ports are located.

Exhibit 26: Economic Impacts of Discretionary Containerized Cargo at West Coast Ports, Annual State-Wide Impacts

Impact Categories	Economic Impact of Discretionary Cargo at California Ports on the California Economy	Economic Impact of Discretionary Cargo at Washington Ports on the Washington Economy	Impacts of Discretionary Cargo
Jobs			
Direct	24,534	6,476	31,010
Induced	26,750	6,285	33,035
Indirect	8,624	1,843	10,467
Total	59,908	14,604	74,512
Income (1,000)			
Direct	$1,293,587	$405,745	$1,699,332
Re-spending/Local Consumption	$3,146,262	$891,829	$4,038,091
Indirect	$482,494	$94,404	$576,898
Total	$4,922,344	$1,391,978	$6,314,322
Direct Revenue (1,000)	$10,923,649	$2,917,420	$13,841,069
Purchases (1,000)	$1,094,095.49	$228,653	$1,322,748
State/Local Taxes (1,000)	$551,302	$126,670	$677,972
Federal Taxes (1,000)	$98,132	$247,772	$345,904
Related Impacts at US Level			
Jobs	2,936,195	684,850	3,621,045
Income (1,000)	$117,356,237	$27,393,994	$144,750,231
Output (1,000)	$748,863,933	$145,832,432	$894,696,365
State/Local Taxes (1,000)	$13,143,899	$2,492,854	$15,636,752
Federal Taxes (1,000)	$20,889,410	$4,876,131	$25,765,541

In 2013, about 75,000 direct, induced and indirect jobs in the states of California and Washington are estimated to be dependent on discretionary containerized cargo moving over the West Coast container terminals. This discretionary containerized cargo also supports 3.6 million jobs with importers and exporters throughout the U.S. (excluding importers and exporters located in Washington and California) that use the West Coast ports for containerized cargo imports and exports. Should terminal charges increase after the 2014 contract negotiations, and the West Coast ports lose competitive position via other port ranges, these direct, induced and indirect impacts are at risk in the West Coast states, and the importers and exporters located in other states and employing 3.6 million Americans will be subject to higher logistics costs, with potential longer

term impacts on the competitive position of these importers and exporters in the world economy.

Summary

As demonstrated in this white paper, the West Coast ports are a critical economic engine for the U.S. economy. Furthermore, the port activity at the West Coast ports represents a significant economic impact to the states in which they are located in terms of job creation and economic value. Any disruption in the operation of these ports would have a significant impact, not only nationally, but on the individual states in which they are located. Furthermore, should terminal charges at the West Coast ports increase as the result of the contract negotiations in 2014, the competitive logistics position of the West Coast ports will be eroded, further resulting in potential job loss, and/or reduced job growth at West Coast ports. Because of the importance of the ports of Los Angeles and Long Beach to the Southern California economy, work stoppages and/or the loss in competitive logistics pricing to reach inland consumption and production markets will have a magnified impact on this region.