



Port of Long Beach: Economic Impact Study



Prepared for:

Port of Long Beach

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Prepared by:

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January 31, 2019

Mr. Matt Plezia
Director, Master Planning Division
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, CA 90815

Dear Mr. Plezia:

On behalf of Economic Development Research Group, Inc. (EDR Group) and the Tioga Group, we are pleased to submit our final report on the Economic Impact of the Port of Long Beach (POLB).

The final report incorporates comments received from POLB and has been reviewed and updated with the most recent set of assumptions provided by POLB.

EDR Group and Tioga Group appreciate all the guidance and attention provided to our team as we worked with POLB on advancing the underlying economic and geographic analysis supporting this economic impact study project. The inputs and close collaboration with the Port, port tenants, suppliers, and stakeholders are also appreciated.

Sincerely,



Stephen S. Fitzroy, P.E., Ph.D.
Executive Vice President

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CITY OF LONG BEACH

51,090 jobs supported, providing **\$3.2 billion** in income

\$5.1 billion in value added to goods

\$9.0 billion in output to the economy

LOS ANGELES COUNTY

394,220 jobs supported, providing **\$22.1 billion** in income

\$35.3 billion in value added to goods

\$63.8 billion in output to the economy

5-COUNTY AREA

576,350 jobs supported, providing **\$30.8 billion** in income

\$49.5 billion in value added to the economy

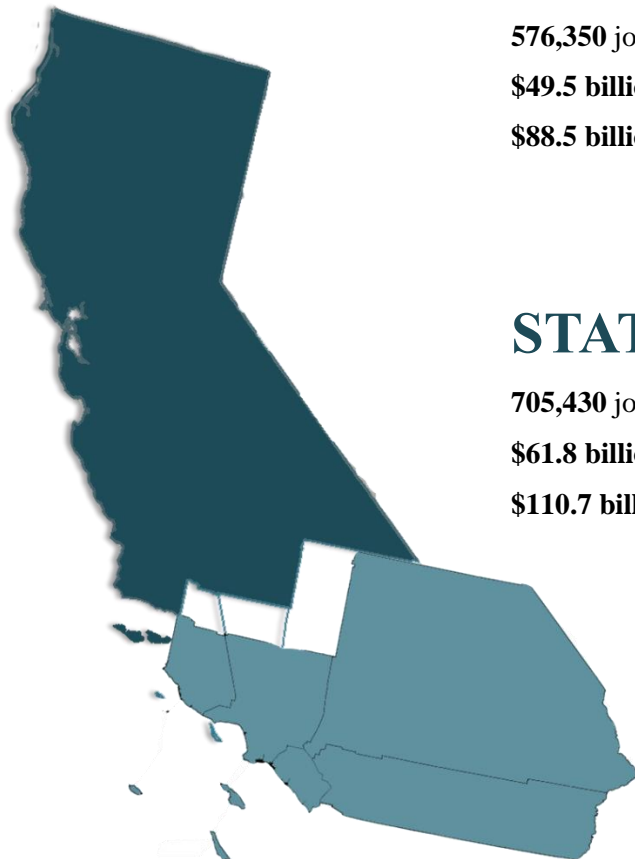
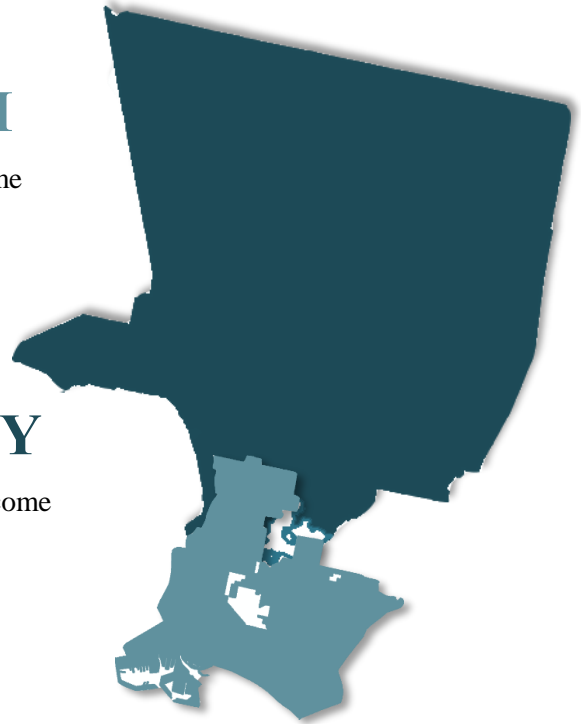
\$88.5 billion in economic output

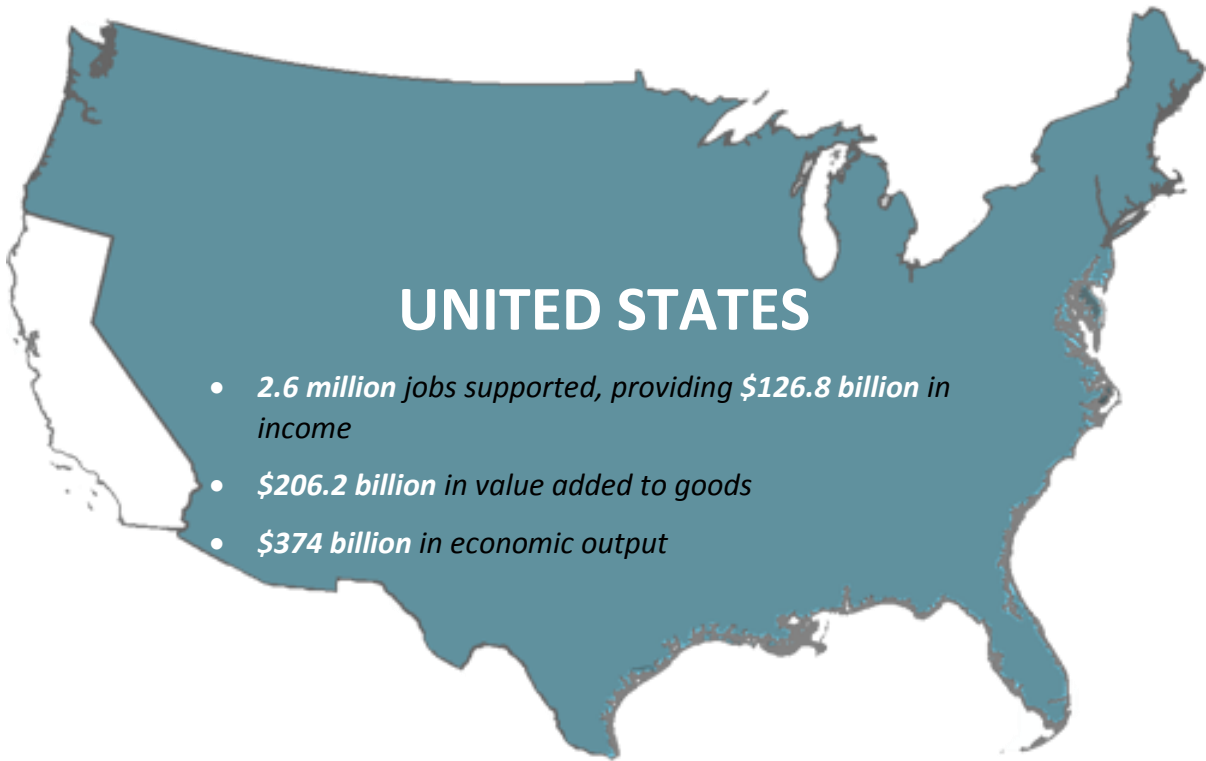
STATE OF CALIFORNIA


705,430 jobs supported, providing **\$38.7 billion** in income

\$61.8 billion in value added to goods






\$110.7 billion in economic output



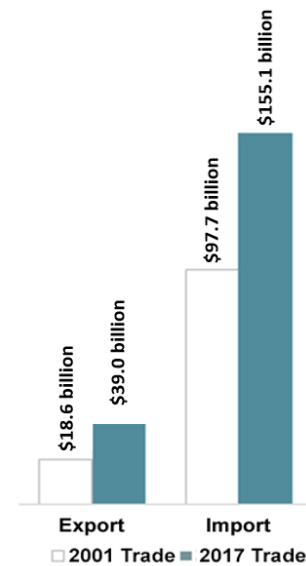


- Machinery (\$23.8 billion) 
- Electronics (\$19.4 billion) 
- Fuel and oil (\$13.3 billion) 
- Vehicles (\$10.6 billion) 
- Apparel (\$10.1 billion) 

TOP IMPORTS

- Aircraft (\$8.5 billion) 
- Machinery (\$3.0 billion) 
- Vehicles (\$1.5 billion) 
- Plastics (\$1.5 billion) 
- Cotton (\$1.2 billion) 

TOP EXPORTS

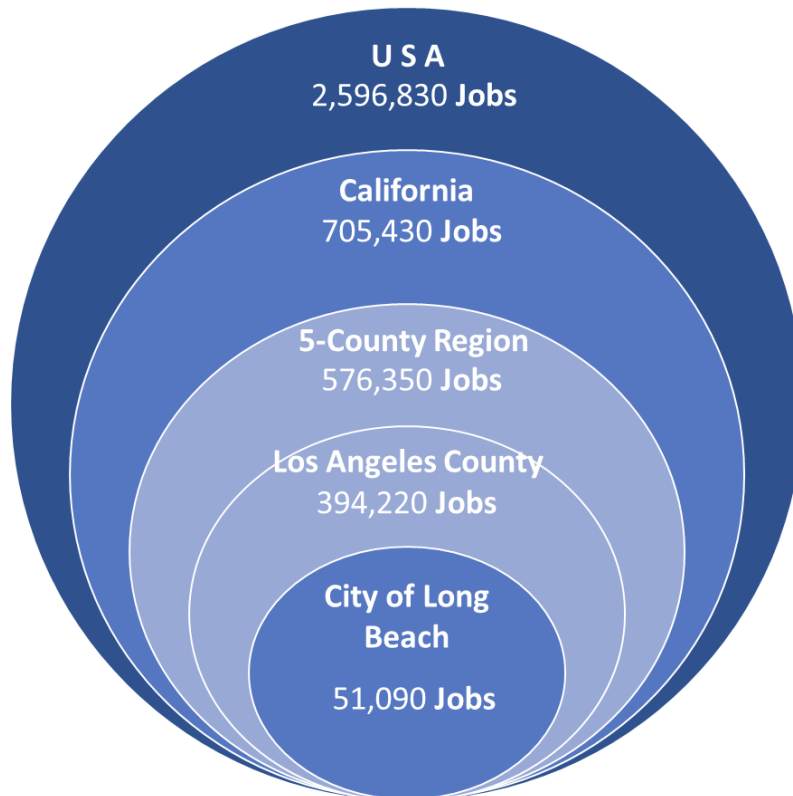


GROWTH IN TRADE

1 EXECUTIVE SUMMARY

The economic impact of the Port of Long Beach analyzed in this report was prepared on behalf of the Port by Economic Development Research Group, Inc. (EDR Group.) In 2017, the Port was responsible for supporting over 51,000 jobs¹ in the City of Long Beach or approximately one in five jobs in the city. [Figure 1](#) illustrates the increasing cumulative number of jobs made possible by the services the Port provides. As the geographic range of analysis expands, employment increases from 394,220 jobs in Los Angeles County to 705,430 jobs statewide, and to approximately 2.6 million jobs nationally. These 2.6 million jobs generated labor income of \$126.8 billion, of which, 69% accrued to workers outside the State of California. With this reach of job impacts, the importance of the Port to the 5-County region, California and the nation is clear.

Figure 1: Diagram of Cumulative Employment Impacts of Port Activity Across the Different Geographies



This assessment involved economic analysis encompassing the full spectrum of Port-related activities, including cargo operations, cruise passenger services, retail, tourism, and the landlord roles of the City Harbor Department and the Port's tenants. Significant construction and infrastructure development activities that improve the physical facilities and mitigate the environmental impact of the Port complex were also included in the economic activity analyzed for this report. The

¹ The total of direct, indirect and induced jobs, as explained subsequently.

accompanying Table 1 indicates the sources of impacts by region, their magnitude, and an estimation of the tax-related impacts.

Table 1: Summary of Regional Impacts by Type of Activity

Region	Type	Economic Output (Sales)		Taxes	
		Direct (\$B)	Total (\$B)	Federal (\$B)	State & Local (\$B)
City of Long Beach	Construction	0.3	0.5	0.03	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	1.9	3.2	0.3	0.2
	Port User	1.1	5.1	0.2	0.1
	TOTAL	3.5	9.0	0.6	0.3
	% of Region	5.8%	15.1%	N/A	
Los Angeles	Construction	0.4	0.6	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	2.7	4.7	3.8	4.0
	Port User	33.1	58.3	0.3	0.1
	TOTAL	36.3	63.8	4.2	4.2
	% of Region	3.2%	5.6%	N/A	
5-County Region	Construction	0.4	0.7	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	2.9	5.4	5.5	5.8
	Port User	42.6	82.1	0.3	0.2
	TOTAL	46.0	88.5	5.9	6.0
	% of Region	2.4%	4.7%	N/A	
California	Construction	0.4	0.7	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	3.0	6.1	6.9	7.0
	Port User	48.9	103.5	0.4	0.2
	TOTAL	52.5	110.7	7.3	7.3
	% of Region	1.3%	2.7%	N/A	
USA	Construction	0.4	0.8	0.0	0.0
	Tourism	0.2	0.4	0.0	0.0
	Port Industry	4.7	11.6	23.3	22.2
	Port User	142.5	361.2	0.7	0.4
	TOTAL	147.8	374.0	24.1	22.6
	% of Region	0.5%	1.1%	N/A	

The categories of impacts in Table 1 are defined as follows:

- **Construction** – capital expenditures on maintenance and improvements from the Harbor Department’s budget
- **Tourism** – activity in the Harbor District related to the Carnival Cruise Line terminal and the operation of the Queen Mary
- **Port Industry** – the physical operations of the Port as they relate to:
 - On-Port tenant operations
 - Harbor Department activity (as measured by employment and budgetary expenditures)

- **Port User** – the various industries across the country involved in the importation and exportation of goods via the Port of Long Beach

1.1 Background

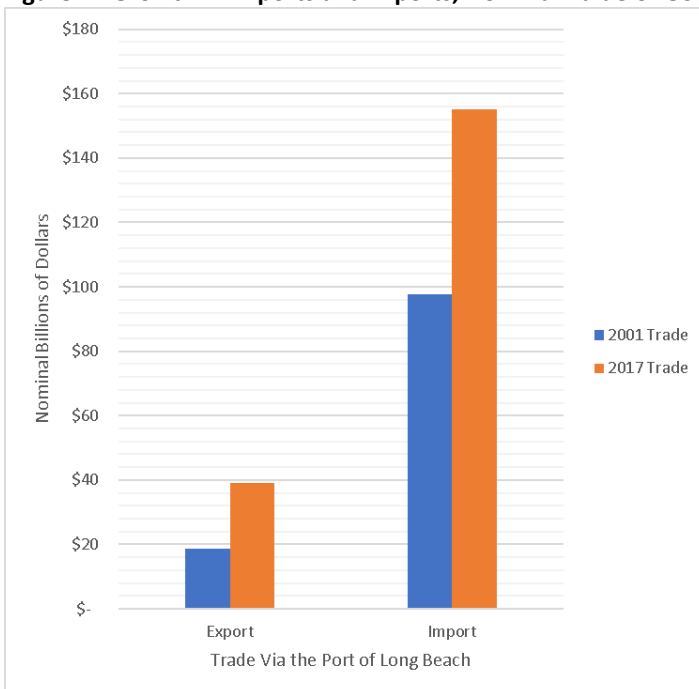
Operations and capital expenditures by the Port of Long Beach represent a significant investment in the economy of the City of Long Beach. These investments contribute to the growth of employment, wages, and economic output in the city and across the region. As such, it is important to quantify the contribution the Port makes to the local economy and communicate that information to stakeholders, decision makers, and the residents of Long Beach.

The Port of Long Beach has prepared estimates in the past describing these economic impacts. This report represents an updated estimate of the Port of Long Beach economic impact. As part of this effort, the EDR Group team designed and developed a tool to assist the Port in quantifying and understanding the Port's role in the economy. This analytical tool provides enhanced, interactive capabilities for evaluating potential challenges to Port operations with respect to investment, cargo throughput and port disruptions. It also has the ability to model changes in policy. These modeling capabilities will enable Harbor Department staff to estimate the impact on the economy of changes in port operations and investments.

2 PORT ASSOCIATED ACTIVITY

Much has changed since 2004 when the last Port of Long Beach economic impact analysis was conducted (using 2001 data). The Port’s importance as a major gateway between the United States and Asia has grown significantly since China joined the World Trade Organization (WTO) in 2001. As China became more integrated in the global economy, two-way transpacific trade volumes soared, making the Port of Long Beach the second largest port in terms of containerized twenty-foot equivalent unit (TEU) volume throughput in North America. Figure 2 reveals the change in the value of goods shipped by direction of trade between 2001 and 2017 based on PIERS import and export trade data for cargo transiting through the Port.

Figure 2: Growth in Imports and Exports, Nominal Value of Goods Shipped 2001-2017



Source: PIERS Data.

Since 2001, the total value of traded goods shipped through POLB has increased by 66% in nominal terms. This growth is the driving force behind the expanding impacts of the Port on the US economy. Growth in the value and volume of trade moving via the Port of Long Beach is directly related to the growth of the manufacturing and retail trade industries in the US and overseas that depend on the Port as a gateway for intermediate and final goods distribution. Unsurprisingly, as the number of US firms that rely on imported inputs for their production has grown, so too has the volume of cargo handled by the Port.

The largest relative gains in trade since 2001 have been in US exports, which have doubled in nominal value.² Proportionally, the share of national exports handled by the Port of Long Beach by value has remained constant at approximately 2.5% across all modes of transportation. Over the same period (2001 to 2017), the Port's share of national imports declined as competing ports gained market share by utilizing the expanded capacity of the Panama and Suez Canals. Nonetheless, growing demand for manufacturing inputs, business supplies and consumer goods has led to an overall increase in the value of imported goods to more than \$155 billion in 2017.³ A subsequent section of this report provides additional comparisons to the Port's 2001 economic impact report and discusses the factors affecting these changes in greater detail.

2.1 Current Patterns of Trade

As indicated in Figure 2 above, the value of imports and exports through the Port of Long Beach in 2017 was \$155.1 billion and \$39.0 billion respectively, for a total trade value of \$194.1 billion. Figure 3 below summarizes the current geographic distribution of these import and export values by region. Note that the data for the different levels of geography are not cumulative. For example, the data for Los Angeles County refers to the remaining portion of Los Angeles County outside the separately identified City of Long Beach. This is why there is not a continuous increase in the value of goods shipped as the geographic area widens.

Figure 3 shows that out of \$194.1 billion in total trade through the Port, \$1.7 billion remained in the City of Long Beach, while an additional \$36.1 billion accrued to Los Angeles County. An additional \$12.5 billion was retained within the remaining counties in the 5-County region surrounding Long Beach (Orange, Riverside, San Bernardino, and Ventura counties), while \$8.8 billion accrued to the rest of California, and \$135.1 billion to the rest of the United States.

