

# Economic Impact of the Port of Boston



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## Executive Summary

Martin Associates was retained by the Massachusetts Port Authority (MASSPORT) to measure the local and regional economic impacts generated by maritime activity at the MASSPORT owned and operated facilities as well as privately owned and operated facilities within the Boston Harbor, including economic impacts generated by cargo activity, the fish/seafood processing operations, harbor sightseeing tours and cruise activity. Economic impacts generated at public facilities include marine cargo that crosses the piers owned by MASSPORT including activity at the Conley Container Terminal and Autoport as well as by the cement discharged over MASSPORT docks for a private cement operation adjacent to the dock. Also included are the impacts created by the harbor tours that are tenants of MASSPORT, the cruise vessels calling at Flynn Cruiseport Boston, and fish/seafood processing/distribution operations located on MASSPORT property. The impacts created at private terminals include the activity at privately owned terminals along the Mystic River within the Port of Boston district such as the Exelon LNG Terminal, Twin Rivers, Eastern Minerals Salt Terminal, and several petroleum and cement terminals. Also included in the impacts generated at private facilities are impacts created by fish/seafood processing/distribution operations that are not located on MASSPORT property as well as harbor tours not based on MASSPORT property. Impacts are estimated in terms of jobs, personal earnings, business revenue, and state and local taxes. The impacts are estimated for maritime activity in 2018.

The Economic Impact Study of the Port of Boston is based on a telephone survey of port tenants and firms providing services to the marine terminals, cruise vessels and associated passengers, and seafood processing operations. Telephone interviews were used to achieve a greater than 95 percent response rate. A total of 254 firms provided data for the study. In addition, a survey of 1,458 passengers and crew was conducted which consisted of 598 passengers embarking on homeport/turnaround vessels, 351 passengers on port of call vessels, and a survey of 509 crew members. The results of these surveys were used to develop the passenger expenditure model for the cruise impact analysis.

***In 2018, a total of 66,091 jobs were in some way related to cargo, cruise, seafood processing, and harbor tours/marina activity within the Port of Boston. Of these jobs:***

- 9,014 direct jobs were created by cargo, cruise, fish processing and harbor tours activity at the public and private terminals at the Port of Boston. Of these direct jobs, 3,979 direct jobs were created by the activity at the MASSPORT facilities;
- 7,531 induced were supported by the local purchases by those directly employed. Of these 7,531 induced jobs, activity at MASSPORT facilities supported 3,105 jobs.

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- 3,176 indirect jobs were created by the \$353.6 million of local purchases by the firms directly dependent upon the activity at the public and private facilities at the Port of Boston. Of the 3,176 indirect jobs, 1,554 jobs are generated by the local purchases made by the firms that are dependent upon the maritime activity at the MASSPORT facilities;
- 46,371 jobs are related jobs with users of the MASSPORT and private marine cargo terminals, as well as jobs related to the seafood processing activity at the Port. These jobs are classified as user jobs since they are with the importers and exporters using the public and private marine terminals, as well as with jobs in the supply chain supported by the seafood processing industry. The majority of these related jobs, 35,630 are associated with the movement of containerized cargo at the Conley Marine Terminal, while the balance is associated with the liquid bulk and petroleum cargo moving via private terminals in the Port of Boston, as well as the seafood processing industry of operation leased from MASSPORT as well as privately owned processing operations within the Port of Boston.

These job impacts are summarized in Table E-1.

**Table E-1**  
**Composition of Total Job Impact**

	Total Port of Boston Jobs	Total Massport Jobs
<b>Direct</b>	9,014	3,979
<b>Induced</b>	7,531	3,105
<b>Indirect</b>	3,176	1,554
<b>Related</b>	<u>46,371</u>	<u>37,642</u>
<b>TOTAL</b>	<b>66,091</b>	<b>46,280</b>

Totals may not add due to rounding

***In 2018, \$8.2 billion of economic value was related to the activity at the Port of Boston.*** This represents economic value of the marine cargo, seafood processing, cruise and harbor tour activity at a given point in time, 2018. It consists of the \$1.8 billion of direct business revenue impact generated by maritime activity at private terminals and MASSPORT owned and operated facilities, plus the related economic output of \$5.5 billion, and the \$0.9 billion of re-spending /local consumption impact generated by the maritime activity at the public and private terminals. These components exclude double counting and represent the total economic value of the cargo activity at the public and private marine terminals. Of the \$8.2 billion, \$1.8 billion is the direct business revenue received by the firms directly dependent upon the port and providing maritime services

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and inland transportation services to the cargo handled at the marine terminals and the vessels calling the port, as well as the cruise activity, seafood processing and harbor tours. The \$5.5 billion represents the value of the output to the New England Region that is created due to the maritime activity at the public and private marine cargo terminals. This includes the value added at each stage of producing an export cargo and the value added at each stage of production for the firms using imported raw materials and intermediate products, as well as consumer products that flow via the marine terminals and are consumed by industries and individuals within the region. Also included in the value of output is the distribution and support activity, including retail and wholesale activity associated with the seafood processing operations at the Port of Boston. The \$0.9 billion is the re-spending of direct personal income and the local consumption expenditures generated by the re-spending. Table E-2 provides a summary breakdown of the \$8.2 billion economic value related to the Port of Boston in 2018. The MASSPORT maritime activity supported \$4.8 billion of total economic value.

