Ports in Peril:

The Alarming Economic Cost of Declining Market Share at the San Pedro Bay Port Complex - An Update

Pacific Maritime Association

Prepared for:
PACIFIC MARITIME ASSOCIATION
555 Market Street, 3rd Floor
San Francisco, CA 94105
(415)576-3200
www.pmanet.org

MARTIN ASSOCIATES

Prepared by:
MARTIN ASSOCIATES
941 Wheatland Avenue, Suite 203
Lancaster, PA 17603
(717) 295-2428
www.johncmartinassociates.com

January 3, 2023

TABLE OF CONTENTS

THE SAN PEDRO BAY PORT COMPLEX AS AN ECONOMIC ENGINE 1

ECONOMIC IMPACT DEFINITIONS 1
1. *Employment Impact* *2*
2. *Wages and Salaries Impact* *3*
3. *Direct Revenue Impact* *3*
4. *Tax Impacts* *4*

ECONOMIC SECTORS IMPACTED BY PORT ACTIVITY 4
1. *The Surface Transportation Sector* *4*
2. *The Maritime Service Sector* *4*
3. *Port Related Cargo Users* *6*

IMPACT METHODOLOGY 7
ECONOMIC IMPACT RESULTS 8
THE BIGGER JOBS PICTURE 11

THE DYNAMICS OF THE UNITED STATES CONTAINER MARKET AND IMPLICATIONS FOR THE PORTS OF LOS ANGELES AND LONG BEACH AND THE WEST COAST PORTS 13

CHANGES IN INTERMODAL VOLUME LEAVING THE SAN PEDRO BAY PORTS 17
CHANGES IN LOGISTICS PATTERNS OF IMPORTERS/EXPORTERS 18
GROWTH IN THE DEPLOYMENT OF ALL-WATER SERVICES CONNECTING ASIA AND THE ATLANTIC AND GULF COASTS 20
CHANGES IN U.S. IMPORT SOURCING AND IMPACT ON DISCRETIONARY CARGO MARKET 23
PORT TERMINAL INVESTMENT TO ACCOMMODATE THE GROWTH IN ALL-WATER SERVICE AND INCREASED INTERMODAL SERVICE VIA U.S. ATLANTIC AND GULF COAST PORTS 24
SHIFTING INTERMODAL TRADE VOLUMES 26

THE IMPACT OF THE CONTINUED LOSS OF DISCRETIONARY CARGO AT THE SAN PEDRO BAY PORTS 28

SUMMARY 31

The San Pedro Bay Port Complex as an Economic Engine

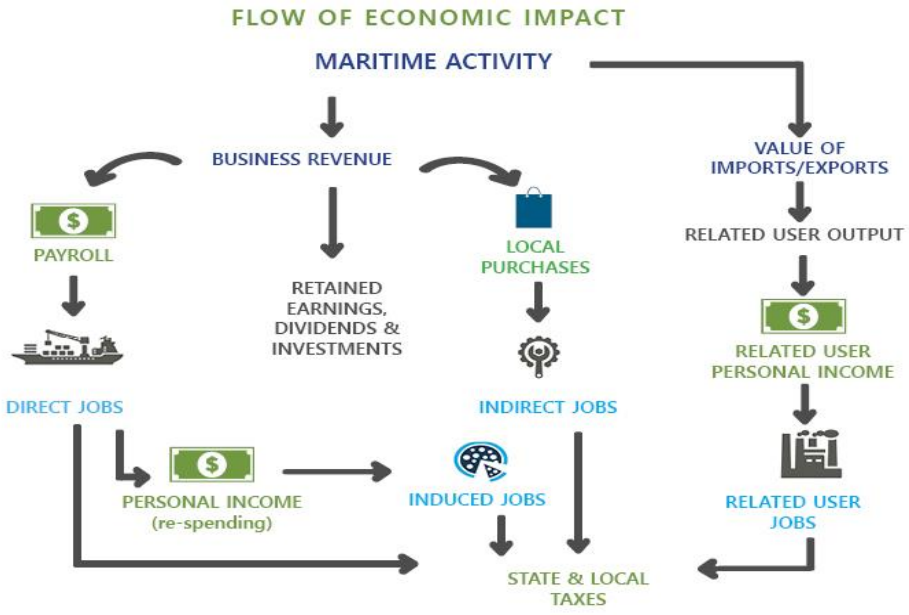
The San Pedro Bay Port Complex is of monumental importance to the economy of Southern California, as well as to California's statewide economy. Its significance stretches far beyond the waterfront, with the majority of direct jobs created in many other industries "downstream" of port operations. The San Pedro Bay Port Complex consists of the marine cargo terminals located at the Ports of Los Angeles and Long Beach. These terminals handle a variety of cargo types, including containerized cargo; automobiles; non-containerized break bulk cargo such as iron and steel products, lumber, non-containerized fruits and produce, and wind energy equipment; dry bulk cargoes such as petroleum coke, coal, and scrap; and liquid bulk cargo especially crude petroleum and petrochemicals. The twin ports support 23.5 percent of the state of California's Gross Domestic Product, generating 233,602 direct, induced, and indirect jobs. Another 3.4 million jobs with importers and exporters within the State are supported by the containers, autos, break bulk, dry bulk and liquid bulk cargoes moving via these ports. In 2021, overall import and export activity at the Ports of Los Angeles and Long Beach accounted for $3.4 billion in state and local tax revenue and supported an additional $21.1 million of state and local tax revenue with importers and exporters located in California and using the Port Complex.

Economic Impact Definitions

The cargo and vessel activity at the Ports of Los Angeles and Long Beach generate economic activity by providing employment and income to individuals, tax revenues to local and state governments, and revenue to businesses engaged in handling, shipping, and receiving cargo via the Port. Exhibit 1 illustrates the flow of economic impacts throughout the state of California's economy. As this exhibit shows, activity at the San Pedro Bay Port Complex (i.e., the handling of cargo and the servicing of vessels) initially creates business revenue to firms providing those cargo handling and vessel services. This revenue is in turn used for several purposes:

- To hire employees to provide the services
- To pay stockholders dividends, retire debt, and invest
- To buy goods from other firms
- To pay federal, state, and local taxes

Exhibit 1
How Activity at Ports of Los Angeles and Long Beach Flows Throughout California Economy



The hiring of employees generates personal income. This personal income is spent throughout the state, local and national economy to purchase goods and services. This re-spending of income is known as the multiplier effect, which in turn creates induced jobs throughout the economy. Finally, state and local taxes are paid by those directly employed due to port activity and those employed as a result of the in-state purchases of goods and services by those individuals directly employed.

As demonstrated in the above exhibit, and the previous discussion, the flow of economic impacts throughout an economy creates four separate and non-additive types of impacts.

1. Employment Impact

The employment impact consists of direct jobs, induced jobs, indirect jobs, and related jobs. The servicing of the vessels and the handling and processing of cargo at the San Pedro Bay Port Complex generate the direct employment impact. These direct jobs would not exist in the absence of cargo and vessel activity at the Port Complex. The induced jobs are supported by the purchases of goods and services by those directly employed and would also cease to exist if the direct jobs were discontinued. Hence, the induced jobs are dependent upon the direct jobs and the associated level of wages and salaries, as well as the resulting local purchases made by those directly employed (direct jobs) by activity at the Port Complex.

In addition to the direct and induced jobs, another type of employment impact supported by seaport activity is the indirect job impact. These indirect jobs are generated in the local economy by the purchases of goods and services by the firms which provide the direct jobs.

The last component of the employment impact is the related job impact. Related jobs are jobs with shippers/consignees using the marine terminals for the export and import of cargo. However, these shippers/consignees also use other ports and are not completely dependent upon the San Pedro Bay Port Complex facilities. The level of employment with these firms is driven by the demand for the firms' products, not because the Ports of Los Angles and Long Beach are used. Therefore, degree of dependence of these related jobs on the terminals at the Port Complex is less than the other components of the job impact[1]. Furthermore, should the marine terminals not be available to these importers and exporters located in California in the longer term, logistics costs will likely increase from the use of other more distant ports, which could result in the relocation of the importers and exporters from the Southern California region to an area in closer proximity to the ports that would be used, such as Oakland, Mexican ports, or U.S. Northwest and Canadian Pacific ports, as well as Atlantic and Gulf Coast ports..

2. Wages and Salaries Impact

The wages and salaries impact (or the personal income impact) is derived from three sources. First, the ***direct personal income impact*** is the measurement of the wages and salaries generated by port activity and paid to those holding the direct jobs. As the result of in-state consumption purchases made by the direct employees who received the wages and salaries, a ***re-spending/personal consumption*** impact also occurs in the state economy. This re-spending/personal consumption impact is known as the personal income multiplier effect, which generates the induced jobs. An ***indirect wage and salary impact*** is estimated as part of this study in order to capture the wage and salary income received by those indirectly employed due to the local purchases by the firms' dependent upon the Port Complex. An estimate is also developed for the wages and salaries received by the related users.

3. Direct Revenue Impact

The direct business revenue impact measures the sales generated by firms engaged in handling and transporting cargo through the Ports of Los Angeles and Long Beach terminals. A portion of this direct revenue generated by the maritime activity is then used to pay wages and salaries to those holding the direct jobs and to purchase goods and services to support port activity.

A measure of the total value of economic activity created in the state of California due to the cargo activity at the Port Complex is also developed to demonstrate the magnitude of the value of the economic activity supported by the port activity in San Pedro at a given point in time.

[1]The related jobs, income, value of output and taxes should not be used when evaluating the incremental economic impacts of specific port projects or the impacts of changes in cargo volume.

4. Tax Impacts

The tax impacts measure the state and local tax revenues generated by port activity. These are taxes paid by both corporations and those holding the direct, induced, indirect and related jobs. The tax revenue impacts include the following types of taxes:

- State taxes, including personal and corporate income tax, state sales and use taxes, motor fuel tax, vehicle registration tax, and miscellaneous taxes
- Local taxes, including the local share of the income tax and property tax, as well as local retail taxes

Economic Sectors Impacted by Port Activity

Shipments and receipts of cargo through the San Pedro Bay Port Complex marine terminals generate economic activity in various business sectors of the state economy. Specifically, the following economic sectors are involved in providing cargo and vessel handling services at the Port Complex. These are the:

- Surface Transportation Sector
- Maritime Service Sector
- Port Related Users

Within each sector, various participants are involved. Separate impacts are estimated for each of the participants. A discussion of each of the economic impact sectors is provided below, including a description of the major participants in each sector.

1. The Surface Transportation Sector

The surface transportation sector consists of the railroad and trucking industries. These sectors are responsible for moving the various cargoes between the marine terminals and their inland origins and destinations. Trucks are typically used to move the cargo within the state of California, while rail is used to move cargo, particularly containerized cargo, to and from out of state inland origins and destinations, which is often referred to as discretionary cargo. The trucking industry includes not only the drivers, but dispatchers, mechanics, and administrative employees of national and local trucking firms, as well as owner operators. The rail industry includes crew, as well as yard employees, maintenance, dispatchers, sales, and administrative employees supported by activity at the Port Complex.[2]

2. The Maritime Service Sector

This sector consists of numerous firms and participants performing functions related to the following maritime services:

- Cargo Marine Transportation
- Vessel Operations
- Cargo Handling

[2] The trucking industry impact does not include the drivers of yard equipment within the marine terminal, as these are included with the ILWU/terminal impacts.

- Line Haul Barge Operators
- Federal, State, and Local Government Agencies
- Maritime Services

A brief description of the major participants in each of these categories is provided below:

- Cargo Marine Transportation - Participants in this category are involved in arranging inland and water transportation for export or import freight through the Ports of Los Angeles and Long Beach. The freight forwarder/customhouse broker arranges for the freight to be delivered between the marine terminals and inland destinations, as well as the ocean transportation, and handles cargo documentation. This function performed by freight forwarders and customhouse brokers is most prevalent for general cargo commodities. For bulk cargo, arrangements are often made by the shipper/receiver, and the cargo passes over private docks.