Of particular note is the importance of the Port to Southern California. Los Angeles County (including the City of Long Beach) accounts for more two-way trade (\$37.8 billion) than the rest of the state's counties combined (\$21.3 billion). Similarly, the rest of 5-County region (Orange, Riverside, San Bernardino, and Ventura counties) also accounts for more trade by value (\$12.5 billion) than the rest of California combined (\$8.8 billion). Of course, the Port also supports businesses far beyond California, with most of the trade through the Port heading to or from the rest of the country (\$135.1 billion). Clearly, the Port's direct economic effects are national in scope.

² The value of exported goods represents sales or intra-company transfers of manufactured goods, agricultural products, raw materials, and waste from the US to the rest of the world.

³ The value of imported goods represents their untaxed value of production, against which the value added from the retail, wholesale, and transportation industries that service the movement and distribution of goods is measured.

Figure 3: Value of Import and Export Flows through the Port of Long Beach by Geography of Origin/Destination.

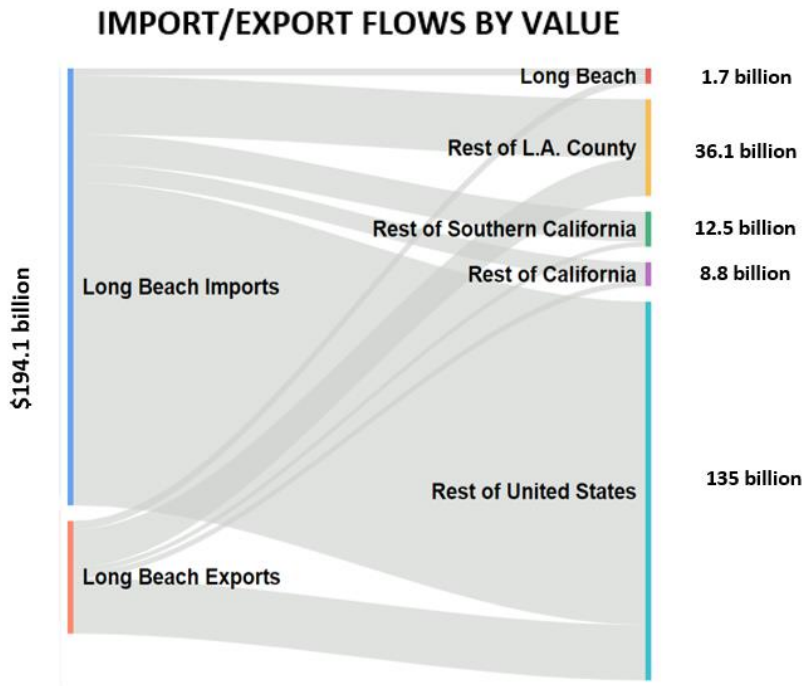
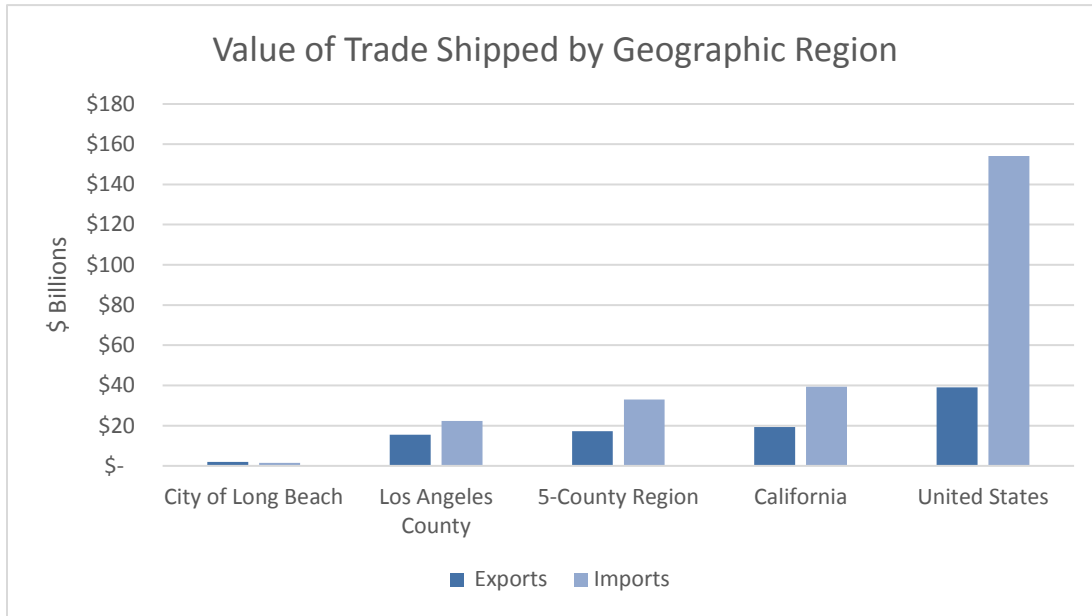


Figure 4 highlights the cumulative value of import and export goods handled through the Port on an increasing regional geographic scale. It is important to note that while impacts are assessed at individual geographies, which are not inclusive of one another, the results presented in this report are aggregated to include sub-geographies so that each region is inclusive of any smaller ones contained within it.

Figure 4: Cumulative Value of Import and Export Flows through the Port of Long Beach by Geography of Origin/Destination.



2.2 Import Patterns

The Port of Long Beach’s role as a national gateway is easily seen by examining the destinations of goods imported through the Port. Figure 5 below, presents these destinations across the continental US by county of all goods imported through the Port of Long Beach. This map draws upon geo-located PIERS trade data, which, while comprehensive, does not always indicate the true ultimate destination of goods due to limitations related to handoffs in company ownership and limitations on data quantifying inland supply chain distribution of these goods. However, the analysis of the available data demonstrates the coast-to-coast influence of the Port in its role as a national gateway for trade. As can be observed in Figure 5, there are dense pockets of consumption in large population and distribution network regions such as California, the Northeast, the Midwest, and Texas.

Figure 5: County Map of the United States Shaded According to Value of Imports Shipped through the Port of Long Beach

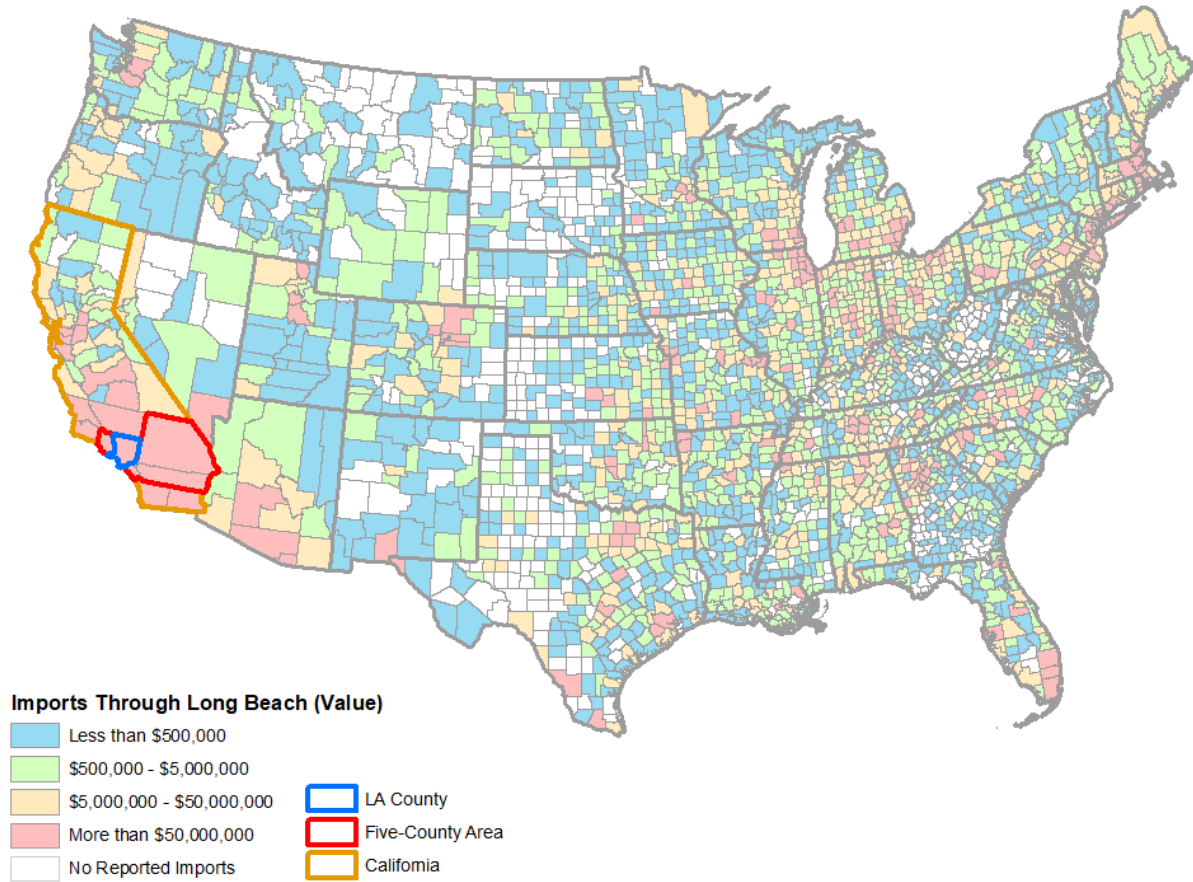
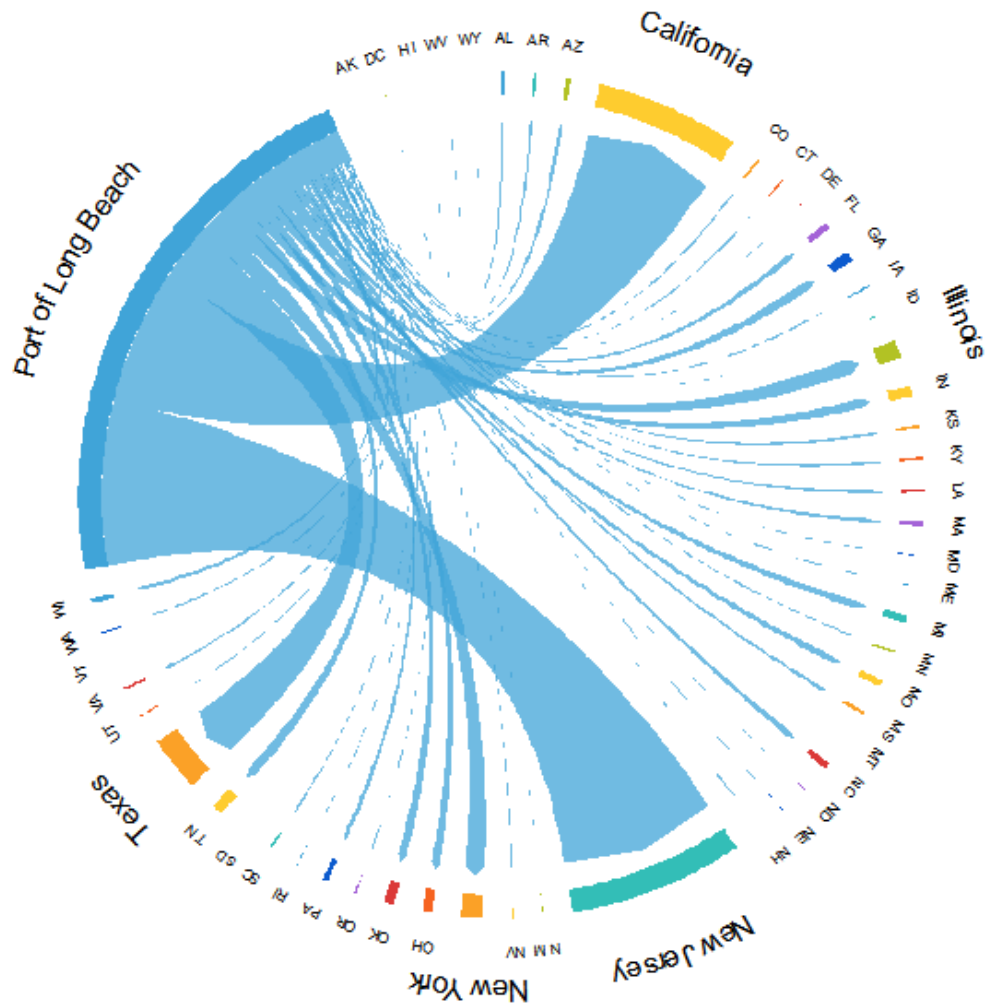


Figure 6 depicts the flow of imported goods via the Port to their inland destinations (based on PIERS) in a migratory plot where the width of the lines represents the magnitude of the value of goods being shipped to that particular state from the Port. By aggregating values to the state level, we can easily see that California, New Jersey, New York, Texas, and Illinois are the top five inland destinations. In the case of New Jersey, goods such as crude oil, semiconductor devices, furniture and motor vehicles are the chief goods being imported.

Figure 6: Major Import Destinations by State Accordingly to Value of Imports Shipped through the Port of Long Beach



Note: Much of this report focuses on the *value* of goods shipped because value is a more reliable metric of how economic activity (i.e. the production and consumption of goods) is measured.

Of these imports, the value of the top commodity categories that the Port of Long Beach handles for the country include the following:

- Machinery, boilers, etc.
- Electric machinery, etc.; sound equipment; television equipment; parts
- Mineral fuel, oil, etc.; bitumen substances; mineral wax
- Vehicles, except railway or tramway, and parts, etc.
- Apparel articles and accessories – not knit, etc.

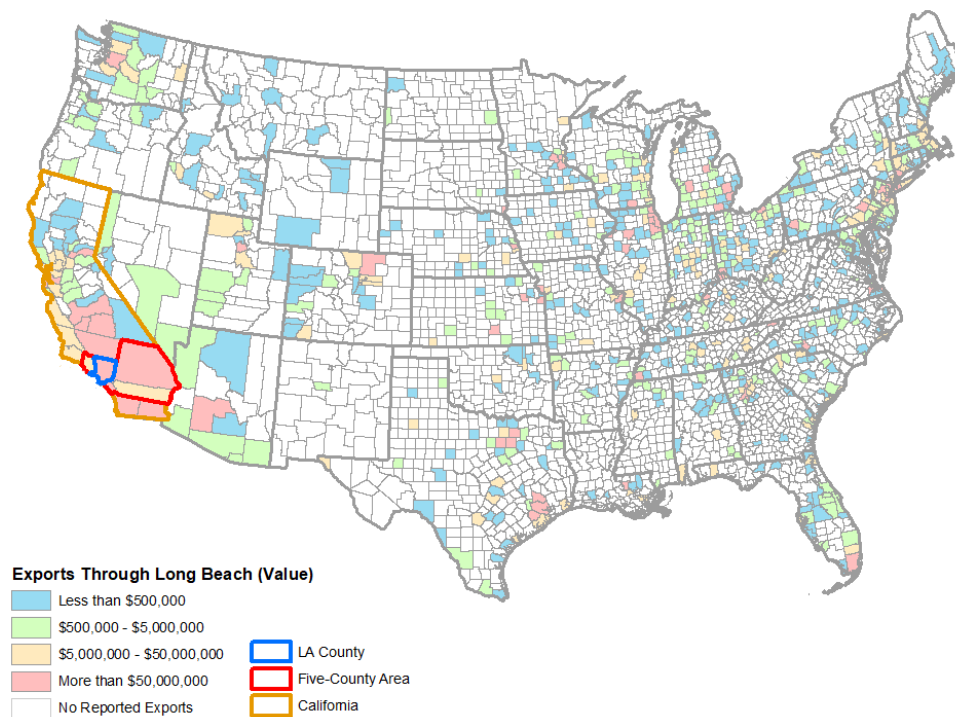
The full list of import values by commodity is provided in the Technical Appendix A.3

The intended purpose and use of these imports are varied. Firms may purchase industrial machinery or intermediate goods to be used as production inputs. In other cases, imports are finished goods that households purchase for consumption such as apparel or vehicles.

2.3 Export Patterns

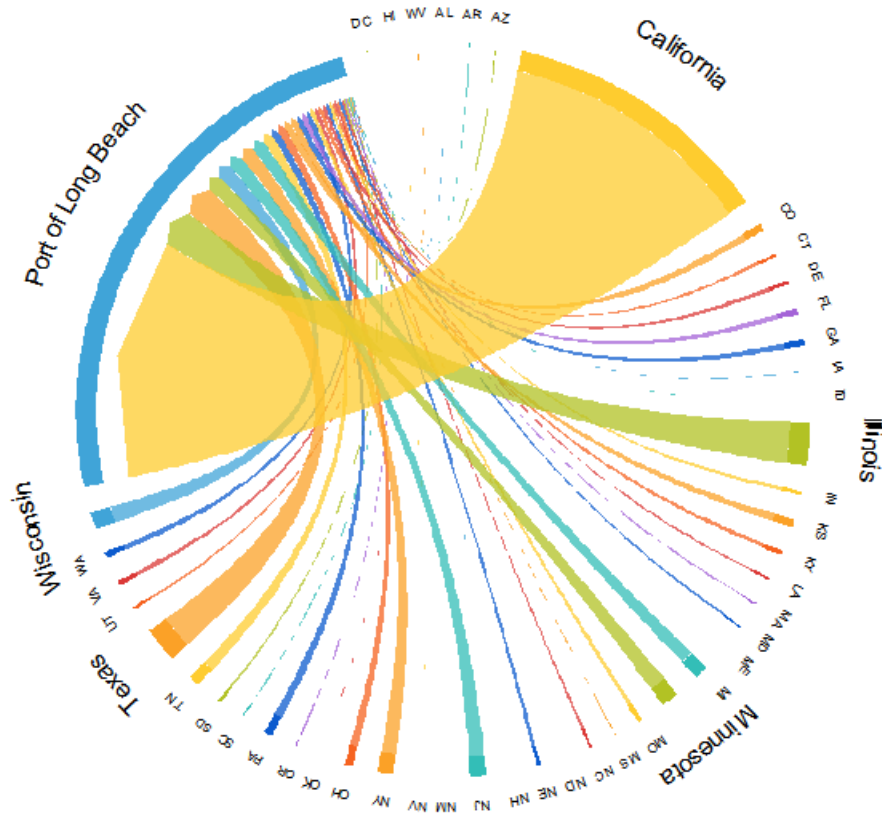
The Port of Long Beach serves as a key gateway for producers across the country shipping their products to overseas customers. Figure 7 presents US counties identified as producing goods for export based on the geo-location of shipping manifest data from the PIERS database. As with the import destination data presented in Figure 5, the PIERS export data do not always present the true county origin of production, particularly for agricultural products and manufactured goods that are handled through third party logistics firms and other aggregators. Figure 8 shows total production of goods (regardless of the type of commodity or source of ultimate origination) and illustrates where goods for export through the Port of Long Beach are most concentrated. Areas of high concentration include Southern California, the Pacific Northwest, Texas, Florida, the Lower Great Lakes and the Northeast.

Figure 7: County Map of the United States Shaded According to Value of Exports Shipped through the Port of Long Beach



More specifically, when we look at exports by state, Figure 8 shows California, Minnesota, Illinois, Texas, and Wisconsin as the top five based on the value of goods shipped through the Port of Long Beach.

Figure 8: Major Export Origins by State According to Value of Goods Shipped Exports Shipped through the Port of Long Beach



Of these exports, the top commodities that the Port of Long Beach handles include the following:

- Aircraft, spacecraft, and parts thereof
- Machinery, boilers, etc.
- Vehicles, except railway or tramway, and parts, etc.
- Plastics and articles thereof
- Cotton, including yarn and woven fabric thereof

The full list of export value by commodity is provided in the Technical Appendix A2.