**Table E-2**  
**Summary of the \$8.2 Billion of Economic Activity Related to the Port of Boston, 2018**

	Total Port of Boston Economic Value (Billions)	MASSPORT Economic Value (Billions)
<b>Direct Business Revenue</b>	\$1.80	\$0.80
<b>Related Economic Output</b>	\$5.49	\$3.64
<b>Re-spending/Local Consumption</b>	\$0.89	\$0.36
<b>TOTAL</b>	<b>\$8.19</b>	<b>\$4.79</b>

Totals may not add due to rounding

The \$1.8 billion of direct business revenue consists of the following components:

- \$544.2 million of direct personal wage and salary income received by those 9,014 direct jobs holders;
- \$353.6 million of in-state purchases made by the firms directly dependent on the Port of Boston; these expenditures supported the 3,176 indirect jobs;

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- \$185.8 million of state and local taxes;
- \$445.5 million of federal taxes;
- The remaining \$275.9 million is used for out of state purchases and for retained earnings.

The last economic impact study of the Port of Boston was conducted by Martin Associates in 2013, using 2012 port data; total direct, induced and indirect jobs increased by 3,364 jobs over the six-year period. Direct business revenue grew by \$559.2 million, while total direct, induced and indirect income and local consumption expenditures grew by \$497.0 million. Local purchases made by firms directly dependent on the public and private marine terminals increased by \$91.8 million. State and local taxes grew by \$49.5 million while federal taxes grew by \$242.8 million. This increase in federal taxes also includes the federal corporate tax which was not included in the previous study, and this inclusion added about 7 percent to the baseline federal tax index.

Direct cargo jobs grew by 828 direct jobs, reflecting the growth in containerized cargo, autos, scrap and salt handled at the Port. Seafood impacts increased significantly due to growth in activity and employment levels at these operations, as well as the inclusion of downstream logistics impacts, particularly the trucking distribution activity of the processors, both MASSPORT tenants as well as non-tenant seafood processors located in Boston. Impacts generated by harbor cruises increased due to the inclusion of a harbor cruise operator not included in the previous study.

Cruise impacts grew slightly by about 130 direct jobs, as cruise passengers increased to nearly 390,000 passengers in 2018. The number of sailings increased from 117 to 151. In 2012, the majority of vessel calls were by smaller coastal ships, and these vessels typically made Boston a port of call, rather than a homeport. In 2018, there was an increase in the size of ships and port of calls.

## I. OVERVIEW OF THE ANALYSIS AND SUMMARY OF RESULTS

Martin Associates was retained by the Massachusetts Port Authority (MASSPORT) to measure the local and regional economic impacts generated by maritime activity at MASSPORT owned and operated facilities as well as privately owned and operated facilities at the Port of Boston, including economic impacts generated by cargo activity, the fish/seafood processing operations, harbor sightseeing tours and cruise activity. Economic impacts generated at public facilities include marine cargo that crosses the piers owned by MASSPORT including activity at the Conley Container Terminal and Autoport, as well as by the cement discharged over MASSPORT docks for a private cement operation adjacent to the dock. Also included are the impacts created by the harbor tours that are tenants of MASSPORT, the cruise vessels calling at Flynn Cruiseport Boston, and fish/seafood processing/distribution operations located on MASSPORT property. The impacts created at private terminals include the activity at privately owned terminals along the Mystic River within the Port of Boston district such as the Exelon LNG Terminal, Twin Rivers, Eastern Minerals Salt Terminal, and several petroleum and cement terminals. Also included in the impacts generated at private facilities are impacts created by fish/seafood processing/distribution operations that are not located on MASSPORT property as well as harbor tours not based on MASSPORT property. Impacts are estimated in terms of jobs, personal earnings, business revenue, and state and local taxes. The impacts are estimated for maritime activity in 2018.

In addition to the baseline impact estimates, computer models specific to the Port of Boston private marine terminals and the MASSPORT owned and leased public terminals have been prepared which can be used in evaluating the sensitivity of impacts to changes in tonnage, labor productivity, labor work rules, commodity mix, inland origins/destinations of commodities and vessel size. The models can also be used to evaluate the impacts of new terminal development, channel deepening, evaluation of master plan scenarios and for annual updates. In addition, the cruise economic impact model can be used to test the sensitivity of changes in passenger levels, length of cruises, size of vessels, and pre and post cruise passenger expenditure patterns while in Boston. The seafood processor model can be used to assess the impacts of new processing activity, including new lines of operations at facilities leased from MASSPORT, as well as those located on private land.

In addition to the 2013 Economic Impact Study for the Port of Boston conducted by Martin Associates, the methodology used in this analysis has been used by Martin Associates to estimate the economic impacts of seaport activity at more than 150 United States and Canadian ports, including:

- |                       |                        |                          |
|-----------------------|------------------------|--------------------------|
| ➤ <i>Everett</i>      | ➤ <i>Longview</i>      | ➤ <i>Long Beach</i>      |
| ➤ <i>Seattle</i>      | ➤ <i>Oakland</i>       | ➤ <i>San Diego</i>       |
| ➤ <i>Tacoma</i>       | ➤ <i>San Francisco</i> | ➤ <i>Port of Hueneme</i> |
| ➤ <i>Portland, OR</i> | ➤ <i>Los Angeles</i>   | ➤ <i>Houston</i>         |

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➤ <i>Galveston</i>	➤ <i>Port Everglades</i>	➤ <i>Baltimore</i>
➤ <i>Corpus Christi</i>	➤ <i>Palm Beach</i>	➤ <i>Philadelphia</i>
➤ <i>Lake Charles</i>	➤ <i>Port Canaveral</i>	➤ <i>Diamond State Port Corp.</i>
➤ <i>New Orleans</i>	➤ <i>Jacksonville</i>	➤ <i>New Jersey Port Corp.</i>
➤ <i>Gulfport</i>	➤ <i>Port Manatee</i>	➤ <i>40 US Great Lakes Ports</i>
➤ <i>Tampa</i>	➤ <i>Wilmington, NC</i>	➤ <i>40 Canadian Great Lakes Ports</i>
➤ <i>Miami</i>	➤ <i>Virginia Port Authority</i>	

In addition, Martin Associates has used the same methodology to estimate the economic impacts of cruise operations at the Ports of Miami, Port Everglades, Port Canaveral, Tampa, Jacksonville, Baltimore, Seattle, San Francisco and Los Angeles. Martin Associates also provides the economic impact studies for Disney Cruise Lines.