- Vessel Operations - This category consists of several participants providing vessel services including:
  - Steamship agents - provide a number of services for the vessel as soon as it enters the Port, including arranging for pilot tug assist services, for medical and dental care of the crew, and for ship supplies. Agents are also responsible for vessel documentation
  - Pilots – provide navigation services to ensure safe transit of vessels between the harbor entrance and docks
  - Chandlers - supply the vessels with ship supplies (food, clothing, nautical equipment, etc.)
  - Towing firms - provide the tug service to guide the vessel to and from port
  - Bunkering firms - provide fuel to the vessels
  - Marine surveyors - inspect the vessels and the cargo
  - Launch services - provide transportation for the crew between land and vessel
  - Chemical testing services - test cargo, such as coal, for proper chemical composition, water content, etc.
  - Shipyards/ship repair firms - provide repairs, either emergency or scheduled

- Cargo Handling - this category involves the physical handling of the cargo at the Port between the land and the vessel. Included in this category are the following participants:
  - Longshoremen - are members of the International Longshore and Warehouse Union (ILWU) and are involved in the loading and unloading of cargo from the vessels, as well as handling the cargo prior to loading and after unloading inside the terminals. With the exception of petroleum and certain dry bulk cargoes, the members of the ILWU handle the loading and unloading and terminal operations at the Port Complex.
  - Stevedoring firms - manage the longshoremen and cargo-handling activities.
  - Terminal operators - are often stevedoring firms who operate the maritime terminals where cargo is loaded and off-loaded.
  - Warehouse operators/distribution centers - store cargo after discharge or prior to loading and consolidate cargo units into shipment lots. This category also includes

transload operations as well as near port distribution centers that are dependent upon the container operations at the Port Complex.

- Container leasing and repair firms - provide containers to steamship lines and shippers/consignees and repair damaged containers. Also included are operators of chassis pools.
- Container consolidators/NVOCC - consolidate containerized cargo as well as full containers in order to achieve favorable transportation rates for their customers
- Automobile service firms - service new automobiles after they are off-loaded from the vessels and are often terminal operators as well

- Government Agencies - this service category involves federal, state, and local government agencies that perform services related to cargo handling and vessel operations at the Port. U.S. Customs and Border Protection, U.S. Department of Labor, U.S. Department of Agriculture, and U.S. Department of Commerce employees are involved. In addition, both civilian and military personnel with the U.S. Coast Guard and the U.S. Army Corps of Engineers have been included. Port of Los Angeles and Port of Long Beach administration employees are included in this category as well.

- Banking and Admiralty/Maritime Law firms - provide legal and financial services such as letters of credit to ocean carriers as well as importers/exporters.

- Maritime Engineering/Construction Services – This category includes engineers, architects and consultants who provide a wide spectrum of services to the maritime industry, including terminal design, naval architect services, and planning services. Also, this category includes a wide range of service providers, including environmental firms, security firms, and firms providing fumigation services.

3. Port Related Cargo Users

Related user impacts are jobs, income, economic activity and taxes with shippers and consignees of containerized cargo moving via the marine cargo terminals. This impact incorporates the distribution and supply chain aspects of the shipper and consignee operations as well as value added services. These jobs include the direct, induced, and indirect jobs created at each level of production of an export cargo produced in California, as well as the total jobs associated with an imported product consumed in-state, either as a final consumption good or as an intermediate or primary raw material used by industries within the state. For example, all aspects of the distribution chain associated with an imported container carrying consumer products are included in the related job impacts (with the exception of the transload operations and fulfillment centers located near the Port Complex that are totally dependent on the marine cargo), from the time the cargo arrives at the off-port distribution center to its final sales at a retail outlet. This includes the actual distribution center operations such as repackaging, sorting, labeling, repairs, etc.; as well as the services supplied in support of the distribution center activity such as technical support, maintenance and repair services, utilities, supplier locations, etc. The aspects of the distribution chain from the discharge of the containers from a ship through the container terminal to its initial destination (i.e., import or regional distribution center within the state or transload operation) are included in the port-generated direct, induced, and indirect jobs, not the related impacts, and excluded from related impacts.

It should be emphasized that these users are related to the Port Complex marine terminals and if these facilities were not available, the users could ship and receive cargo via other ports. In fact, the majority of these users currently use multiple ports for export and import. Furthermore, the level of employment with the related users is driven by the demand for the products produced by these firms, and not as the result of providing cargo handling or vessel support services at the marine terminals. In the long run, if these users could no longer ship and receive their goods through the Ports of Los Angeles and Long Beach marine terminals, they would face an increase in logistics costs. Therefore, it is possible that these importers and exporters in California could relocate their businesses outside the state to be closer to other ports should the terminals in the Port Complex no longer be available for use or provide a competitive logistics supply chain.

Income, value of economic activity (which measures the revenue generated at each stage of the logistics supply chain outside the port complex), and state and local taxes are also estimated for the related users based on the value and volume of cargo moved through the Port Complex and the associated impact metrics for the export producers and the import consumers. The direct, induced, and indirect impacts associated with each cargo type for which related impacts are estimated are subtracted from the related impacts to avoid double counting.

Impact Methodology

Martin Associates has conducted over 750 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. Martin Associates conducted the Economic Impact of the West Coast Ports in 2022 for the Pacific Maritime Association.[3] As part of the "Economic Impacts of the West Coast Ports", Martin Associates developed individual seaport models for the 27 West Coast deep water ports in order to assess the economic impacts that are generated by these ports in terms of total cargo throughput at the marine terminals, including terminals operated by the International Longshore and Warehouse Union (ILWU), as well as the terminals not operated by the ILWU, which are primarily handling petroleum and certain dry bulk cargoes[4]. This current report focuses on the economic impacts generated by the Ports of Los Angeles and Long Beach, (San Pedro Bay Ports), and uses the economic impact model structure developed for the Ports of Los Angeles and Long Beach as part of the "Economic Impact of the West Coast Ports".

The San Pedro Bay Ports economic impact model is based on a series of more than 5,000 interviews with terminal operators, maritime service firms, government agencies, conducted by Martin Associates, and reflect operational metrics for the each marine terminal located in the San Pedro Bay Ports Complex, including terminal productivity by commodity type, ILWU vs. terminals not operated by the ILWU, inland modal share (truck vs. rail), average truck trips per day per driver, intermodal rail operations, transload operations, etc., as well as the evolving size of the container ships that have been

[3] The Economic Impacts of the West Coast Ports, by Martin Associates, for the Pacific Maritime Association, February 15, 2022.

[4] The economic impacts of the non-ILWU terminals are included in the analysis to measure the ***total*** economic impact of the West Coast ports on the U.S. and the regional economies. The comparison of the total economic impacts of all marine terminals on the West Coast with the impacts generated by the cargo activity handled by ILWU operated terminals underscores the importance of the ILWU terminals when compared to the total economic impacts generated by cargo activity at all marine terminals, including those operated by non-ILWU workers.

deployed at the Ports of Los Angeles and Long Beach. These metrics were developed from direct interviews with each terminal operator. Wages are based on actual survey data for 2021, and the re-spending impact is based on the most recent personal income multiplier for the water transportation sector as developed for the state of California by the U.S. Bureau of Economic Analysis.

Using the Martin Associates' economic impact models for the Ports of Los Angeles and Long Beach, and the 2021 tonnage for break bulk cargoes, dry bulk cargo, and liquid bulk cargo, as well as the number of containers and automobiles handled at each marine terminal at each of the two ports, the economic impacts of the San Pedro Bay Port Complex on the state of California were estimated for the year 2021. Separate impacts were estimated for all cargo and vessel operations at all marine cargo terminals, whether they were ILWU operated or not. Secondly, the economic impacts on the state of California generated by the cargo and vessel activity at ILWU operated terminals were calculated, and finally, the impacts of containerized cargo only at the Port Complex were estimated.

Economic Impact Results

Exhibit 2 presents the economic impacts on the state of California of the marine cargo and vessel activity at the Ports of Los Angeles and Long Beach in 2021, for all terminals (those operated by the ILWU, as well as those not utilizing ILWU labor), and for containerized cargo only (utilizing ILWU labor.)

Exhibit 2
2021 State of California Economic Impacts of Marine Cargo and Vessel Activity at the San Pedro Bay Port Complex

JOBS	All San Pedro Bay Marine Terminals	ILWU Terminals Only at San Pedro Bay	Container Terminals Only at San Pedro Bay
Direct	95,957	89,648	86,188
Induced	109,556	100,786	96,004
Indirect	28,088	26,241	25,229
Subtotal	*233,602*	*216,675*	*207,420*
Related User Jobs	3,436,677	3,428,335	3,427,663
Total Jobs	**3,670,278**	**3,645,010**	**3,635,083**
PERSONAL INCOME			
Direct	$7,620	$6,979	$6,630
Re-spending/Local Consumption	$19,435	$17,801	$16,911
Indirect	$1,682	$1,571	$1,511
Subtotal	*$28,737*	*$26,352*	*$25,052*
Related User Income	$120,328	$119,995	$119,968
Total Income and Consumption (Millions	**$149,065**	**$146,346**	**$145,021**
TOTAL ECONOMIC VALUE			
Direct Business Revenue	$39,197	$34,818	$34,079
Re-spending/Local Consumption	$19,435	$17,801	$16,911
Related User Output	$732,716	$699,682	$699,542
Total Economic Value (Millions $)	**$791,348**	**$752,301**	**$750,533**
STATE AND LOCAL TAXES			
Direct/Induced/ Indirect State/Local Tax	$3,413	$3,116	$2,974
Related User State/Local Taxes	$21,065	$20,637	$20,633
Total State and Local Taxes (Millions $)	**$24,478**	**$23,753**	**$23,607**

Source: Martin Associates

In 2021, a total of 233,602 direct, induced, and indirect jobs were generated in the State by the maritime activities at both ILWU and non-ILWU marine terminals located at the Ports of Los Angeles and Long Beach. Of these jobs:

- 95,957 direct jobs were created by the marine cargo activity at the Port Complex.
- 109,556 induced jobs were supported in the State as the result of the re-spending of the direct income and the value of the local consumption purchases of $19.4 billion.

- 28,088 indirect jobs within the State were supported by the $4.3 billion of in-state purchases of goods and services by the firms employing the direct job holders.
- 3.4 million related jobs in the State are with users of the marine terminals of the Port. These jobs are classified as user jobs since they are with the importers and exporters using the marine terminals. The majority of the jobs are associated with the movement of containerized cargo at the Port Complex marine container terminal.

The Port Complex activity generated $28.7 billion in personal wage and salary income and personal consumption:

- The 95,957 directly employed individuals received $7.6 billion of personal wage and salary income, for an average salary or wage of $79,408.
- As a result of the multiplier effects of using a portion of this income for local purchases, $19.4 billion in induced income (re-spending) and local consumption expenditures were created within the state of California.[5]
- Those 28,088 indirectly employed received $1.7 billion of indirect income.
- An additional $120.3 billion in wages and salaries was received as income by the related users in the State.

Businesses providing maritime services at the Port Complex received $39.2 billion of revenue:

- The $39.2 billion of direct business revenue received by the businesses providing the services at the Port Complex does not include the value of the cargo moving over the marine terminals, since the value of the cargo is determined by the demand for the cargo, not the use of the Port Complex.
- Of the $39.2 billion, $7.6 billion was paid out in terms of direct salaries to those 95,957 directly employed and $4.3 billion of in-state purchases were made by the firms directly dependent on the marine activity at the Port Complex, which supported the 28,088 indirect jobs.