2.4 Domestic/Coastwise Maritime Activity

The Port of Long Beach serves as a key connecting gateway port for maritime shipments between Southern California and other US Pacific ports. These include ports in Hawai'i and Guam as well as other West Coast ports in Alaska, Washington state and Oregon. The Port of Long Beach handles inbound shipments of Alaskan crude oil destined for Southern California petroleum refineries, and

lumber and wood products inbound from the Pacific Northwest to serve construction markets in the Southwest. The Port also handles cargo of all kinds shipped from the continental United States to and from the state of Hawai'i, and other US Pacific Islands such as Guam.

In 2017, the Port of Long Beach handled 11.8 million short tons of domestic maritime cargo.⁴ This represented an increase of 1.4 million tons or 13.5% compared with domestic/coastwise cargo handled through the Port in 2016. Additionally, domestic/coastwise maritime cargo tonnage comprised 13.8% of all maritime cargo handled by the Port in 2017.

The coastwise commodity shipments received at the Port of Long Beach, in tonnage terms, consist largely of inbound crude and petroleum products. Together these commodities accounted for 83% of domestic tonnage in 2017, of which, 76% was crude oil. All domestic crude oil shipments were inbound and shipped from Alaska.

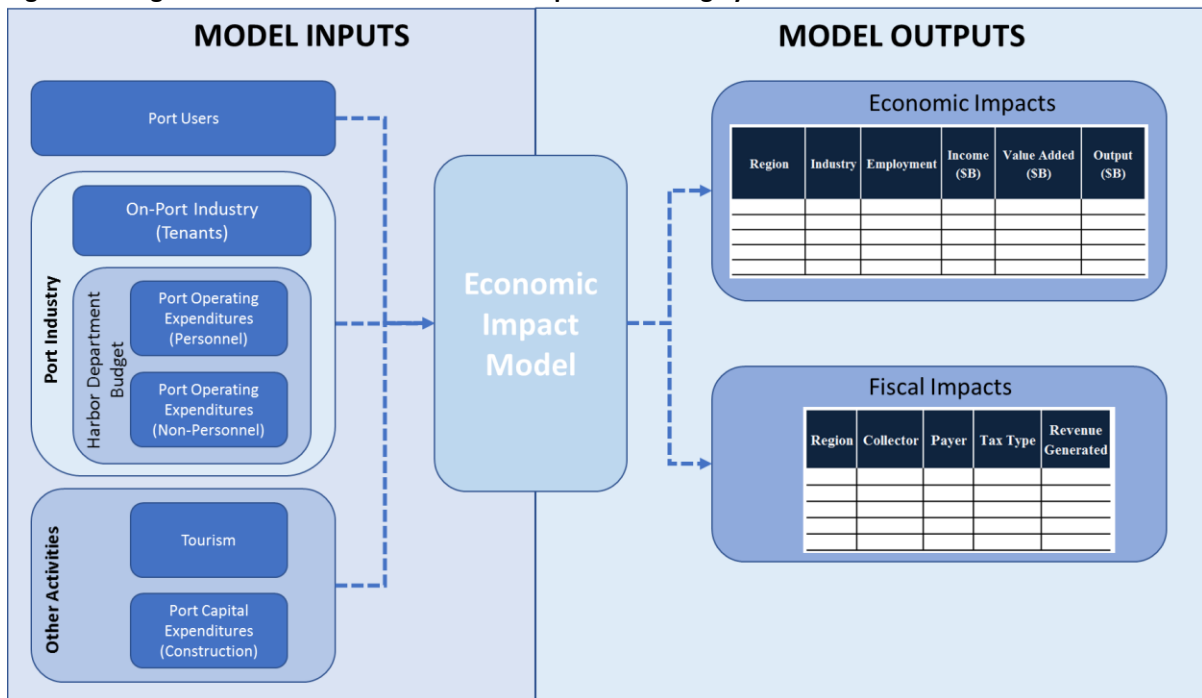
Other Port of Long Beach domestic commodities include inbound lumber, outbound agricultural products, and manufactured machinery (most in the not-elsewhere-classified category). Domestic outbound tonnage exceeds the non-petroleum domestic inbound tonnage, a reflection of the imbalance between California domestic trade with Hawai'i – Hawai'i residents and visitors consume much more tonnage of inbound commodities than are shipped to the US mainland through the Port of Long Beach.

⁴ Waterborne Commerce Statistics, U.S. Army Corps of Engineers, Navigation Data Center, 2017. No cargo value is published for domestic maritime cargo so comparisons with import and export cargo values are not directly available.

3 METHODOLOGY

The Port’s updated economic impact modeling system continues with the tradition of using input-output based economic models. This section provides a description of the methodology used for the modeling system that produced the impact estimates in this report. The Port’s economic impact analysis system also accounts for multi-regional analysis that shows how direct economic impacts from Port activities ripple out to other geographic regions and industry sectors. These impact estimates are based on patterns of wage income re-spending and indirect business purchases (referred to as secondary effects) that follow the direct activities tied to the Port. Expanding on the foundations of the Port’s earlier models, the current system incorporates a direct expenditure-based approach designed to capture what businesses pay with respect to Port services as part of shipping and receiving goods or other Port-related activities. One of the many features of the model is the ability to incorporate the Port’s budgetary information as a direct measure of Port-related economic activity. Figure 9 below, highlights the different data elements related to various aspects of Port-related activity. It also shows the types of information generated by the modeling system as model outputs.

Figure 9: Diagram of the Port’s New Economic Impact Modeling System and Data Sources



The economic modeling approach uses the well-established input/output (I/O) models developed by IMPLAN. These data have been used extensively for economic impact studies throughout the country over the last 20 years. The Port’s economic impact model uses the 536-industry sector IMPLAN data to reflect the diversity of businesses using the Port. It also provides the detail necessary to develop a multi-regional model for the Port and City of Long Beach. This enables a more accurate and consistent quantification of the economic effects of the Port’s activities on Los Angeles County compared with

using only county-level data. This approach also provides a better assessment of the interactions between the Port of Long Beach and the wider 5-County region, the remainder of the state of California, and the rest of the United States.

There are three primary sources of impacts to the national economy that originate with the Port of Long Beach. Each of these sources involve different types of stimuli that the model is capable of capturing explicitly or implicitly. The following subsections explain the different kinds of effects captured in the model and the basic methods applied to them. The order follows the sequence in the flow diagram from the top with Port User impacts to the bottom with Other Activities impacts.

3.1 Port User Impacts

The first type of economic activity captured in the model falls under the Port User category. It includes the businesses that interface with the global market via the Port to source production inputs or ship finished goods for consumption worldwide. This activity is captured implicitly in the model using PIERS shipment-level bill of lading data. In addition to the name of the company on the bill of lading, this data captures the individual values and types of commodities being imported or exported. It also identifies the address of the shipper/consignee. PIERS data was processed by geocoding the address data and turning the record addresses into point locations that were then associated with the various geographies covered in the model.

The electronic bill of lading data reported by carriers, and collated and distributed by PIERS, sometimes contains errors that are not corrected by PIERS in their processing of the data. Considerable time was invested to clean up the more egregious errors in the PIERS data – including cases of over-attribution of shipping geography to company headquarters locations, incomplete and partial records that required completion or pattern matching, and standardization of data field entries. Even with this effort, there are records where information remains incomplete or inaccurate from a true inland US origin/destination perspective for the import and export flows. As an example, there are records where the reported company listed in the data is a third party such as a freight forwarder as opposed to the actual shipper/consignee. Although these records have been noted and are relatively few in number, there are some records where nothing further can be done to improve the PIERS data without additional first-hand information.

The commodity detail of the import and export data was linked to the industry sectors of an I/O model to identify which industries were involved in the production, consumption or distribution of that commodity. The two types of commodity trade flow activities captured within this database that are counted in the report are:

- Export flows – representing the full value of goods produced by an industry. The value of goods shipped that is reported in the PIERS database represents the sales value/economic output of the associated industry sector.
- Import flows – represent either the intermediate inputs to production (if it involves an industry) or imported final goods for consumption by businesses and households. The value of the commodity as reported in the PIERS data represents an estimate of the raw value of each commodity. The costs of transportation and distribution are not included in the value of

the commodity in the PIERS data. The cost of wholesale and retail distribution is estimated explicitly in the model using IMPLAN data for what are termed “margin ratios.” The cost of commodity transportation is explicitly captured in the following Port Industry section rather than as part of the Port User impacts.

3.2 Port Industry Impacts

The second type of economic activity covered in the economic impact model represents the specific industry sectors operating at the Port that provide or enable the transportation of commodities. These types of activities are broadly split between on-port tenants and the Harbor Department’s own operations and budgetary activity.

- **On-Port Industry (Tenant Data/Terminal Operations)** – represents the terminal operators and businesses on Port premises that provide services facilitating trade and maritime activity. Examples of industries on-Port include terminals and tug operators, and longshore services workers. The basis of estimation was derived from a combination of sources involving the U.S. Army Corps of Engineers, stakeholder surveys, and reported income and employment data. This category explicitly captures the following types of port activity:

- | | |
|------------------------------|---------------------------|
| ✓ Tugs | ✓ Watching |
| ✓ Pilots | ✓ Cleaning/Fitting |
| ✓ Line Handling | ✓ Equipment Rental |
| ✓ Launch | ✓ Agency Fee |
| ✓ Radio/Radar/Communications | ✓ Chandlery |
| ✓ Surveyors | ✓ Laundry |
| ✓ Lighterage | ✓ Medical |
| ✓ Bunkering (Oil/Water) | ✓ Security |
| ✓ Longshore/Stevedoring | ✓ Demurrage |
| ✓ Clerking and Checking | ✓ Trucking Transportation |
| | ✓ Rail Transportation |

- **Port Operations (Port Budget Data)** – Port operations represents the City of Long Beach Harbor Department. This component of Port-related activity includes the wages and salaries of workers employed by the city’s Harbor Department and the operating expenditures as recorded in the department’s annual budget.
 - **Port Industry – Personnel** captures the number of staff employed at the Harbor Department by job classification and total compensation.
 - **Port Industry – Non-Personnel** focuses on purchases of services, interdepartmental charges, and expenditures on furniture, fixtures, and equipment. Regarding interdepartmental charges, the valuation of impacts was treated as though services rendered were dependent upon the existence of the Port. Examples include business information services and mail delivery.

It is important to note that although the information used in the model incorporates the Port’s own budget expenditures, it does not double count revenue streams from sources such as wharfage, dockage, bunker charges, or rental income.

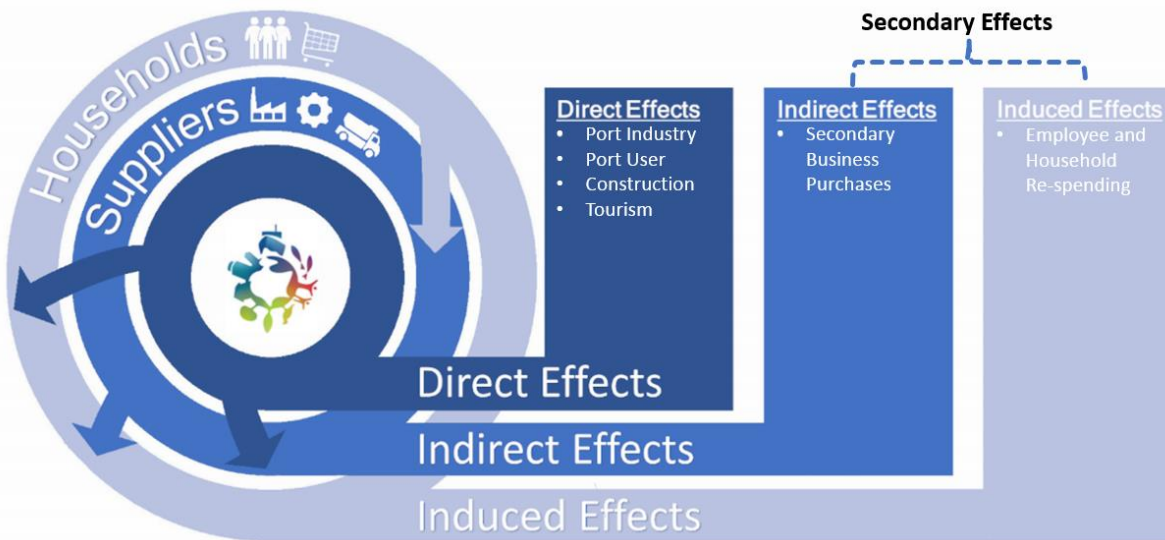
3.3 Other Activities Impacts

The final category of effects measured in the economic impact model captures remaining activity occurring in and around the Port. This activity ranges from the capital expenditures of the Harbor Department for construction and infrastructure improvement projects, such as for the Gerald Desmond Bridge replacement, to tourism activity related to the Carnival Cruise Line terminal and the Queen Mary. While much of the Port’s contribution to the regional and national economies stems from its maritime operations and the businesses that depend on the Port, tourism and construction activities occurring within the Harbor District also make a notable contribution.

3.4 Model Terminology and Understanding the Results

Because this report examines in detail the ways in which the Port of Long Beach affects the economy, it is helpful to explain the terminology used to describe the components of Port economic impacts. The impacts generalize to three types of interactions, which are depicted in Figure 10 below.

Figure 10: Description of Port Direct, Indirect, Induced Impacts.

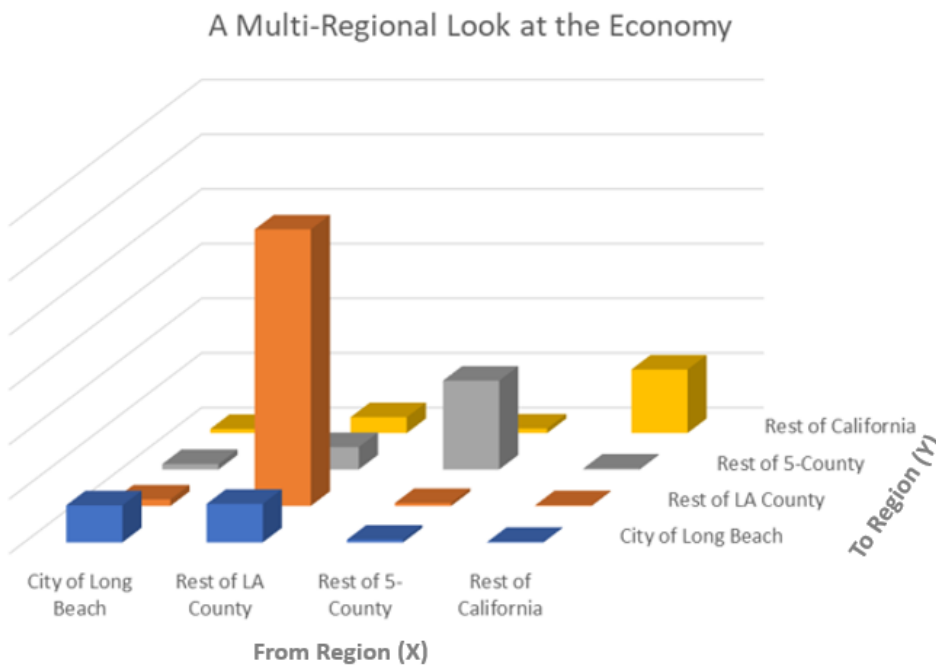


- Direct Effects** – these are the result of expenditures associated with the Port User, Port Industry, and Other Activities (construction and tourism) aspects of the Port. All of these effects arise from initial purchasing of goods, labor, and materials associated with the Port’s operation and utilization.

- **Indirect Effects** – represent the purchase of goods and services by suppliers in order to meet the demands of direct port activity.
- **Induced Effects** – represent the income earned by workers being re-spent in the economy on household goods and services.

Thus, as indicated by the arrows in the diagram, the direct effects of the Port in the center generate indirect effects because of the need to supply direct activities with goods and services, and induced effects from labor income spending by both direct and indirect workers. There is a bit of a simplification in the way the diagram is presented. It portrays an overview of the types of effects captured in the model but does not fully demonstrate the scope of what is being captured. The following diagram explodes out the inter-regional activity and impacts analyzed in this report. The x-axis represents the different regions generating activity, the y-axis represents the regions in which those effects are being felt, and the z-axis represents the magnitude of those effects. Note in Figure 11, the national impacts are not being shown for reasons of clarity because their magnitude dwarfs the rest of the information being presented.

Figure 11: Visual Depiction of Multi-Regional Impact Analysis



Economic activity generated in one region results in intermediate purchases of supplies and materials that are sourced not just from the region in which the activity took place, but from the other regions nationwide. These effects are computed using a Multi-Regional Input/Output model (MRIO). The effects of this type of economic activity are tabulated separately in the analysis that follows. This is an improved methodology for assessing the full economic impacts of the Port because it is sensitive to cross border flows of economic activity. The model captures and reports this effect with geographic detail by region so that we can differentiate between impacts that occur as a result of activity in a region, versus secondary effects that arise as a result of activity in other regions.

Functional Definitions of Economic Measures

The following are useful definitions to help the reader gain a clearer understanding of what the measures presented in the following section describing the Port's impacts actually capture within the various regional economies.

Employment – represents both fulltime and part-time jobs within a region for a given industry. This means that one person working multiple jobs may be represented twice if he/she works two part-time jobs.

(Labor) Income – represents not just an employee's level of compensation, but also fringe benefits and proprietor income. It is a measure of all forms of income gained from employment.

Value Added (GDP) – is measured as the difference between an industry's economic output, and the value of intermediate inputs to its production process. Value added is the combination of labor costs, taxes, and any other proprietor or property income. It focuses on new production net of purchased inputs.

Output – Represents the total measure of economic activity for an industry in a region. This measure is computed as the cost of intermediate inputs of production for the industry, plus any value-added activity.

4 CUMULATIVE ECONOMIC IMPACTS BY REGION

Nationally, the Port of Long Beach supported approximately 2.6 million jobs in 2017.⁵ These jobs generated over \$126 billion of wage and salary income for US households and contributed \$374 billion of economic output to the US economy. Table 2 highlights the cumulative economic impact for each of the five levels of regional geography analyzed in this report.