This chapter presents an overview of the economic impact analysis by defining the following:

- The types of economic impacts estimated and the overall impact structure;
- The cargo impact methodology;
- Seafood processing
- The cruise impact methodology.

In addition, a summary of the data sources used in the analysis is presented.

### ***1. ECONOMIC IMPACT STRUCTURE***

A deep water port such as Boston, contributes to the local, regional, and national economies by providing employment and income to individuals, tax revenues to local and state governments, customs fees to the Federal Government, and revenue to businesses engaged in handling, shipping, and receiving cargo via the Port. Exhibit 1 illustrates the flow of economic impacts throughout the economy. As this exhibit shows, activity at a seaport (i.e., the handling of cargo and the servicing of vessels) initially creates business revenue to firms providing those cargo handling and vessel services. This revenue is in turn used for several purposes:

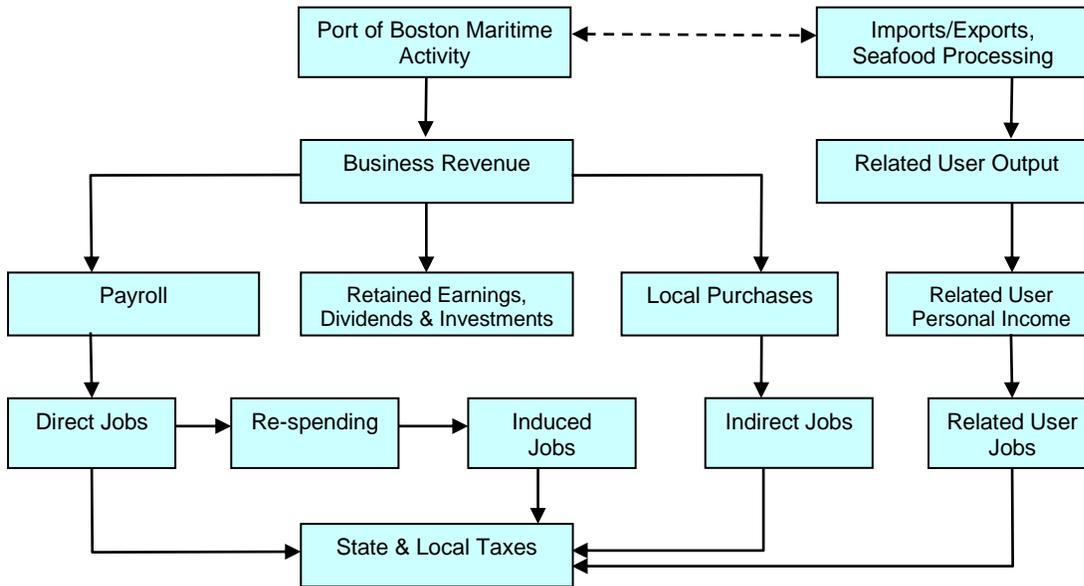
- To hire employees to provide the services;
- To pay stockholders dividends, retire debt, and invest;
- To buy goods from other firms; and
- To pay federal, state, and local taxes.

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**Exhibit 1**  
**Flows of Economic Activity through the Economy**



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

As demonstrated in Exhibit 1, and the previous discussion, the flow of economic impacts throughout an economy creates four separate and non-additive types of impacts.

These four types of impacts are:

## 1.1 Employment Impact

The employment impact consists of direct jobs, induced jobs, indirect jobs and related jobs. The servicing of the vessels, the handling of cargo and processing at the Port generates the direct employment impact. These direct jobs would not exist in the absence of cargo and vessel activity at the Port, activity with the fish processors, the cruise operations and the harbor tours. The induced jobs are supported by the purchases of goods and services by those directly employed and would also cease to exist if the direct jobs were discontinued. Hence, the induced jobs are dependent upon the direct jobs and the associated level of wages and salaries, and the resulting local purchases made by those directly employed (direct jobs) by activity at the Port of Boston.

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In addition to the direct and induced jobs, another type of employment impact supported by seaport activity is the indirect job impact. These indirect jobs are generated in the local economy by the purchases of goods and services by the firms which provide the direct jobs. For this study, indirect jobs are estimated based on the regional purchase patterns of the firms providing the vessel and cargo handling services at the port, those providing services to the cruise vessels and cruise passengers, and those firms involved in fish processing.

The last component of the employment impact is the related job impact. Related jobs are jobs with shippers/consignees using the private and public marine terminals for the export and import of cargo. However, these shippers/consignees also use other ports and are not completely dependent upon the Port of Boston or MASSPORT facilities. The level of employment with these firms is driven by the demand for the firms' products, not because the Port of Boston is used. Therefore, these related jobs are not dependent upon port activity, and their degree of dependence on the public and private terminals at the Port of Boston is much less than the other components of the job impact<sup>1</sup>. Furthermore, should the Port of Boston marine terminals not be available to these importers and exporters in the longer term, logistics costs will likely increase from the use of other more distant ports, which could result in the relocation of the importers and exporters from the New England region to an area in closer proximity to the ports that would be used. In addition, related jobs associated with the seafood processing activity at both facilities leased from MASSPORT as well as the private processors are measured. These related jobs are associated with the final sales of the seafood processed in Boston at the retail and wholesale level, and also include repackaging as well as final distribution from cold storage facilities to the final consumers not included in the direct, induced and indirect jobs.

