



U.S. PORT & MARITIME INDUSTRY

# **ECONOMIC CONTRIBUTION TECHNICAL REPORT**

# U.S. PORT & MARITIME INDUSTRY ECONOMIC CONTRIBUTION TECHNICAL REPORT

## Contents

Executive summary..... i

I. Introduction ..... 1

II. Economic activity in the port and maritime industry ..... 6

III. Economic activity related to and facilitated by the port and maritime industry ..... 8

IV. State distribution of economic activity ..... 13

V. Caveats and limitations ..... 17

Appendix. Benchmarking ..... 20

Endnotes ..... 23



## Executive summary

Over the past five decades, world trade has grown from 25% of global gross domestic product (GDP) to more than 60%,<sup>1</sup> with more than 90% of world trade occurring over the world's oceans.<sup>2</sup> US ports play a significant role in moving goods and connecting US manufacturers and American households across the country to global markets.

In the United States alone, imports into and exports out of the United States amounted to \$5.1 trillion of goods in 2023, an amount equivalent in size to roughly 20% of the US economy. And over \$2.1 trillion dollars, or more than 40% of all goods entering or leaving the United States, passed through a port.<sup>3</sup> Ports not only facilitate an extraordinary volume of trade but also serve as essential gateways for tourism, further diversifying their contribution to the economy.

### Key results

- ▶ **In 2023, the port and maritime industry's total economic contribution to the United States included an estimated 2.5 million workers earning \$214 billion in wages and benefits and generating \$311 billion of GDP in the United States.** The total economic contribution, or economic footprint, of the port and maritime industry consists of the industry's operations and capital expenditures in the United States, as well as suppliers to the port and maritime industry and related consumer spending. This does not include the economic activity facilitated by the movement of goods through ports.
  - Employment in maritime activity supported over 290,000 jobs. These jobs include dockworkers, tugboat pilots, crew aboard cruise ships, commercial fishers, shipbuilders, and naval architects throughout the United States. These workers serve the critical role of ensuring the efficient movement of goods and people over US waterways and oceans.
  - The port and maritime industry is more than ports. Today's modern economy has significantly interconnected supply chains. Over 90% of goods arriving or leaving a port do so on a truck, in a railcar, or through a pipeline.<sup>4</sup> The industry directly supported 425,000 trucking, rail, pipeline, warehousing, and logistics jobs that reach beyond the coasts, lakeshores, and rivers in the United States.
  - Public administration fosters a secure and resilient maritime supply chain. Government agencies, such as the Coast Guard and Customs and Border Protection, patrol US waters and ensure the safe passage of both goods and people. The US Army Corps of Engineers focuses on advancing critical waterway projects. Over 58,000 workers served in these capacities in the United States as part of the port and maritime industry.
  - Ports are a capital-intensive industry that often require billions of dollars in new construction, repairs, and dredging. In 2021, the US Census Bureau estimated

<sup>1</sup> World Bank, <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS>, accessed March 2024.

<sup>2</sup> OECD, <https://www.oecd.org/ocean/topics/ocean-economy/>, accessed March 2024.

<sup>3</sup> US Department of Commerce, Census Bureau, USA Trade Online data, accessed March 2024.

<sup>4</sup> US Department of Transportation, Bureau of Transportation Statistics, Freight Analysis Framework (Version 5.5.1).

state and local governments spent \$6.8 billion on sea and inland port facilities.<sup>5</sup> The most recent American Association of Port Authorities (AAPA) survey found that ports planned on spending over \$163 billion in capital expenditures between 2021 and 2025.<sup>6</sup> In 2023, these capital expenditures in the industry resulted in an additional 248,000 jobs. As ports invest more in both their infrastructure and sustainability initiatives, these numbers could increase in future years.

- Wages and benefits for port and maritime workers were 20% higher than the national average in 2023. The port and maritime industry's one million directly employed workers earned \$100 billion in wages and benefits in 2023 and generated \$124 billion of GDP in the United States. The average worker earned approximately \$98,000 in wages and benefits in 2023. Wages and benefits is a component of GDP.
  - Altogether the employment directly supported by the port and maritime industry would be larger than the workforce in 90% of US metropolitan areas. With over one million workers, the port and maritime industry is approximately the size of the San Jose, CA metropolitan area workforce and nearly twice the size of the workforce in the New Orleans metropolitan area. It would be larger than the workforce of the District of Columbia or New Hampshire and nearly as large as the workforce of New Mexico.<sup>7</sup>
- ▶ **Suppliers to the port and maritime industry supported 714,000 workers throughout the United States.** Capital intensive industries regularly sustain deep and interconnected supply chains, and the port and maritime industry is no different. Suppliers to the port and maritime industry supported 714,000 workers throughout the US economy earning \$59 billion in wages and benefits and generating \$89 billion of GDP in the United States. The average wages and benefits of workers supported by related supplier activity was approximately \$82,000.
  - ▶ **Related consumer spending supports an additional 803,000 workers.** Consumer spending of workers in the port and maritime industry and in the industry's supply chain supported 803,000 workers throughout the United States. Those workers earned \$55 billion in wages and benefits and generated \$98 billion of GDP in 2023. The average worker supported by related consumer spending earned approximately \$69,000 in wages and benefits.
  - ▶ **Beyond the total economic contribution of the port and maritime industry, the goods that moved through ports directly facilitated the employment of approximately 6.6 million workers.** Many domestic and international businesses rely on ports to send or receive shipments of goods. The goods that moved through ports directly facilitated the employment of approximately 6.6 workers throughout the United States.<sup>8</sup>

---

<sup>5</sup> US Census Bureau, "Annual Survey of State and Local Government Finances: 2021," June 2023.

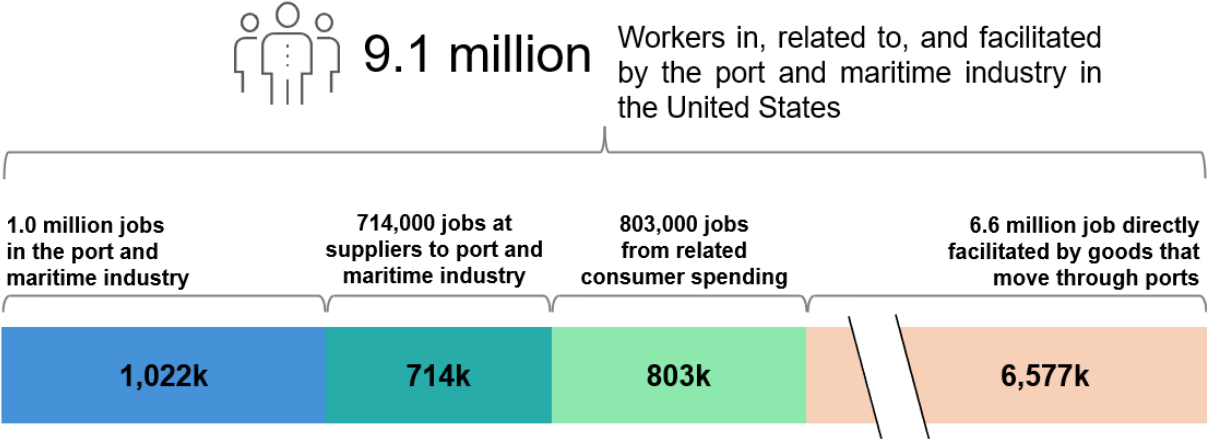
<sup>6</sup> AAPA Survey, "Survey Shows U.S. Ports Plan Big Infrastructure Investments Through 2025," April 29, 2020.

<sup>7</sup> US Census Bureau, "American Community Survey," April 2022.

<sup>8</sup> This analysis only examines the economic activity directly facilitated by the movement of goods through ports. It does not examine this economic activity's potential spillover effects into the broader economy.

This report estimates the economic contribution of the US port and maritime industry in 2023. As such, the estimates are a snapshot of the industry’s economic footprint as measured by employment, wages and benefits, and GDP in the United States. By providing information on the overall scope of the industry, this report attempts to shed light on the reach of the port and maritime industry within the US economy.

**Figure E-1. Total economic activity in, related to, and facilitated by the port and maritime industry, 2023**



Note: Figures are rounded.  
Source: EY analysis.

## I. Introduction

Ports contribute significantly to the nation's supply chain, connecting manufacturers and consumers across the country to global markets. Imports into and exports out of the United States amounted to \$5.1 trillion of goods in 2023, an amount equivalent in size to roughly 20% of the US economy. And over \$2.1 trillion dollars, or more than 40% of all goods entering or leaving the United States, passed through a port.<sup>1</sup> Moreover, over 90% of these goods arrived or left the port on a truck, in a railcar, or through a pipeline, underscoring the interdependency of the US supply chain.<sup>2</sup>

This report estimates the economic contribution of the US port and maritime industry in 2023. As such, the estimates are a snapshot of the industry's economic footprint as measured by employment, wages and benefits, and gross domestic product (GDP) in the United States. The report also examines the employment directly facilitated by the movement of goods through ports. By providing information on the overall scope of the industry and the goods that move through ports, this report attempts to shed light on the reach of the port and maritime industry within the US economy. The estimates are based on a widely used economic model for economic contribution analyses.

The total economic contribution of the port and maritime industry includes the operations at ports, other economic activity in the maritime industry, transportation and warehousing related to ports, construction associated with maintaining and expanding ports, and the regulators of the ports, as well as suppliers to the port and maritime industry and related consumer spending. Related supplier activity accounts for the port and maritime industry purchasing goods and services from other businesses, which supports jobs, wages and benefits, and GDP at these supplier businesses. Related consumer spending refers to consumer spending supported by workers in the port and maritime industry and at their suppliers. That is, when these workers spend their earnings at US businesses (e.g., grocery stores, retailers, movie theaters), they support economic activity. This does not include the economic activity facilitated by the movement of goods through ports.

This analysis primarily relies on the US Census Bureau's County Business Patterns (CBP) data and generally follows the definitions of those data. For data not available from CBP, the analysis relies on other government sources including the US Bureau of Labor Statistics (BLS), Department of Transportation (DOT), US Army Corps of Engineers (USACE), the US Department of Homeland Security (DHS), and the US Department of Defense (DOD), as well as other publicly available information from the American Association of Railroads and IMPLAN.