A total of $3.4 billion of state and local tax revenue within the State was generated by Port activity in 2021, including the tax impact of the re-spending and personal consumption impact. In addition, $21.1 billion of state and local taxes were generated by the impacts supported with the related users.

In addition to the direct, induced, and indirect impacts generated by the cargo and vessel activity at the Port Complex, $791.4 billion of total economic value was supported within the State in 2021, which represents 23.5 percent of the 2021 state of California GDP of $3.4 trillion. The total economic value to the state of California supported by the Port Complex consists of:

- **$732.7 billion value of the output** that is created with the related users due to the cargo moving via the marine terminals at the Port Complex, and includes the value added at each stage of producing an export cargo, as well as the value added at each stage of production for the firms using imported raw materials and intermediate products that flow via the marine

[5] The re-spending impact includes the local purchases by those directly employed as well as the consumption expenditures. Therefore, the total re-spending and consumption impact cannot be divided by 109,556 induced jobs to estimate induced salary, as this would be an overestimation of personal income.

terminals and are consumed within the State, as well as the revenue generated at each stage of delivery of a consumer import (via the Port Complex) to final sales.

- **$39.2 billion of direct business revenue to the providers of the marine services to the cargo and vessels calling the Port Complex.**
- **$19.4 billion of re-spending and personal consumption expenditures**, which is not part of the direct revenue impact but is in addition to the direct wage and salary impact and the direct revenue impact.

As Exhibit 2 demonstrates, the containerized cargo and associated vessels handled at the ILWU operated facilities account for the majority of the total economic impacts generated by all terminals at the Port Complex, accounting for about 89 percent of the direct, induced, and indirect impacts at the Port Complex, and for 99 percent of the related user impacts.

The Bigger Jobs Picture

The ability to identify the direct jobs by type of job is critical when evaluating the demand for job skills required at a marine terminal, and how specific jobs categories could be impacted in the future due to changes in terminal operations such as the increased automation of the marine terminals, changes in the share of containers that move intermodally to other parts of the United States, and changes in the volume and market share of total containerized cargo that moves through the San Pedro Bay Port Complex.

Exhibit 3 identifies the direct jobs generated by job category for marine cargo and vessel activity at both ILWU terminals and non-ILWU operated terminals at the Ports of Los Angles and Long Beach, as well as the number of direct jobs generated by containerized cargo only handled at the ILWU terminals at the San Pedro Bay Port Complex.

Exhibit 3
Direct Jobs Generated in California by Cargo and Vessel Activity at the San Pedro Bay Port Complex, 2021

JOB CATEGORY	All Port Facilities	ILWU Facilities	Containerized Cargo
RAIL INDUSTRY	3,659	3,656	3,529
TRUCKING INDUSTRY	38,313	38,192	37,593
TERMINAL OPERATORS	7,510	1,896	1,119
ILWU	9,527	9,527	8,827
PILOTS/TUGS	236	204	114
MARITIME SERVICES	5,108	4,815	4,217
FREIGHT FORWARDERS	5,324	5,316	5,095
DISTRIBUTION CENTER/WAREHOUSE/TRANSLOAD	24,472	24,472	24,172
GOVERNMENT/INSURANCE/BANKING/LEGAL	1,808	1,571	1,521
TOTAL	***95,957***	***89,648***	***86,188***

*Includes Steamship Agents, Chandlers, Surveyors, Marine Construction

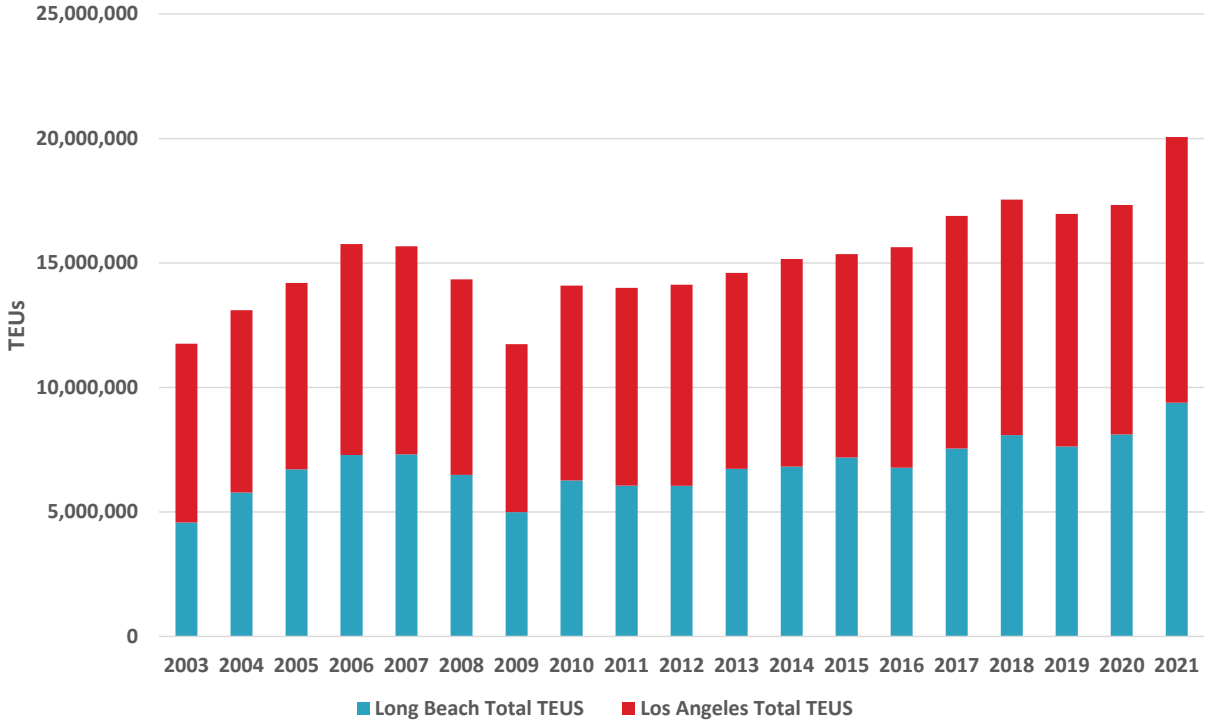
As shown in Exhibit 3, the greatest job impact is with the trucking industry, followed by jobs with near dock distribution centers/warehousing and transloading/cross dock operations and on-site fulfillment centers. Direct jobs supported in the trucking industry account for about 40 percent of all direct jobs generated. These jobs include not only drivers, but the dispatchers, mechanics and administrative employees associated with trucking and port drayage operations, but do not include the drivers within the marine terminals, as these are jobs with the ILWU. The 38,313 trucking industry jobs represent about 22,000 actual drivers. The majority of the trucking industry jobs, and the distribution center/warehouse/transload/fulfillment sector jobs, are supported by the container operations at the ILWU operated terminals. The direct jobs generated in the trucking industry and warehouse/transload/fulfillment sector account for 72 percent of the direct jobs supported by the ILWU container operations at the Ports of Los Angeles and Long Beach. The cargo activity at the ILWU operated terminals supported 9,527 jobs with the members of the ILWU (including registered longshoremen, clerks, and foremen) or about 24.4 million paid ILWU hours in 2021. As the result of rail operations, primarily intermodal container operations, 3,659 rail industry jobs were supported in California. Rail jobs are calculated based on the volume of intermodal containers, as well as autos, break bulk, dry bulk and liquid bulk cargoes moving by rail; the length of haul and associated crew changes that occur on the trains within the State; rail yard employees on dock and near dock; as well as maintenance, dispatchers, and administrative jobs.

As demonstrated, the San Pedro Bay Port Complex is a major catalyst to the state of California's economy, accounting for about 23.5 percent of the State's Gross Domestic Product in 2021. The majority of the economic impact is generated by the terminals operated by the ILWU, and furthermore, containerized cargo is the key generator of the economic impact of the San Pedro Bay Port Complex. Since the majority of the economic impacts are generated by the containerized cargo handled at the Pots of Los Angeles and Long Beach, the ability to grow and, at the minimum, maintain this economic contribution to the State will depend upon the health of the future container market served by the Port Complex. The balance of this paper focuses on the dynamics of the container market in which the San Pedro Bay Port Complex competes, and the identification of the challenges facing these ports in the future.

The Dynamics of the United States Container Market and Implications for the Ports of Los Angeles and Long Beach and The West Coast Ports

In 2021, the volume of containers handled at the San Pedro Bay Ports reached a record volume of 20 million twenty-foot equivalent units (TEUs). As indicated by Exhibit 4, from 2017 through 2020, these ports handled an average of about 17.2 million TEUs annually, with little year over year fluctuation in volume. Between 2020 and 2021, the San Pedro Bay Ports experienced a nearly 16 percent increase in container volume, reflecting the increased import demand during the height of the Pandemic, as consumers curtailed spending on services and travel, and refocused purchases on goods. In addition to the change in the composition of expenditures by consumers, federal and state expenditure programs were widespread, including increases in unemployment benefits, the Federal PPP Loan Program, and rent moratoriums, added to the disposable income of consumers.

Exhibit 4
Container Volume Handled at San Pedro Bay Ports (TEUs)



Source: Ports of Los Angeles and Long Beach

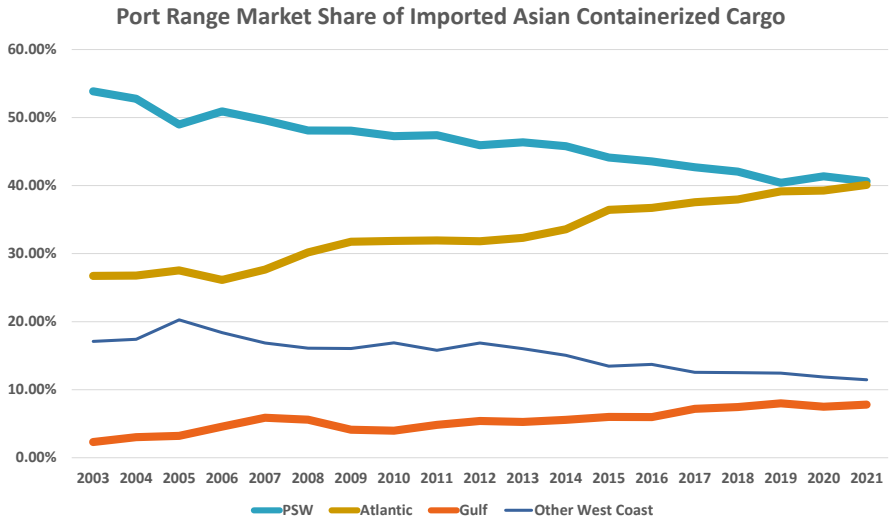
A meaningful portion of the ports' economic activity (and jobs, wages, tax revenue, etc.) derives from handling discretionary cargo. However, that cargo is increasingly served by other port regions, primarily the Atlantic and Gulf Coast ports. Typically, this discretionary cargo is cargo that is not consumed or produced in the local and regional economy and is moved between the San Pedro Ports and inland locations by rail. This discretionary cargo consists of international marine containers loaded directly at the port for delivery inland, or transloaded cargo, which is trucked to a local cross-dock/transload operation where the marine container is stripped, and its contents moved into a

domestic container and then loaded onto the rail for a move to an inland consumption point. The discretionary cargo is further identified by the fact that the majority of inland destinations and origins are typically east of the Mississippi River as well as Texas (accounting for about 60 percent of the international intermodal rail cargo leaving the San Pedro Bay Ports), which are areas that can be competitively served via the Atlantic and Gulf Coast ports. However, the inland points west of the Mississippi River are subject to potential diversion to Canadian Pacific ports and to a lesser extent, Mexican Pacific ports. The balance of this section focuses on the competition with the U.S. Atlantic and Gulf Coast ports for the discretionary cargo market. It is estimated that overall discretionary cargo accounts for about 33% of total containerized cargo handled at the San Pedro Bay Ports in 2021. This includes international marine containers that are moved directly via rail to eastbound locations, as well as international cargo that is transloaded from marine containers to domestic 53 ft. containers for transcontinental rail shipments.