### **1.2 Personal Income Impact**

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

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

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### 1.3 Direct Revenue Impact

The direct business revenue impact measures the sales generated by firms engaged in handling and transporting cargo through the MASSPORT terminals and the private marine cargo terminals at the Port of Boston; the revenue generated by seafood processing at the Port of Boston; the revenue generated by cruise ship activity and spending by the cruise passengers and crew in the Boston area; and the revenue generated by the harbor cruises and marinas. This impact includes national, as well as, local and state revenue.<sup>2</sup> A portion of this direct revenue generated by the maritime activity at the Port of Boston is then used to pay wages and salaries to those holding the direct jobs and to purchase goods and services to support port activity.

A measure of the total value of economic activity created in the state by cargo and seafood processing activity at the Port is developed to demonstrate the magnitude of the value of the economic activity supported these sectors.

### 1.4 Tax Impacts

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

- State taxes, including personal and corporate income tax, state sales and use taxes, motor fuel tax, vehicle registration tax, property tax, property transfer tax, shellfish tax, recordation tax, death tax, horse racing tax, telecommunication tax and miscellaneous taxes;
- Local taxes, including the local share of the income tax and property tax;
- Federal taxes include both individual as well as corporate taxes.
- Federal, state and local taxes created by the related use activity are also quantified.

## 2. *CARGO IMPACT METHODOLOGY*

Shipments and receipts of cargo through the public and private marine terminals within the Port of Boston generate economic activity in various business sectors of the state and local economy. Specifically, the following economic sectors are involved in providing cargo and vessel handling services at the Port of Boston. These are the:

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<sup>2</sup> The value of shipments through the Port is not included as a revenue impact for the purposes of this analysis because the value of a particular commodity shipped or received via the Port of Boston is determined by the demand for that particular commodity, not by the fact that the commodity moves via the Port.

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

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

### 2.1 The Surface Transportation Sector

The surface transportation sector consists of the railroad, trucking and pipeline industries. These sectors are responsible for moving the various cargoes between the marine terminals and their inland origins and destinations. In general, the truck is the most frequently used mode of inland transportation, while pipeline is used to move LNG. A combination rail-truck routing is used to move domestic cars to the Port for processing.

Many local and national trucking firms serve the marine terminals at the Port of Boston, as do numerous individual owner-operators. The trucking industry's major involvement is in moving containers, break bulk cargoes, automobiles and petroleum for local and regional distribution.

### 2.2 The Maritime Service Sector

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

- Cargo Marine Transportation
- Vessel Operations
- Cargo Handling
- Line Haul Barge Operators
- Federal, State, and Local Government Agencies
- Maritime Services

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

- Cargo Marine Transportation - Participants in this category are involved in arranging for inland and water transportation for export or import freight through the Port of Boston. The freight forwarder/customhouse broker is the major participant in this category along with the eight ocean carriers calling Conley Terminal with direct weekly service. The freight forwarder/customhouse broker arranges for the freight to be delivered between the marine terminals and inland destinations, as well as the ocean transportation. This function

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performed by freight forwarders and customhouse brokers is most prevalent for general cargo commodities. For bulk cargo, arrangements are often made by the shipper/receiver, and the cargo passes over private docks.

- Vessel Operations - This category consists of several participants providing vessel services including:
  - Steamship agents - provide a number of services for the vessel as soon as it enters the Port; including arranging for pilot tug assist services, for medical and dental care of the crew, and for ship supplies. Agents are also responsible for vessel documentation
  - Pilots – provide navigation services to ensure safe transit of vessels between the harbor entrance and docks
  - Chandlers - supply the vessels with ship supplies (food, clothing, nautical equipment, etc.)
  - Towing firms - provide the tug service to guide the vessel to and from port
  - Bunkering firms - provide fuel to the vessels
  - Marine surveyors - inspect the vessels and the cargo
  - Launch services - provide transportation for the crew between land and vessel
  - Chemical testing services - test cargo, such as coal, for proper chemical composition, water content, etc.
  - Shipyards/ship repair firms - provide repairs, either emergency or scheduled
  
- Cargo Handling - this category involves the physical handling of the cargo at the Port between the land and the vessel. Included in this category are the following participants:
  - Longshoremen - are members of the International Longshoremen’s Association, and are involved in the loading and unloading of cargo from the vessels, as well as handling the cargo prior to loading and after unloading
  - Stevedoring firms - manage the longshoremen and cargo-handling activities
  - Terminal operators - are often stevedoring firms who operate the maritime terminals where cargo is loaded and off-loaded
  - Warehouse operators - store cargo after discharge or prior to loading and consolidate cargo units into shipment lots
  - Container leasing and repair firms - provide containers to steamship lines and shippers/consignees and repair damaged containers
  - Container consolidators - consolidate containerized cargo as well as full containers in order to achieve favorable transportation rates for their customers
  - Automobile service firms - service new automobiles after they are off-loaded from the vessels and are often terminal operators as well

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- Barge Operators - move liquid and dry bulk cargo such as petroleum products, cement, and bunker ships while in port.
- Government Agencies - this service category involves federal, state and local government agencies that perform services related to cargo handling and vessel operations at the Port. U.S. Customs and Border Protection, U.S. Department of Labor, U.S. Department of Agriculture, and U.S. Department of Commerce employees are involved. In addition, both civilian and military personnel with the U.S. Coast Guard and the U.S. Army Corps of Engineers have been included.
- Maritime Services – This category includes engineers, architects and consultants who provide a wide spectrum of services to the maritime industry, including terminal design, naval architect services, and planning services. Also, this category includes a wide range of service providers, including environmental firms, security firms, and firms providing fumigation services.