In 2023, the port and maritime industry employed one million workers throughout the US economy earning \$100 billion in wages and benefits and generating \$124 billion of GDP. Suppliers to the port and maritime industry employed an additional 714,000 workers throughout the US economy earning \$59 billion in wages and benefits and generating \$89 billion of GDP. The consumer spending of workers of the port and maritime industry and the industry's suppliers supported an additional 803,000 workers throughout the US economy earning \$55 billion in wages and benefits and generating \$98 billion of GDP. In addition to this economic activity, many domestic and international businesses rely on this infrastructure to send or receive shipments of goods. The movement of goods through ports directly facilitated approximately 6.6 million US jobs in 2023.

## Port and maritime industry

This report defines the port and maritime industry to include businesses and entities that engage in (1) maritime activity, (2) related transportation and warehousing, (3) related public administration, and (4) construction activity related to ports and waterways.<sup>3</sup>

Below is a brief description of the four categories, their component parts, and the methodology underlying the estimates:

1. **Maritime activity** consists of waterborne transportation; ports, harbors, and support activities for water transportation; and ship building and repair.
  - **Waterborne transportation** businesses provide transportation of freight and passengers through deep seas, the Great Lakes, and inland waterways. It includes ship captains, towboat operators, port engineers, longshore workers, and deck officers. This category includes US-based cruise lines or pleasure craft cruises that transport passengers in the ocean and on the Great Lakes. It does not include marinas. The direct employment data for waterborne transportation is sourced from CBP. The entirety of waterborne transportation from CBP is included. For more detail see the endnotes.<sup>4</sup>
  - **Ports, harbors, and support activities for water transportation** provide services supporting water transportation that include port and harbor operations, marine cargo handling, and navigational services to shipping. It includes port operation managers, harbor masters, dockworkers, stevedores, material handlers, and marine repairs in both drydocks and on floating ships. This category also includes commercial fishing such as finfish (e.g., salmon, tuna), shellfish (e.g., crabs, lobsters, shrimp), and other marine animals. The direct employment data for ports, harbors, and support activities is sourced from CBP. CBP data do not include state and local government workers in the port and maritime industry. Port authorities could operate as state or local government entities and would not be included in the data. Accordingly, the analysis includes state and local water transportation workers from the BLS Occupational Employment and Wage Statistics (OEWS). The entirety of ports, harbors, and support activities for water transportation is included. For more details see the endnotes.<sup>5</sup>
  - **Ship and boat building and repairing** businesses provide services such as ship construction, repair, conversion, alteration, and scaling among other operations and includes the businesses that build boats or other watercrafts generally suited for personal use. It includes shipbuilders, marine engineers, naval architects, fiberglass technicians, and life raft manufacturers. The direct employment data for ship and boat building and repairing is sourced from CBP. The analysis includes marine architects and naval engineers relevant to ship and boat building from BLS OEWS data that are not already included in the Census definitions. The entirety of ship building and repairing is included. For boat building, only the portion relevant to ports and harbors is included. For more details see the endnotes.<sup>6</sup>

2. **Related transportation and warehousing** consist of trucking; rail; pipelines; freight logistics; and warehousing and storage related to the port and maritime industry.

- **Trucking** businesses provide trucking services moving cargo and freight from point of origin to destination. This includes marine terminals trucking, local freight trucking, and long-distance trucking, as well as support activities such as trucking terminals, pick-up, sorting, and local delivery. Jobs in this category include truck drivers, freight managers, and marine terminal truckers. Only the portion related to ports and harbors (i.e., related to goods shipped into or out of ports and harbors) is included. The trucking data are prorated using the DOT's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck for export/import in 2018-2022. The analysis calculates a five-year average ratio of water-related trucking value flows in each state to total trucking flows in each state. An adjustment is also made to account for domestic port-related flows. For more details and illustrative examples, see the endnotes.<sup>7</sup>
- **Rail** businesses provide transportation services of cargo within a rail network. This includes between-terminal, short-line, and line-haul railroads and support activities for rail transportation including servicing, repairing, and maintaining of rail cars. Jobs in this category include railroad engineers, railroad drivers, and conductors. Only the portion related to ports and harbors (i.e., related to goods shipped into or out of ports and harbors) is included. The rail data are prorated using the DOT's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by rail for export/import in 2018-2022. The analysis calculates a five-year average ratio of water-related rail value flows in each state to total rail flows in each state. An adjustment is also made to account for domestic port-related flows. For more details and illustrative examples, see the endnotes.<sup>8</sup>
- **Pipeline** businesses use pipelines to transport products such as crude oil, natural gas, gasoline, and other liquids and gases to either storage or distribution. Jobs in this category include pipeline construction workers, engineers, inspectors, and operators. Only the portion related to ports and harbors (i.e., related to goods shipped into or out of ports and harbors) is included. The pipeline data are prorated using the DOT's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by pipeline for export/import in 2018-2022. The analysis calculates a five-year average ratio of water-related pipeline value flows in each state to total pipeline flows in each state. An adjustment is also made to account for domestic port-related flows. For more details and illustrative examples, see the endnotes.<sup>9</sup>
- **Warehousing and storage** businesses provide warehousing and storage facilities for general merchandise, refrigerated or frozen goods, farm products, lumber, documents, and other goods. These businesses may offer logistic services related to storage and distribution of goods. These businesses do not sell the goods they store. Jobs in this category include warehouse managers, general warehouse workers, and receiving clerks. Only the portion related to ports and harbors (i.e., related to goods shipped into or out of ports and harbors) is included. The



warehousing data are prorated using the DOT's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck, rail, and water for export/import in 2018-2022. The analysis calculates a five-year average ratio of water-related truck, rail, and water value flows in each state to total truck, rail, and water flows in each state. An adjustment is also made to account for domestic port-related flows. For more details and illustrative examples, see the endnotes.<sup>10</sup>

- **Freight logistics** includes businesses that arrange for freight transportation between shippers and carriers as well as business that assist other companies with inventory management, distribution, storage, and other operational components as well as other aspects of a business operation. These include marine shipping agents, freight forwarders, and inventory consulting services. Only the portion related to ports and harbors (i.e., related to goods shipped into or out of ports and harbors) is included. The freight logistics data are prorated using the DOT's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck, rail, and water for export/import in 2018-2022. The analysis calculates a five-year average ratio of water-related truck, rail, and water value flows in each state to total truck, rail, and water flows in each state. An adjustment is also made to account for domestic port-related flows. For more details and illustrative examples, see the endnotes.<sup>11</sup>
3. **Public administration** includes the government agencies engaged in the regulation, administration, planning, licensing, inspection, and investigation of services and facilities under the port and maritime industry. This includes the US Coast Guard, US Customs and Border Protection Agency, and the USACE. Jobs include coast guardsmen, customs officers, port authority officers, and engineers. The total employee count for the US Coast Guard is from the Department of Defense's personnel data by service/agency by state and country for September 2023. Only the coast guardsmen deployed within the United States are included. For the US Customs and Border Protection, the analysis begins with the total number of employees in fiscal year 2023 from the Department of Homeland Security's Customs and Border Protection Budget Overview for Fiscal Year 2024. The relevant portion was created by dividing the employment into agricultural-related employment and all other employment as provided in the budget data and then further dividing it based on US Customs and Border Protection workload staffing models. USACE employment is from the organization's website. The portion relevant to the port and maritime industry was estimated using the Congressional Budget Office's spending projections by budget account. For more details, see the endnotes.<sup>12</sup>
  4. **Construction activity** includes capital expenditures relevant to US port and waterway infrastructure. In addition to the economic contribution of the port and maritime industry from its operations, ports also fund billions of dollars of new construction and routine capital expenditures on existing infrastructure each year. These expenditures support construction-related jobs. The analysis uses capital expenditure data from the American Association of Port Authorities 2020 Port Planned Infrastructure Investment Survey for 2021-2025. The analysis converts the five-year planned infrastructure investments into annual values and allocates the capital expenditures by USACE data on waterborne

tonnage by state. The analysis excludes any state that did not have a port and US territories. For more details, see the endnotes.<sup>13</sup>

#### Suppliers to the port and maritime industry

The port and maritime industry purchases goods and services from other businesses, which supports jobs, wages and benefits, and GDP at these supplier businesses. Moreover, demand for these goods and services leads to additional rounds of economic activity as suppliers to the port and maritime industry purchase operating inputs from their own suppliers. Goods and services imported from abroad are not included in this report's estimates of US economic activity.

#### Related consumer spending

Related consumer spending refers to the consumer spending supported by workers in the port and maritime industry and their suppliers. When these workers spend their earnings at US businesses (e.g., grocery stores, retailers, movie theaters), they support economic activity in those sectors. The earnings that these workers spend on food at a restaurant, for example, create jobs at the restaurant and at farms, transportation companies, and other industries that are involved in the restaurant's supply chain.

#### Economic activity directly facilitated by the movement of goods through ports

In addition to the port and maritime industry, its suppliers, and the related consumer spending, ports facilitate the movement of goods both domestically and internationally. Many businesses rely on port infrastructure to either send or receive goods both as intermediate inputs or final goods for sale to their customers. The goods moved through ports facilitate employment at these businesses. This report examines the employment directly facilitated by the movement of goods through ports. It does not examine this economic activity's potential spillover effects into the broader economy.

## II. Economic activity in the port and maritime industry

The economic activity described in this report includes the following measures:

- ▶ **Employment.** Employment is measured as the total headcount of workers. For example, a company with three full-time workers and a company with two full-time workers and one part-time worker would each be measured as having three workers.
- ▶ **Wages and benefits.** Wages and benefits includes employee cash compensation and benefits, as well as proprietor income.<sup>14</sup> Wages and benefits is a component of GDP.
- ▶ **GDP.** GDP measures an industry's contribution to the production of all final goods and services produced in the United States.