As shown in Exhibit 5, the San Pedro Bay Ports' market share of Asian imported containerized cargo at the U.S. ports (in the lower 48 states) has continually contracted since 2003. This loss of market share reflects the fact that discretionary cargo handled at the Ports of Los Angeles and Long Beach, which is cargo that destined for consumption markets east of California, and typically east of the Rocky Mountains, and moved via intermodal rail, has been slowly diverted to East and Gulf Coast ports.[6] This diversion began as the result of the lockdown of West Coast ports during the 2002 contract negotiations between the International Longshore and Warehouse Union and the Pacific Maritime Association (representing the steamship lines and marine terminal operators that serve the West Coast ports). Between September 29 and October 9, 2002, operations at the West Coast ports were shut down following labor slowdowns at the ports. The shutdown ended when President George Bush enacted the Taft-Hartley Act. This shutdown and the ensuing impacts that occurred since 2002 highlight the long-term impacts that this 10-day disruption of the West Coast ports supply chain had on the overall use of the West Coast ports, particularly the San Pedro Bay Ports of Los Angeles and Long Beach.

[6] As noted in Exhibit 5, while small in comparative volume to the San Pedro Bay Ports, the other West Coast ports also experienced a declining market share of Asian imported cargo over the 19-year period. Falling from about 20% in 2005 to nearly 10% in 2021.

Exhibit 5
Market Share by Port Range of Asian Imported Cargo Tonnage into the U.S.



Source: USA Trade OnLine

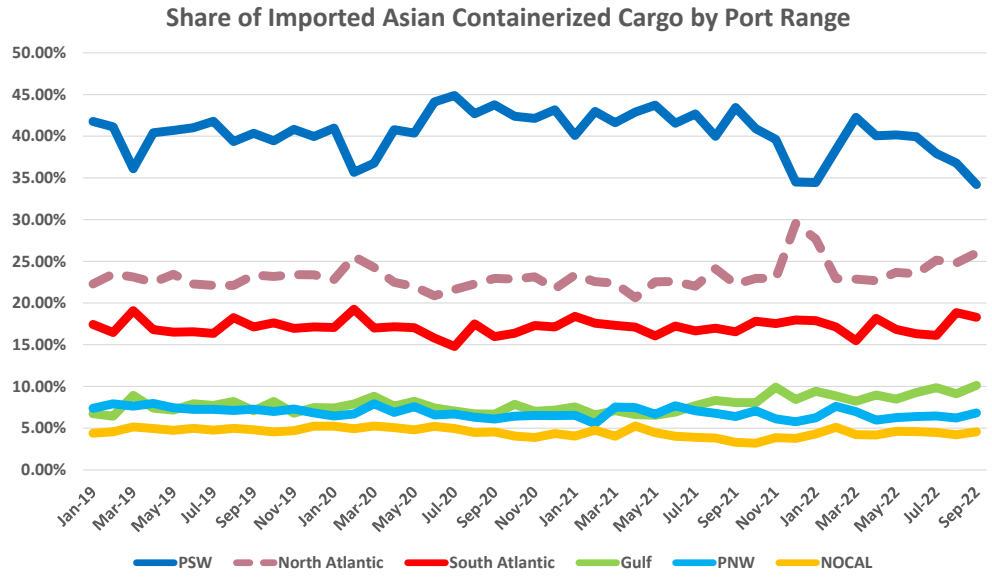
The disruption of port operations had an immediate cumulative effect not only on the port industry and its employees, but also on the exporters and importers as well as the entire transportation infrastructure and supply chain of the United States. The impact of the port shutdown was not just confined to 2002 but has had a long-lasting impact on the use of the West Coast ports by importers and exporters that have responded by developing alternative logistics supply chains. After the 2002 port closure, importers and exporters responded by using Atlantic Coast and Gulf Coast U.S. ports and Western Canadian ports to handle Asian cargo. To support this change in the logistics supply chain, these importers and exporters have established an increasing number of import distribution centers on the Atlantic and Gulf Coasts, which are now served by all water Asian cargo services calling such ports as New York, Norfolk, Charleston, Savannah, Miami, Jacksonville, Baltimore, Houston, and Mobile.

Adding to the increased deployment of direct all-water Asian service at the East and Gulf Coast ports was the was the port operations slowdown that occurred during the 2014-2015 ILWU contact negotiations and the opening of the expanded Panama Canal in 2016, which allowed larger container vessels to transit the Canal to the Atlantic and Gulf coast ports. To accommodate the deployment of the larger container vessels, a majority of the Atlantic Coast ports engaged in channel and harbor deepening projects to handle the larger containerships. Similar channel deepening and intermodal rail projects also have been undertaken at Gulf Coast ports of Houston, Mobile, and New Orleans.

In addition to channel and harbor deepening projects, these Atlantic and Gulf Coast ports have established competitive rail service to also serve the midwestern markets such as Chicago, Indianapolis, St. Louis, Kansas City, etc. that are also the key markets of the West Coast ports intermodal/discretionary cargo As a result, more direct Asian container ship service and cargo is now discharged at these ports and destined for key consumption points such as Dallas that had previously been served intermodally via the San Pedro Bay Ports.

It is to be noted that during the surge in imports at the San Pedro Bay Ports in 2021, the decline in the San Pedro Bay Ports' market share stabilized temporarily, but an assessment of the monthly market share shows that this loss of market share has once again accelerated in the third quarter of 2022, as shown in Exhibit 6. This accelerated loss of market share in the third quarter of 2022 reflects the uncertainty of the prolonged labor negotiations that have been in progress since May 2022 between the Pacific Maritime Association and the International Longshore and Warehouse Union. This uncertainty in dependability of service at the West Coast ports and the outcome of the contract negotiations, and in particular at the San Pedro Bay Ports, has resulted in the continual diversion of Asian imported containerized cargo (that historically moved intermodally via the West Coast ports) to the East and Gulf Coast ports.[7] It is important to note that since 2002, the West Coast ports, and in particular the San Pedro Bay Ports, have never regained lost market share, and this reversal is not likely in the foreseeable future, and the uncertainty around the current contract negotiations will continue this loss of market share and decline in discretionary cargo handled at the San Pedro Bay Ports.

Exhibit 6
Monthly Port Range Share of Asian Imported Containerized Tonnage During the Pandemic



Source: USA Trade OnLine

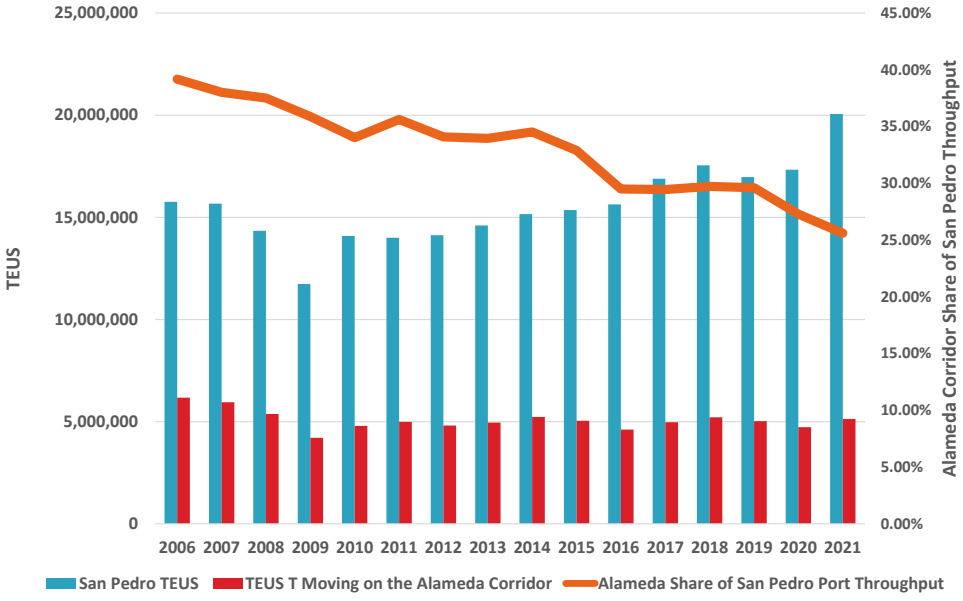
[7] "New Routings for Big Business", The Wall Street Journal, Exchange, by Paul Berger, December 10-11, 2022

Changes in Intermodal Volume Leaving the San Pedro Bay Ports

The loss of intermodal/discretionary cargo moving via the San Pedro Bay Ports is very evident when the volume of international intermodal cargo moving via the Alameda Corridor is evaluated. The Alameda Corridor is a 20-mile-long rail high-capacity freight expressway linking the San Pedro Bay Ports to the BNSF Hobart Yard and UP East Los Angeles Yard where transcontinental intermodal trains are assembled. The majority of the international intermodal rail traffic leaving the San Pedro Bay Port Complex moves on this corridor. Thus, the corridor's historical volume of intermodal traffic moving on this corridor is a strong indicator of the flow of discretionary cargo handled at the San Pedro Bay Ports.

The fact that the intermodal volume moving on the Alameda Corridor has remained nearly constant at about 5 million TEUs annually since 2010 is in direct contrast to the growth in TEU volume at the Ports of Los Angeles and Long Beach. Exhibit 7 shows the annual volume (in TEUs) of intermodal traffic moving on the Alameda Corridor, the TEUs handled at the San Pedro Bay Ports, as well as the share of the intermodal traffic on the Alameda Corridor compared to total TEUs handled at the San Pedro Bay Ports of Los Angeles and Long Beach. As this exhibit indicates, the share of San Pedro Bay Port's annual volume moving via intermodal rail through the Alameda Corridor has continually fallen since 2006, from a high of about 39% in 2006 to a 16 year low of 25.6% in 2021. The declining share of intermodal rail traffic on the Alameda Corridor reflects the overall loss of U.S. discretionary container market share that has characterized the San Pedro Bay Ports since 2003.