### **2.3 Massachusetts Port Authority**

This category includes employees of the MASSPORT Maritime Department that operate Conley Container Terminal, Flynn Cruiseport Boston and the Fish Pier as well as manage other Port properties. In addition, MASSPORT leases terminal space to Autoport for the import and processing of automobiles.

### **2.4 Port Related Cargo Users**

Related user jobs are jobs with shippers and consignees of containerized cargo moving via the MASSPORT cargo terminals as well as the private terminals in the Boston Harbor. This impact incorporates the distribution and supply chain aspects of the shipper and consignee operations as well as value added services. These jobs include the direct, induced, and indirect jobs created at each level of production of an export cargo produced in Massachusetts, as well as the total jobs associated with an imported product consumed in-state, either as a final consumption good or as an intermediate or primary raw material used by industries within the state. For example, all aspects of the distribution chain associated with an imported container carrying consumer products are included in the related job impacts, from the time the cargo arrives at the distribution center to its final sales at a retail outlet. This includes the actual distribution center operations such as cross dock operations, repackaging, sorting, labeling, repairs, etc.; as well as the services supplied in support of the distribution center activity such as technical support, maintenance and repair services, utilities, supplier locations, etc.

The aspects of the distribution chain from the discharge of the containers from a ship through the container terminal to its initial destination (i.e., regional distribution center within the state) are included in the port-generated direct, induced, and indirect jobs, not the related impacts.

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

### **2.5 Commodities Included in the Cargo Analysis**

A major use of an economic impact analysis is to provide a tool for port development planning. As a port grows, available land and other resources for port facilities become scarce, and decisions must be made as to how to develop the land and utilize the resources in the most efficient manner. Various types of facility configurations are associated with different commodities. For example, automobiles require a large area for storage, while containerized cargo requires container cranes, yard equipment and open storage. Covered storage is needed for break bulk cargo such as steel and lumber. Silos are needed for cement storage and storage tanks for petroleum products.

An understanding of the commodity's relative economic value in terms of employment and income to the local community, the cost of providing the facilities, and the relative demand for the different commodities, is essential in making future port development plans. Because of this need for understanding relative commodity impacts, economic impacts are estimated for the following commodities handled via public and private facilities at the Port of Boston:

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### *Public Terminals:*

- ◆ Containerized Cargo
- ◆ Automobiles
- ◆ Cement

### *Private Terminals:*

- ◆ Scrap
- ◆ Petroleum
- ◆ Salt
- ◆ Food Oils
- ◆ LNG
- ◆ Other Dry Bulk
- ◆ Other Liquid Bulk
- ◆ Cement

It should be emphasized that commodity-specific impacts are not estimated for each of the economic sectors described in the last section. Specific impacts could not be allocated to individual commodities with any degree of accuracy for the banking/insurance/law job category, marine construction and the government category.

### **3. SEAFOOD PROCESSORS / SEAFOOD INDUSTRY**

The Port of Boston is home to numerous fish/seafood processors located on MASSPORT property and in other parts of Boston Harbor. This is a growing sector of the Port of Boston and includes seafood processing facilities that process locally caught seafood, as well as seafood caught in other harbors. With regards to the seafood industry, once the seafood is processed, it is then distributed for consumption locally, regionally or internationally. From the processor, the seafood can be trucked locally to wholesalers, go to a cold storage warehouse, trucked to an airport such as Boston's Logan International Airport or New York's John F. Kennedy International Airport, where it is flown to various domestic and international destinations, or trucked to the Port of Boston where it is put on container vessel to be shipped internationally. The processors that make up the Boston Seafood Industry range from large processors operating their own fishing fleets to small packaging and distribution companies serving local wholesale and retail markets. The impacts of the seafood industry in Boston are based on interviews with 60 seafood processors/distributors including those leasing property from MASSPORT. From these interviews, the direct impact was estimated, and local and regional truck distribution models were developed to quantify the impacts of the processing, packaging as well as the distribution aspects of the seafood industry.

Related user impacts occur with firms in the downstream logistics operations involved in the seafood processing industry, such as delivery to the final consumers from the warehouses and further repackaging, as well as the ultimate sales from the wholesalers and restaurants. The direct, induced and indirect impacts generated by the seafood processing operations are excluded from these related user impacts. These related impacts are not entirely dependent upon the

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## Economic Impact of the Port of Boston

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seaport and Harbor, but reflect the importance of the Harbor to local and national firms, particularly at the retail level. While the facilities and services provided in the Harbor are a crucial part of the infrastructure allowing these related jobs to exist, they would not necessarily be immediately displaced if marine cargo or seafood operations were to cease.

### **4. CRUISE IMPACT METHODOLOGY**

Cruise activity at Flynn Cruiseport Boston consists of homeport calls as well as port of calls vessel service. Flynn Cruiseport Boston had 151 sailings of cruise ships from its docks in 2018. This included turnaround sailings and port-of-call sailings. These cruises brought nearly 390,000 passengers through Flynn Cruiseport Boston.

The key difference between port of call and a homeport call is the fact that a vessel homeporting will take on passengers and supplies at Flynn Cruiseport Boston, while a vessel making a port of call typically does not take on or discharge passengers. These port of call vessels also usually do not take on supplies from local chandlers and caterers or use local services such as advertising, maintenance and repair, linen services, etc. Hence, a call by a homeported vessel will generate a greater economic impact than an in-transit call.