Table 2: Cumulative Economic Impact by Region

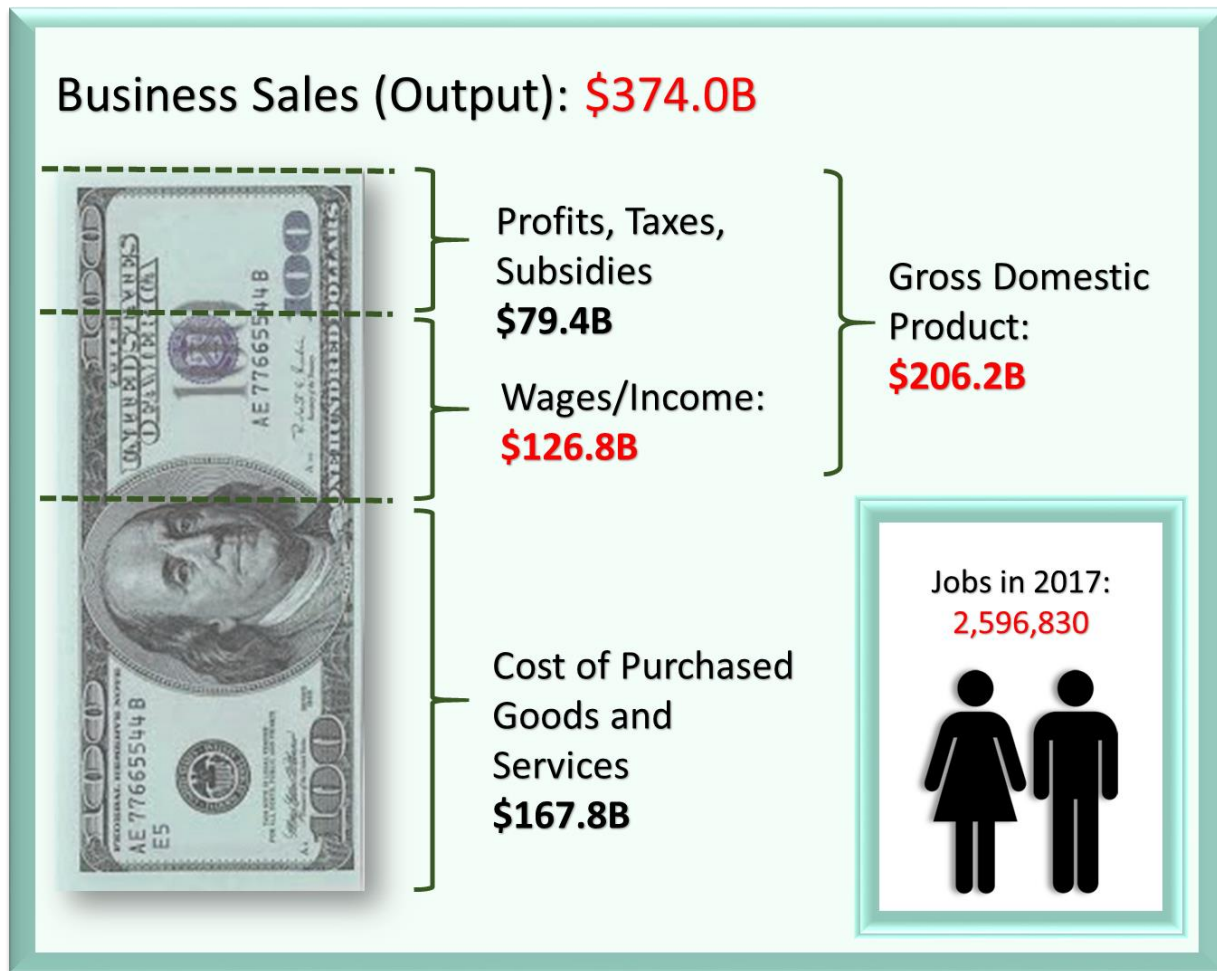
Region	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
City of Long Beach	51,090	\$ 3.2	\$ 5.1	\$ 9.0
Los Angeles County	394,220	\$ 22.1	\$ 35.3	\$ 63.8
5-County Region	576,350	\$ 30.8	\$ 49.5	\$ 88.5
California	705,430	\$ 38.7	\$ 61.8	\$ 110.7
USA	2,596,830	\$ 126.8	\$ 206.2	\$ 374.0

Source: Port of Long Beach Economic Impact Analysis Tool.

Incremental changes in economic impacts when comparing the expanding geographies show the increasing scale of impacts that are driven by two types of activity. First, it encapsulates port users and their effects on their respective regional economies. Second, the incremental regional impacts also include the secondary effects which occur from indirect purchasing in other regions. The model captures, for example, impacts occurring in the US, external to the City of Long Beach, that stem from indirect business purchases in the City of Long Beach as they purchase inputs to production. Figure 12 shows the national impacts, with the interrelationship of the economic measures presented.

⁵ These jobs include direct employment as well as employment tied to secondary effects related to indirect business purchases and induced worker income re-spending in the local economy.

Figure 12: Breakdown of National Effects



Thinking about the different types of activities driving these impacts, the following table shows a detailed breakout by region based on direct and total economic output (measured as sales) and taxes (federal, state, and local). Note how the operation, construction, and tourism-related effects are localized, while the Port user-related impacts scale exponentially as the geography expands to include more and more of the businesses dependent upon the Port for their operations. The tax effects estimated are based on the federal, state, and local taxes levied on businesses and households ranging from corporate taxes on profits, to personal taxes on income and consumption, to taxes on production and imports such as sales tax.⁶

⁶ Based on Employee Compensation, Proprietor Income, Taxes on Production and Imports, Other Property Type Income.

Table 3: Cumulative Economic Impact by Region

Region	Type	Economic Output (Sales)		Taxes	
		Direct (\$B)	Total (\$B)	Federal (\$B)	State & Local (\$B)
City of Long Beach	Construction	0.3	0.5	0.03	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	1.9	3.2	0.3	0.2
	Port User	1.1	5.1	0.2	0.1
	TOTAL	3.5	9.0	0.6	0.3
	% of Region	5.8%	15.1%	N/A	
Los Angeles	Construction	0.4	0.6	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	2.7	4.7	3.8	4.0
	Port User	33.1	58.3	0.3	0.1
	TOTAL	36.3	63.8	4.2	4.2
	% of Region	3.2%	5.6%	N/A	
5-County Region	Construction	0.4	0.7	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	2.9	5.4	5.5	5.8
	Port User	42.6	82.1	0.3	0.2
	TOTAL	46.0	88.5	5.9	6.0
	% of Region	2.4%	4.7%	N/A	
California	Construction	0.4	0.7	0.0	0.0
	Tourism	0.2	0.3	0.0	0.0
	Port Industry	3.0	6.1	6.9	7.0
	Port User	48.9	103.5	0.4	0.2
	TOTAL	52.5	110.7	7.3	7.3
	% of Region	1.3%	2.7%	N/A	
USA	Construction	0.4	0.8	0.0	0.0
	Tourism	0.2	0.4	0.0	0.0
	Port Industry	4.7	11.6	23.3	22.2
	Port User	142.5	361.2	0.7	0.4
	TOTAL	147.8	374.0	24.1	22.6
	% of Region	0.5%	1.1%	N/A	

Source: Port of Long Beach Economic Impact Analysis Tool.

Between the export producing manufacturing sector, and the wholesale and retail jobs responsible for the distribution of traded commodities, approximately 73% of the total number of jobs created by Port-related activity occur outside the State of California. This is further evidence of the importance of the Port to the national economy. It is not just the activity occurring on location, but also the activity the Port enables throughout the US. The following sub-sections cover the impacts in detail for each of the five geographic regions analyzed in this report. These results document the economic impacts of the Port of Long Beach on the respective regional economies, patterns of activity, and their estimated tax contributions. Note that the state/local portion of taxes is specific to whichever taxing authority is contained within that region.

4.1 City of Long Beach

Summary – The Port of Long Beach supported 51,090 direct, indirect and induced jobs in the City of Long Beach. This represents approximately one in five jobs in the city. Of these jobs, there are 18,810 direct jobs attributable to the services and industries resulting from activity at the Port. Secondary (indirect +

induced) effects pertaining to business purchases wage income re-spending and industry purchases from outside city boundaries supported an additional 32,280 jobs. Altogether, Port activity provided labor income of over \$3.2 billion to households in the City of Long Beach. Table 4 summarizes the impact of the Port on the local economy by impact type.

Table 4: Regional Economic Impacts by Type (City of Long Beach)

Impact Type	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
Direct	18,810	\$ 1.4	\$ 1.9	\$ 3.5
Indirect	14,580	\$ 0.9	\$ 1.6	\$ 2.7
Induced	17,700	\$ 0.9	\$ 1.7	\$ 2.8
Total	51,090	\$ 3.2	\$ 5.1	\$ 9.0

Source: Port of Long Beach Economic Impact Analysis Tool.

The secondary employment effects include impacts from sources both *internal* and *external* to the City of Long Beach. Therefore, the indirect effects may further be broken down between the indirect impacts that occur entirely within the city (5,410 jobs) and jobs that result from the activities of Long Beach businesses that supply goods and services produced outside the city (9,160 jobs).

Similarly, the induced effects of income spending can be further differentiated between the jobs that were created by household income spending related to direct employment in the city (6,590 jobs), relative to the additional 11,110 that were the result of workers whose income was earned from supplying goods and services to regions outside the city.

This illustrates the model’s ability to perform multi-regional analysis by identifying impacts on a region stemming from own-region effects, versus secondary impacts occurring due to purchasing activities outside of the region. The result of this, is that the calculation of metrics such as ‘implied multipliers’ which quantify how much a dollar spent will ‘ripple’ through that economy, needs to be used in the proper context to avoid misuse, misinterpretation, or over attribution.

Figure 13: Regional Employment Breakdown

Employment Composition: City of Long Beach

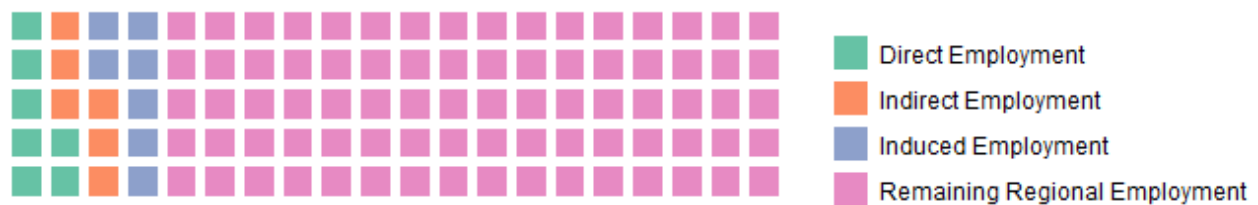


Figure 13 summarizes the importance of the Port as a source of jobs in the region. Each square in the diagram represents 1% of the working population within the City. Seven percent of Long Beach workers were directly associated with the Port of Long Beach, employed variously by a Port Industry, Port User, tourist activity or construction project. In addition, another 13% of workers were tied indirectly or by induced employment to Port operations. Table 5 below, shows the composition of industries that depend upon the Port. Note that the construction-related employment effects are likely to be temporary and last

only for the period during which projects are being funded by the Port. Included within the employment in the ‘Government’ aggregated industry sector are 551 staff directly employed by the Port Authority.

Table 5: Regional Economic Impacts by Type (City of Long Beach)

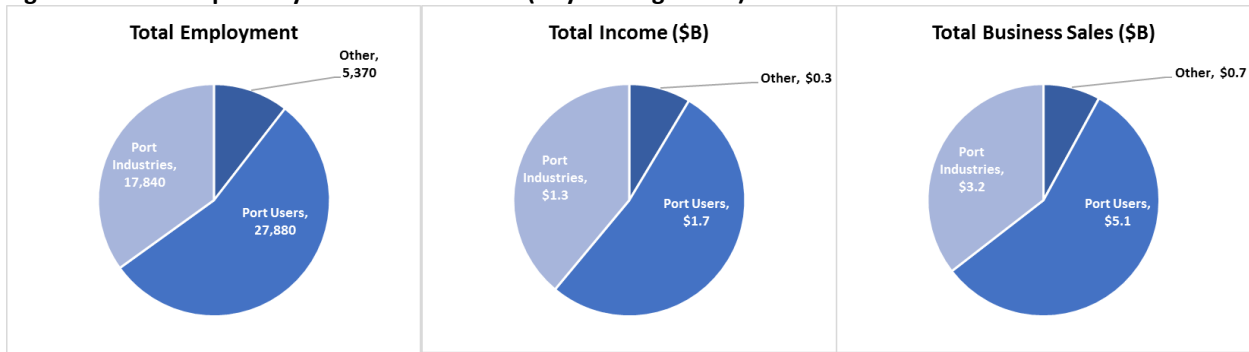
Aggregated Industry	Employment		Income (\$M)		Value Added (\$M)		Output (\$M)	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Agriculture & Extraction	910	1,550	0	211	196	283	245	358
Construction	1,930	2,420	105	131	145	181	283	361
Education & Health Services	10	3,890	1	230	2	252	3	392
Financial Activities	20	6,460	1	354	4	1,234	6	1,832
Government	620	680	71	80	107	120	202	224
Manufacturing	1,580	2,120	111	150	178	243	539	845
Media and Information	10	1,390	1	187	2	316	4	717
Other Services	1,210	7,310	40	260	51	336	82	583
Postal & Warehousing	10	1,770	0	104	1	128	1	194
Professional & Business Services	1,780	8,740	196	586	245	735	452	1,180
Retail Trade	3,220	5,170	131	209	210	336	292	470
Transportation	7,190	8,760	528	654	664	834	1,313	1,651
Utilities	-	40	0	7	1	19	1	40
Wholesale Trade	320	800	25	64	50	126	79	200
Total	18,810	51,090	1,211	3,227	1,855	5,144	3,501	9,047

While total output effects by industry illustrate the extent to which different industry sectors are affected by port activities, the inclusion of induced effects puts more of an emphasis on the wage income re-spending portion of regional activity. Wage income re-spending is concentrated in purchases of household goods and services.

Looking at the distribution of direct effects on an output basis, one can see that approximately 53% of impacts in the region are focused on the manufacturing and transportation sectors. These Port-related effects are much more concentrated than the overall distribution of regional output, which accounts for only 29% of output within the City of Long Beach for the same industry sectors.

Due to the challenges in identifying locations of cargo handling in and around the Port that are present in the PIERS database, further detail at the city level was not included. At that granular level of detail, it is difficult to attribute specific industry sector growth from real economic producer/consumer activity versus the inaccuracies in the PIERS database. There is also an inherent difference between addresses used for PIERS bill of lading data and the actual ultimate origination/destination of goods. To understand better the mixture of activity driving City of Long Beach impacts, the pie charts in Figure 14 show the various port-associated activities involved in driving city-specific economic impacts. The following subsections break out each type of activity in increasing detail to describe the activities responsible for generating the impacts above.

Figure 14: Total Impacts by Economic Measure (City of Long Beach)



Source: Port of Long Beach Economic Impact Analysis Tool.

Port Industry – These industries represent not just the city’s Harbor Department, its staff, and their operating expenditures and purchases, but also the Port tenant and supporting businesses involved in the handling and processing of cargo. The transportation sector involved in the physical movement of goods is also included in this category with expenditures calculated explicitly using the PIERS data. (See Technical Appendix for more detail)

Table 6 lists the direct sales for Port Industries based on 2017 data. Capital expenditures related to construction and maintenance are analyzed separately. Terminal operations were responsible for approximately 74% of direct sales related to Port Industries. Over 70% of the direct sales resulting from terminal operations arose from the activity of local longshore workers, foremen and clerks who handle and manage cargo.

Table 6: Port Industry Direct Effects (City of Long Beach)

Port Industry Type	City of Long Beach (\$M)
Port Industry-Personnel	\$176
Port Industry-Non-Personnel	\$66
Rail Transportation Services	\$79
Terminal Operations	\$1,452
Truck Transportation Services	\$151
Vessel Fueling	\$26
Total	\$1,949

Source: Port of Long Beach Economic Impact Analysis Tool.

Direct Port expenditures amounted to approximately \$1.9 billion in economic output in the City of Long Beach. These direct sales generated an additional \$1.3 billion in secondary effects related to indirect business purchases by suppliers and re-spending of workers’ wages. This combined output of \$3.2 billion was produced by 17,840 workers in the City of Long Beach, who collectively earned \$1.3 billion in wage and salary income.

Port User – Port Users are distinct from the businesses classified as Port Industry. These can best be described as the businesses that produce goods, which are then exported via the Port to foreign markets or the wholesalers/distributors charged with handling import goods to be moved to the appropriate businesses/household consumer.

In 2017, the Port exported goods valued at \$784.7 million that originated in the City of Long Beach (based on PIERS data). The top export commodities by value originating in the City of Long Beach were:

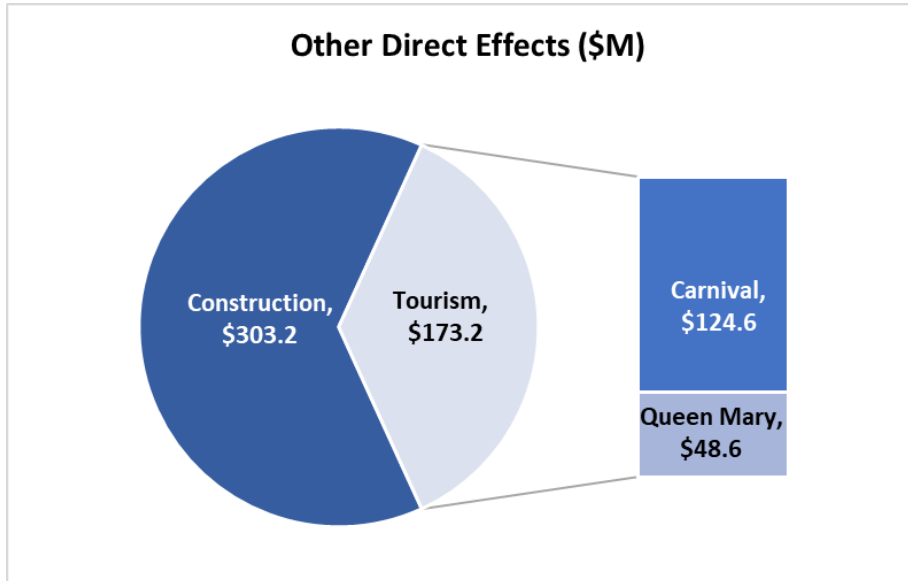
- Machinery, boilers, etc.
- Mineral fuel, oil etc.; bitumen substances; mineral wax
- Marine containers, and equipment/tin and articles thereof
- Vehicles, except railway or tramway, and parts etc.

The production of these goods led to further secondary effects totaling an additional \$1.3 billion in indirect and induced impacts, for a total of \$2.1 billion in economic output flowing around the region. This activity (\$2.1 billion) provided employment for 9,640 workers within the City of Long Beach, earning total income of \$690 million, and contributing almost \$1.1 billion of gross product to the local economy.

In addition to the impact of activities related to the export of goods, the Port handled \$933.1 million of goods imported to the City of Long Beach in 2017. These imported goods were comprised of inputs to industry production, and final goods for purchase by households and businesses. Businesses spent \$291 million on wholesale/retail distribution services within the region, a direct contribution to the economy. In addition to this \$291 million in spending on wholesale/retail distribution, there were secondary effects, which created additional economic output of \$2.7 billion. The total output effect of the import activities described above supported 18,240 jobs within the city earning total labor income of \$1.0 billion.

Other – Port-related expenditures also include capital improvement projects funded in whole or part by the Harbor Department, as well as the operation of on-site tourist attractions such as the Queen Mary and the Carnival Cruise Line terminal. The following table highlights the split between direct sales activity associated with construction from the Harbor Department’s annual budget and tourism activities at the Port.

Figure 15: Breakdown of Other Direct Activity (City of Long Beach)



OTHER: Construction – In the 2017 Fiscal Year Budget, the Harbor Department funded \$496.3 million in capital expenditures for improving the operational functionality of the Port. Of this, \$366.6 million was expended to fund infrastructure development including the following projects:

- Gerald Desmond Bridge Replacement
- Middle Harbor Redevelopment Program
- Fireboat Stations Nos. 15 & 20
- Port Headquarters/Civic Center
- Double Track Access from Pier G to J
- Demolition of NRG Intake Fore Bay Structure
- Pier J Bike and Pedestrian Path
- Civil Infrastructure Projects

The \$366.6 million utilized for capital projects by the Port generated an estimated \$303.2 million of direct sales within the City of Long Beach.