Exhibit 7
Comparison of TEU Volume Handled at the Ports of Los Angeles and Long Beach and the Intermodal TEUs Moving on the Alameda Corridor



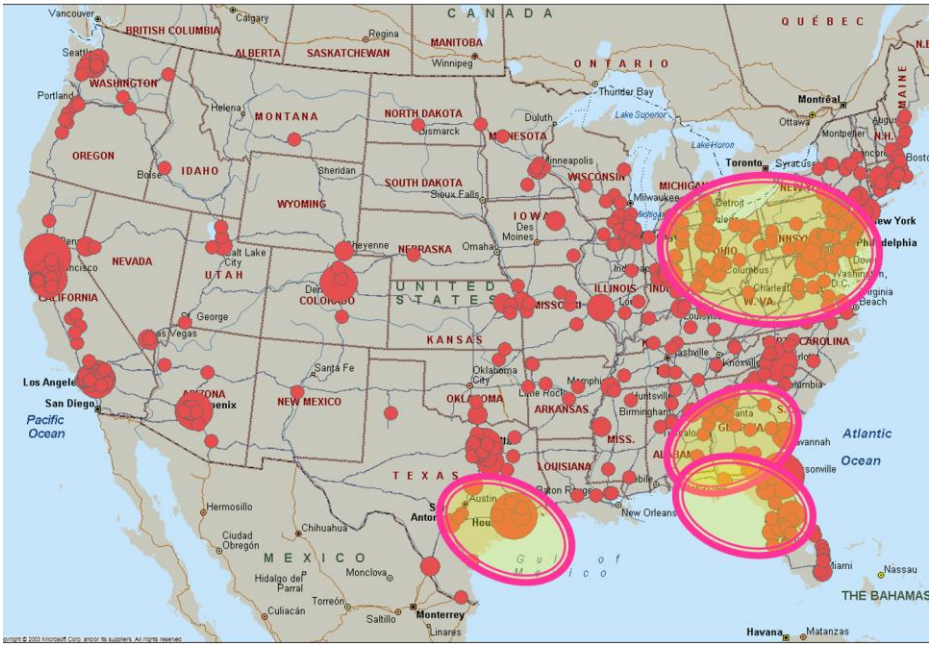
Source: Ports of Los Angeles and Long Beach and The Alameda Corridor Transportation Authority

Changes in Logistics Patterns of Importers/Exporters

The impact of the port shutdown was not just confined to 2002 but has had a long-lasting impact on the use of the West Coast ports by importers and exporters that have responded by developing alternative logistics supply chains. After the 2002 port closure, importers and exporters responded by using Atlantic Coast and Gulf Coast U.S. ports and Western Canadian ports to handle Asian cargo. To support this change in the logistics supply chain, these importers and exporters have established an increasing number of import distribution centers on the Atlantic and Gulf Coasts, which are now served by all water Asian cargo services calling such ports as New York, Baltimore, Norfolk, Charleston, Savannah, the Florida ports of Jacksonville, Port Everglades, Miami, Houston, and Mobile. Exhibit 9 shows the distribution center locations of the top 25 retailers in the United States. As indicated by the highlighted areas, these distribution centers are highly concentrated in the northeast, southeast and the Houston area, which are all in close proximity to key ports of New York, Baltimore, Norfolk, Charleston, Savannah, Jacksonville, Miami/Port Everglades, Houston, and Mobile.

Hence, these ports have become the logical gateways to serve these markets on all trade lanes, including China, Southeast Asia, Southwest Asia, the West and East coasts of South America, as well as Europe, the Mediterranean/Middle East, Africa, Central America, and the Caribbean.

Exhibit 8
Location of top 25 Retail Chains Import and Regional Distribution Centers



Source: Chain Store Guide

The location of distribution centers is critical in attracting cargo, particularly consumer goods such as furniture, apparel, electronics, toys, and perishables, and the location of distribution centers in proximity to the port is critical in attracting ocean carrier service. Port-centric locations are becoming more critical in attracting ocean carrier service to the nearby port in that a key cost

component to an ocean carrier is the ability to control empty containers and minimize the cost of repositioning the empty containers from the consumption points back to the seaport, with no revenue bearing cargo. In addition, carriers are continuing to price "port-to-port" moves more frequently than "point-to-point" moves. Under the port-to-port moves, the ocean carrier is responsible for the cost of moving the cargo from the foreign port to the U.S. port, including the terminal and stevedoring charges. The beneficial cargo owner (BCO) is responsible for the inland transportation part of the move. With the greater emphasis on port-to-port pricing, BCO's are incentivized to develop distribution centers closer to the port as well as to population centers, thereby minimizing the inland cost from the port to the consumption point, and further from the import distribution center to a regional distribution center or directly to the consumer from the distribution center. This later method of serving the consumers directly from the distribution center/fulfillment center is very advantageous to the growth in e-commerce, as the distribution center serves not only as an import distribution center, but also as a fulfillment center. At the distribution center, the marine containers are stripped, and cargo is warehoused, orders filled, and transloaded into domestic trailers (often 53 ft. trailers) for delivery to a regional distribution center. In cases where the distribution center also serves as a fulfillment center supporting e-commerce and last mile delivery (often within 24 hours), the imported containers are stripped, and often the cargo is reloaded into less than truckload lots for direct delivery to consumers.

Whether serving as an import center located in proximity to the port or as a fulfillment center, the near port location of distribution centers reduces the drayage cost between the port of discharge and the distribution center, as well as provides the ocean carrier with near port control of its marine container. In addition, with the escalation in trucking costs due to rising fuel prices, strictly enforced driving hours due to the mandatory electronic logging devices (ELD) installed on all trucks, and truck driver shortages, the minimization of trucking costs is critical to beneficial cargo owners. Thus, near port and near consumer market locations to the distribution center is a key factor driving ocean carrier port selection. In addition, the location of fulfillment centers in densely populated regions is further critical not only from the ability to meet 24-hour order fulfillments, but the fact that more than 30 percent of all E-Commerce products are returned, compared to 8.9 percent for purchases from brick and mortar stores.

The COVID-19 Pandemic has underscored the importance on E-Commerce, as well as dependability and diversification of logistics supply sourcing and inventory management. As experienced during this pandemic, there is growing demand for more warehouse/distribution center space near ports serving the large consumption markets, and the need for larger inventories and less dependence on just-in-time logistics supply chains. During the Pandemic, a growing share of purchases involved e-commerce, with a focus on last mile delivery within a limited time period. Total E-Commerce sales for 2021 were estimated at $820.8 billion, an increase of 16.0% from 2020 and accounted for 16.2% of total retail sales in the U.S. Overall, all retail sales (excluding automobile sales)

grew by 15.4% between 2020 and 2021.[8] E-Commerce requires greater utilization of warehouse space than traditional distribution centers serving brick-and-mortar stores.[9]

While the Pandemic increased the use of E-Commerce, sales from E-Commerce activity have been increasing strongly over the past 6 years. Between 2015 and 2021, the dollar value of E-Commerce in the U.S. grew by 285%, underscoring the increasing demand for warehouse space to support this growth.[10] With this growth expected to continue, the demand for warehouse space to accommodate E-Commerce sales and last mile delivery will continue in the future. This favors the development of port-centric distribution centers serving as fulfillment centers as well and emphasizing the use of all-water services for Asian cargo at Atlantic and East Coast ports serving the large consumption markets, as well as development of such near port distribution/fulfillment centers in Southern California and the San Francisco Bay Area. However, warehouse space is at premium in Southern California given the land scarcity for such development. In summary, the recent COVID Pandemic and growth in E-Commerce will likely negatively impact the movement of discretionary cargo through the San Pedro Bay Port Complex, as the cargo destined for the Atlantic and Gulf Coasts will likely use ports in these two port ranges.

Growth in the Deployment of All-Water Services Connecting Asia and the Atlantic and Gulf Coasts

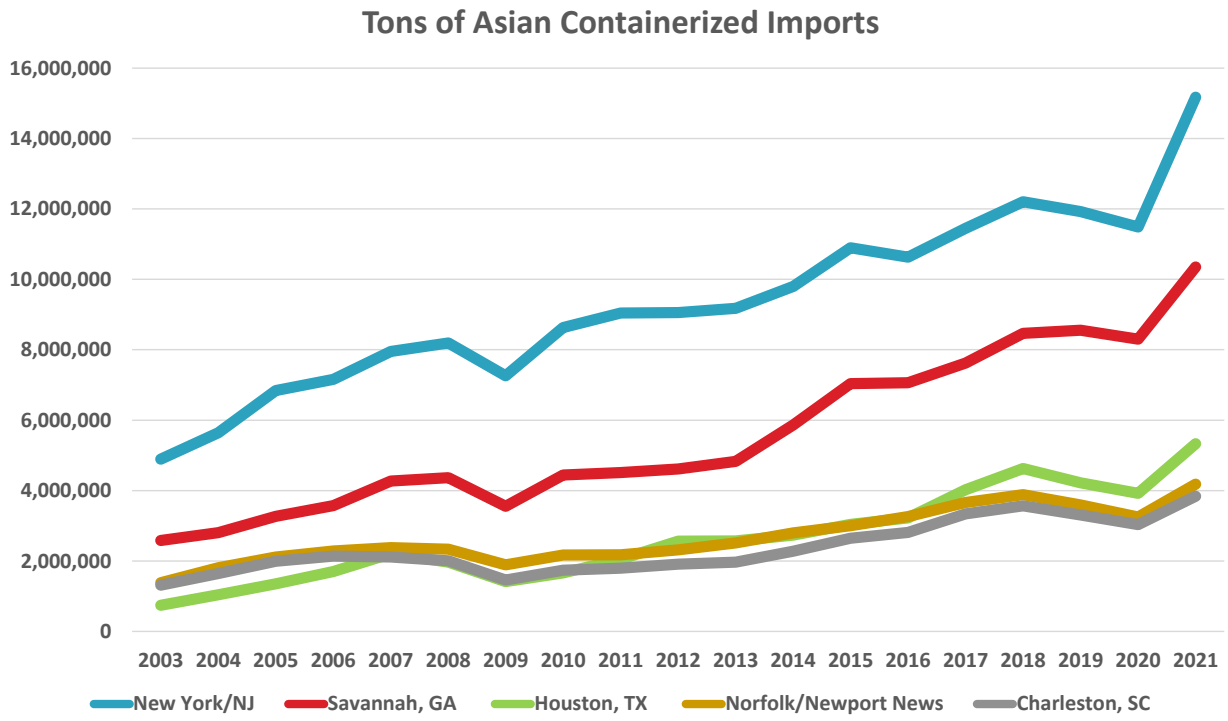
Exhibit 9 highlights this increased growth in Asian imported containerized tonnage at the U.S. Atlantic and Gulf Coast ports. It is to be noted that this growth accelerated after the West Coast port shutdown in 2002. The impact of labor contract issues in 2014 and 2015 at the West Coast ports that led to service disruptions and terminal congestion is also visible in the increased rate of growth in Asian imports at the Ports of New York and Savannah during this time. In addition, the impact of the opening of the expanded Panama Canal in 2016 (to accommodate larger vessels operating on all water Trans-Pacific trade) is clearly seen by the accelerated growth in Asian imports at these key Atlantic and Gulf Coast ports. Finally, the unprecedented growth in Asian imported containerized cargo at the Atlantic and Gulf Coast ports is clearly visible in Exhibit 9. This growth also reflects the vessel and terminal congestion that occurred at the West Coast ports, particularly the San Pedro Bay Ports, during the height of the Pandemic in 2021.

[8] U.S. Bureau of the Census, "Quarterly Retail E-Commerce Sale 4TH Quarter 2021, February 14, 2022"; and U.S. Bureau of the Census, "Supplemental Estimated Sales for Electronic Shopping and Mail-Order Houses, Total and E-Commerce Sales by Primary Business Activity": 2015-2021; and U.S. Bureau of the Census, Annual Sales of U.S. Retail Stores by Kind of Business, 1992-2021.

[9] ASSESSMENT OF THE IMPACTS OF CONGESTION AT SAN PEDRO BAY PORTS ON MARKET SHARE AND FUTURE UTILIZATION OF ATLANTIC AND GULF COAST U.S. PORTS, by Martin Associates, for the Pacific Maritime Administration, March 2022.