#### **4.1 Homeport Activity Economic Impacts**

Homeport cruise activity at Flynn Cruiseport Boston affects two sectors of the local and regional economy. These sectors are the:

- Maritime Service Sector
- Visitor Industry Sector

The maritime service sector includes those firms that provide services to the cruise vessels while in port, such as:

- Chandlers and other local retailers and wholesalers that provide ship stores and provisions to be used by passengers and crew, such as food, beverages, retail items, flowers
- Trucking firms that bring supplies to the homeported vessel, either from local vendors or those located out of state
- Towing services that assist vessels in docking and undocking (a majority of the new cruise vessels are equipped with bow and stern thrusters and the need for tug assistance is minimized)
- Pilots assist the vessels navigating the channels from the open sea to the docks

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## Economic Impact of the Port of Boston

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- Stevedoring services performed by members of the International Longshoremen's Association and include handling baggage and ship supplies
- Linehandling services that are required when a vessel enters port
- Bunkering firms that provide fuel to the vessels
- Landside tours and other charters providing services to both homeport passengers as well as port of call passengers
- Parking services for the passengers driving from their place of residence to embark on the cruise
- Ground transfers from the airport and hotels to the ship prior to and after the cruise.
- Security firms providing security at the terminal
- Linen and waste removal companies servicing the vessels when it is at port
- Maintenance and repair operations to support the vessel when at port

The visitor industry sector consists of firms providing services to the passengers and crew of the vessels prior to and after the cruise. Included in this category are:

- Hotels and motels
- Restaurants/bars
- Retail goods
- Entertainment establishments such as ground tours, museums, fishing, amusements, etc.

To estimate these impacts, the cruise lines currently calling Flynn Cruiseport Boston were interviewed. The purpose of these interviews was to determine the amount of purchases, by type of service, made by each vessel call and type of service. Types of purchases include vessel purchases for:

- |                       |                          |
|-----------------------|--------------------------|
| • Ship stores         | • Linehandling           |
| • Bunkers             | • Tendering services     |
| • Water               | • Stevedoring            |
| • Liquor              | • Retail items           |
| • Flowers             | • Maintenance and repair |
| • Pilots              | • Trash disposal         |
| • Tugs                | • Laundry                |
| • Local advertising   | • Crew allowance         |
| • Local travel agents | • Wharfage and dockage   |

Cruise ship expenditure data was provided by the various cruise operators calling Boston. This data was used to develop a typical ship disbursement account profile. Associated with each vessel expenditure category are jobs to sales ratios with the types of firms providing the goods and

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## Economic Impact of the Port of Boston

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services to a homeported/turnaround vessel. These jobs to sales ratios, as well as personal income levels were developed from the U.S. Bureau of Census data sources for the Boston metropolitan area. The total annual expenditures, by type of service, is multiplied by the corresponding jobs to sales ratios to estimate the total direct job impacts in the maritime service sector, by type of service.

The revenue impacts are estimated directly from the expenditure profiles provided by the carriers. Direct income is estimated from the average annual salaries developed by type of firm, from the Census data specific to the Boston metropolitan area. The jobs generated in the Visitor Industry/Tourism Sector (for example, hotels, restaurants, etc.) are estimated based on the results of a survey of 1,458 passengers and crew that was conducted. This survey consisted of 598 passengers embarking on homeport/turnaround vessels, 351 passengers on port of call vessels, and 509 crew. The results of these surveys were used to develop the passenger expenditure model for the cruise impact analysis.

Using these purchase patterns, and the appropriate jobs to sales ratios and personal income measures for the supplying firms, the visitor industry model calculates the direct jobs, induced and indirect impacts that are generated by the homeport cruise service at Flynn Cruiseport Boston.

### **4.2 Port of Call Economic Impacts**

Economic impacts created by a port of call, rather than a homeport call, generate impacts primarily on the landside consisting of tour packages and individual sightseeing excursions. To estimate these impacts, the cruise lines calling Flynn Cruiseport Boston, along with the tour operators and travel agents, provided Martin Associates with the typical purchases and value of the landside tour packages. These local purchases were converted into direct, induced and indirect impacts using the visitor industry methodology described above. In addition to the passenger expenditures, the vessels also spend money for linehandling, pilots, tender services, and in some cases miscellaneous emergency purchases. These purchases are also included in the port of call impact analysis.

### **4.3 Cruise Service Impact Model**

In order to assess the economic impacts of potential cruise business at Flynn Cruiseport Boston, Martin Associates developed a cruise service model, which can be used to assess the impacts of changes in such factors as:

- Number of cruise vessel calls
- Passenger levels
  - Passenger characteristics:
    - Local expenditures
    - Local residents versus tourists
    - Length of time and where stayed after disembarking

## Economic Impact of the Port of Boston

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- Different types of cruise service, including:
  - Homeport
  - Port of Call
- Number of crew
  - Size of vessel

This model will estimate the impacts of current and potential cruise operations at Flynn Cruiseport Boston.

### **5. *HARBOR TOURS / MARINAS***

Numerous tour boat operators provide sightseeing tours of the Boston Harbor. These operations include tenants of MASSPORT as well as operations at non-MASSPORT facilities. Also included in this category are marina operations in Boston Harbor, some of which are located on MASSPORT property.

### **6. *DATA COLLECTION***

This Economic Impact Study of the Port of Boston is based on a telephone survey of members of each of the economic sectors. Participants for this study were identified by MASSPORT as well as from the 2005 and 2013 data bases that were developed for the previous economic studies conducted by Martin Associates for MASSPORT. Telephone interviews were used to achieve a greater than 95 percent response rate in all sectors. Table 1 summarizes the 254 firms contacted.

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## Economic Impact of the Port of Boston

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**Table 1**  
**Summary of Firms Contacted**

<b>Category</b>	<b>Number Contacted</b>
Agents/Lines	27
Bunkering	1
Chandlers/Suppliers	13
Cruise	3
Freight Forwarders	26
Government	6
ILA	1
Marina	3
Marine Surveyors	18
Maritime Services	26
Pilots	2
Seafood / Processors	60
Shipyards	2
Ship Repair	1
Terminal Operators/Stevedores	19
Tug & Barge Operators	8
Warehouse/CFS/Container Repair	<u>38</u>
<b>TOTAL BUSINESSES CONTACTED</b>	<b>254</b>

Secondary data sources include the following U.S. Bureau of Census publications:

- Census of Wholesale Trade;
- Census of Retail Trade;
- Census of Construction; and
- Census of Service Industries Annual Survey of Manufacturers.