OTHER: Tourism – The remaining effects of the Port originate from the tourism activities situated in the Harbor District, the majority of which are generated by Carnival Cruise Lines and the activity associated with the Queen Mary and its attractions. These activities serve to draw overnight and day visitors to the region, who then spend money in local retail stores, restaurants, and a variety of tourist-related businesses within the City of Long Beach.

In 2017, an estimated 670,000 passengers used Carnival’s Long Beach Cruise Terminal. These visitors spent an estimated \$124 million on a variety of goods and services including meals and lodging before and after embarkation. Additionally, Carnival sourced local goods and services to supply and operate their vessels. The Queen Mary attracted 1.6 million visitors in 2017. These visitors spent their money on a

combination of entertainment, food and beverages, local transportation, lodging and parking that equaled another \$48.6 million in direct sales.

Fiscal Impacts – The Port’s impacts, as described above, have implications not just on employment, wages and output. There are also fiscal effects. Federal and state/local governments collect taxes from the inter-industry and household transactions, which occur as part of normal economic activity. These taxes are paid by the businesses responsible for the economic activity, as well as the households from which the businesses employ workers for their operation. Tax impacts are estimated in the model using the regional social account matrix in IMPLAN. Detail is provided for income taxes, property and sales taxes, taxes on dividends and social insurance taxes. Table 7 below shows the distribution of tax revenues in terms of the activities responsible for generating them and the government institutions collecting them.

Table 7: Regional Fiscal Impacts by Type (City of Long Beach)

Total Tax Impacts: City of Long Beach						
Collector	Payer	Tax Activity Generator (\$M)				
		Construction	Tourism	Port Users	Port Industry	TOTAL
Federal	Businesses	\$ 14	\$ 10	\$ 185	\$ 104	\$ 313
Federal	Households	\$ 14	\$ 9	\$ 141	\$ 108	\$ 272
State & Local	Businesses	\$ 11	\$ 14	\$ 192	\$ 60	\$ 277
State & Local	Households	\$ 3	\$ 2	\$ 26	\$ 20	\$ 50
Total Federal		\$ 28	\$ 19	\$ 325	\$ 212	\$ 585
Total State & Local		\$ 13	\$ 16	\$ 218	\$ 80	\$ 327

Businesses within the City of Long Beach paid a total of \$590 million in federal, state and local taxes, while workers in the City of Long Beach associated with the Port paid a total of \$322 million in federal, state and local taxes. Port User businesses paid had the highest total tax bill at \$377 million in combined taxes.

4.2 Los Angeles County

Summary – The Los Angeles County economy was supported by 234,930 direct jobs attributable to the services and industries operating in and around the Port. Secondary effects stemming from business purchases and wage income re-spending supported an additional 159,280 jobs in the county. In 2017, these 394,210 jobs represented approximately 6% of all jobs in Los Angeles County. Altogether, Port activity provided over \$22.1 billion in labor income to county households. Table 8 summarizes the economic impact of the Port on the Los Angeles County economy, detailed by the type of effect generating impacts within the region.

Table 8: Regional Economic Impacts by Type (Los Angeles County)

Impact Type	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
Direct	234,930	12.5	19.3	36.3
Indirect	73,800	5.1	8.2	14.4
Induced	85,480	4.5	7.8	13.2
Total	394,210	22.1	35.3	63.8

Source: Port of Long Beach Economic Impact Analysis Tool.

The secondary effects from sources external to the region were included because they affect Los Angeles County. Therefore, the indirect effects are more accurately broken down between the 61,580 jobs that were indirectly created by regional Port activity, and the 12,220 jobs that result from businesses located in the county that supplied production occurring outside of the region.

Similarly, the induced effects of income re-spending can be further differentiated between the 69,960 jobs in the region that were created by spending of household income earned from direct jobs in the region and an additional 15,530 jobs that were the result of workers whose income was earned from supplying external regions.

Figure 16: Regional Employment Breakdown
Employment Composition: Los Angeles County

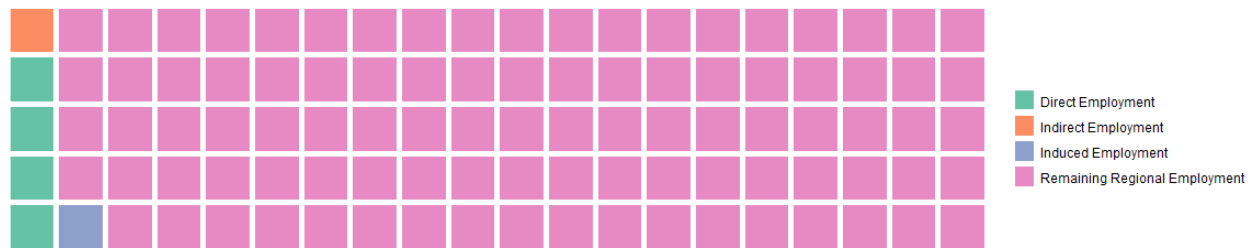


Figure 16 summarizes the importance of the Port as a source of jobs in the county. Each square in the diagram represents 1% of the working population in the County of Los Angeles. In Los Angeles County 4% of workers were employed in jobs that were directly associated with the Port of Long Beach (Port Industry, Port User, or Port-related tourism and construction projects). In addition, 2% of workers were tied indirectly or by induced employment to Port operations. Table 9 below, shows the composition of port-related employment by industry sector.

Table 9: Regional Economic Impacts by Type (Los Angeles County)

Aggregated Industry	Employment		Income (\$M)		Value Added (\$M)		Output (\$M)	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Agriculture & Extraction	4,550	5,590	291	396	334	476	445	634
Construction	1,930	3,890	105	211	145	291	283	600
Education & Health Services	10	22,090	1	1,265	2	1,379	3	2,130
Financial Activities	20	19,370	2	1,128	5	4,266	7	6,424
Government	620	1,010	71	134	107	197	202	351
Manufacturing	40,600	49,930	3,488	4,204	5,060	6,302	14,863	18,776
Media and Information	10	3,570	1	622	2	982	4	1,950
Other Services	1,220	30,820	41	1,088	52	1,447	83	2,432
Postal & Warehousing	10	7,110	1	395	1	491	1	769
Professional & Business Services	2,600	39,640	252	2,661	334	3,283	630	5,088
Retail Trade	157,580	170,800	6,292	6,819	9,848	10,721	13,942	15,182
Transportation	9,630	15,430	704	1,109	877	1,385	1,799	2,892
Utilities	-	670	0	117	1	283	2	559
Wholesale Trade	16,140	24,300	1,285	1,934	2,542	3,827	4,023	6,056
Total	234,930	394,210	12,532	22,081	19,310	35,330	36,286	63,842

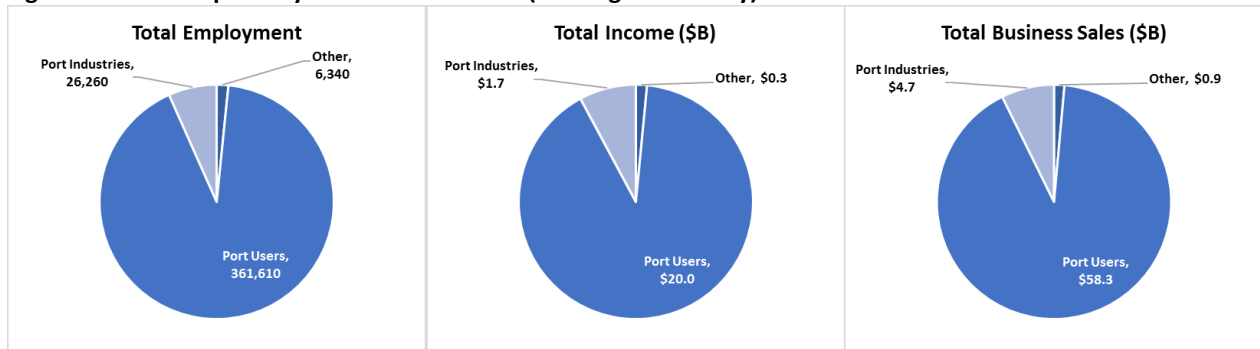
As a share of direct economic output, the effects of Port activity in Los Angeles County were concentrated in Port User-related effects with manufacturing and retail jobs capturing the highest shares of industry activity. These two sectors accounted for 79% of direct output – a much higher concentration than found in overall regional economic activity. Looking deeper into the types of manufacturing represented (Table 10), one can see that industry subsectors such as transportation equipment, and computer and electronics manufacturing were driving the economic effects of the Port on Los Angeles County.

Table 10: Top 10 Manufacturing Industries by Output Impact (Los Angeles County)

Top 10 Manufacturing Industries Affected				
Aggregated Industry	Employment	Income (\$M)	Value Added (\$M)	Output (\$M)
Transportation Equipment Mfg	25,780	2,410	3,251	9,152
Computer and Electronic Mfg	4,800	511	819	1,992
Fabricated Metal Mfg	6,580	456	662	1,665
Chemical Mfg	1,130	109	376	1,289
Primary Metal Mfg	1,840	125	177	1,175
Food Manufacturing	1,400	91	157	788
Machinery Mfg	1,650	123	196	568
Plastics & Rubber Products Mfg	1,640	97	146	535
Petroleum and Coal Products Mfg	170	31	159	492
Miscellaneous Mfg	1,210	103	157	356
Rest of Manufacturing Sectors	7,760	454	592	1,850
Total	53,960	4,510	6,692	19,859

The composition of Port-associated activities responsible for generating the economic impacts in the County of Los Angeles are shown in the pie charts in the figure below. These charts reveal the dominance of Port Users in the composition of impact-generating activity within the regional economy. The following subsections break out each type of activity with increasing detail to identify and describe the sources of port-related economic impacts at a high level. This highlights the key activities driving impacts.

Figure 17: Total Impacts by Economic Measure (Los Angeles County)



Source: Port of Long Beach Economic Impact Analysis Tool

Port Industry – These industries represent not only the Harbor Department, its staff, and operating expenditures related to the working of the Port, but also Port tenants and supporting businesses involved

in the handling and processing of cargo. The transportation sector involved in the physical movement of goods is also included in this category with expenditures calculated explicitly using the PIERS data.

Table 11 shows detailed direct sales for the various Port industries based on 2017 data. In terms of regional direct effects arising from Port Industry activity, most of the terminal and Harbor Department activity falls within the City of Long Beach. Vessel fueling however, is largely relegated to facilities outside of the city, and is captured in the analysis of the rest of Los Angeles County. Additionally, as the regional coverage is expanded, the associated trucking and rail costs are increasingly realized based on their usage to and from inland origin or destination points. Despite the increased presence of transportation and fueling activities, terminal operations were responsible for approximately 55% of direct sales related to Port Industries in Los Angeles County.

Table 11: Port Industry Effects: Direct Sales (Los Angeles County)

Port Industry Type	Los Angeles County (\$M)
Port Industry-Personnel	\$176
Port Industry-Non-Personnel	\$67
Rail Transportation Services	\$234
Terminal Operations	\$1,493
Truck Transportation Services	\$448
Vessel Fueling	\$260
Total	\$2,677

Source: Port of Long Beach Economic Impact Analysis Tool.

Direct Port expenditures accounted for approximately \$2.7 billion in economic output in Los Angeles County. These direct sales, in turn, generated secondary effects related to indirect business purchases and re-spending of workers’ wages that resulted in additional output of \$2.0 billion. This combined \$4.7 billion of output served to employ 26,260 workers in Los Angeles County, earning wage and salary income of \$1.7 billion.

Port User – Port Users are distinct from the businesses classified as Port Industry. They are involved in the production/consumption of goods for export/import, or the distribution and retailing of these goods. As the region of analysis expands from the City of Long Beach to encompass the rest of Los Angeles County, the pattern and volume of associated industry activity increases to encompass new activity occurring in the net new economic geography.

In 2017, the Port was responsible for exporting \$15.4 billion worth of goods originating in Los Angeles County, based on the PIERS data. The top export commodities by value produced in Los Angeles County were the following:

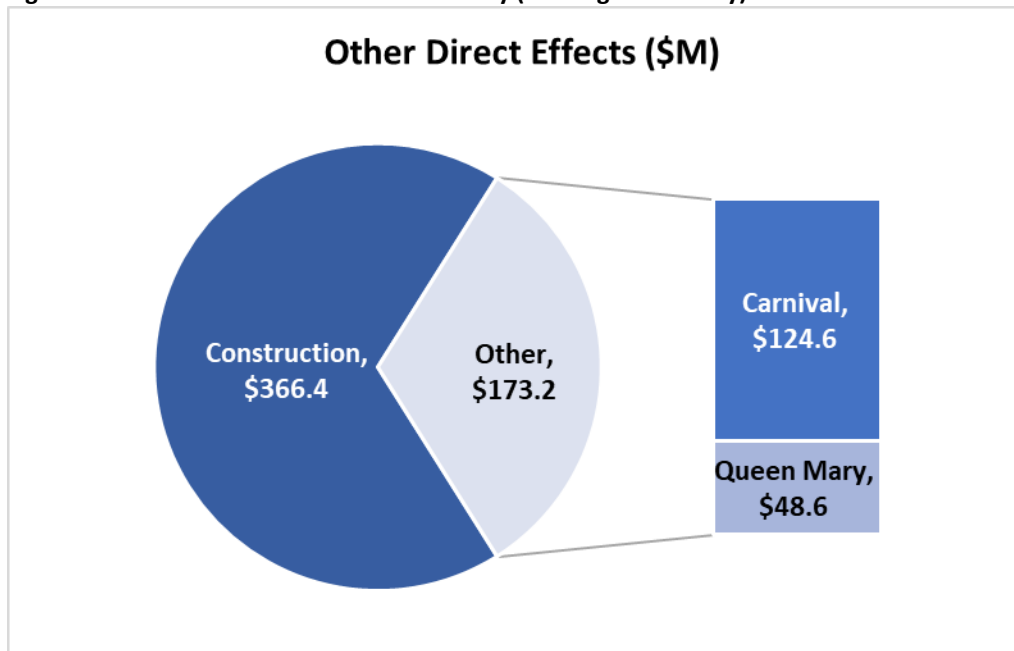
- Aircraft, spacecraft, and parts thereof
- Machinery, boilers, etc.
- Vehicles, except railway or tramway, and parts etc.
- Mineral fuel, oil etc.; bitumen substances; mineral wax
- Electric machinery etc.; sound equipment; television equipment; parts

The production of these goods generated indirect and induced effects totaling \$10.9 billion in additional output for total economic impact of \$26.3 billion. This \$26.3 billion of economic impacts provided employment for 104,613 workers in Los Angeles County, earning total income \$7.5 billion, and contributing \$11.4 billion of gross regional product to the local economy.

In addition to the impact of the Port’s export operations, the Port handled \$22.4 billion of imported goods in 2017. These imported goods were distributed by a combination of wholesale and retail businesses that together, spent \$17.6 billion to provide their services to customers within the region. This wholesale/retail activity produced secondary effects that created an additional \$14.3 billion in economic output. The combined effect of import related activities supported 256,999 jobs in Los Angeles County and labor income of \$12.5 billion.

Other – The remaining effects of the Port on the county were related to travel and tourism activities based largely on the Carnival Cruise Line terminal and Queen Mary attraction. Capital and maintenance expenditures incurred by the Port as part of their maintenance and infrastructure projects were also included in this category. Figure 18 highlights the relative split in direct output generation for the two types of activities.

Figure 18: Breakdown of Other Direct Activity (Los Angeles County)



In addition to the Port’s \$366.4 million construction budget, \$173.2 million in tourism-related spending was included in the estimation of the Port’s economic impacts. The \$539.6 million in direct expenditures generated \$0.9 billion in output. These impacts served to create 6,340 jobs within the county that were directly or indirectly supported by construction and tourism activities.

Fiscal Impacts for Los Angeles County include estimated taxes paid to the City of Long Beach, and the taxes arising from Port-related activity in the rest of the County. Altogether, federal, state and local taxes

totalled \$8.3 billion. Summarized in Table 12, taxes from Port User businesses in Los Angeles County generated the most revenue: \$2.1 billion in federal taxes, and \$3.7 billion in state and local taxes. Los Angeles County households associated with Port Users pay \$1.7 billion in federal taxes and \$289 million in state and local taxes. Port Industry tax revenues in the county totaled \$447 million, while construction and tourism activities related to the Port generated \$54 million and \$39 million in total tax revenues, respectively.

Table 12: Regional Fiscal Impacts by Type (Los Angeles County)

Total Tax Impacts: Los Angeles						
Collector	Payer	Tax Activity Generator (\$M)				
		Construction	Tourism	Port Users	Port Industry	TOTAL
Federal	Businesses	\$ 18	\$ 12	\$ 2,080	\$ 152	\$ 2,261
Federal	Households	\$ 18	\$ 11	\$ 1,728	\$ 148	\$ 1,904
State & Local	Businesses	\$ 15	\$ 16	\$ 3,683	\$ 120	\$ 3,834
State & Local	Households	\$ 3	\$ 2	\$ 289	\$ 27	\$ 321
Total Federal		\$ 36	\$ 22	\$ 3,807	\$ 300	\$ 4,165
Total State & Local		\$ 19	\$ 17	\$ 3,972	\$ 147	\$ 4,155

4.3 The 5-County Region

In 2017, the Port supported 576,350 jobs, or approximately 5% of all jobs in the 5-County region. Direct employment totaled 327,570 jobs, while secondary effects related to business purchases and wage income re-spending supported an additional 248,780 jobs. Total labor income earned by these workers was over \$30.8 billion. Table 13 below summarizes the impact of the Port on the region’s economy, detailed by type of impact.

Table 13: Regional economic impacts by type (5-County Region)

Impact Type	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
Direct	327,570	16.6	25.2	46.0
Indirect	106,400	7.0	11.5	20.6
Induced	142,380	7.2	12.8	22.0
Total	576,350	30.8	49.5	88.5

Source: Port of Long Beach Economic Impact Analysis Tool.

The secondary effects from sources external to the region were included because they affect the 5-County region. Therefore, the indirect effects are more accurately broken down between the 79,890 jobs that were indirectly created by regional port activity, and the 26,510 jobs that resulted from businesses located in the 5-County region that supplied production occurring outside of the region.

Similarly, the induced effects of income re-spending can be further differentiated between the 96,550 jobs in the region that were created by household income spending earned from direct jobs in the region and an additional 45,830 jobs that were the result of household workers whose income was earned from supplying external regions.