[10] U.S. Bureau of the Census, "Supplemental Estimated Sales for Electronic Shopping and Mail-Order Houses, Total and E-Commerce Sales by Primary Business Activity": 2015-2021

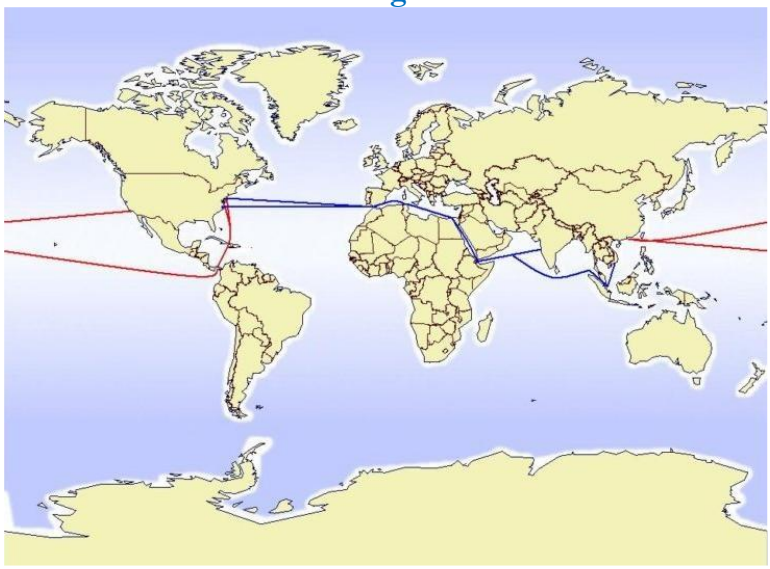
Exhibit 9
Asian Imported Containerized Cargo by Key Atlantic and Gulf Coast Port



Source: USA Trade OnLine

To accommodate the growing demand for the use of the Atlantic and Gulf Coast ports to handle Asian cargo, ocean carriers responded by increasing sailings between Asia and the Atlantic and Gulf Coast ports via the Panama Canal and the Suez Canal (Exhibit 10). Typically, the Suez routing provides a more competitive transit time to the Atlantic and Gulf Coast ports (over the use of the Ports of Los Angeles and Long Beach) to serve the southeastern Asian market (typically south and west of Singapore), while the Panama Canal routing is the all-water routing usually used to serve the Asian trade north of Singapore, including, China. This is particularly the case to serve the consumption markets located in proximity to the Atlantic and Gulf Coast ports.

Exhibit 10
All-Water Asian Service Routings to the East and Gulf Coasts



As the ocean carriers increased the number of all-water sailings between Asia and the Atlantic and Gulf Coast ports after the 2002 West Coast ports shutdown, the size of the container ships deployed on the all-water routings also began to increase in order to minimize shipping costs per container. An expanded Panama Canal was opened in 2016, further increasing the cost competitive all-water Asian routing. The Trans-Pacific trade is characterized by the deployment of larger containerships compared to the size of vessels deployed on European, Mediterranean, Middle East and South American trade lanes. This deployment of larger ships is driven by the economies of scale that are achieved on the size of the market, as well as on the length of sail for container vessels transiting the Trans-Pacific trade and the Panama Canal (and Suez Canal) routings to the U.S. East Coast and Gulf Coast ports. As the ships of larger sizes cascade from one trade lane to another, there is a constant growth in the size of vessels deployed on all trade routes.

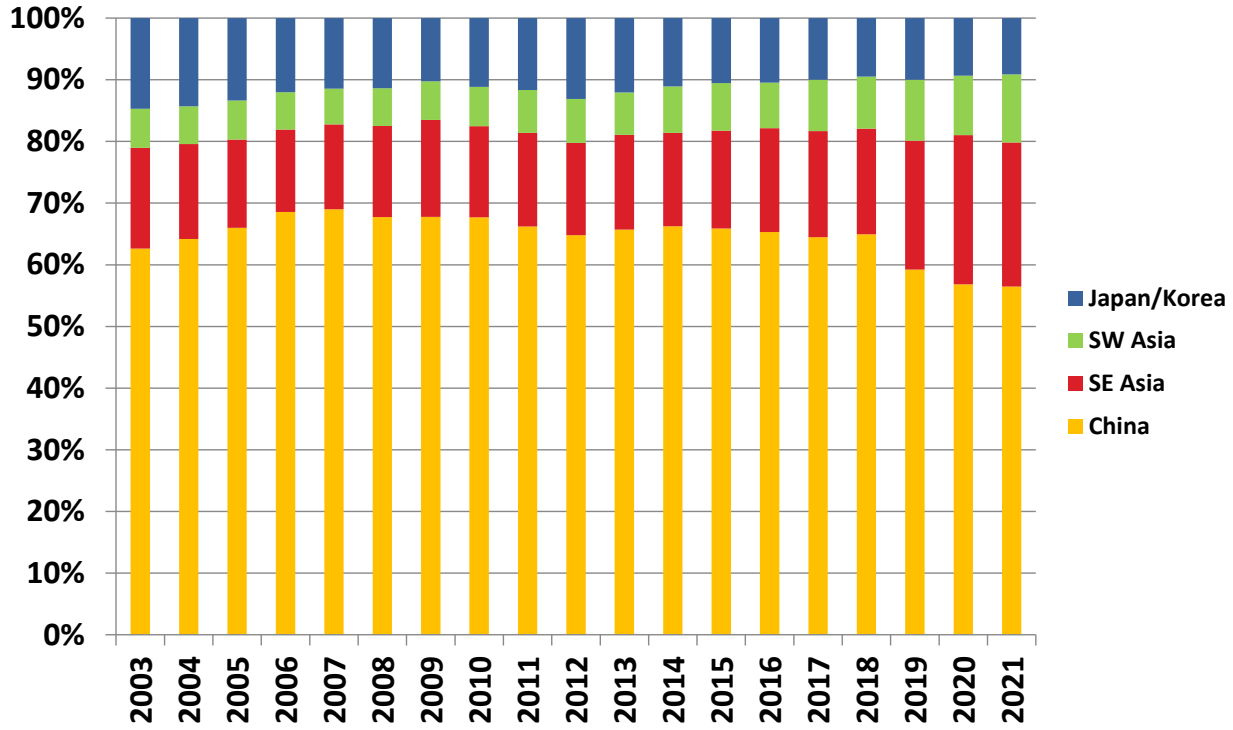
For example, the largest container vessels, those in the 18,000 - 22,000 TEU and above category are deployed on the Asia-Europe trade, as the economies of the largest container vessels are realized on the longest trade routes with minimal port calls. As these larger ships, the 18,000 TEU vessels and greater, are deployed on the Asia-Europe routings, the current vessels on that route are moved to the Trans-Pacific routing, which is the routing offering the next level of distance and minimal port calls. These newly deployed vessels on the Trans-Pacific trade (from the Asia-Europe trade) displace the current sized fleet on the Trans-Pacific trade and these displaced vessels then cascade to the all-water Asia-U.S. Atlantic Coast/Gulf Coast trade via the Panama Canal.

As the vessel size increased on the all-water Asian trades on the Atlantic and Gulf Coast ports, investment in wider and deeper channels, super-post Panamax cranes and efficient terminal operations and expanded intermodal rail operations have become a necessity at those ports participating in the Asian all-water services. As documented, these investments have been and are continuing to be made at the Atlantic and Gulf Coast ports, as will be discussed later in this report.

Changes in U.S. Import Sourcing and Impact on Discretionary Cargo Market

The production centers in Asia for imports destined into the United States have gradually been shifting away from China to other regions, particularly counties in Southeast Asia. Exhibit 11 shows that China continues to be the leading source of imports into the United States, but the share of U.S. imports from China has been declining over the period, and in particular since 2018, reflecting the impact of trade policy actions, and is likely to continue to fall as importers diversify the logistics supply chains away from China into countries in Southeast Asia such as Vietnam, Thailand, and Cambodia as well as Southwest Asian countries such as India and Pakistan.

Exhibit 11
Supply Sources of U.S. Containerized Imports



Source: USA Trade OnLine

The COVID -19 Pandemic has further underscored the importance of diversification of supply sourcing in the future. While China will likely continue to be the largest trading partner in the short to mid-term, its dominance will likely diminish as manufacturing infrastructure and port, highway and rail infrastructure are developed in the other areas of Asia.

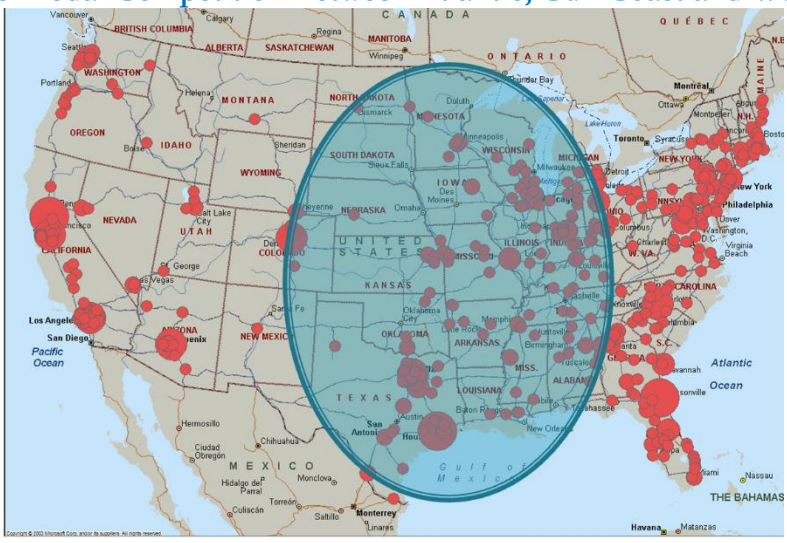
These changes in the sourcing of imports to diversify the supply chains of key U.S. importers away from China, has further implications on the future shipping patterns. For example, as supply sources shift away from China into Southeast Asia, the Suez Canal becomes the preferred trade lane to serve all water services into the Atlantic and Gulf Coast ports, and transit time differentials to serve the midwestern consumption markets with Southeast Asian cargo via these two coasts become more competitive with the use of the San Pedro Bay Port Complex. As near market sourcing continues, overall Trans-Pacific trade will likely be negatively impacted, affecting not only the discretionary cargo

moving via the San Pedro Bay Ports destined for the midwestern and southeastern U.S., but the overall level of containers moving via the San Pedro Bay Port Complex into California and western U.S. states.

Port Terminal Investment to Accommodate the Growth in All-Water Service and Increased Intermodal Service via U.S. Atlantic and Gulf Coast Ports

As the vessels increased in size requiring deeper and wider channels at the Atlantic and Gulf Coast ports, the key container ports embarked on channel deepening and widening projects, and also invested in larger (post Panamax) container cranes, as well as terminal upgrades. Finally, the investment in rail service at the Atlantic and Gulf Coast ports increased in order to serve more inland markets and logistics centers that were previously served via the West Coast ports. These investments in deeper channels, terminal infrastructure and equipment, and intermodal rail terminals at the Atlantic and Gulf Coast ports are not only focused on serving the port local consumption markets, but the focus has been on increasing the markets of these Atlantic and Gulf Coast ports to serve the distribution centers located in the midwestern states that have historically been served intermodally via the West Coast ports for Asian trade, particularly the San Pedro Ports Complex. This battle ground market area is shown in Exhibit 12.

Exhibit 12
Region for Intermodal Competition Between Atlantic, Gulf Coast and West Coast Ports



With respect to channel dredging projects at the Atlantic and Gulf Coast ports to accommodate the growing size of container vessels, several ports on the Atlantic coast have a 50 ft. or greater shipping channel. These are the Ports of New York, Baltimore, Norfolk, Charleston, and Miami. Deepening projects of 47 ft. and greater are under way at the Ports of Boston, Savannah, Jacksonville and Port Everglades, and the Port of Charleston is completing anticipating a 52 ft. channel by 2021. The Delaware River shipping channel has been deepened from 40 ft. to 45 ft. On the Gulf Coast, the Port of Mobile is deepening its shipping channels to 47 ft., while the widening of the Houston Ship Channel to accommodate container vessels in excess of 1,100 ft. in length (LOA) is now under way. The U.S. Army Corps of Engineers allocated the funding for the Port of Mobile's

shipping channel navigational project in fiscal 2020, which will deepen the channel to 50 ft. from its current 45 ft. depth and widen the channel from 400 ft. to 500 ft. to accommodate the larger sized container vessels. Furthermore, the deepening of the Lower Mississippi River Shipping Channel from 45 ft. to 50 ft. between Baton Rouge and the Gulf of Mexico is now underway.