Other published data included U.S. County Business Patterns and U.S. Bureau of Labor Statistics, Consumer Expenditure Survey. Indirect impacts and related user impacts were estimated using the U.S. Bureau of Economic Analysis, Regional Input-Output Model for the Commonwealth of Massachusetts.

In addition, a survey of 1,458 passengers and crew was conducted. This survey consisted of 598 passengers embarking on homeport/turnaround vessels, 351 passengers on port of call vessels, and 509 crew. The results of these surveys were used to develop the passenger expenditure model for the cruise impact analysis.

### 7. *CARGO AND CRUISE MODEL*

The cargo model has been designed to update the port impact assessment on an annual basis, as well as to test sensitivities of impacts to changes in commodity tonnage, labor productivity, labor work rules, vessel calls (by type of vessel), pilotage and tug assist assumptions. Also, the model is designed to test the impacts of new facilities development. The cruise impact model is used to estimate the changes in impacts due to changes in the number of passengers, number of homeport vs. port of call vessels, length of cruises, size of vessels, and pre and post expenditure patterns of cruise passengers.

## Economic Impact of the Port of Boston

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### 8. *IMPACT SUMMARY*

The resulting economic impacts are presented in Table 2.

**Table 2**  
**Summary of Economic Impacts Generated By**  
**Port Activity in 2018**

IMPACTS	Total MASSPORT	Total Private	Total Port of Boston
<b>JOBS</b>			
DIRECT	3,979	5,035	9,014
INDUCED	3,105	4,426	7,531
INDIRECT	<u>1,554</u>	<u>1,621</u>	<u>3,176</u>
<b>TOTAL JOBS</b>	8,638	11,083	19,720
<b>PERSONAL INCOME (1,000)</b>			
DIRECT	\$225,609	\$318,571	\$544,180
RE-SPENDING/CONSUMPTION	\$358,375	\$531,088	\$889,463
INDIRECT	<u>\$95,600</u>	<u>\$93,567</u>	<u>\$189,168</u>
<b>TOTAL INCOME AND CONSUMPTION</b>	\$679,584	\$943,227	\$1,622,811
<b>BUSINESS REVENUE (1,000)</b>	\$796,156	\$1,008,739	\$1,804,895
<b>LOCAL PURCHASES (1,000)</b>	\$145,315	\$208,241	\$353,556
<b>STATE &amp; LOCAL TAXES (1,000)</b>	\$77,470	\$108,287	\$185,757
<b>FEDERAL TAXES (1,000)</b>	\$188,890	\$256,585	\$445,474
<b>RELATED USER IMPACTS</b>			
<b>JOBS</b>	37,642	8,729	46,371
<b>PERSONAL INCOME (1,000)</b>	\$1,033,483	\$281,122	\$1,314,605
<b>OUTPUT (1,000)</b>	\$3,635,874	\$1,855,772	\$5,491,646
<b>STATE/LOCAL TAXES (1,000)</b>	\$155,325	\$48,987	\$204,312
<b>FEDERAL TAXES (1,000)</b>	\$427,912	\$166,670	\$594,583

Note: Totals may not add due to rounding

## Economic Impact of the Port of Boston

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*A total of 19,720 direct, induced, and indirect jobs were generated by the maritime activities at the public and private marine terminals at the Port of Boston. Of these jobs:*

- 9,014 direct jobs were created by cargo, cruise, fish processing and harbor tours activity at the public and private terminals at the Port of Boston. Of these direct jobs, 3,979 direct jobs were created by the activity at the MASSPORT facilities.
- 7,531 induced jobs were supported by the local purchases by those directly employed. Activity at MASSPORT facilities supported 3,105 induced jobs.
- 3,176 indirect jobs were created by the \$353.6 million of local purchases by the firms directly dependent upon the activity at the public and private facilities at the Port of Boston. 1,554 jobs are generated by the local purchases by the firms dependent upon the maritime activity at the MASSPORT facilities.
- 46,371 jobs are related jobs with users of the MASSPORT and private marine cargo terminals, as well as the seafood processing activity at the Port. These jobs are classified as user jobs since they are with the importers and exporters using the public and private marine terminals. The majority of the jobs, 37,642 are associated with MASSPORT maritime activity, of which 35,630 jobs are supported by the movement of containerized cargo at the Conley Marine Terminal. The balance, 8,729 jobs, is associated with the seafood processing activity at non-MASSPORT associated operations, and liquid bulk and petroleum cargo moving via private terminals at the Port of Boston.

*The port activity generated \$1.6 billion in personal wage and salary income.*

- The 9,014 directly employed individuals received \$544.2 million of personal wage and salary income, for an average salary or wage of \$60,373.
- As a result of the multiplier effects of using a portion of this income for local purchases, \$889.5 million in induced income and local consumption expenditures were created within the Commonwealth.<sup>3</sup>
- Those 3,176 indirectly employed received \$189.2 million of indirect income.

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<sup>3</sup> The re-spending impact includes the local purchases by those directly employed as well as the consumption expenditures. Therefore, the total re-spending impact cannot be divided by 7,531 induced jobs to estimate induced salary, as this would be an overestimation of personal income.