Figure 19: Regional Employment Breakdown

Employment Composition: 5-County Region

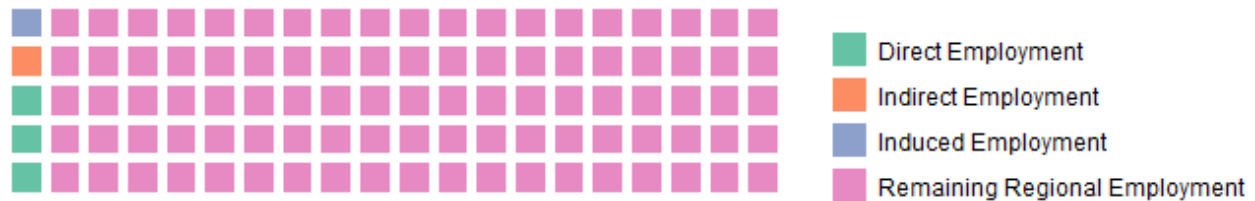


Figure 19 summarizes the importance of the Port as a source of jobs in the 5-county region. Each square in the diagram represents 1% of the working population in the 5-County region. Three percent of the workers in the 5-County region were employed in jobs directly associated with the Port of Long Beach (Port Industry, Port User, or Port-related tourism and construction projects). Another 2% were tied either indirectly or through induced effects to the operation of the Port. Altogether, approximately 5% of employment within the 5-County region was tied to Port of Long Beach operations, or approximately one in twenty jobs. Table 14 below, shows the impact of the Port on industries within the 5-County region. As in the above sections, the regional impacts are inclusive and incorporate the secondary impacts of activities in the City of Long Beach and Los Angeles County on the 5-County region. At this spatial level of detail, the balance of industry sectors shifts from being predominantly manufacturing based impacts, to more retail and supporting activities. This is due to the relative proportion of export-linked manufacturing activities versus retail/distribution magnitudes attached to imports and the spatial pattern of exports relative to imports.

Table 14: Regional Economic Impacts by Type (5-County Region)

Aggregated Industry	Employment		Income (\$M)		Value Added (\$M)		Output (\$M)	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Agriculture & Extraction	5,030	7,170	317	483	369	598	502	838
Construction	1,930	5,430	105	303	145	420	283	864
Education & Health Services	10	33,090	1	1,838	2	1,998	3	3,110
Financial Activities	20	32,770	2	1,819	5	6,820	7	10,382
Government	620	1,840	71	215	107	302	202	583
Manufacturing	44,780	61,240	3,771	5,000	5,504	7,584	16,501	23,225
Media and Information	10	5,120	1	760	2	1,377	4	2,800
Other Services	1,220	47,420	41	1,638	52	2,176	83	3,706
Postal & Warehousing	10	10,910	1	593	1	744	1	1,174
Professional & Business Services	2,970	58,950	277	3,702	375	4,562	712	7,119
Retail Trade	237,910	259,640	9,321	10,159	13,965	15,355	19,936	21,930
Transportation	10,550	18,140	774	1,306	960	1,621	1,989	3,419
Utilities	-	870	0	146	1	378	2	771
Wholesale Trade	22,500	33,770	1,876	2,815	3,677	5,518	5,741	8,616
Total	327,570	576,350	16,556	30,776	25,164	49,454	45,966	88,537

The figure below shows the top 10 subsectors involved in manufacturing within the 5-County region that are affected by Port activity. While Los Angeles County has more computer and electronic manufacturing

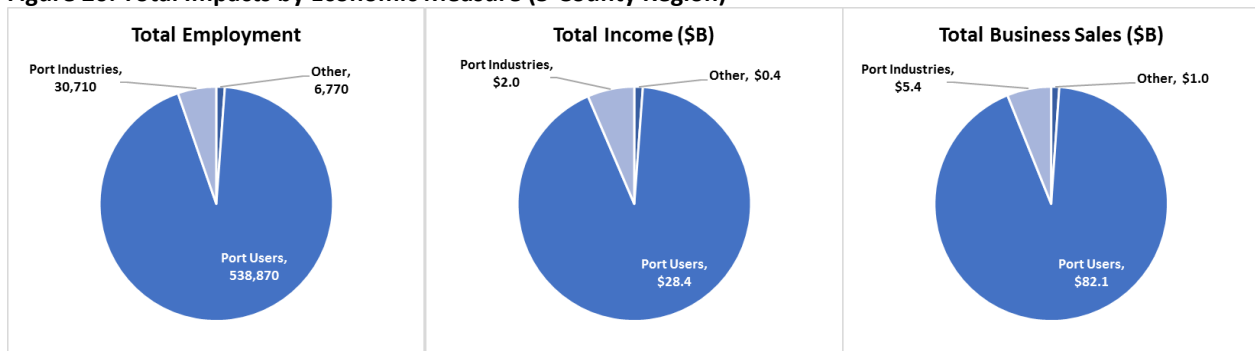
activity, primary metal manufacturing predominates in the other four counties. From an output perspective, this results in a change in the relative importance in these sectors.

Table 15: Top 10 Manufacturing Industries by Output Impact (5-County Region)

Top 10 Manufacturing Industries Affected				
Aggregated Industry	Employment	Income (\$M)	Value Added (\$M)	Output (\$M)
Transportation Equipment Mfg	24,770	2,318	3,119	8,779
Computer and Electronic Mfg	5,250	562	903	2,181
Fabricated Metal Mfg	8,350	577	835	2,155
Primary Metal Mfg	2,500	179	254	1,734
Chemical Mfg	1,470	147	496	1,637
Machinery Mfg	2,530	180	300	1,140
Food Manufacturing	1,770	114	197	998
Petroleum and Coal Products Mfg	250	50	262	849
Plastics & Rubber Products Mfg	2,110	124	189	686
Electrical Equipment & Appliance Mfg	1,480	121	155	524
Rest of Manufacturing Sectors	10,760	629	873	2,543
Total	61,240	5,000	7,584	23,225

The composition of Port associated activities responsible for generating the economic impacts in the 5-County region are shown in the pie charts below. Figure 20 shows in detail the composition of impacts generating activity within the regional economy. Due to the sheer magnitude of activity captured by Port Users, the economic output of the on-port industries, as well as any residual construction and tourism, accounted for approximately 7.2% of the total impact generated within the 5-County region. The scale of port impacts based on Port Users demonstrates the scale of activity, and how truly wide reaching the services rendered are.

Figure 20: Total Impacts by Economic Measure (5-County Region)



Source: Port of Long Beach Economic Impact Analysis Tool

Port Industry – These industries represent not only the city’s Harbor Department its staff, and their operating expenditures, but also the Port tenant and supporting businesses involved in the handling and processing of cargo. The transportation sector involved in the physical movement of goods is also included in this category with expenditures calculated explicitly using the PIERS data.

The chart below shows direct sales for the various Port Industries based on 2017 data. Overall, as the geographic area increases from Los Angeles County to encompass the entire 5-County region, direct sales increased from \$2.7 billion to \$2.9 billion. This increase is solely attributable to the additional activity surrounding the transportation of imported and exported goods via truck and rail.

Table 16: Port Industry Effects: Direct Sales (5-County Region)

Port Industry Type	5-County Region (\$M)
Port Industry-Personnel	\$176
Port Industry-Non-Personnel	\$67
Rail Transportation Services	\$300
Terminal Operations	\$1,493
Truck Transportation Services	\$573
Vessel Fueling	\$260
Total	\$2,868

Source: Port of Long Beach Economic Impact Analysis Tool

Direct Port expenditures accounted for approximately \$2.9 billion of economic output in the 5-County region. The \$2.9 billion in direct sales generated secondary effects related to indirect business purchases and re-spending of labor income totaling additional output of \$2.5 billion. This combined \$5.4 billion of output served to employ 30,710 workers in the 5-County region, earning wage and salary income \$2.0 billion.

Port User – Port Users are distinct from the businesses classified as Port Industry. Port Users can best be described as the businesses that produce goods, which are then exported though the Port to foreign markets, or the wholesalers/distributors charged with handling imported goods to be moved to the appropriate businesses or household consumers.

In 2017, the Port was responsible for exporting \$17.2 billion of goods produced within the 5-County region, based on the PIERS data. The top export commodities by value produced in the 5-County region were the following:

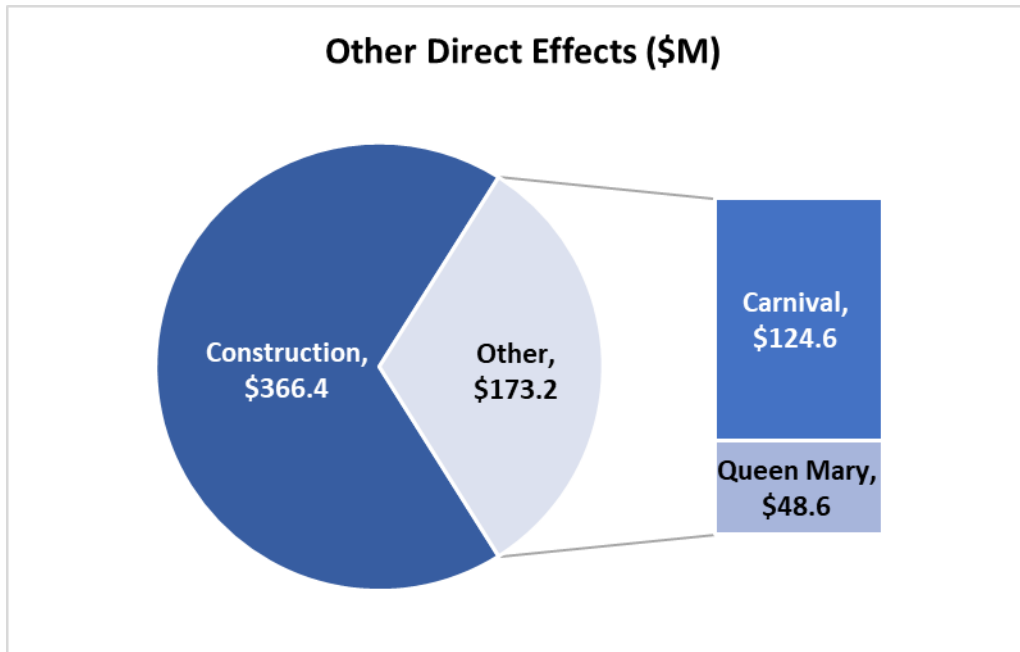
- Aircraft, spacecraft, and parts thereof
- Machinery, boilers, etc.
- Vehicles, except railway or tramway, and parts etc.
- Mineral fuel, oil etc.; bitumen substances; mineral wax
- Base metals not elsewhere specified or included;
- Cermets (ceramic/metal composites); articles thereof

The production of these goods generated indirect and induced effects totaling \$16 billion in additional output for a total economic impact of \$33.2 billion. The combined effects of this activity supported 135,620 jobs in the 5-County region with labor income totaling \$9.3 billion. The contribution in gross regional product to the local economy was \$14.4 billion.

In addition to the impact of the Port’s export-related operations, the Port handled \$33.1 billion of imported goods in 2017 destined for the 5-County region. These imported goods were distributed by a combination of wholesale and retail businesses generating a direct effect of \$25.4 billion in the region. In addition, this activity produced secondary effects responsible for creating economic output totaling another \$23.6 billion for a total of \$49 billion of economic output. The combined effects of port user related activity supported 538,870 jobs within the region earning income totaling \$28.4 billion dollars.

Other – The remaining effects of the Port are related to the travel and tourism activities of the Carnival Cruise Line terminal and the Queen Mary. Capital and maintenance expenditures incurred by the Port as part of their maintenance and infrastructure projects were also counted in this category. Included within these construction projects are the budgetary expenditures of such projects as the Gerald Desmond Bridge replacement, various on-dock rail expansion projects and the development of fireboat stations. All direct impacts related to these activities occurred in Los Angeles County, with the effects split between construction and tourism associated impacts shown in Figure 21 below.

Figure 21: Breakdown of Other Direct Activity (5-County Region)



Construction activity amounted to expenditures of approximately \$366.4 million of within the 5-County region. Tourism activities generated direct sales of \$173.2 million, with 70% of those sales attributable to Carnival Cruise Line operations. The combined effects of these expenditures prompted additional secondary effects totaling \$448.6 million, bringing the total impact to \$1.0 billion of economic output. This activity supported 6,770 jobs. The difference in total jobs created between Los Angeles County and the 5-County region (430 jobs), was the result of indirect and induced jobs that fell outside Los Angeles County to the other four counties in the region.

Fiscal Impacts for the 5-County region included the federal, state and local taxes collected from port-related businesses and households in Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. These taxes totaled \$11.9 billion, reflecting the additional \$3.6 billion in tax revenue generated

in the region compared with tax revenues from Los Angeles County alone. In Table 17, these taxes are summarized by type of economic activity for businesses and households. Port User businesses generated the highest tax bill, paying a total of \$8.4 billion in federal, state and local taxes. The households associated with Port Users paid \$2.9 billion in taxes. Port Industry tax revenues in the 5-County region totaled \$518 million, while construction and tourism activities related to the Port generated \$60 million and \$42 million in total tax revenues, respectively.

Table 17: Regional Fiscal Impacts by Type (5-County Region)

Total Tax Impacts: 5-County Region						
Collector	Payer	Tax Activity Generator (\$M)				
		Construction	Tourism	Port Users	Port Industry	TOTAL
Federal	Businesses	\$ 20	\$ 12	\$ 3,005	\$ 176	\$ 3,213
Federal	Households	\$ 19	\$ 11	\$ 2,481	\$ 172	\$ 2,683
State & Local	Businesses	\$ 17	\$ 16	\$ 5,395	\$ 140	\$ 5,569
State & Local	Households	\$ 3	\$ 2	\$ 411	\$ 30	\$ 447
Total Federal		\$ 39	\$ 24	\$ 5,486	\$ 348	\$ 5,896
Total State & Local		\$ 21	\$ 18	\$ 5,806	\$ 170	\$ 6,015

4.4 California

Summary – In 2017, the Port supported 705,430 jobs in California, representing approximately 3% of all jobs in the state. Direct employment totaled 378,990 jobs, while secondary effects related to business purchases and wage income re-spending supported an additional 326,440 jobs. Total labor income earned by these workers was \$38.7 billion. Table 18 below summarizes the impact of the Port on the state economy by type of effect generating the impact.

Table 18: Regional Economic Impacts by Type (California)

Impact Type	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
Direct	378,990	19.3	28.9	52.5
Indirect	134,950	9.2	14.9	27.0
Induced	191,490	10.2	17.9	31.3
Total	705,430	38.7	61.8	110.7

Source: Port of Long Beach Economic Impact Analysis Tool.

Secondary effects from sources external to the State of California, arising from their purchase of goods and services from California firms, are included in the regional impacts. Therefore, the indirect effects are more accurately broken down between the 93,140 jobs that are indirectly impacted by port activity, and the 41,810 jobs, that resulted from businesses within the state supplying production that occurs outside of the region.

Similarly, the induced effects of income re-spending can be further differentiated between the 114,740 jobs in the state that were created by the spending of household income earned from direct jobs in the

state and an additional 76,750 jobs that were the result of household workers whose income was earned from supplying external regions.

In California, 1.7% of workers were directly associated with the Port of Long Beach (Port Industry, Port User, or Port-related tourism and construction projects). Another almost 1.4% were tied either indirectly or through induced effects to the operation of the Port. Altogether, approximately 3.1% of employment within the state was tied to port operations. Table 19 below, shows the composition of impacted industry sectors.

Table 19: Regional Economic Impacts by Type (California)

Aggregated Industry	Employment		Income (\$M)		Value Added (\$M)		Output (\$M)	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Agriculture & Extraction	7,410	17,230	518	1,127	626	1,457	933	2,359
Construction	1,930	6,690	105	382	145	530	283	1,084
Education & Health Services	10	41,640	1	2,294	2	2,509	3	3,872
Financial Activities	20	42,080	2	2,366	5	8,634	7	13,147
Government	620	2,630	71	295	107	409	202	810
Manufacturing	49,650	72,510	4,073	5,858	5,978	9,174	18,169	28,362
Media and Information	10	8,330	1	1,462	2	2,458	4	4,721
Other Services	1,220	60,080	41	2,079	52	2,753	83	4,686
Postal & Warehousing	10	13,250	1	717	1	899	1	1,420
Professional & Business Services	3,070	73,420	284	4,768	387	5,804	734	8,953
Retail Trade	277,190	304,620	11,113	12,179	16,164	17,942	23,086	25,625
Transportation	11,300	21,130	821	1,508	1,016	1,866	2,132	3,982
Utilities	-	1,390	0	237	1	619	2	1,265
Wholesale Trade	26,530	40,430	2,248	3,430	4,391	6,699	6,825	10,409
Total	378,990	705,430	19,279	38,702	28,876	61,753	52,464	110,694

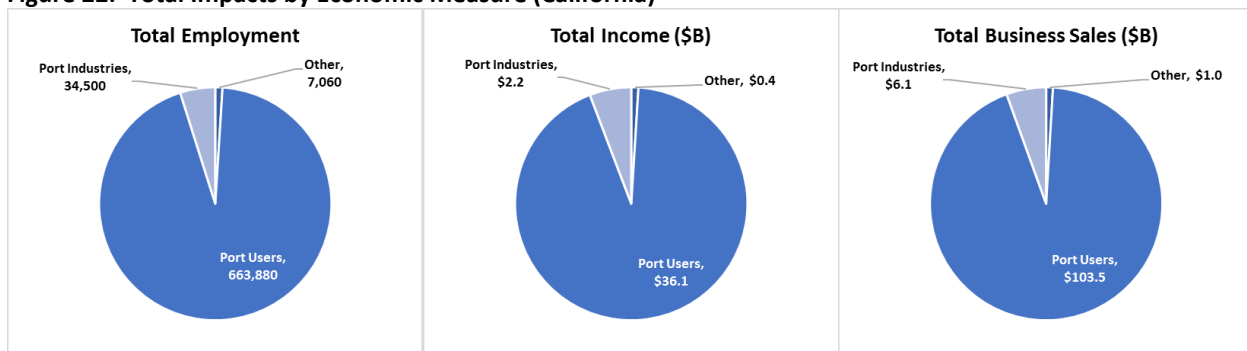
With Port User-related activity driving the economic impacts in California beyond the immediate region around the Port, the following manufacturing industries are driving export-related activity at the state level.

Top 10 Manufacturing Industries Affected				
Aggregated Industry	Employment	Income (\$M)	Value Added (\$M)	Output (\$M)
Transportation Equipment Mfg	25,300	2,375	3,209	9,182
Fabricated Metal Mfg	10,860	741	1,059	2,764
Computer and Electronic Mfg	6,120	717	1,192	2,760
Chemical Mfg	1,990	226	797	2,448
Primary Metal Mfg	3,190	220	315	2,215
Food Manufacturing	2,880	176	302	1,629
Machinery Mfg	2,970	212	357	1,325
Petroleum and Coal Products Mfg	310	65	352	1,140
Plastics & Rubber Products Mfg	2,340	138	211	765
Miscellaneous Mfg	2,360	177	269	647
Rest of Manufacturing Sectors	14,190	812	1,112	3,487
Total	72,510	5,858	9,174	28,361

Compared with the overall distribution of manufacturing activity in California, the manufacturing sectors impacted by the Port of Long Beach are more specialized. State manufacturing output is focused on computer and electronic manufacturing (23.9%), chemical manufacturing (14.6%), and food manufacturing (12.8%). In contrast, the table above demonstrates that the industry sectors most affected by Port-related activities are transportation equipment manufacturing (32.4%), fabricated metal manufacturing (9.7%), and Computer and Electronic manufacturing (9.7%); following the top three were chemicals, Primary Metal manufacturing and food. The composition of Port associated activities responsible for generating the economic impacts in California are illustrated in the pie charts below.

Figure 22 details the composition of impacts generating activity within the state economy.

Figure 22: Total Impacts by Economic Measure (California)



Source: Port of Long Beach Economic Impact Analysis Tool

Port Industry – These industries represent not just the Port Authority, its staff, and their operating expenditures related to the operation of the Port, but also the tenant and supporting businesses involved in the handling and processing of cargo. The transportation sector involved in the physical movement of goods is also included in this category with expenditures calculated explicitly using the PIERS data. The

table below, outlines the detailed direct sales for the various Port industries based on 2017 data. Terminal Operations are responsible for approximately 50% of direct sales related to Port Industries.