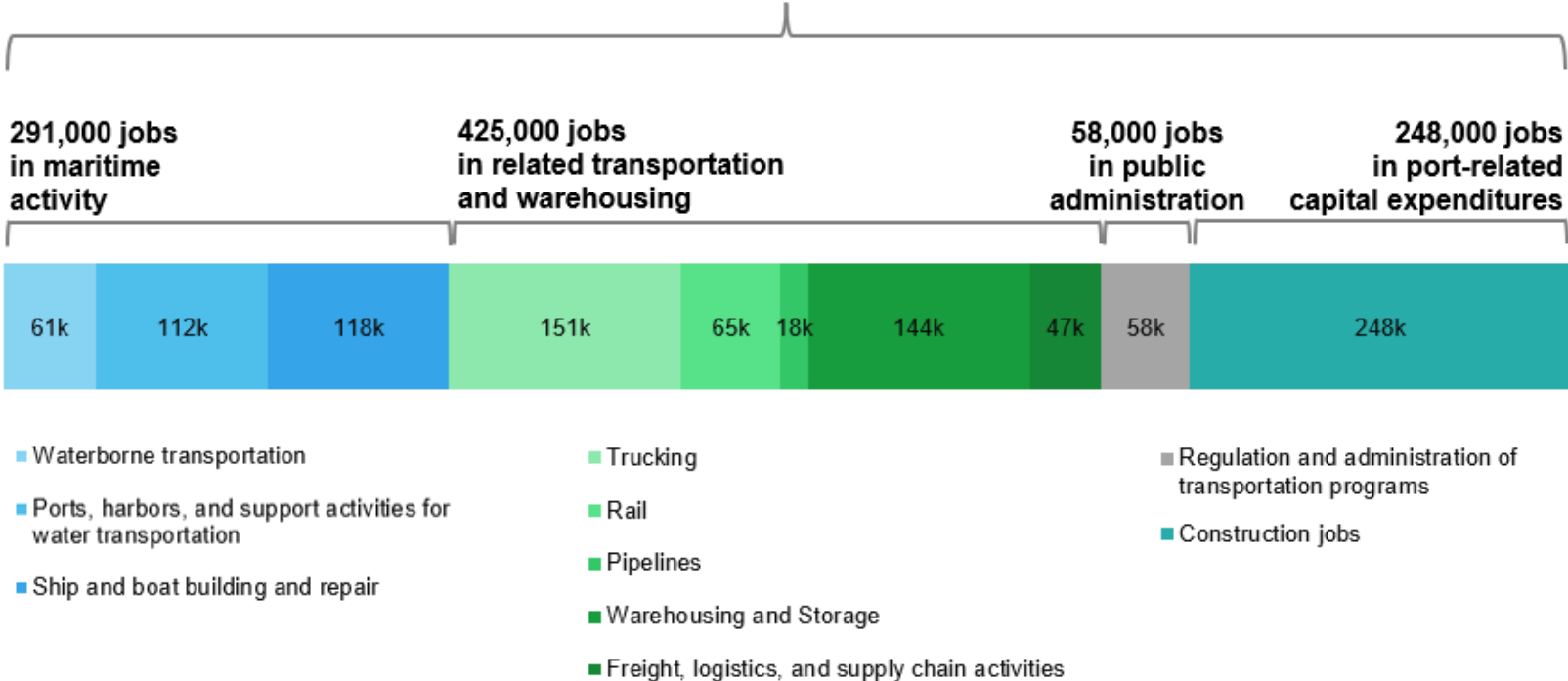
In 2023, the port and maritime industry employed more than one million workers earning \$100 billion in wages and benefits and generating \$124 billion of GDP. Accordingly, the average wages and benefits of workers at port and maritime industry businesses and entities in 2023 was roughly \$98,000 per worker, about 20% higher than the national average. The comparable average wages and benefits for workers throughout the US economy was approximately \$82,000 in 2023.<sup>15</sup> The average worker in the port and maritime industry generated approximately \$121,000 in GDP in 2023.<sup>16</sup>

As displayed in Figure 1, transportation and warehousing employed the most workers with over 425,000 workers (41%) of jobs in the port and maritime industry. The next largest segment in the port and maritime industry was maritime activity, and it employed 291,000 workers (28% of the total). These two segments represented roughly two thirds of employment in the port and maritime industry. The remaining segments are port-related capital expenditures (248,000 jobs, 24%) and public administration (58,000, 6%).

Figure 1. Jobs in the port and maritime industry, 2023



**1 million** Workers in the port and maritime industry in the United States



Note: Figures are rounded.  
Source: EY analysis.

### **III. Economic activity related to and facilitated by the port and maritime industry**

The magnitude of the economic activity related to the port and maritime industry is estimated with the Impacts for Planning (IMPLAN) multi-region input-output model of the United States.<sup>17</sup> Unlike other economic models, IMPLAN includes the interaction of more than 500 industries, thus identifying the interaction of specific industries that are related to the port and maritime industry.

#### IMPLAN model of the US economy

The multipliers in the IMPLAN model are based on the Leontief production function, which estimates the total economic requirements for every unit of direct output in each industry based on detailed inter-industry relationships documented in the input-output model. The input-output framework connects commodity supply from one industry to commodity demand by another. The multipliers estimated using this approach capture all the upstream economic activity (or backward linkages) related to an industry's production by attaching technical coefficients to expenditures. These output coefficients (dollars of demand) are then translated into dollars of GDP and wages and benefits and number of employees based on industry averages.

The multipliers presented in this report include the US port and maritime industry, suppliers to the US port and maritime industry, and related consumer spending. Economic activity at suppliers to the port and maritime industry is attributable to operating input purchases from US suppliers. Economic activity related to consumer spending is attributable to spending by workers in the port and maritime industry and at their suppliers based on household spending patterns. The port and maritime industry is estimated to have an employment multiplier of 2.5, a wages and benefits multiplier of 2.1, and a GDP multiplier of 2.5.

#### Suppliers to the port and maritime industry

As displayed in Figure 2, suppliers to the port and maritime industry were estimated to support 714,000 jobs throughout the US economy in 2023. The largest supplier segments to the port and maritime industry were estimated to be professional, management, and business services (203,000 jobs; 28% of total), transportation and warehousing (180,000 jobs; 25% of total), finance, insurance, and real estate (130,000 jobs; 18% of total), personal services (82,000 jobs; 11% of total), and manufacturing (45,000; 6% of total). These five supplier industries comprise roughly 90% of the total employment related to suppliers to port and maritime industry. The remaining related supplier employment includes retail trade (23,000; 3% of total), information (10,000 jobs; 1% of total), and all other industries (17,000; 2% of total).

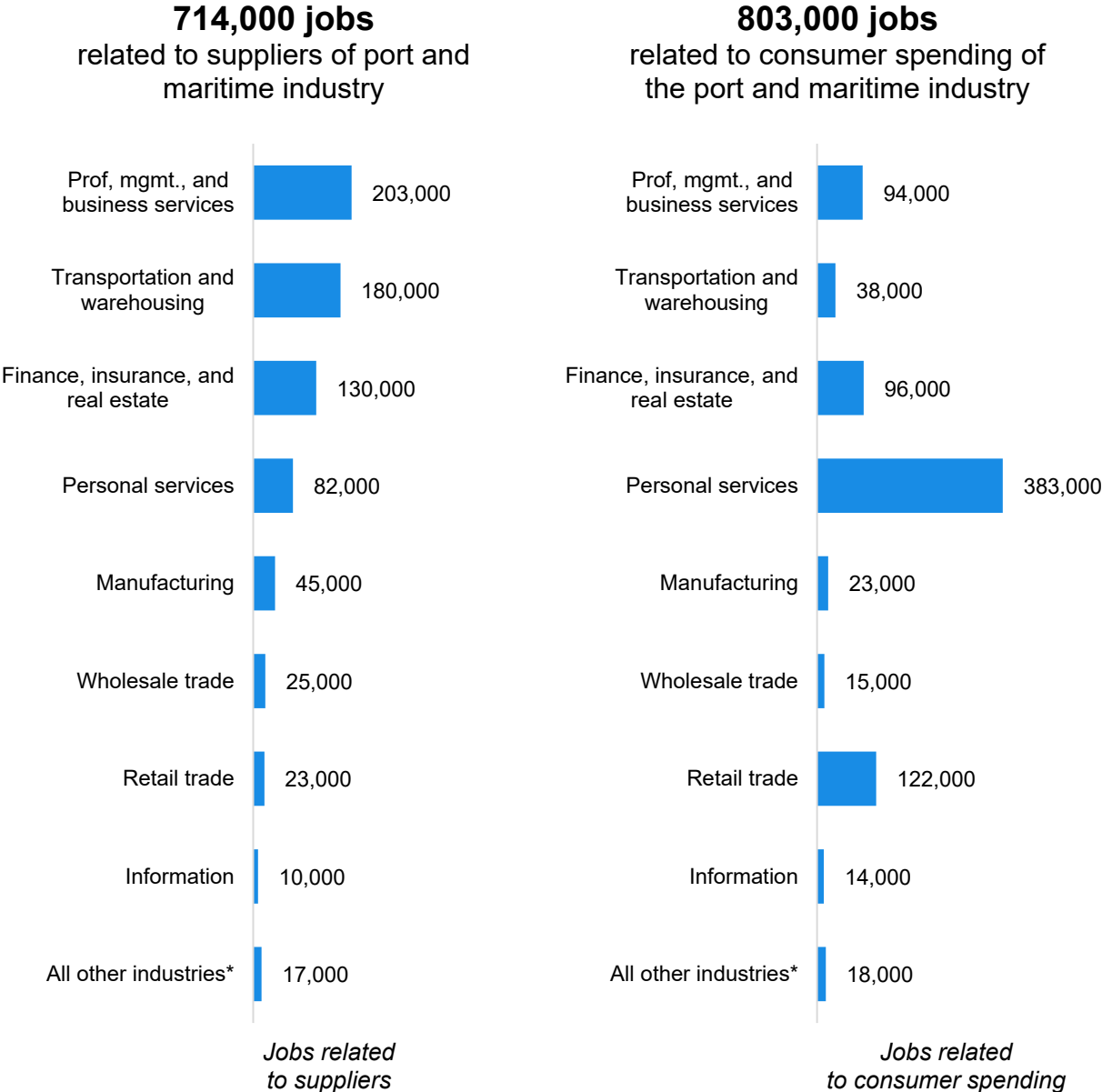
#### Related consumer spending

Consumer spending of workers in the port and maritime industry and at the industry's suppliers was estimated to support 803,000 jobs throughout the US economy in 2023. The largest segments were estimated to be personal services (383,000 jobs; 48% of total), retail trade (122,000 jobs; 15% of total), and finance, insurance, and real estate (96,000 jobs; 12% of total). These three industries comprise roughly 75% of this related economic activity.