Not only have the Atlantic and Gulf Coast ports responded to the growing number of all-water sailings utilizing the larger container vessels, but the ports have also responded to this growth in Asian all water services by investing in terminal and intermodal rail capacity. Nearly $13 billion of investment has been or are planned to be invested over the next 5-7 years in port terminal investments to accommodate the growth in all-water service and increased intermodal service via U.S. Atlantic and Gulf Coast Ports

For example, over the next 5-7 years more than $5 billion of terminal and rail infrastructure projects are underway or planned at the Port Authority of New York and New Jersey. These are in addition to the recently completed $1.6 billion project to increase the height of the Bayonne Bridge to allow for sufficient air draft clearance for the largest container ships to serve the Port Authorities container terminals in Newark and Elizabeth, New Jersey. Other investments include a $356 million investment in the intermodal yard to serve the Global Container terminal in Bayonne, NJ; a $661 million expansion project at Port Newark Container Terminal; a $187 million investment at Port Elizabeth Marine Terminal; a $1.5 billion Goethals Bridge replacement project; a $1 billion wharf and berth replacement project; and a $44.5 million investment at the Howland Hook Marine Terminal. In addition, the long-term development plan recently approved by the Port Authority includes the development of a new container complex outside the Bayonne Bridge.

The Port of Philadelphia (Philaport) is investing more than $750 million in marine terminal development. These projects include the completion of a $392 million deepening project; $255 million investment in the Packer Avenue Marine Terminal (the Port's container terminal); a $93 million investment in an auto processing facility; a $12 million investment in the Tioga Marine terminal (a break bulk forest products and steel terminal); and the initiation of a new CN/CSX rail service.

With respect to the Port of Baltimore, the Maryland Port Administration has just been awarded a grant to elevate the Howard Street Tunnel, which will provide the ability to handle double stack intermodal rail service between the Port's Seagirt Marine Terminal and points in the midwestern United States. The development of Trade Point Atlantic distribution center complex near the Port of Baltimore has been key in securing the location of major import distribution centers that can also perform as fulfillment centers to serve the Baltimore-Washington Corridor.

The Port of Virginia (Norfolk) has planned for $1.06 billion of new terminal and intermodal investment. These projects include the completion of the $320 million Virginia International Gateway project which will double the size of the current container rail yard and increase intermodal share of the port to 40 percent from its current 35 percent intermodal share. At the Virginia Inland Port in Front Royal, VA, a $42.5 million investment is underway to double rail capacity. The Virginia Port Authority is also investing about $350 million into the Norfolk International Terminal to expand existing capacity; and the completion of a $350 million channel deepening navigational project.

The South Carolina State Port Authority is investing $3 billion in terminal development, intermodal rail facilities and inland ports, and navigational projects. The SCSPA is investing $450 million to deepen the channel to 52 ft. and nearly $1.2 billion to develop a new container terminal, the Hugh Leatherman Terminal, with a capacity to handle 2.8 million TEUs, and the development of a refrigerated facility, as well as a new access road. With respect to the development of inland ports to grow the SCSPA, intermodal rail service to more efficiently serve the southeastern and midwestern United States, $96.2 million is being invested in the SCPA's inland rail port at Greer, NC, and $51.3 million at the Port's Inland Port Dillion. A $250 million intermodal rail facility is being developed at Charleston by Palmetto Railways, a division of the South Carolina Department of Commerce. The SCSPA is also investing $350 million in terminal improvements at the Wando Welch Container terminal.

The Georgia Ports Authority (GPA) is investing more than $500 million in rail infrastructure projects to increase service into the southeastern and midwestern United States. The project includes a $220 million investment at the Mason Mega Rail Terminal on-dock ICTF rail yard at the Garden City Terminal and $15 million investment in the Northeast Georgia Inland Port (Gainesville, GA). Finally, the GPA is investing $266 million to complete the Savannah Harbor Expansion Project.

The Jacksonville Port Authority is investing in deepening the St. Johns River to 47 ft. This is a $484 million project and will provide a 47 ft. channel to a new container terminal being developed at the Blount Island Marine Terminal.

With respect to the Gulf Coast ports, the Port of Mobile completed its third phase of a $50 million terminal expansion at the APM Container Terminal, which is part of the $450 million invested recently in the development and expansion of the container terminal and the development of an ICTF intermodal rail facility. The U.S. Army Corps of Engineers has just allocated funding for the deepening and widening of the Port of Mobile shipping channel to 50 ft. The widening and eventual deepening of the Houston Ship Channel is underway which will allow the largest container ships to transit the Channel to access the Port's container terminals at Bayport and Barbours Cut, and the site(s) of a new container terminal along the Houston Ship Channel is now under study.

The Port of New Orleans has adapted a $100 million port expansion plan that includes the purchase of four post-Panamax cranes, and the purchase of the New Orleans Public Belt Railroad, which will enhance the growth of intermodal rail service at the Port. Planning for the development of a new container terminal at the Port of New Orleans is well underway.

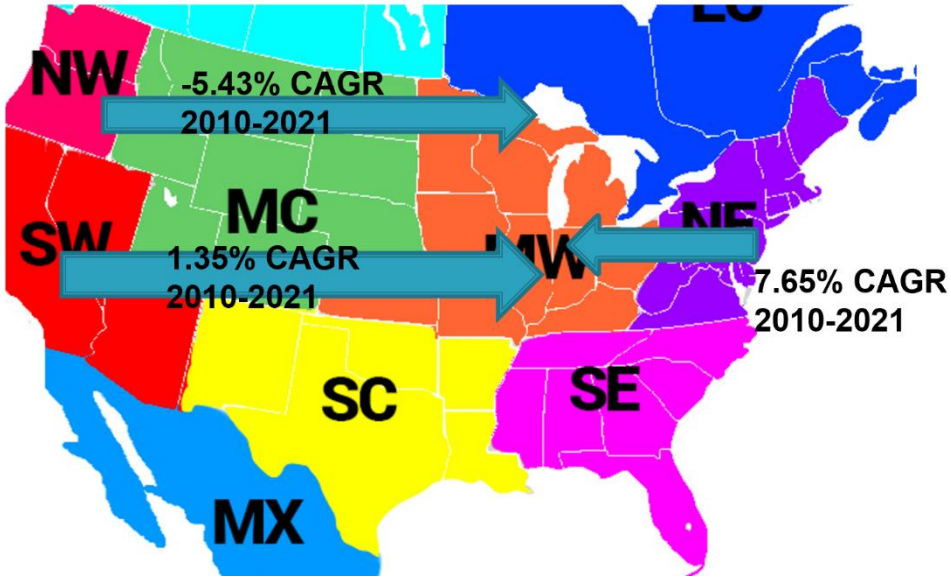
Shifting Intermodal Trade Volumes

A comparison of trends in the share of Inland Point Intermodal (IPI) activity, which is the movement of import/export marine containers by rail, underscores impact that the investment in marine terminal development and accompanying rail infrastructure at the U.S. Atlantic and Gulf Coast ports and underscores the loss of market share to serve the "battle ground" of Midwest consumption markets described previously. To assess the changes in intermodal international containers moving from the San Pedro Bay Ports to the Midwestern consumption battle ground compared to the growth in intermodal international volume from the Northeastern ports, primarily New York, Norfolk, Baltimore, and Philadelphia, to this consumption market, historical intermodal international container

volumes developed by the Intermodal Association of North America (IANA) were evaluated. The IANA database provides intermodal lifts (defined as actual containers whether 20 ft., 40 ft., or 53 ft.) that are loaded or discharged from a rail car. This data base includes strictly international cargo moving in marine containers from the San Pedro Bay Ports to inland points in the midwestern U.S. such as Chicago. The international cargo is classified as Intermodal Point Inland (IPI).

Exhibit 13 shows the historical flows of international intermodal cargo (IPI) to the Midwestern region, which is the destination and origin if the largest intermodal lane flows. As Exhibit 13 shows, between 2010 and 2021, the international intermodal traffic between the Southwest region, in which the San Pedro Bay Ports are located, grew at a 1.35% CAGR. This compares to a 7.65% CAGR for international intermodal volume from the Northeastern ports (primarily New York and Norfolk) to the Midwestern region, reflecting the shift in discretionary containerized cargo from the West Coast to the East Coast ports to serve the Midwestern market. Additionally, international intermodal cargo (IPI) from the Pacific Northwest container ports of Seattle, Tacoma and Portland actually posted a significant annual decline of -5.43% annually, reflecting the loss of discretionary cargo destined from the PNW ports to the Midwestern U.S., primarily the Chicago market.

Exhibit 13
International Intermodal (IPI) Cargo Flows to the Midwest Region, 2010-2021



Source: IANA IPI Trade Lane Data

The Impact of the Continued Loss of Discretionary Cargo at the San Pedro Bay Ports

This report has documented the decline in the market share of the West Coast ports in handling Asian imported containers, with an emphasis on the San Pedro Bay Ports, which have handled the majority of this cargo historically. As noted, this decline in market share has been driven by the loss of discretionary cargo that has typically moved from the San Pedro Bay Ports to inland destinations, most concentrated in the midwestern states. Further as demonstrated in this report, the lack of service dependability at the West Coast ports, starting with the West Coast port shutdown in 2002, and continuing through the last 20 years, has resulted in beneficial cargo owners (BCOs) searching for alternative logistics solutions to handle imported Asian cargo. With the service interruptions that started in 2002, and again reappeared during the 2014-2015 ILWU contract negotiations, the accelerated loss of discretionary cargo is now occurring during the current contract negations that have been underway since May 2002, with no end in sight. Furthermore, as documented, the West Coast ports, and in particular the San Pedro Bay Ports, have not been successful in regaining any lost market share since 2002, and the uncertainty as to the future of the current contract negotiations further exacerbates the ability to stop the market share erosion.

To underscore the impact of the discretionary containerized cargo handled at the San Pedro Bay Ports, Martin Associates developed a specific discretionary cargo economic impact model that isolates the economic impact of the current discretionary cargo volume handled at the Port Complex, which is estimated at about one-third of the total volume of containers handled at the Ports of Los Angeles and Long Beach. The model also includes the impact of the transloading of the intermodal cargo into 53 ft. domestic containers to move via rail to eastern destinations. This transloaded cargo is trucked from the ports' marine terminals to regional transload/warehouse/distribution centers, where the cargo destined for eastward locations served by rail is transferred from the marine container to the domestic container for its final intermodal move. The transloaded container is then trucked from the warehouses/distribution centers to the intermodal rail yards such as the BNSF Hobart Yard and the UP East Los Angeles Yard for its transcontinental journey. The empty marine container is then returned to the San Pedro Bay Port Complex or loaded with export cargo and then returned to the Port Complex for the return voyage to Asia.

Exhibit 14 presents the economic impacts to the state of California of the discretionary cargo now handled at the San Pedro Bay Ports in 2021

Exhibit 14
2021 Economic Impact of Discretionary Cargo Handled at the San Pedro Bay Ports

IMPACT CATEGORIES	DISCRETIONARY CARGO IMPACT
JOBS	
Direct	22,875
Induced	26,450
Indirect	6,696
TOTAL DIRECT, INDUCED, INDIRECT JOBS	**56,022**
WAGES/SALARIES (Millions)	
Direct	$1,846.1
Re-spending/Consumption	$4,708.8
Indirect	$400.9
TOTAL PERSONAL INCOME AND CONSUMPTION (Millions)	**$6,955.8**
DIRECT BUSINESS REVENUE (Millions)	**$19,293.7**
TAXES (Millions)	**$942.9**

Source: Martin Associates Economic Impact Model for the San Pedro Bay Ports Complex

In 2021, the discretionary cargo handled at the San Pedro Bay Ports supported 56,022 direct, induced, and indirect jobs, $19.3 billion of direct business revenue to the local service providers, and $942.9 million of state and local taxes to the State. The majority of the direct induced and indirect impacts occur in the San Pedro Bay regional economy.