Table 21: Port Industry Effects: Direct Sales (California)

Port Industry Type	California (\$M)
Port Industry-Personnel	\$176
Port Industry-Non-Personnel	\$67
Rail Transportation Services	\$349
Terminal Operations	\$1,493
Truck Transportation Services	\$667
Vessel Fueling	\$260
Total	\$3,010

Source: Port of Long Beach Economic Impact Analysis Tool.

Direct Port-expenditures amounted to approximately \$3.0 billion of economic output in the State of California. These direct sales generated secondary effects related to indirect business purchases and re-spending of workers’ wages totaling an additional output effect of \$3.1 billion. This combined \$6.1 billion of output served to employ 34,500 workers in California, earning \$2.2 billion in wage and salary income.

Port User – Port Users are distinct from the businesses classified as Port Industry. These can best be described as the businesses that produce goods, which are then exported via the Port to foreign markets, or the wholesalers/distributors charged with handling imported goods to be moved to the appropriate businesses or household consumers.

In 2017, according to PIERS data, the Port was responsible for exporting \$19.3 billion of goods produced within in the State of California. The top export commodities by value produced in California were the following:

- Aircraft, spacecraft, and parts thereof
- Machinery, boilers, etc.
- Vehicles, except railway or tramway, and parts etc.
- Base metals not elsewhere specified or included; ceramic metals; articles thereof
- Mineral fuel, oil etc.; bitumen substances; mineral wax

The production of these goods resulted in secondary effects, which created an additional \$21.6 billion in indirect and induced impacts, for a total economic impact of \$40.9 billion of output. The sum of this activity kept 170,120 workers employed in California, earning total income of \$11.6 billion, and contributing \$11.0 billion to total gross state product.

In 2017, the Port also handled \$39.7 billion of imported goods that remained California. These imported goods were distributed by a combination of wholesale and retail businesses with expenditures of \$29.6 billion in the state. In addition, this activity produced secondary effects responsible for creating economic output totaling \$33.0 billion. The combined effect of wholesale and retail trade linked to import activity supported 493,760 jobs in the state and generated total income of \$24.4 billion.

Other - The remaining effects of the Port were related to tourism and construction. Construction spending totaled approximately \$366.4 million in the state, while tourism generated direct sales of \$166.7 million. The combined effects of these expenditures resulted in secondary effects totaling \$508.3 million, which brought the combined impact of construction and tourism activities to \$1.0 billion of economic output. This activity, in turn, served to create 7,060 jobs which otherwise would have not occurred in the state; 1,690 of those jobs occurred outside of the City of Long Beach, and 290 jobs fell outside the 5-County region.

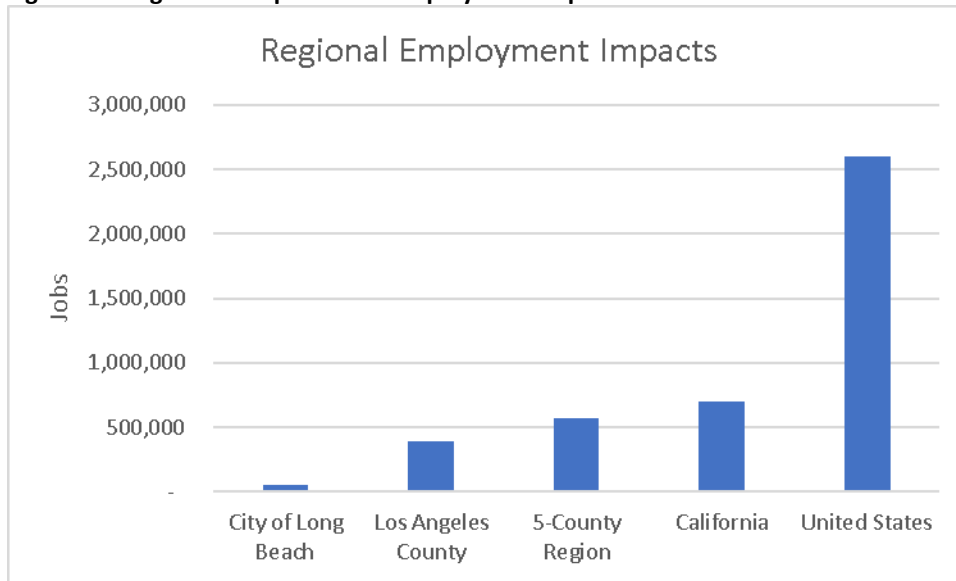
Fiscal Impacts for the State of California associated with the Port of Long Beach are substantial. These taxes, paid by businesses and households across the state, totaled an estimated \$14.6 billion in 2017, of which, \$7.3 billion was California state and local tax revenue. As demonstrated in Table 22, the Port User businesses generated the highest levels of tax revenue, paying \$10.3 billion in federal, state, and local taxes. The households associated with Port Users paid \$3.6 billion in federal, state, and local taxes. Port Industry federal, state and local tax revenues in California totaled \$581 million, while construction and tourism activity related to the Port generated \$63 million and \$44 million in total tax revenues, respectively.

Table 22: Regional Fiscal Impacts by Type (California)

Total Tax Impacts: California						
Collector	Payer	Tax Activity Generator (\$M)				TOTAL
		Construction	Tourism	Port Users	Port Industry	
Federal	Businesses	\$ 21	\$ 13	\$ 3,728	\$ 198	\$ 3,959
Federal	Households	\$ 20	\$ 12	\$ 3,124	\$ 193	\$ 3,349
State & Local	Businesses	\$ 18	\$ 17	\$ 6,522	\$ 156	\$ 6,714
State & Local	Households	\$ 4	\$ 2	\$ 519	\$ 34	\$ 558
Total Federal		\$ 41	\$ 25	\$ 6,852	\$ 391	\$ 7,308
Total State & Local		\$ 22	\$ 19	\$ 7,041	\$ 190	\$ 7,272

4.5 USA

Figure 23: Regional Comparison of Employment Impacts



Summary – The national employment impact of Port of Long Beach activity was 2.6 million jobs. These jobs represented approximately 1.4% of all jobs in the US. Port activity supported 1.3 million direct jobs attributable to the services and industries supported by activity at the Port. Secondary effects pertaining to business purchases and wage income re-spending supported nearly 1.3 million additional jobs. Altogether, Port activity generated over \$126.8 billion worth of labor income in the country. Table 23 summarizes the impact of the Port on the economy.

Table 23: Regional Economic Impacts by Type (USA)

Impact Type	Employment	Income (\$B)	Value Added (\$B)	Output (\$B)
Direct	1,327,520	55.9	84.2	147.8
Indirect	472,930	30.0	50.7	96.1
Induced	796,370	40.9	71.3	130.2
Total	2,596,830	126.8	206.2	374.0

Source: Port of Long Beach Economic Impact Analysis Tool.

One percent of US workers were employed in jobs directly associated with the Port of Long Beach (Port Industry, Port User, or Port-related tourism and construction projects). Another 0.3% were tied either indirectly or through induced effects to the operation of the Port. Altogether, approximately 1.3% of national employment depended on activities that originated with the Port. Table 24 below, shows the composition of industry activity enabled by the Port of Long Beach.

Table 24: Regional Economic Impacts by Type (USA)

Aggregated Industry	Employment		Income (\$M)		Value Added (\$M)		Output (\$M)	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Agriculture & Extraction	18,070	64,370	1,053.1	3,758.6	1,342.9	5,506.0	2,304.4	10,131.2
Construction	1,930	21,400	104.7	1,209.8	144.9	1,596.2	282.7	3,440.5
Education & Health Services	10	166,180	1.3	9,246.7	1.5	10,070.5	2.5	15,886.5
Financial Activities	40	172,000	2.1	9,341.7	7.7	32,447.2	10.7	50,730.1
Government	620	7,780	70.9	699.1	107.1	988.2	202.4	2,161.5
Manufacturing	89,390	171,860	6,991.8	13,105.3	11,253.2	23,319.4	36,268.6	78,330.6
Media and Information	10	30,660	1.4	3,868.1	2.5	7,270.8	4.3	14,633.5
Other Services	1,260	230,390	41.6	7,370.3	52.7	9,852.7	84.9	17,454.7
Postal & Warehousing	10	52,760	0.6	2,749.4	0.8	3,453.3	1.4	5,533.0
Professional & Business Services	3,710	256,830	327.3	16,243.6	451.2	19,764.7	868.4	30,415.1
Retail Trade	1,102,840	1,217,340	38,145.6	42,108.0	54,145.6	60,523.6	80,758.3	90,296.2
Transportation	19,320	61,300	1,354.6	4,241.5	1,779.1	5,402.6	3,803.9	11,713.4
Utilities	-	7,180	0.3	1,060.8	0.9	3,427.5	1.8	8,196.7
Wholesale Trade	90,310	136,800	7,813.9	11,839.9	14,889.3	22,561.1	23,176.0	35,114.1
Total	1,327,520	2,596,830	\$ 55,909.2	\$ 126,842.8	\$ 84,179.4	\$ 206,183.8	\$ 147,770.3	\$ 374,037.1

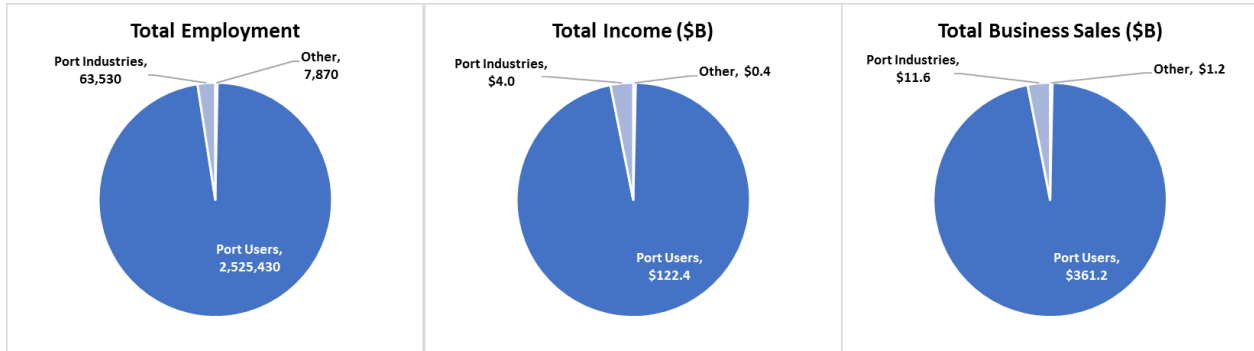
Much of the industry emphasis on Port-enabled jobs is focused on the manufacturing of goods that are exported through the Port, or the retail/wholesale activities that support the distribution of imported goods. Table 25 shows the manufacturing industry sectors driving national impacts. At the national level, this activity is more heavily weighted toward chemical and food manufacturing activity compared with activity in California.

Table 25: Top 10 Manufacturing Industries by Output Impact (USA)

Top 10 Manufacturing Industries Affected				
Aggregated Industry	Employment	Income (\$M)	Value Added (\$M)	Output (\$M)
Transportation Equipment Mfg	32,360	2,961	4,269	13,374
Chemical Mfg	8,700	1,062	3,267	12,305
Food Manufacturing	13,800	780	1,461	8,281
Primary Metal Mfg	9,200	710	1,340	7,274
Fabricated Metal Mfg	27,520	1,823	2,595	6,885
Computer and Electronic Mfg	11,800	1,321	2,412	5,442
Petroleum and Coal Products Mfg	970	243	1,360	3,990
Machinery Mfg	8,310	642	1,070	3,799
Plastics & Rubber Products Mfg	8,390	525	854	2,867
Paper Mfg	3,970	360	587	2,378
Rest of Manufacturing Sectors	46,840	2,678	4,106	11,735
Total	171,860	13,105	23,319	78,331

The dominance of the Port User activities among the composition of Port-associated activities responsible for the economic impacts of the Port nationwide are clear in the pie charts below. Figure 24 shows the national composition of employment, income, and business sales.

Figure 24: Total Impacts by Economic Measure (USA)



Source: Port of Long Beach Economic Impact Analysis Tool

Port Industry – These industries represent not just the Harbor Department, its staff, and expenditures related to the operation of the Port, but also the Port tenant and supporting businesses involved in the handling and processing of cargo. The transportation sector involved in the physical movement of goods is also included in this category with expenditures calculated explicitly using the PIERS data.

Table 26 shows detailed direct sales for the various Port-related industries based on 2017 data. Terminal Operations were responsible for approximately 32% of direct sales related to Port-industries. Note, the capital expenditures related to construction and maintenance are analyzed separately.

Table 26: Port Industry Effects: Direct Sales (USA)

Port Industry Type	United States (\$M)
Port Industry-Personnel	\$176
Port Industry-Non-Personnel	\$67
Rail Transportation Services	\$923
Terminal Operations	\$1,493
Truck Transportation Services	\$1,765
Vessel Fueling	\$260
Total	\$4,682

Source: Port of Long Beach Economic Impact Analysis Tool.

Direct Port expenditures amounted to approximately \$4.7 billion of economic output in the US. These \$4.7 billion of direct sales generated additional secondary effects related to indirect business purchases and re-spending of workers’ wages totaling additional output of \$6.9 billion. This combined \$11.6 billion of output served to employ 63,530 workers across the country, earning wage and salary income of \$4.0 billion.

Port User – Port Users are distinct from the businesses classified as Port Industry. These can best be described as the businesses that produce goods, which are then exported through the Port to foreign markets, or the wholesaler/distributors charged with handling imported goods to be moved to the appropriate businesses or household consumers.

In 2017, the Port was responsible for exporting \$39 billion of goods produced across the country, based on PIERS data. The top export commodities by value produced in the United States were the following:

- Aircraft, spacecraft, and parts thereof
- Machinery, boilers, etc.
- Vehicles, except railway or tramway, and parts etc.
- Plastics and articles thereof
- Cotton, including yarn and woven fabric thereof

The production of these goods led to secondary effects (indirect and induced impacts) totaling an additional \$65.2 billion, for a total economic impact of \$104.2 billion of output. This \$104.2 billion of economic impact supported employment for 427,060 workers in the US, earning total income of \$27.2 billion, and contributing \$44.7 billion in value-added to the nation's gross domestic product (GDP).

In addition to the impact of the Port's export-related operations, the Port handled \$155.1 billion of imported goods in 2017. These imported goods were distributed by a combination of wholesale and retail businesses with expenditures of \$103.6 billion. In addition to the \$103.6 billion of stimulus to the wholesale/retail distribution industries, there were secondary effects that created additional economic output totaling another \$153.5 billion. The combined effect of this activity supported 2,098,370 jobs earning income of \$95.2 billion and contributing \$154.7 billion to GDP.

Other – The remaining effects of the Port are related to the travel and tourism activities of the Carnival Cruise Line terminal and the Queen Mary. Capital and maintenance expenditures incurred by the Port as part of their maintenance and infrastructure projects are also counted in this category. Included in these construction projects were expenditures for the Gerald Desmond Bridge replacement, on-dock rail expansion projects and the development of fireboat facilities. Construction expenditures totaled approximately \$366.4 million, while tourism activities led to direct sales of \$173.2 million in the City of Long Beach, with 70% of sales attributable to Carnival Cruise Line operations. The combined effects of these expenditures gave rise to secondary effects totaling \$789.9 million, which brought the combined impact of construction and tourism activities to \$1.3 billion of economic output. Employment impacts outside California amounted to 7,870 jobs.

Fiscal Impacts for the nation associated with the Port of Long Beach totaled an estimated \$46.6 billion in tax revenues in 2017: \$34.6 billion in business taxes and \$12.1 billion in taxes paid by households. These fiscal effects were primarily associated with Port Users. As shown in Table 27, Port User businesses generated the most taxes - \$33.8 billion in federal, state and local taxes. The households associated with Port Users paid \$11.6 billion in total federal, state and local taxes. The importance of the Port as an international gateway for the country is reflected in the large tax revenues generated nationally by Port Users. The fiscal impacts from businesses and households classified as Port Industry, and the construction and the tourism sectors were modest by comparison at the national level. Nation-wide federal, state and local tax revenues generated by Port Industry totaled \$1.1 billion, while construction and tourism related activities generated \$73 million and \$49 million in total tax revenues, respectively.

Total Tax Impacts: USA						
Collector	Payer	Tax Activity Generator (\$M)				
		Construction	Tourism	Port Users	Port Industry	TOTAL
Federal	Businesses	\$ 24	\$ 15	\$ 12,929	\$ 371	\$ 13,339
Federal	Households	\$ 23	\$ 13	\$ 10,370	\$ 339	\$ 10,745
State & Local	Businesses	\$ 23	\$ 19	\$ 20,888	\$ 316	\$ 21,244
State & Local	Households	\$ 4	\$ 2	\$ 1,266	\$ 49	\$ 1,321
Total Federal		\$ 47	\$ 28	\$ 23,299	\$ 710	\$ 24,084
Total State & Local		\$ 26	\$ 21	\$ 22,154	\$ 365	\$ 22,565

TECHNICAL APPENDICES

A.1 Changes to the Model

Estimation of Truck/Rail Transportation Costs

As part of the economic impact analysis, significant effort was made to scrutinize and clarify the PIERS database records for the inland origin/destination locations of shipments. This process led to correcting some of the common mis-coding related to identification of shipments associated with business administrative headquarters locations instead of points of production, extraction of destination for sales, filling in of missing data record field checks, and identifying incomplete records found in the original PIERS data records. To leverage the improved data, the estimation of truck/rail related transportation costs were derived using an enhanced version of the PIERS data. To do this we analyzed PIERS data by applying the domestic modal detail from the US DOT's Freight Analysis Framework (FAF).

To identify the modal share of goods movement in the PIERS data, we geocoded the addresses included in the database so that we could point-locate them and associate the businesses with a county level of geography. Next, we associated the county-commodity level trade in PIERS to the appropriate FAF zone so we could directly relate the different types of geography. After this, we used an HS-SCTG⁷ commodity classification crosswalk to build inferences between the PIERS and FAF data sources so that for a given type of flow represented in PIERS, we could look at its corresponding flow in the FAF data to see the split of goods moving via truck and rail.

Next, for each record we added the network distance from the Port to the reported county of origin/destination by using the Oakridge National Laboratory's national county-to-county modal freight network distance data, often referred to as a skim table.⁸ This, when combined with the prior steps, allowed us to estimate the rail and truck ton/container-miles which was input into the model and then multiplied out based on the cost per container/ton-mile⁹ to arrive at an estimated direct transportation cost.

Multi-Regional Impact Calculation in the Model

As referenced in Section 3 of the Final Report, the economic impact model methodology has evolved from a simple application of multiplier tables representing the five different geographies to a system that tracks the wider impacts to the specific geography. For example, in the prior 2001 Port economic impact report, some of the state impacts which would have occurred as a direct effect in the 'Rest of' portion of California would have generated secondary effects due to industry purchasing of materials in the City of Long Beach.

⁷ HS (Harmonized System) of import / exports commodity classification and the SCTG (Standard Classification of Transported Goods) North American freight transportation commodity classification.

⁸ <https://cta.ornl.gov/transnet/SkimTree.htm>.

⁹ BTS:<https://www.bts.gov/content/average-freight-revenue-ton-mile> ATRI:<http://atri-online.org/wp-content/uploads/2018/10/ATRI-Operational-Costs-of-Trucking-2018.pdf> .