The remaining employment related to the consumer spending of workers at the port and maritime

industry and those companies' suppliers includes professional, management, and business services (94,000 jobs; 12% of total), transportation and warehousing (38,000 jobs; 5% of total), manufacturing (23,000 jobs; 3% of total), wholesale trade (15,000 jobs; 2% of total), information (14,000 jobs; 2% of total), and all other industries (18,000 jobs; 2% of total).

**Figure 2. Jobs related to the port and maritime industry, 2023**



Note: \*All other industries include construction; mining, quarrying, and oil and gas extraction; utilities; and agriculture, forestry, fishing, and hunting. Industry definitions are based on the North American Industry Classification System (NAICS). Figures are rounded.  
Source: EY analysis.

### Economic activity directly facilitated by the movement of goods through ports

The total economic contribution, or economic footprint, of the port and maritime industry includes the industry's operations and capital expenditures, as well as the suppliers to the port and maritime industry and related consumer spending. In addition to this economic activity, many domestic and international businesses rely on this infrastructure to send or receive shipments of goods. For example, some manufacturers may depend on ports to export their goods or to receive intermediate inputs via import. Additionally, some manufacturers choose to locate their facilities at or near ports to capitalize on potential logistical and supply-chain advantages.<sup>18</sup>

In 2023, ports handled over \$1.4 trillion in imported goods, over \$860 billion in exports, and nearly \$330 billion in domestic freight.<sup>19</sup> The analysis classifies the goods imported, exported, and shipped domestically as either intermediate goods in a larger supply chain or goods for final consumption. Using the ratio of sales per worker by relevant industry, the analysis estimates the number of workers required to produce or sell the goods that travel through the ports.<sup>20</sup> For example, if ports imported and exported \$100 of a certain good and it required \$10 per worker to produce that good, this would directly facilitate 10 jobs.

This analysis estimates that the movement of goods through ports directly facilitated approximately 6.6 million US jobs in 2023. These jobs facilitated by ports are additive to the economic activity supported by the industry's operations and capital expenditures, as well as the industry's related supplier activity and consumer spending. Due to the high-level nature of the analysis of economic activity directly facilitated by the movement of goods through ports, only employment is estimated.

Note that this analysis only examines the employment directly facilitated by the movement of goods through ports. It does not examine this economic activity's potential spillover effects into the broader economy.

### Economic activity in, related to, and facilitated by the port and maritime industry

Table 1 displays the estimated economic activity in, related to, and facilitated by the port and maritime industry in the 2023 US economy. The port and maritime industry employed more than one million workers throughout the US economy who earned \$100 billion in wages and benefits and generated \$124 billion of GDP. Wages and benefits is a component of GDP. Suppliers to the port and maritime industry supported 714,000 workers throughout the US economy who earned \$59 billion in wages and benefits and generated \$89 billion of GDP. The consumer spending of workers in the port and maritime industry and their suppliers supported 803,000 workers throughout the US economy who earned \$55 billion in wages and benefits and generated \$98 billion in GDP.

**Table 1. Economic activity in, related to, and facilitated by the port and maritime industry, 2023**  
*Thousands of jobs; billions of dollars*

	<b>Port and maritime industry</b>	<b>Suppliers to the port and maritime industry</b>	<b>Related consumer spending</b>	<b>Employment directly facilitated by the movement of goods through ports</b>	<b>Total</b>
Employment	1,022	714	803	6,577	9,116
Wages and benefits	\$100	\$59	\$55	*	\$214
GDP	\$124	\$89	\$98	*	\$311

\*Due to the high-level nature of the analysis of economic activity directly facilitated by the movement of goods through ports, only employment is estimated.

Note: Wages and benefits include all labor income (i.e., employee cash compensation and benefits, as well as proprietors' income). Wages and benefits is a component of GDP. The employment directly facilitated by the movement of goods through ports is additive to the economic activity supported by the port and maritime industry's operations and capital expenditures, as well as the industry's related supplier activity and consumer spending. This analysis only examines the economic activity directly facilitated by the movement of goods through ports. It does not examine this economic activity's potential spillover effects into the broader economy. Figures are rounded.

Source: EY analysis.

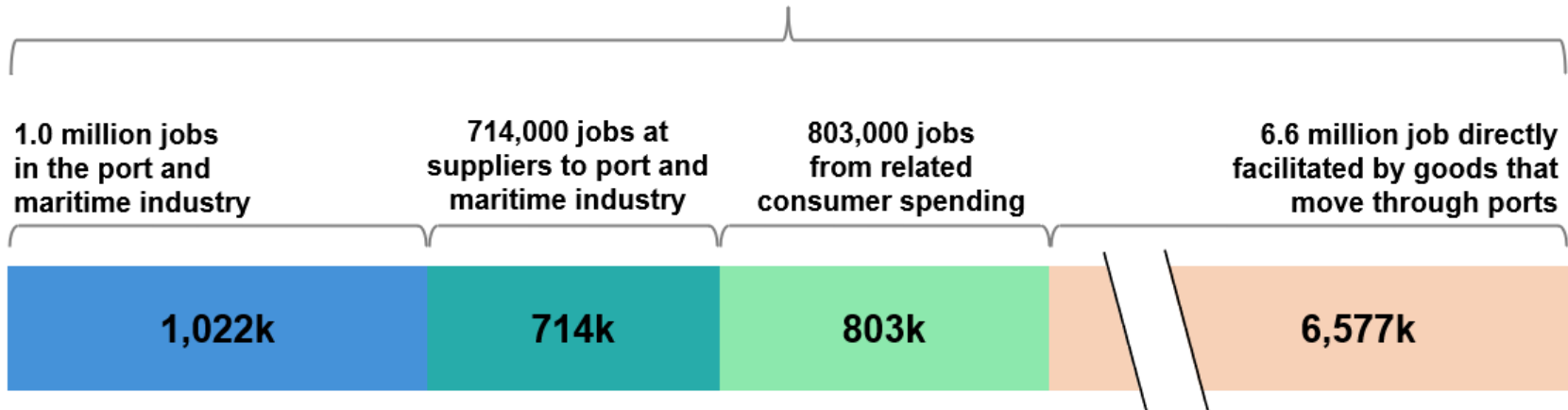


Figure 3. Jobs in, related to, and facilitated by the port and maritime industry, 2023



9.1 million

Workers in, related to, and facilitated by the port and maritime industry in the United States



Note: Figures are rounded.  
Source: EY analysis.

## IV. State distribution of economic activity

The distribution of jobs, wages and benefits, and GDP by state (plus the District of Columbia) in the port and maritime industry is displayed in Table 2 and Figure 4. The states estimated to have the most jobs in the port and maritime industry are: (1) California (160,000 jobs), (2) Texas (136,000 jobs), (3) Louisiana (83,000 jobs), (4) Florida (72,000 jobs), and (5) Virginia (67,000 jobs).

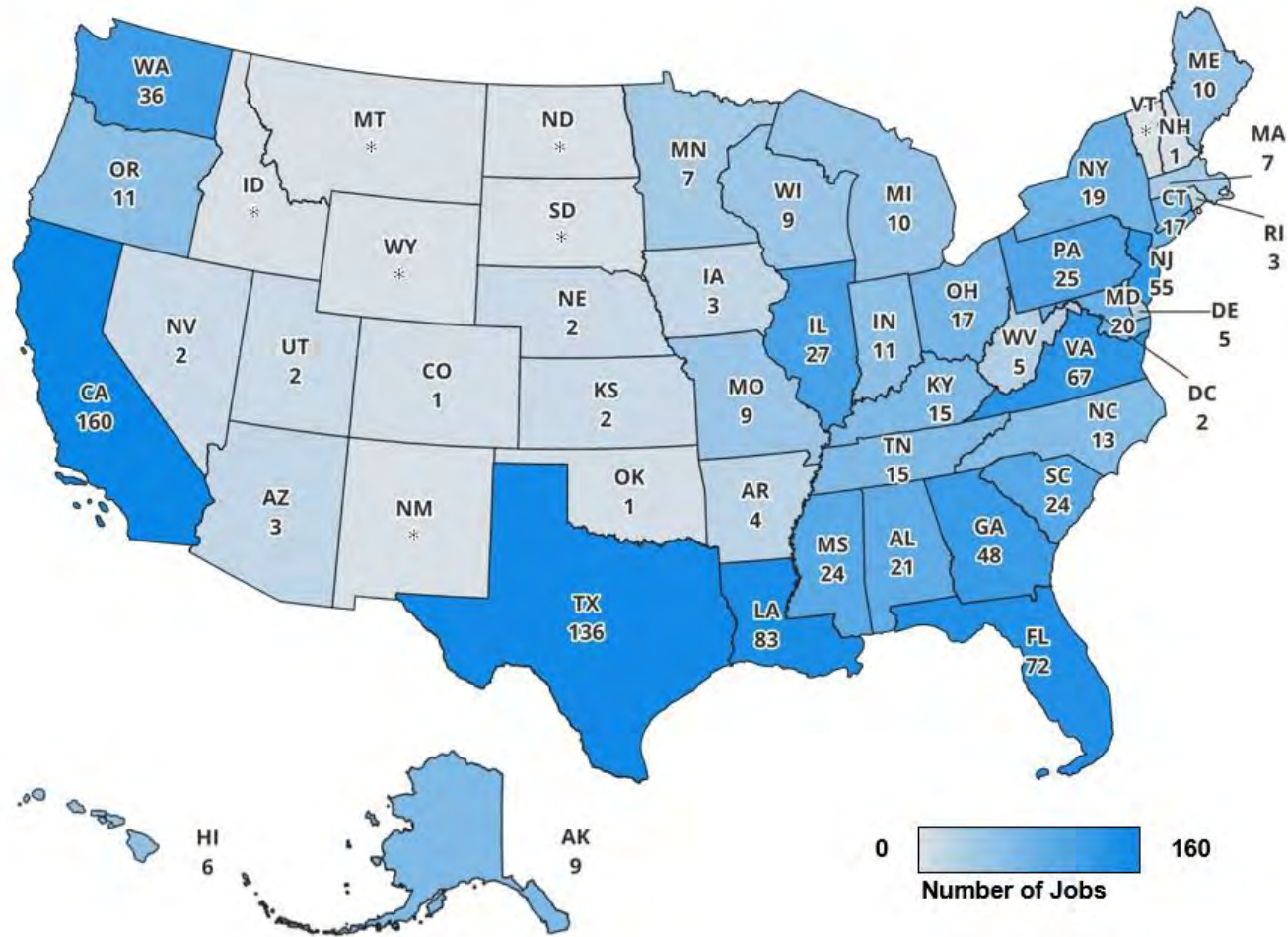
**Table 2. Economic activity in the port and maritime industry, 2023**  
*Thousands of jobs; millions of dollars*