Martin Associates further estimated the impact of an additional 1 percent loss in the San Pedro Bay Ports' market share of imported Asian Cargo handled at U.S. ports, which would reflect a loss of discretionary cargo at the Port Complex. This equates to about 114,000 container moves or about 200,000 TEUs per year of lost discretionary cargo from the San Pedro Bay Ports. Exhibit 15 shows the projected economic impact to the state of California of a 1 percent loss in discretionary cargo from the 2021 levels. For each 1 percent loss in discretionary cargo at the San Pedro Bay Ports, 5,763 direct, induced, and indirect jobs within the state of California are projected to be lost, along with $1.4 billion of local business revenue from providing maritime services, and $101.2 million of state and local taxes.

Exhibit 15
2021 Economic Impact of a 1 Percent Market Share Loss In Discretionary Cargo at San Pedro Bay Ports

IMPACT CATEGORIES	1% Loss In Discretionary Cargo
JOBS	
Direct	2,126
Induced	3,016
Indirect	622
TOTAL DIRECT, INDUCED, INDIRECT JOBS	**5,763**
WAGES/SALARIES (Millions)	
Direct	$221.2
Re-spending/Consumption	$564.2
Indirect	$37.3
TOTAL PERSONAL INCOME AND CONSUMPTION (Millions)	**$822.7**
DIRECT BUSINESS REVENUE (Millions)	**$1,412.7**
TAXES (Millions)	**$101.2**

Source: Martin Associates

Summary

The Ports of Los Angeles and Long Beach are a significant economic engine for the southern California economy as well as the state of California, supporting more than 23.5 percent of the State's Gross Domestic Product and creating nearly 233,602 direct, induced, and indirect jobs. Another 3.4 million jobs with importers and exporters within the State are supported by the containers, autos, break bulk, dry bulk and liquid bulk cargoes moving via these ports. The cargo handled at the ILWU operated facilities at the San Pedro Bay Port Complex generate and support the majority of these impacts, accounting for nearly 216,675 direct, induced and indirect jobs, and supporting the majority of the 3.4 million jobs with importers and exporters located within California. The handling of the containerized cargo that moves through the container terminals generates the majority of the total Port Complex impacts, creating about 207,420 direct, induced jobs, and supports the majority of nearly all of the 3.4 million jobs with the importers and exporters within the State. Of the 207,420 direct, induced, and indirect jobs generated by the container traffic moving via the Port Complex, 86,188 jobs are directly supported. The majority of these jobs are with the trucking industry moving the cargo to and from the marine terminals, followed by the jobs with the distribution centers, warehouses and transload facilities in the Southern California area, in which goods are repackaged and readied for further distribution to intermediate stops on the logistics supply chain or to the final consumers.

Of the containerized cargo moving through the Port Complex, about 33 percent moves by rail, either directly via intermodal trains that move to and from the Port Complex daily, or containers that are first trucked to the local distribution centers and transload facilities where they goods are transloaded into domestic containers and then moved to inland destinations by intermodal rail. It is estimated that more than 50 percent of the intermodal rail moves are actually trucked to the distribution centers/transload facilities prior to the rail move.[11] These marine containers are trucked to local warehouses and distribution centers, repackaged, and loaded into larger domestic containers for further distribution to final destinations. The empty marine container is then returned by truck from the warehouses, transload facilities and distribution centers to the marine terminals. The transloaded containers are then loaded onto rail cars for further delivery into eastern consumption markets such as Denver, Dallas, Chicago, St. Louis, Nashville, Atlanta, and even coastal cities such as New York, Boston, and the Washington-Baltimore Corridor.

Furthermore, about 60 percent of the intermodal containers move to and from the San Pedro Ports and points east of the Mississippi River. It is this intermodal discretionary cargo that has become the focus of the loss of market share by the San Pedro Bay Ports, and as this report as demonstrated, this erosion of market share since the 2002 West Coast shutdown has been driven by many factors beyond the control of the Ports of Los Angeles and Long Beach, most notable the disruption of service and dependability that have occurred during the ILWU contract negotiations over the past 20 years.

Overall, the intermodal cargo at risk supported 56,022 direct, induced, and indirect jobs in 2021, of which 22,875 jobs were directly generated by the intermodal containers moving through the Port Complex. Of these 22,875 direct jobs, the majority were with the local trucking industry (7,547 jobs) and 4,786 jobs were with the distribution centers, warehouses and transload facilities in the San

[11] "Is the Alameda Corridor In Trouble?", Railway Age, November 22, 2019, by Jim Blaze, Contributing Editor, and verified through interviews with ocean carriers and terminal operators at the San Pedro Bay Ports Complex.

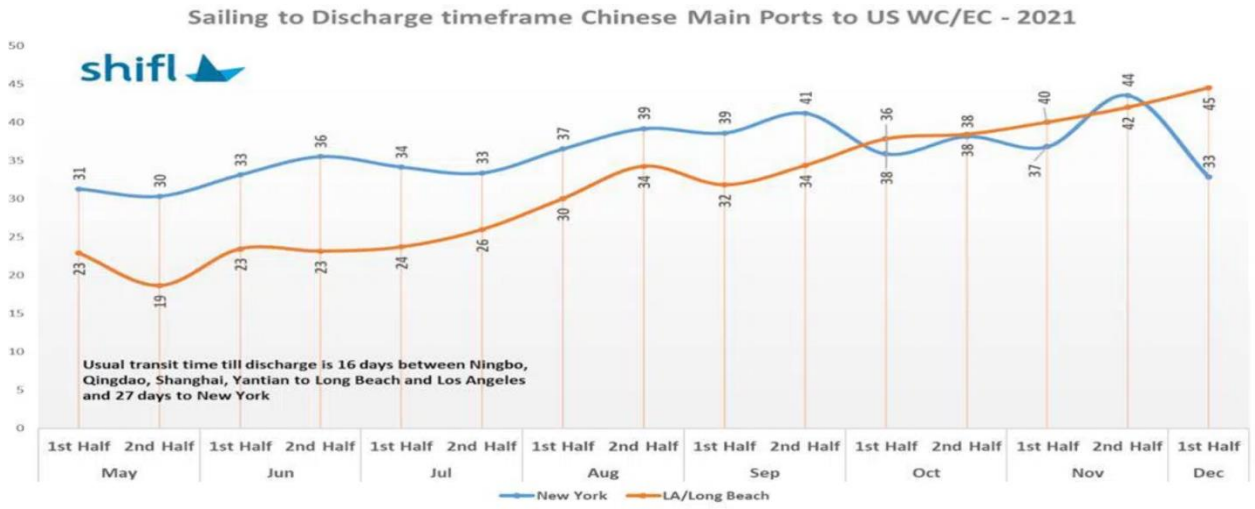
Pedro Bay community. It is estimated that 2,913 jobs with the ILWU were supported by the intermodal cargo, while 2,718 jobs were with the railroads and rail yards operating in Southern California.

Martin Associates further estimated the impact of an additional 1 percent loss in the San Pedro Bay Ports' market share of imported Asian Cargo handled at U.S. ports, which would reflect a loss of discretionary cargo at the Port Complex. This equates to about 114,000 container moves or about 200,000 TEUs per year of lost discretionary cargo from the San Pedro Bay Ports. This 1 percent loss in market share represents an estimated loss of 5,763 direct, induced, and indirect jobs within the state of California, along with $1.4 billion of local business revenue from providing maritime services, and $101.2 million of state and local taxes.

As emphasized in this report, the market dynamics favor the growth in all water Asian services at Atlantic and Gulf Coast ports, and terminal investment and development of intermodal rail capacity at Atlantic and Gulf Coast ports have positioned these port ranges well to compete for the intermodal cargo now moving via the San Pedro Bay Port Complex. In order to maintain the San Pedro Bay Ports' market share of Asian containerized imports at the current level, it is critical that any further disruptions to service at the San Pedro Bay Port Complex be averted, and the current lengthy contract negations be completed. While it is unlikely that the San Pedro Bay Ports can regain significant lost market share of the Asian imported containerized cargo that has occurred since 2002, the assurance of long term continuity of service at the San Pedro Bay Port Complex must be demonstrated to beneficial cargo owners. It appears that dependability of service above all else is key to maintaining market share and stemming any additional loss.

In addition to providing a demonstrated continuity of service at the West Coast ports by avoiding any work slowdowns associated with contract negotiations like those that have occurred in 2002, 2014-2015, and the current uncertainty surround the 2022 contract negotiations, continuity of service is also driven by the ability to avoid terminal congestion as was the case during the 2021-2022 COVID-19 Pandemic. The unprecedented growth in container volume at the San Pedro Bay Ports of Los Angeles and Long Beach between 2020-2021 led to the widely publicized import supply chain collapse due to the logistics capacity constraints at literally all levels of the import supply chain - including the ship berths at the terminals; container yard handling capacity; capacity at the warehouse and distribution centers handling the containers; the availability of chassis and truck drivers to handle the unprecedented volume of containers; and a shortage of intermodal rail car capacity throughout the rail systems serving the import market, not to mention the restricted labor supply due to COVID-19. As shown in Exhibit 16, during the supply chain congestion of 2020-2021, the average transit time for a container from the departure of major Chinese ports to the discharge of the container at New York/New Jersey was faster than the same metric between major Chinese ports and the container discharge at San Pedro Bay Ports. Beginning in October 2021, the transit time between a Chinese port and a container discharge at the San Pedro Ports was about equal to the transit time of a container between the Chinese port and the discharge at the New York/New Jersey container terminals. In fact, by the end of 2021, the use of the marine terminals at the Port of New York/New Jersey Port Authority provided a transit time savings of 12 days compared to using the San Pedro Bay Ports container terminals. This suggests that in order to regain market share, it is critical that the capacity crunch and resulting vessel delays and queueing at the San Pedro Bay Ports be avoided in the future during times of peak demand, or more cargo will flow via the Atlantic and Gulf Coast ports.

Exhibit 16
Transit Time Between Leaving a Chinese Port and Discharging the Container at the Port Authority of New York and New Jersey Terminals and Los Angeles/Long Beach Container Terminals



Should the capacity constraint situation at the West Coast ports reappear in the future, and given the fact that land for expansion of marine terminals in Southern California is limited compared to the situation at the Atlantic and Gulf Coast ports, the inability for the container terminals, especially in San Pedro Bay, to handle additional container throughput will result in further service disruptions, leading to further market share loss as BCOs will continue to establish logistics supply chains that can be served via the Atlantic and Gulf Coasts. As the move to near shore manufacturing continues, as well as the trend to move away from the dependence on the Chinese import sources to Southeast and Southwest Asia, the vessel routings of Asian cargo from Southeast and Southwest Asia will use the Suez Canal to serve the Atlantic and Gulf Coast ports to a greater degree, and it is this Suez routing that further favors an Atlantic Coast routing from a cost and time perspective over a West Coast routing to serve midwestern states.

Therefore, in order to avoid a continual loss of market share to the Atlantic and Gulf Coast ports, it is critical that San Pedro Bay Port Complex container terminal capacity be expanded to handle future growth, which can be accomplished through increased densification and efficiencies, given the limited availability of land for terminal footprint expansion, and disruptions to terminal operations and service during the 2022-2023 contract negotiations be minimized.