In the model, each region is computed such that it is not inclusive of smaller regions (the reported impact of Los Angeles is in fact a combination of City of Long Beach and Rest of Los Angeles County). Therefore, a matrix of multipliers covering the incremental inclusion of effects was constructed.

The table below highlights the difference in model methodology. Whereas the impact analysis conducted in 2001 focused on estimating the economic impact nationally and presented it sequentially as a summing of the greyed-out boxes, we estimated it based on pair-wise computations, with each regional row against the asterisked region. While the result is still consistent at a national level, it means that the tallies of regional economic impacts are presented as the sum of the columns in the table (and therefore are inclusive of the external effects from other regions). Therefore, we also presented our results by isolating the region-specific effects against externally induced effects.

Table 28: A look at Multi Regional Impacts (MRIO)

	City of Long Beach	Los Angeles	5-County	California	USA
City of Long Beach	X	*	*	*	*
Los Angeles	*	X	*	*	*
5-County	*	*	X	*	*
California	*	*	*	X	*
USA	*	*	*	*	X

We were able to do this by generating combinations of regional multipliers (factorial) and then constraining them such that the end combination of each sequence still arrives at the national impact. For example, the model considers the effects of the impact of ‘Rest of Los Angeles County’ on:

- City of Long Beach
- Itself (rest of Los Angeles County)
- Rest of 5-County Region,
- Rest of California
- Rest of US

When aggregated, these values still produce approximately the same magnitude as if the model were run for a simple national impact on an industry-by-industry basis, however, this disaggregates the multi-regional effects the impacts to the specific regions which were responsible for producing them within the national effects. The point of doing so is to represent the interrelated nature of the economies: especially in and around the port region. Economic effects are not contained by political boundaries, and as industries operate, the purchases they make, and the re-spending of worker incomes is not all limited to a small isolated region.

A.2 Top Exported Commodities

HS Code	Description	Value (\$1,000,000s)
88	AIRCRAFT, SPACECRAFT, AND PARTS THEREOF	8,550.40
84	NUCLEAR REACTORS, BOILERS, MACHINERY ETC.; PARTS	3,014.74
87	VEHICLES, EXCEPT RAILWAY OR TRAMWAY, AND PARTS ETC.	1,544.40
39	PLASTICS AND ARTICLES THEREOF	1,541.74
52	COTTON, INCLUDING YARN AND WOVEN FABRIC THEREOF	1,184.33
27	MINERAL FUEL, OIL ETC.; BITUMIN SUBST; MINERAL WAX	1,180.80
85	ELECTRIC MACHINERY ETC.; SOUND EQUIP; TV EQUIP; PTS	1,120.39
90	OPTIC, PHOTO ETC., MEDIC OR SURGICAL INSTRUMENTS ETC.	1,028.55
81	BASE METALS NESOI; CERMETS; ARTICLES THEREOF	930.87
12	OIL SEEDS ETC.; MISC GRAIN, SEED, FRUIT, PLANT ETC.	820.99
28	INORG CHEM; PREC & RARE-EARTH MET & RADIOACT COMPD	688.75
2	MEAT AND EDIBLE MEAT OFFAL	595.44
86	RAILWAY OR TRAMWAY STOCK ETC.; TRAFFIC SIGNAL EQUIP	565.52
41	RAW HIDES AND SKINS (NO FURSKINS) AND LEATHER	549.57
21	MISCELLANEOUS EDIBLE PREPARATIONS	517.70
49	PRINTED BOOKS, NEWSPAPERS ETC.; MANUSCRIPTS ETC.	484.53
47	PULP OF WOOD ETC.; WASTE ETC. OF PAPER & PAPERBOARD	462.82
8	FRUIT AND NUTS, EDIBLE; PEEL OF CITRUS FRUIT OR MELONS	451.35
30	PHARMACEUTICAL PRODUCTS	426.97
95	TOYS, GAMES & SPORT EQUIPMENT; PARTS & ACCESSORIES	419.09
29	ORGANIC CHEMICALS	414.80
40	RUBBER AND ARTICLES THEREOF	397.77
94	FURNITURE; BEDDING ETC.; LAMPS NESOI ETC.; PREFAB BD	389.17
42	LEATHER ART; SADDLERY ETC.; HANDBAGS ETC.; GUT ART	369.99
23	FOOD INDUSTRY RESIDUES & WASTE; PREP ANIMAL FEED	355.71
91	CLOCKS AND WATCHES AND PARTS THEREOF	332.32
72	IRON AND STEEL	306.27
38	MISCELLANEOUS CHEMICAL PRODUCTS	303.31
33	ESSENTIAL OILS ETC.; PERFUMERY, COSMETIC ETC. PREPS	281.49
76	ALUMINUM AND ARTICLES THEREOF	273.03
73	ARTICLES OF IRON OR STEEL	272.88
63	TEXTILE ART NESOI; NEEDLECRAFT SETS; WORN TEXT ART	237.56
57	CARPETS AND OTHER TEXTILE FLOOR COVERINGS	233.16
48	PAPER & PAPERBOARD & ARTICLES (INC PAPR PULP ARTL)	191.32
4	DAIRY PRODS; BIRDS EGGS; HONEY; ED ANIMAL PR NESOI	180.37
82	TOOLS, CUTLERY ETC. OF BASE METAL & PARTS THEREOF	175.03
74	COPPER AND ARTICLES THEREOF	174.40
44	WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL	174.04
22	BEVERAGES, SPIRITS AND VINEGAR	154.14
62	APPAREL ARTICLES AND ACCESSORIES, NOT KNIT ETC..	150.29

HS Code	Description	Value (\$1,000,000s)
34	SOAP ETC.; WAXES, POLISH ETC.; CANDLES; DENTAL PREPS	136.15
83	MISCELLANEOUS ARTICLES OF BASE METAL	134.80
7	HOUSEHOLD GOODS	122.49
25	SALT; SULFUR; EARTH & STONE; LIME & CEMENT PLASTER	116.62
71	NATURAL, CULTURED PEARLS; PRECIOUS, SEMI-PRECIOUS STONES; PRECIOUS METALS, METALS CLAD WITH PRECIOUS METAL, AND ARTICLES THEREOF; IMITATION JEWELLERY; COIN	111.25
32	TANNING & DYE EXT ETC.; DYE, PAINT, PUTTY ETC.; INKS	104.35
10	CEREALS	99.66
70	GLASS AND GLASSWARE	84.75
20	PREP VEGETABLES, FRUIT, NUTS OR OTHER PLANT PARTS	78.32
35	ALBUMINOIDAL SUBST; MODIFIED STARCH; GLUE; ENZYMES	74.65
11	MILLING PRODUCTS; MALT; STARCH; INULIN; WHT GLUTEN	68.73
98	MISCELLANEOUS	59.57
26	ORES, SLAG AND ASH	59.15
19	PREP CEREAL, FLOUR, STARCH OR MILK; BAKERS WARES	52.08
89	SHIPS, BOATS AND FLOATING STRUCTURES	51.91
9	COFFEE, TEA, MATE AND SPICES	44.20
17	SUGARS AND SUGAR CONFECTIONARY	42.87
64	FOOTWEAR, GAITERS ETC. AND PARTS THEREOF	41.20
15	ANIMAL OR VEGETABLE FATS, OILS ETC. & WAXES	40.91
5	PRODUCTS OF ANIMAL ORIGIN, NESOI	32.02
69	CERAMIC PRODUCTS	31.17
3	FISH, CRUSTACEANS & AQUATIC INVERTEBRATES	28.61
96	MISCELLANEOUS MANUFACTURED ARTICLES	26.69
13	LAC; GUMS, RESINS & OTHER VEGETABLE SAP & EXTRACT	22.66
92	MUSICAL INSTRUMENTS; PARTS AND ACCESSORIES THEREOF	22.13
18	COCOA AND COCOA PREPARATIONS	20.42
93	ARMS AND AMMUNITION; PARTS AND ACCESSORIES THEREOF	19.91
16	EDIBLE PREPARATIONS OF MEAT, FISH, CRUSTACEANS ETC.	19.56
37	PHOTOGRAPHIC OR CINEMATOGRAPHIC GOODS	16.39
65	HEADGEAR AND PARTS THEREOF	15.87
51	WOOL & ANIMAL HAIR, INCLUDING YARN & WOVEN FABRIC	14.91
68	ART OF STONE, PLASTER, CEMENT, ASBESTOS, MICA ETC.	14.70
46	MFR OF STRAW, ESPARTO ETC.; BASKETWARE & WICKERWRK	13.76
75	NICKEL AND ARTICLES THEREOF	13.70
56	WADDING, FELT ETC.; SP YARN; TWINE, ROPES ETC.	13.42
59	TEXTILE FABRICS; IMPREGNATED, COATED, COVERED OR LAMINATED; TEXTILE ARTICLES OF A KIND SUITABLE FOR INDUSTRIAL USE	11.78
36	EXPLOSIVES; PYROTECHNICS; MATCHES; PYRO ALLOYS ETC.	9.44
54	MANMADE FILAMENTS, INCLUDING YARNS & WOVEN FABRICS	7.40
55	MANMADE STAPLE FIBERS, INCL YARNS & WOVEN FABRICS	5.25

HS Code	Description	Value (\$1,000,000s)
61	APPAREL ARTICLES AND ACCESSORIES, KNIT OR CROCHET	5.05
31	FERTILIZERS	4.82
24	TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES	4.36
97	WORKS OF ART, COLLECTORS' PIECES AND ANTIQUES	3.35
53	VEGETABLE TEXTILE FIBRES; PAPER YARN AND WOVEN FABRICS OF PAPER YARN	2.96
14	VEGETABLE PLAITING MATERIALS & PRODUCTS NESOI	2.82
78	LEAD AND ARTICLES THEREOF	2.02
80	TIN AND ARTICLES THEREOF	1.94
67	PREP FEATHERS, DOWN ETC.; ARTIF FLOWERS; H HAIR ART	1.71
58	SPEC WOV FABRICS; TUFTED FAB; LACE; TAPESTRIES ETC.	1.63
60	KNITTED OR CROCHETED FABRICS	1.54
66	UMBRELLAS, WALKING-STICKS, RIDING-CROPS ETC., PARTS	0.41
50	SILK, INCLUDING YARNS AND WOVEN FABRIC THEREOF	0.40
6	LIVE TREES, PLANTS, BULBS ETC.; CUT FLOWERS ETC.	0.31
1	LIVE ANIMALS	0.22
45	CORK AND ARTICLES OF CORK	0.20
43	FURSKINS AND ARTIFICIAL FUR; MANUFACTURES THEREOF	0.02

A.3 Top Imported Commodities

HS Code	Description	Value (\$1,000,000s)
84	NUCLEAR REACTORS, BOILERS, MACHINERY ETC.; PARTS	23,736.7
85	ELECTRIC MACHINERY ETC.; SOUND EQUIP; TV EQUIP; PTS	19,219.0
27	MINERAL FUEL, OIL ETC.; BITUMIN SUBST; MINERAL WAX	12,995.2
87	VEHICLES, EXCEPT RAILWAY OR TRAMWAY, AND PARTS ETC.	10,590.3
62	APPAREL ARTICLES AND ACCESSORIES, NOT KNIT ETC.	10,088.5
79	ZINC AND ARTICLES THEREOF	9,278.3
94	FURNITURE; BEDDING ETC.; LAMPS NESOI ETC.; PREFAB BD	8,014.3
39	PLASTICS AND ARTICLES THEREOF	5,633.4
61	APPAREL ARTICLES AND ACCESSORIES, KNIT OR CROCHET	5,293.1
95	TOYS, GAMES & SPORT EQUIPMENT; PARTS & ACCESSORIES	4,986.8
73	ARTICLES OF IRON OR STEEL	3,925.5
64	FOOTWEAR, GAITERS ETC. AND PARTS THEREOF	3,690.7
90	OPTIC, PHOTO ETC., MEDIC OR SURGICAL INSTRMENTS ETC.	3,552.8
40	RUBBER AND ARTICLES THEREOF	2,812.6
42	LEATHER ART; SADDLERY ETC.; HANDBAGS ETC.; GUT ART	2,736.6
63	TEXTILE ART NESOI; NEEDLECRAFT SETS; WORN TEXT ART	2,558.1
83	MISCELLANEOUS ARTICLES OF BASE METAL	1,881.4
32	TANNING & DYE EXT ETC.; DYE, PAINT, PUTTY ETC.; INKS	1,755.8
82	TOOLS, CUTLERY ETC. OF BASE METAL & PARTS THEREOF	1,497.6
76	ALUMINUM AND ARTICLES THEREOF	1,491.3
70	GLASS AND GLASSWARE	1,290.9
29	ORGANIC CHEMICALS	1,204.7
48	PAPER & PAPERBOARD & ARTICLES (INC PAPER PULP ARTL)	1,096.6
44	WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL	1,041.5
52	COTTON, INCLUDING YARN AND WOVEN FABRIC THEREOF	960.1
69	CERAMIC PRODUCTS	861.9
28	INORG CHEM; PREC & RARE-EARTH MET & RADIOACT COMPD	841.3
96	MISCELLANEOUS MANUFACTURED ARTICLES	714.4
72	IRON AND STEEL	689.9
33	ESSENTIAL OILS ETC.; PERFUMERY, COSMETIC ETC. PREPS	651.7
3	FISH, CRUSTACEANS & AQUATIC INVERTEBRATES	619.9
74	COPPER AND ARTICLES THEREOF	597.6
22	BEVERAGES, SPIRITS AND VINEGAR	529.9
49	PRINTED BOOKS, NEWSPAPERS ETC.; MANUSCRIPTS ETC.	478.9

38	MISCELLANEOUS CHEMICAL PRODUCTS	402.1
65	HEADGEAR AND PARTS THEREOF	364.2
97	WORKS OF ART, COLLECTORS' PIECES AND ANTIQUES	321.8
2	MEAT AND EDIBLE MEAT OFFAL	306.2
20	PREP VEGETABLES, FRUIT, NUTS OR OTHER PLANT PARTS	305.4
16	EDIBLE PREPARATIONS OF MEAT, FISH, CRUSTACEANS ETC.	274.8
88	AIRCRAFT, SPACECRAFT, AND PARTS THEREOF	268.1
8	FRUIT AND NUTS, EDIBLE; PEEL OF CITRUS FRUIT OR MELONS	265.3
91	CLOCKS AND WATCHES AND PARTS THEREOF	263.2
35	ALBUMINOIDAL SUBST; MODIFIED STARCH; GLUE; ENZYMES	259.8
30	PHARMACEUTICAL PRODUCTS	242.5
21	MISCELLANEOUS EDIBLE PREPARATIONS	241.4
68	ART OF STONE, PLASTER, CEMENT, ASBESTOS, MICA ETC.	230.1
54	MANMADE FILAMENTS, INCLUDING YARNS & WOVEN FABRICS	204.8
92	MUSICAL INSTRUMENTS; PARTS AND ACCESSORIES THEREOF	204.3
37	PHOTOGRAPHIC OR CINEMATOGRAPHIC GOODS	195.4
59	TEXTILE FABRICS; IMPREGNATED, COATED, COVERED OR LAMINATED; TEXTILE ARTICLES OF A KIND SUITABLE FOR INDUSTRIAL USE	194.2
15	ANIMAL OR VEGETABLE FATS, OILS ETC. & WAXES	175.0
34	SOAP ETC.; WAXES, POLISH ETC.; CANDLES; DENTAL PREPS	174.4
57	CARPETS AND OTHER TEXTILE FLOOR COVERINGS	173.1
71	NATURAL, CULTURED PEARLS; PRECIOUS, SEMI-PRECIOUS STONES; PRECIOUS METALS, METALS CLAD WITH PRECIOUS METAL, AND ARTICLES THEREOF; IMITATION JEWELLERY; COIN	148.6
9	COFFEE, TEA, MATE AND SPICES	143.1
56	WADDING, FELT ETC.; SP YARN; TWINE, ROPES ETC.	142.2
86	RAILWAY OR TRAMWAY STOCK ETC.; TRAFFIC SIGNAL EQUIP	141.7
46	MFR OF STRAW, ESPARTO ETC.; BASKETWARE & WICKERWRK	141.5
7	HOUSEHOLD GOODS	139.2
19	PREP CEREAL, FLOUR, STARCH OR MILK; BAKERS WARES	136.8
67	PREP FEATHERS, DOWN ETC.; ARTIF FLOWERS; H HAIR ART	136.7
36	EXPLOSIVES; PYROTECHNICS; MATCHES; PYRO ALLOYS ETC.	136.4
25	SALT; SULFUR; EARTH & STONE; LIME & CEMENT PLASTER	132.3
55	MANMADE STAPLE FIBERS, INCL YARNS & WOVEN FABRICS	113.6
12	OIL SEEDS ETC.; MISC GRAIN, SEED, FRUIT, PLANT ETC.	95.8
66	UMBRELLAS, WALKING-STICKS, RIDING-CROPS ETC., PARTS	84.7
81	BASE METALS NESOI; CERMETS; ARTICLES THEREOF	83.6
11	MILLING PRODUCTS; MALT; STARCH; INULIN; WHT GLUTEN	83.4
58	SPEC WOV FABRICS; TUFTED FAB; LACE; TAPESTRIES ETC.	81.5

60	KNITTED OR CROCHETED FABRICS	75.7
50	SILK, INCLUDING YARNS AND WOVEN FABRIC THEREOF	73.1
17	SUGARS AND SUGAR CONFECTIONARY	63.5
41	RAW HIDES AND SKINS (NO FURSKINS) AND LEATHER	58.8
89	SHIPS, BOATS AND FLOATING STRUCTURES	57.4
4	DAIRY PRODS; BIRDS EGGS; HONEY; ED ANIMAL PR NESOI	48.0
80	TIN AND ARTICLES THEREOF	47.4
13	LAC; GUMS, RESINS & OTHER VEGETABLE SAP & EXTRACT	37.6
23	FOOD INDUSTRY RESIDUES & WASTE; PREP ANIMAL FEED	36.1
51	WOOL & ANIMAL HAIR, INCLUDING YARN & WOVEN FABRIC	34.9
5	PRODUCTS OF ANIMAL ORIGIN, NESOI	32.4
93	ARMS AND AMMUNITION; PARTS AND ACCESSORIES THEREOF	31.8
75	NICKEL AND ARTICLES THEREOF	30.9
10	CEREALS	30.2
24	TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES	28.3
18	COCOA AND COCOA PREPARATIONS	24.2
43	FURSKINS AND ARTIFICIAL FUR; MANUFACTURES THEREOF	22.3
78	LEAD AND ARTICLES THEREOF	19.4
31	FERTILIZERS	18.8
53	VEGETABLE TEXTILE FIBRES; PAPER YARN AND WOVEN FABRICS OF PAPER YARN	16.1
6	LIVE TREES, PLANTS, BULBS ETC.; CUT FLOWERS ETC.	11.9
45	CORK AND ARTICLES OF CORK	10.6
47	PULP OF WOOD ETC.; WASTE ETC. OF PAPER & PAPERBOARD	7.5
26	ORES, SLAG AND ASH	5.0
14	VEGETABLE PLAITING MATERIALS & PRODUCTS NESOI	4.4
1	LIVE ANIMALS	2.8
99	MISCELLANEOUS	0.0
98	PROJECT IMPORTS	0.0