	Jobs	Wages and benefits	GDP		Jobs	Wages and benefits	GDP
<b>United States</b>	<b>1,022</b>	<b>100,409</b>	<b>124,080</b>	Missouri	9	864	1,242
Alabama	21	1,693	2,204	Montana	*	23	50
Alaska	9	1,334	3,326	Nebraska	2	213	497
Arizona	3	238	300	Nevada	2	180	255
Arkansas	4	285	385	New Hampshire	1	75	110
California	160	16,322	18,751	New Jersey	55	6,227	6,651
Colorado	1	130	182	New Mexico	*	17	32
Connecticut	17	2,186	3,339	New York	19	1,996	2,408
Delaware	5	399	407	North Carolina	13	970	1,302
District of Columbia	2	664	665	North Dakota	*	9	15
Florida	72	6,552	8,851	Ohio	17	1,649	2,003
Georgia	48	3,660	4,394	Oklahoma	1	81	132
Hawaii	6	697	910	Oregon	11	1,054	1,273
Idaho	*	26	44	Pennsylvania	25	2,268	2,471
Illinois	27	2,528	3,017	Rhode Island	3	269	312
Indiana	11	964	1,123	South Carolina	24	1,851	2,145
Iowa	3	237	385	South Dakota	*	18	31
Kansas	2	248	452	Tennessee	15	1,296	1,623
Kentucky	15	1,270	1,631	Texas	136	14,963	16,621
Louisiana	83	7,049	7,552	Utah	2	149	179
Maine	10	872	1,108	Vermont	*	16	20
Maryland	20	1,616	1,829	Virginia	67	7,175	10,955
Massachusetts	7	1,155	1,410	Washington	36	3,918	5,197
Michigan	10	821	991	West Virginia	5	351	412
Minnesota	7	778	847	Wisconsin	9	868	1,129
Mississippi	24	2,160	2,843	Wyoming	*	25	69

Note: The table only includes economic activity in the port and maritime industry. Wages and benefits includes all labor income (i.e., employee compensation and proprietor income). Wages and benefits is a component of GDP. Figures are rounded. \*Denotes there are fewer than 500 jobs.

Source: EY analysis.

**Figure 4. Employment in the port and maritime industry by state, 2023**  
*(Jobs supported by the port and maritime industry)*  
*Thousands of jobs*



Note: The figure only includes employment in the port and maritime industry. Figures are rounded.  
 \*Denotes there are fewer than 500 jobs.  
 Source: EY analysis.

The distribution of jobs, wages and benefits, and GDP by state (plus the District of Columbia) in, and related to, the port and maritime industry is displayed in Table 3 and Figure 5. In addition to the economic activity in the port and maritime industry, this also includes the related economic activity of: (1) suppliers to the port and maritime industry, and (2) related consumer spending. The states estimated to have the most jobs in, and related to, the port and maritime industry are: (1) California (320,000 jobs), (2) Texas (318,000 jobs), (3) Florida (224,000 jobs), (4) Louisiana (206,000 jobs), and (5) New Jersey (145,000 jobs).

**Table 3. Total economic activity in, and related to, the port and maritime industry by state, 2023**  
*Thousands of jobs; millions of dollars*

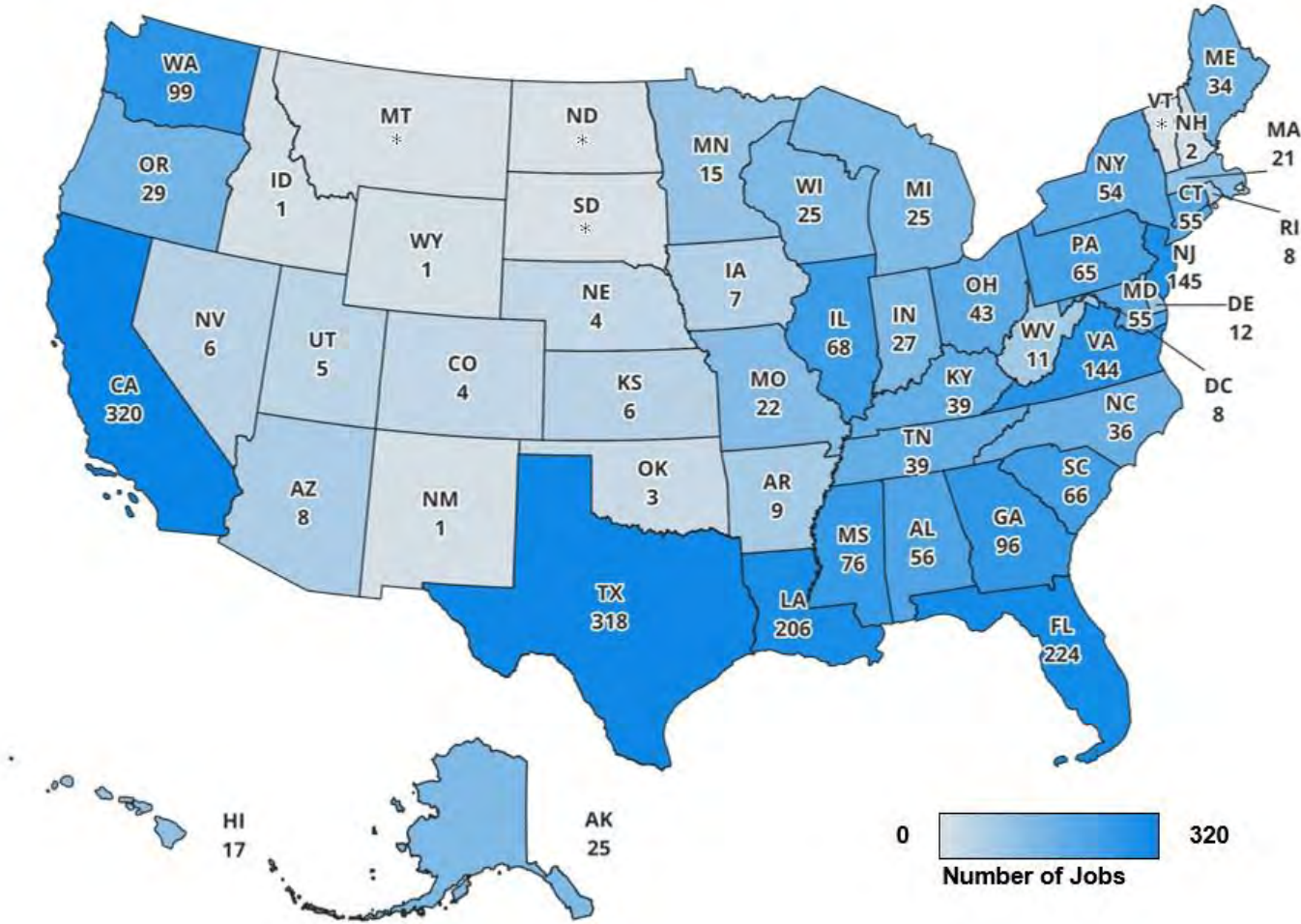
	Jobs	Wages and benefits	GDP		Jobs	Wages and benefits	GDP
United States	2,539	214,141	310,819	Missouri	22	1,960	3,315
Alabama	56	4,042	6,291	Montana	*	52	125
Alaska	25	3,095	8,768	Nebraska	4	483	1,244
Arizona	8	569	803	Nevada	6	414	650
Arkansas	9	652	1,034	New Hampshire	2	167	297
California	320	30,020	41,275	New Jersey	145	14,404	18,108
Colorado	4	301	465	New Mexico	1	40	80
Connecticut	55	5,534	10,064	New York	54	4,737	6,706
Delaware	12	902	1,089	North Carolina	36	2,289	3,574
District of Columbia	8	1,707	2,021	North Dakota	*	19	37
Florida	224	16,400	24,132	Ohio	43	3,709	5,303
Georgia	96	6,763	9,808	Oklahoma	3	188	339
Hawaii	17	1,631	2,587	Oregon	29	2,441	3,471
Idaho	1	59	111	Pennsylvania	65	5,196	6,537
Illinois	68	5,741	7,911	Rhode Island	8	630	879
Indiana	27	2,164	2,984	South Carolina	66	4,394	5,859
Iowa	7	530	984	South Dakota	*	42	77
Kansas	6	571	1,150	Tennessee	39	2,973	4,354
Kentucky	39	2,964	4,660	Texas	318	27,528	37,448
Louisiana	206	16,301	21,379	Utah	5	344	459
Maine	34	2,201	3,307	Vermont	*	42	59
Maryland	55	3,744	4,939	Virginia	144	12,617	20,177
Massachusetts	21	2,795	4,047	Washington	99	9,018	14,284
Michigan	25	1,855	2,718	West Virginia	11	753	1,112
Minnesota	15	1,672	2,110	Wisconsin	25	1,988	3,026
Mississippi	76	5,442	8,477	Wyoming	1	59	187

Note: Table includes economic activity in the port and maritime industry as well as that of related supplier and consumer spending. Wages and benefits includes all labor income (i.e., employee compensation and proprietor income). Wages and benefits is a component of GDP. Due to high-level nature of the analysis, state-level economic activity directly facilitated by the movement of goods through ports was not estimated. Figures are rounded. \*Denotes there are fewer than 500 jobs.

Source: EY analysis.

Due to the high-level nature of the analysis of economic activity directly facilitated by the movement of goods through ports, only national employment is estimated.

**Figure 5. Total economic activity in, and related to, the port and maritime industry by state, 2023**  
*(Jobs supported by the port and maritime industry, its suppliers, and related consumer spending)*  
*Thousands of jobs*



Note: Figure includes employment in the port and maritime industry as well as the related supplier and consumer spending employment. Due to high-level nature of the analysis, state-level economic activity directly facilitated by the movement of goods through ports was not estimated. Figures are rounded.  
 \*Denotes there are fewer than 500 jobs.  
 Source: EY analysis.

## V. Caveats and limitations

Any modeling effort is only an approximate depiction of the economic forces it seeks to represent, and the economic modeling developed for this analysis is no exception. The estimates of the economic contribution of the port and maritime industry and the employment directly facilitated by the movement of goods through ports presented in this report are based on an input-output model of the US economy and/or the data and assumptions described elsewhere in the report. Although various limitations and caveats might be listed, several are particularly noteworthy:

- ▶ **Estimates based on a specific definition of the port and maritime industry.** There is not a standard definition of the port and maritime industry in the United States. Studies of specific ports or regional ports define the port and maritime industry differently. A different definition of the port and maritime industry could lead to lower or higher estimates depending on which economic activity is included, how linked transportation networks are, and whether shippers or industries that heavily rely on ports are included.<sup>21</sup>
- ▶ **The estimates are for a snapshot of the economic contribution in 2023.** The input-output modeling approach used in this analysis shows the 2023 economic contribution of the port and maritime industry based on its relationships with other industries and households in the US economy. The analysis is at a single point in time (i.e., 2023). The results do not reflect or attempt to estimate an expansion, contraction, or any other changes, or related impacts, of the industry or companies therein.
- ▶ **Estimates do not reflect the economic impact of the port and maritime industry.** This analysis does not attempt to estimate or indicate the effect or impact of the port and maritime industry on the US economy. Rather, the analysis presents estimates of the economic contribution or economic footprint of the port and maritime industry.

By providing information on the overall scope of the sector, measured, and defined in several different ways, this report attempts to shed light on the reach of the port and maritime industry within the US economy. In contrast, an economic impact analysis might instead analyze the impact on the US economy of a change to or in an industry or sector, perhaps due to a policy change, natural disaster, or some other exogenous factor. An economic impact analysis might also attempt to account for the economic dynamics that occur in response to such a change and show the impact net of shifts of economic activity across different parts of the economy (e.g., industries, sectors) as impacts ripple through the economy.<sup>22</sup>

As compared to economic impact analyses, in input-output modeling there is generally no consideration of what the economic activity being examined would otherwise be engaged in (e.g., workers in the examined activity may have otherwise been employed in another economic activity). Nor is there generally any consideration of whether the economic activity being examined is an efficient use of resources. There is also no fixed relationship between the results of an economic contribution analysis and an economic impact analysis; the relationship can change, for example, depending on the current unemployment and labor force participation rates. As such, an economic contribution analysis should not be confused with an economic impact analysis.

- ▶ **Estimates are limited by available public information.** The analysis relies on information reported by federal government agencies (primarily the US Census Bureau, US Bureau of Labor Statistics, Department of Transportation, USACE, the US Department of Homeland Security, and the US Department of Defense), and other publicly available sources (i.e., IMPLAN model). The analysis did not attempt to verify or validate this information using sources other than those described in the report.
- ▶ **Estimates rely on data available at the time.** The analysis relies on data that could change as new information becomes available. For example, the analysis relies on the Bureau of Transportation Statistics' Freight Analysis Framework Version 5.5.1. The Freight Analysis Framework is based on Census Commodity Flow Survey data from 2017 released in 2020 and it is regularly updated as new data becomes available. Additionally, the analysis also relies on planned infrastructure investment data from the American Association of Port Authorities released in 2020. The economy experienced significant changes since 2020. It is likely that port infrastructure investment needs and plans changed with shifting economic conditions.
- ▶ **Modeling the economic contribution of the port and maritime industry relies on government industry classifications.** This report relates the activities of the port and maritime industry to the operating profiles of various industries as defined by the North American Industry Classification System (NAICS) to estimate the economic contribution of the port and maritime industry most effectively. Workers in the port and maritime industry are assumed to receive the average wages and benefits of workers in their respective industries and to require the level of operating input purchases characteristic of the industries into which they have been categorized. This analysis relies on estimates of the domestically purchased inputs from the IMPLAN economic model, which are estimated using aggregate trade flow data and may vary by industry.
- ▶ **Modeling the average wage in the port and maritime industry relies on industry averages.** This report relates the activities of the port and maritime industry to the operating profiles of various industries as defined by the NAICS industry classification system to estimate the average wage most effectively in the port and maritime industry. Workers in the port and maritime industry are assumed to receive the average wages and benefits of workers in their respective industries and to require the level of operating input purchases characteristic of the industries into which they have been categorized.
- ▶ **Without adjustments input-output analyses can produce overestimates.** In input-output modeling, suppliers of the port and maritime industry or suppliers of suppliers could be in the port and maritime industry. Additionally, consumer re-spending of income supported by the port and maritime industry could then support economic activity in the port and maritime industry. In these cases, jobs in the port and maritime industry would be counted more than once between results for: (1) the port and maritime industry, (2) suppliers of the port and maritime industry, and (3) related consumer spending of the port and maritime industry.

This analysis includes an adjustment to remove this double counting. Specifically, this analysis reduces the economic activity included in the supplier and consumer spending related estimates, by industry, proportional to the direct employment share in each industry.

This reduces the total amount of economic activity (i.e., jobs, wages and benefits, and GDP) supported via suppliers of the port and maritime industry and the related consumer spending of the port and maritime industry.



## **Appendix. Benchmarking**

There is not a standard definition of the port and maritime industry in the United States. Studies of specific ports or regional ports define the port and maritime industry differently. This analysis benchmarked itself against the direct jobs estimates from recent economic contribution studies of other ports or regions for comparison. As displayed in the tables below, this analysis also estimated the percentage of US tonnage going through each port or region using reported tonnage in the studies and with US Army Corps of Engineers data.

Note that national estimates created from port or regional data (e.g., scaling up direct jobs by the estimated % of US tonnage) could lead to overestimates if there are economies of scale or underestimates if port operations and supply chains vary significantly across ports or regions. The analysis did not attempt to verify or validate the direct jobs in other reports or reported tonnages using sources other than those described. The analysis did not compare indirect or induced jobs from the benchmarked studies. Also note that studies vary in the transparency of what types of economic activity are included in the port and maritime industry and the tables below are based on publicly available information.

Study	Methodology	Maritime services	Trucking <sup>1</sup>	Rail <sup>1</sup>	Pipeline <sup>1</sup>	Warehouses <sup>1</sup>	Cruises	Port users <sup>2</sup>	Port authorities	Regulators	Direct jobs	Estimated % of US tonnage <sup>3</sup>
<i>AAPA – EY (2023)</i>	<i>Direct jobs estimated from Census, Bureau of Labor Statistics, and other sources from a state level and included in the IMPLAN model.</i>	✓	✓	✓	✓	✓	✓		✓	✓	1,022,000	100%
<i><u>Great Lakes – St. Lawrence Seaway</u> (2022)</i>	Direct interviews to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓		✓	✓	✓	50,335	8.2%
<i><u>West Coast Ports</u> (2021)</i>	Direct interviews to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓		✓	✓	✓	98,790	17.2%
<i><u>Ports of Indiana</u> (2022)</i>	Direct interviews to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓		✓	✓	✓	10,586	0.6%
<i><u>Houston Ship Channel</u> (2022)</i>	Direct interviews to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓		✓	✓	✓	78,308	11.4%
<i><u>Port of Virginia</u> (2022)</i>	Data modeled using IMPLAN.	✓	✓	✓		✓			✓		25,478	1.2%

<sup>1</sup> For trucking, rail, pipeline, and warehousing, the studies include prorated shares or the total jobs for these categories serving the ports analyzed (i.e., not the entirety of these industries are included).

<sup>2</sup> The definition of port users differs significantly across studies.

<sup>3</sup> The estimated percentage of US tonnage moved is created from data in the reports or on the sponsoring organization's website. It is compared to the total US waterborne tonnage moved from the US Army Corps of Engineers for the year the estimate covers.

Note: Parentheticals indicate the data year and not the year of publication. The analysis did not attempt to verify or validate the direct jobs in other reports or reported tonnages using sources other than those described in the report. Figures are rounded.

Source: Economic contribution studies, US Army Corps of Engineers, and EY analysis.

Study	Methodology	Maritime services	Trucking <sup>1</sup>	Rail <sup>1</sup>	Pipeline <sup>1</sup>	Warehouses <sup>1</sup>	Cruises	Port users <sup>2</sup>	Port authorities	Regulators	Direct jobs	Estimated % of US tonnage <sup>3</sup>
<u><i>Georgia's Deepwater Ports (2021)</i></u>	Georgia Ports Authority data used in DOT's MARAD Port Economic Impact Kit and port users were surveyed. Outputs used in IMPLAN.	✓	✓	✓		✓		✓	✓		51,280	1.9%
<u><i>Ports of Texas (2018)</i></u>	Direct interviews with ports and data from previous studies to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓		✓	✓	✓	128,848	27.9%
<u><i>Port of Jacksonville (2018)</i></u>	Direct interviews with ports and previous study data to develop baseline direct jobs and included in RIMS II model.	✓	✓	✓		✓			✓	✓	10,876	0.8%
<u><i>Port of Long Beach (2017)</i></u>	For the port industry, the analysis uses data from US Army Corps of Engineers, stakeholder surveys, and reported income and employment data as inputs to the IMPLAN model.	✓	✓	✓			✓	✓	✓		1,327,520 <sup>4</sup>	4.0%

<sup>1</sup> For trucking, rail, pipeline, and warehousing, the studies include prorated shares or the total jobs for these categories serving the ports analyzed (i.e., not the entirety of these industries are included).

<sup>2</sup> The definition of port users differs significantly across studies.

<sup>3</sup> The estimated percentage of US tonnage moved is created from data in the reports or on the sponsoring organization's website. It is compared to the total US waterborne tonnage moved from the US Army Corps of Engineers for the year the estimate covers.

Note: Parentheticals indicate the data year and not the year of publication. The analysis did not attempt to verify or validate the direct jobs in other reports or reported tonnages using sources other than those described in the report. Figures are rounded.

Source: Economic contribution studies, US Army Corps of Engineers, and EY analysis.

## Endnotes

---

<sup>1</sup> US Department of Commerce, Census Bureau, USA Trade Online data, accessed March 2024.

<sup>2</sup> US Department of Transportation, Bureau of Transportation Statistics, Freight Analysis Framework (Version 5.5.1).

<sup>3</sup> Definitions throughout this report generally follow the US Census Bureau's County Business Patterns (CBP) unless otherwise noted. CBP data from 2021 (most recent available) are used and projected to 2023.

<sup>4</sup> Waterborne transportation is comprised of six North American Industry Classification System (NAICS) codes: (1) NAICS 483111 deep sea freight transportation; (2) NAICS 483112 deep sea passenger transportation; (3) NAICS 483113 coastal and Great Lakes freight transportation; (4) NAICS 483114 coastal and Great Lakes passenger transportation; (5) NAICS 483211 inland water freight transportation; and (6) NAICS 483212 inland water passenger transportation. Deep sea freight transportation and deep-sea passenger transportation include deep sea transportation of cargo or passengers to or from foreign ports. Coastal and Great Lakes freight transportation and coastal and Great Lakes passenger transportation include water transportation of cargo or passenger using coastal waters, the Great Lake System (which includes establishments using facilities of the St. Lawrence Seaway Authority Commission), deep seas between ports of the United States, Puerto Rico, and United States island possessions or protectorates. Inland water freight transportation and inland water passenger transportation include inland water transportation of cargo or passenger on rivers, lakes, or intracoastal waterways.

<sup>5</sup> Ports, harbors, and support activities for water transportation is composed of seven NAICS codes: (1) NAICS 114111 finfish fishing; (2) NAICS 114112 shellfish fishing; (3) NAICS 114119 other marine fishing; (4) NAICS 488310 port and harbor operations; (5) NAICS 488320 marine cargo handling; (6) NAICS 488330 navigational services to shipping; and (7) NAICS 488390 other support activities for water transportation. Finfish fishing includes establishments primarily engaged in commercial catching of finfish such as salmon, trout, and tuna from their natural habitat. It does not include fish hatcheries. Shellfish fishing includes establishments primarily engaged in the commercial catching of shellfish such as crabs, lobsters, and shrimp from their natural habitat. Other marine fishing includes establishments primarily engaged in the commercial catching of marine animals, except finfish and shellfish, from their natural habitat. Port and harbor operations include establishments primarily engaged in the operation of ports, harbors, and canals. Marine cargo handling includes establishments providing stevedoring and other marine cargo handling services. Navigational services to shipping include establishments providing navigational services to shipping. Other support activities for water transportation is composed of establishments providing other support services such as floating drydocks, ship scaling services, and marine cargo checkers and surveyors. The CBP data do not include state and local government workers in the port and maritime industry. Port authorities could operate as state or local government entities and would not be included in the data. Accordingly, the analysis includes state and local water transportation workers from the US Bureau of Labor Statistics Occupational Employment and Wage Statistics (OEWS). The analysis includes marine architects and naval engineers relevant to port and harbor operations from Bureau of Labor Statistics OEWS data that are not already included in the CBP data. The OEWS data from 2022 are used and projected to 2023.

<sup>6</sup> The ship and boat building and repairing sector is composed of two NAICS codes: (1) NAICS 336611 ship building and repairing and (2) NAICS 336612 boat building. Ship building and repairing includes establishments engaged in the operation of shipyards (facilities with drydocks and fabrication equipment that could build a ship). Boat building includes establishments engaged in boat building, the building of watercrafts typically suitable and intended for personal use. Boat building is prorated to include only the employment in counties that have an operational port in them. The analysis includes marine architects and naval engineers relevant to ship and boat building from Bureau of Labor Statistics OEWS data that are not already included in the NAICS codes above. The OEWS data from 2022 are used and projected to 2023.

<sup>7</sup> Trucking is composed of seven NAICS codes: (1) NAICS 484110 general freight trucking, local; (2) NAICS 484121 general freight trucking, long-distance, truckload; (3) NAICS 484122 general freight trucking, long-distance, less than truckload; (4) NAICS 484210 used household and office goods moving; (5) NAICS 484220 specialized freight (except used goods) trucking, local; (6) NAICS 484230 specialized freight (except used goods) trucking, long-distance; and (7) NAICS 488490 other support activities for road transportation. Local general freight trucking includes businesses that provide palletized or containerized freight transportation within a metropolitan area. Long-distance truckload general freight trucking includes businesses providing long-distance freight full-truckload freight trucking that is not combined with other shipments. Long-distance less than truckload general freight trucking includes businesses providing long distance freight trucking where the carriage contains multiple shipments combined into a single truck and generally delivered to multiple recipients within a network. Used household and office goods moving includes companies providing local or long-distance trucking of used furniture and equipment. Local specialized freight (except used goods) trucking includes businesses providing trucking services within a metropolitan area with cargo that requires specialized equipment such as flatbeds, tankers, or refrigerated trailers. Long-distance specialized freight (except used goods) trucking includes businesses providing long-distance trucking services between metropolitan areas with cargo that requires specialized equipment such as flatbeds, tankers, or refrigerated trailers. Other support activities for road

---

transportation are composed of businesses that provide services to road network users that includes wide load warning services, automobile deliveries, and truck or weighing stations.

The trucking data are prorated using the Department of Transportation's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck for export/import in 2018-2022. An adjustment is also made to account for domestic port-related flows. The analysis calculates a five-year average ratio of water-related trucking value flows in each state to total trucking flows in each state. This is described in more detail below.

Goods transported to/from a port via truck are considered water-related trucking flows for the origination/destination state and the port location state. For example, if \$100 of goods are transported from a port in New Jersey to Maryland, it is considered \$100 of trucking flows in New Jersey (port state) and \$100 of trucking flows in Maryland (destination state). The analysis only counts activity to or from a port to the same state once (i.e., if the port and origin/destination state are the same, it is only counted once).

The analysis calculates the total trucking flows to and from each state. For example, if \$100 of goods travel by truck from New Jersey to Maryland, it is considered \$100 of trucking flows in New Jersey (origin state) and \$100 of trucking flows in Maryland (destination state). The analysis only counts activity to or from the same state once (i.e., origin and destination state are the same, it is only counted once).

For both estimates, the analysis does not attribute any flows to intermediary states between the origin and destination state. That is, the analysis assumes that economic activity occurs at the destination and origin of the flows.

The analysis uses this state-level import and export flows to and from ports to estimate the water-related trucking shares. The analysis accounts for domestic flows in and out of ports by adjusting the prorated shares by the ratio of total water flows to import and export water flows. The analysis applies each state's prorated share of water-related trucking to each trucking NAICS code.

<sup>8</sup> Rail includes three NAICS codes (1) NAICS 482111 line-haul railroads; (2) NAICS 482112 short line railroads; and (3) NAICS 488210 support activities for rail transportation. Line-haul railroads include businesses operating railroads that transport passengers or cargo over a long distance within a rail network. Short line railroads includes businesses operating railroads that transport passengers or cargo over a short distance on local rail lines. Support activities for rail transportation is composed of businesses providing specialized services to railroad transportation, including servicing, repairing, and maintaining of rail cars, loading and unloading rail cars, and operating independent terminals. The US Census Bureau CBP data do not include employment data for line-haul and short line railroads. The analysis uses American Association of Railroads data on freight rail employment by state. The data is from 2021 and is grown to 2023 levels using Surface Transportation Board change in Class I railroad employment data. The analysis splits the larger rail transportation employment data into the two NAICS codes using Federal Railway Administration estimates on the revenue split between Class-1 railroads and all other railroads in 2017.

The rail data are prorated using the Department of Transportation's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by rail for export/import in 2018-2022. An adjustment is also made to account for domestic port-related flows. The analysis calculates a five-year average ratio of water-related rail value flows in each state to total rail flows in each state. This is described in more detail below.

Goods transported to/from a port via rail are considered water-related rail flows for the origination/destination state and the port location state. For example, if \$100 of goods travel by rail from a port in California to Arizona, it is considered \$100 of rail flows in California (port state) and \$100 of rail flows in Arizona (destination state). The analysis only counts activity to or from a port to the same state once (i.e., if the port and origin/destination state are the same, it is only counted once).

The analysis calculates the total rail flows to and from each state. For example, if \$100 of goods travel by rail from California to Arizona, it is considered \$100 of rail flows in California (origin state) and \$100 of rail flows in Arizona (destination state). The analysis only counts activity to or from the same state once (i.e., origin and destination state are the same, it is only counted once).

For both estimates, the analysis does not attribute any flows to intermediary states between the origin and destination state. That is, the analysis assumes that economic activity occurs at the destination and origin of the flows.

The analysis uses this state-level import and export flows to and from ports to estimate the water-related rail shares. The analysis accounts for domestic flows in and out of ports by adjusting the prorated shares by the ratio of total water flows to import and export water flows. The analysis applies each state's prorated share of water-related railroads to each railroad NAICS code.

<sup>9</sup> Pipelines includes five NAICS codes: (1) NAICS 237120 oil and gas pipeline and related structures construction; (2) NAICS 486110 pipeline transportation of crude oil; (3) NAICS 486210 pipeline transportation of natural gas; (4) NAICS 486910 pipeline transportation of refined petroleum products; and (5) NAICS 486990 all other pipeline transportation. Oil and gas pipeline and related structures construction includes businesses that generally construct or repair oil and gas lines, mains, refineries, and storage tanks. Pipeline transportation of crude oil includes businesses that move crude oil through pipelines. Pipeline transportation of natural gas includes businesses that move natural gas through pipelines. Pipeline transportation of refined petroleum products include businesses that move refined petroleum products, such

---

as gasoline, diesel, aviation fuel, etc., through pipelines. All other pipeline transportation includes businesses that move any other products that are not crude oil, natural gas, and refined petroleum products through pipelines.

The pipeline data are prorated using the Department of Transportation's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by pipeline for export/import in 2018-2022. An adjustment is also made to account for domestic port-related flows. The analysis calculates a five-year average ratio of water-related pipeline value flows in each state to total pipeline flows in each state. This is described in more detail below.

Goods transported to/from a port via pipeline are considered water-related pipeline flows for the origination/destination state and the port location state. For example, if \$100 of goods are transported from a port in Alabama to Mississippi, it is considered \$100 of pipeline flows in Alabama (port state) and \$100 of pipeline flows in Mississippi (destination state). The analysis only counts activity to or from a port to the same state once (i.e., if the port and origin/destination state are the same, it is only counted once).

The analysis calculates the total pipeline flows to and from each state. For example, if \$100 of goods travel by pipeline from Alabama to Mississippi, it is considered \$100 of pipeline flows in Alabama (origin state) and \$100 of pipeline flows in Mississippi (destination state). The analysis only counts activity to or from the same state once (i.e., origin and destination state are the same, it is only counted once).

For both estimates, the analysis does not attribute any flows to intermediary states between the origin and destination state. That is, the analysis assumes that economic activity occurs either at the destination and origin of the flows.

The analysis uses this state-level import and export flows to and from ports to estimate the water-related pipeline shares. The analysis accounts for domestic flows in and out of ports by adjusting the prorated shares by the ratio of total water flows to import and export water flows. The analysis applies each state's prorated share of water-related pipeline to each pipeline NAICS code.

<sup>10</sup> Warehousing and storage includes four NAICS codes: (1) NAICS 493110 general warehousing and storage; (2) NAICS 493120 refrigerated warehousing and storage; (3) NAICS 493130 farm product warehousing and storage; and (4) NAICS 493190 other warehousing and storage. General warehousing and storage includes businesses that generally handle goods in containers and are not specialized in handling bulk products. Refrigerated warehousing and storage includes businesses that store items either in lower or frozen temperatures and generally offer blast freezing, tempering, and other modified atmospheric storage services. Farm product warehousing includes businesses that store bulk farm products such as grain elevators. Other warehousing and storage includes businesses that store other items such as bulk petroleum, lumber, documents, and whiskey but are not storing general merchandise, refrigerated, or farm products.

The warehousing data are prorated using the US Department of Transportation's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck, rail, and water for export/import in 2018-2022. An adjustment is also made to account for domestic port-related flows. The analysis calculates a five-year average ratio of water-related truck, rail, and water value flows in each state to total truck, rail, and water flows in each state. This is described in more detail below.

Goods transported to/from a port via these three modes are considered water-related flows for the origination/destination state and the port location state. For example, if \$100 of goods are transported from a port in Washington to Idaho, it is considered \$100 of flows in Washington (port state) and \$100 of flows in Idaho (destination state). The analysis only counts activity to or from a port to the same state once (i.e., if the port and origin/destination state are the same, it is only counted once).

The analysis calculates the total flows to and from each state. For example, if \$100 of goods travel by these three modes from Washington to Idaho, it is considered \$100 of flows in Washington (origin state) and \$100 of flows in Idaho (destination state). The analysis only counts activity to or from the same state once (i.e., origin and destination state are the same, it is only counted once).

For both estimates, the analysis does not attribute any flows to intermediary states between the origin and destination state. That is, the analysis assumes that economic activity occurs at the destination and origin of the flows.

The analysis uses this state-level import and export flows to and from ports to estimate the share of warehousing and storage that is water-related. The analysis accounts for domestic flows in and out of ports by adjusting the prorated shares by the ratio of total flows to import and export for water flows. The analysis applies each state's prorated share of water-related flows to each warehouse NAICS code.

<sup>11</sup> Freight logistics includes two NAICS codes: (1) NAICS 488510 freight transportation arrangement and (2) NAICS 541614 process, physical distribution, and logistics consulting services. Freight transportation arrangement includes businesses such as marine shipping agents and freight forwarders that coordinate transportation between shippers and receivers. Process, physical distribution, and logistics consulting services businesses generally provide operational advice and assistance to companies and other organizations.

The freight logistics data are prorated using US Department of Transportation's Freight Analysis Framework state-level data on the value of goods shipped to/from ports by truck, rail, and water for export/import in 2018-2022. An adjustment is also made to account for domestic port-related flows. The analysis calculates a five-year average ratio

---

of water-related truck, rail, and water value flows in each state to total truck, rail, and water flows in each state. This is described in more detail below.

Goods transported to/from a port via these three modes are considered water-related flows for the origination/destination state and the port location state. For example, if \$100 of goods are transported from a port in Virginia to North Carolina, it is considered \$100 of flows in Virginia (port state) and \$100 of flows in North Carolina (destination state). The analysis only counts activity to or from a port to the same state once (i.e., if the port and origin/destination state are the same, it is only counted once).

The analysis calculates the total flows to and from each state. For example, if \$100 of goods travel by these three modes from Virginia to North Carolina, it is considered \$100 of flows in Virginia (origin state) and \$100 of flows in North Carolina (destination state). The analysis only counts activity to or from the same state once (i.e., origin and destination state are the same, it is only counted once).

For both estimates, the analysis does not attribute any flows to intermediary states between the origin and destination state. That is, the analysis assumes that economic activity occurs at the destination and origin of the flows.

The analysis uses this state-level import and export flows to and from ports to estimate the share of warehousing and storage that is water-related. The analysis accounts for domestic flows in and out of ports by adjusting the prorated shares by the ratio of total flows to import and export water flows. The analysis applies each state's prorated share of water-related flows to each freight, logistics, and supply chain NAICS code.

<sup>12</sup> Public administration includes the coast guardsman and civilian employees within the US Coast Guard. The total employee count is from the Department of Defense's personnel data by service/agency by state and country for September 2023. The analysis removed any coast guardsman or civilian employees deployed outside the United States. For the US Customs and Border Protection, the report begins with total number of employees in fiscal year 2023 from the Department of Homeland Security's Customs and Border Protection Budget Overview for Fiscal Year 2024. The relevant portion was created by dividing the employment into agricultural related employment and all other employment as provided in the budget data. Both categories were divided into specific work environment (air, sea, Northern border, Southwest border, and other) based on the staffing ratios in "U.S. Customs and Border Protection Port of Entry Workload Staffing Models" and the ratio of employment in sea environment to total US Customs and Border Protection employment was used to estimate the US Customs and Border Protection jobs directly related to the port and the maritime industry. USACE employment is from the organization's website. The portion relevant to the port and maritime industry was estimated using the Congressional Budget Office's spending projections by budget account. The proration is equal to the fiscal year 2023 ratio of budget authority for the USACE allocated to the Inland Waterways Trust Fund, Rivers and harbors contributed funds, and the Harbor maintenance trust fund to total USACE budget authority.

<sup>13</sup> Capital expenditures support one-time economic activity. In particular, the direct economic activity supported includes one-year construction employment and the labor income paid to these construction workers. The indirect and induced economic activity includes the related supply chain and consumer spending for this one-time economic activity.

The analysis uses capital expenditure data from the American Association of Port Authorities 2020 Port Planned Infrastructure Investment Survey for 2021-2025. The analysis converts the five-year planned infrastructure investments into annual values and allocates the capital expenditures by USACE data on waterborne tonnage by state. The analysis excludes any state that did not have a port and US territories. The total tonnage excluded represents less than 2% of all tonnage in the United States.

<sup>14</sup> Proprietor income includes the payments received by self-employed individuals and unincorporated business owners. That is, this includes the pre-tax income of sole proprietorships, partnerships, and other private for-profit businesses that are not classified as corporations. For more information see chapter 11 of US Bureau of Economic Analysis, "[NIPA Handbook: Concepts and Methods of the U.S. National Income and Product Accounts](#)," December 2023.

<sup>15</sup> The comparable average wage is the average wage for the overall US economy in the IMPLAN model, which was approximately \$73,000 in 2021. The \$73,000 salary in 2021 is equivalent to around \$82,000 in 2023 based on personal consumption expenditures price index. The main IMPLAN economic data sources are Census of Employment and Wages (Bureau of Labor Statistics), Regional Economic Accounts (Bureau of Economic Analysis), County Business Patterns (Census Bureau), and National Income and Product Accounts (Bureau of Economic Analysis).

<sup>16</sup> The comparable average GDP per worker is the average GDP per worker for the overall US economy in the IMPLAN model, which was approximately \$119,000 in 2021. The \$119,000 average GDP per worker in 2021 is equivalent to around \$134,000 in 2023 based on the personal consumption price index. The main IMPLAN economic data sources are Census of Employment and Wages (Bureau of Labor Statistics), Regional Economic Accounts (Bureau of Economic Analysis), County Business Patterns (Census Bureau), and National Income and Product Accounts (Bureau of Economic Analysis). The average 2023 GDP per worker is \$121,000 for the port and maritime industry, \$124,000 for suppliers to the port and maritime industry, and \$122,000 for related consumer spending. The average 2023 wages and benefits per worker is \$98,000 for the port and maritime industry, \$82,000 for suppliers to the port and maritime

---

industry, and \$69,000 for related consumer spending. The comparable average wages and benefits for workers throughout the US economy was approximately \$82,000 in 2023.

<sup>17</sup> Dollars were grown to 2023 dollars with the personal consumption expenditures price index (PCEPI).

<sup>18</sup> As noted in the caveats and limitation section, there is not a standard definition of the port and maritime industry in the United States. Studies of specific ports or regional ports define the port and maritime industry differently. A different definition of the port and maritime industry could lead to lower or higher estimates depending on which economic activity is included, how linked transportation networks are, and whether shippers or industries that heavily rely on ports are included.

<sup>19</sup> The analysis estimated this using the value of water imports, exports, and domestic shipments by commodity in 2022 (most recent data) from the FAF. The analysis projects the 2022 values to 2023 using BEA data on the change in goods imported for imports, goods exported for exports, and GDP for domestic shipments. This analysis does not include goods moved through ports that used other forms of transportation.

<sup>20</sup> The analysis matched the 43 FAF commodity codes to relevant industry NAICS codes. Specifically, the analysis split the imported goods by water into either intermediate goods or final goods and linked them to their relevant NAICS code and assumed that goods exported or shipped domestically originated from producers located within the United States. Separately, output per employee was estimated from BEA data for 2022. The analysis projected the output per employee to 2023 and estimated the directly facilitated jobs by dividing the value of goods shipped via water by the output per employee in the corresponding industry.

<sup>21</sup> For examples of studies that included port cargo shippers or receivers see: "[The Local and Regional Economic Impacts of the Ports of Indiana](#)," September 2023; "[The Economic Impacts of Maritime Shipping in the Great Lakes – St. Lawrence Region](#)," July 2023; "[2022 Economic Impact of Houston Ship Channel](#)," April 2023; or "[Port of Long Beach: Economic Impact Study](#)" January 2019. Studies vary in whether port users are included as direct or related economic contributions.

<sup>22</sup> A key point is that an economic impact analysis typically attempts to estimate impacts that net out shifts in economic activity across industries and sectors as the economy moves from its initial equilibrium to its new equilibrium. In contrast, an economic contribution analysis shows the gross amount of economic activity tied to an industry or sector directly, and through its suppliers and related consumer spending. The EY Quantitative Economics and Statistics (QUEST) practice has other modeling frameworks it uses to account for the shifts in economic activity and estimate net impacts.