## Economic Impact of the Port of Boston

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***Businesses providing maritime services at the Port of Boston received \$1.8 billion of revenue.***

- The \$1.8 billion of direct business revenue received by the businesses providing the services at the Port does not include the value of the cargo moving over the marine terminals, since the value of the cargo is determined by the demand for the cargo, not the use of the Port of Boston.
- Of the \$1.8 billion, \$544.2 million was paid out in terms of direct salaries to those 9,014 directly employed by activity at the Port of Boston.
- A total of \$353.6 million of in-state purchases were made by the firms directly dependent on the Port of Boston. These expenditures supported the 3,176 indirect jobs.

***A total of \$185.8 million of state and local tax revenue was generated by Port activity in 2018. The port activity generated \$445.5 million in federal taxes.***

***In addition to the direct, induced and indirect impacts generated by the cargo, cruise passengers, seafood processing, and harbor tours at the Port of Boston, nearly \$5.5 billion of economic output was related to the cargo activity handled at the Port of Boston in 2018.*** This represents the value of the output of the Port of Boston that is created due to the cargo moving via the Port of Boston's public and private marine terminals, and the seafood processing activity at the Port of Boston. The majority of the related value of output, \$3.4 billion, is supported by cargo activity at the public and private marine cargo facilities. This includes the value added at each stage of producing an export cargo, as well as the value added at each stage of production for the firms using imported raw materials and intermediate products that flow via the marine terminals and are consumed within the Commonwealth, as well as the revenue generated at each stage of delivery of a consumer import (via the Port) to final sales. The majority of these cargo user impacts are associated with imported containerized cargo via the MASSPORT Conley Marine Terminal.

It is to be emphasized that these users are related to the Port in that if the Port of Boston were not available, these users could ship and receive cargo via other ports. In fact, the majority of these users currently use multiple ports for export and import, especially those moving containerized cargo through the Port. Furthermore, the level of employment with the related users is driven by the demand for the products produced by these firms, and not by the provision of cargo handling or vessel support services at the Port of Boston.

Similarly, the related users impacts associated with the seafood activity in Boston, namely the impacts supported in retail sales and restaurant activity would continue in the absence of the local seafood processing activity

## Economic Impact of the Port of Boston

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### *Comparison of Economic Impacts – 2012-2018*

The last economic impact study conducted for the Port of Boston was conducted by Martin Associates in 2013, using 2012 cargo data; total direct, induced and indirect jobs increased by 3,364 jobs over the six-year period. Direct business revenue grew by \$559.2 million, while total direct, induced and indirect income and local consumption expenditures grew by \$497.0 million. Local purchases made by firms directly dependent on the public and private marine terminals increased by \$91.8 million. State and local taxes grew by \$49.5 million while federal taxes grew by \$242.8 million. This increase in federal taxes also includes the federal corporate tax which was not included in previous study.

Direct, induced and indirect cargo jobs grew by 1,397 jobs, reflecting the growth in containerized cargo, autos, scrap and salt handled at the Port. Direct, induced and indirect jobs with seafood processing operations in Boston impacts increased by 1,128 jobs due growth in activity and employment levels at these operations, and the inclusion of a downstream logistics impacts, particularly the trucking distribution activity of the processors, both MASSPORT tenants as well as non-tenant seafood processors located in Boston. The harbor cruises generated an additional 613 total direct, induced and indirect jobs since 2012.

Cruise impacts grew slightly by about 130 direct jobs. The number of sailings increased from 117 to 151. In 2012, the majority of vessel calls were by smaller coastal ships, and these vessels typically made Boston a port of call, rather than a homeport. In 2018, the size of the vessels increased and the number of homeport calls also increased.

### II. EMPLOYMENT IMPACTS

In this chapter, the employment generated by maritime activity at the public and private marine terminals within the Boston Harbor is documented. The chapter is organized as follows:

- First, the total employment that is in some way related to the activities at the public and private marine terminals is estimated
- Second, the subset of total employment that is judged to be totally dependent on maritime activity is analyzed in the following ways:
  - ✓ Direct jobs are estimated in terms of key economic sectors, e.g., surface transportation sector
  - ✓ Direct jobs are estimated for each of the key commodities/commodity groups
- Third, induced jobs generated by local purchases made by those directly employed as a result of port activity are described
- Fourth, indirect jobs created by local purchases by the firms directly dependent on maritime activity at the Port of Boston are defined

The impacts presented in this chapter are for the year 2018.

#### 1. ***TOTAL EMPLOYMENT IMPACT***

***In 2018, a total of 66,091 jobs were in some way related to cargo, cruise, seafood processing, and harbor tours/marina activity within the Port of Boston. Of these jobs:***

- 9,014 direct jobs were created by cargo, cruise, fish processing and harbor tours activity at the public and private terminals at the Port of Boston. Of these direct jobs, 3,979 direct jobs were created by the activity at the MASSPORT facilities;
- 7,531 induced jobs were supported by the local purchases by those directly employed. Of these 7,531 induced jobs, activity at MASSPORT facilities supported 3,105 jobs.
- 3,176 indirect jobs were created by the \$353.6 million of local purchases by the firms directly dependent upon the activity at the public and private facilities at the Port of Boston. Of the 3,176 indirect jobs, 1,554 jobs are generated by the local purchases made by the firms that are dependent upon the maritime activity at the MASSPORT facilities;

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## Economic Impact of the Port of Boston

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- 46,371 jobs are related jobs with users of the MASSPORT and private marine cargo terminals and the seafood processing activity at facilities leased from MASSPORT as well as private fish seafood processing operations. The 39,955 cargo jobs are classified as related jobs since they are with the importers and exporters using the public and private marine terminals. These jobs are considered to be related to activities at the Port, but the degree of dependence on the Port is difficult to estimate. If the marine terminals were not available to these organizations, they would suffer an economic penalty over the longer term. Such a penalty would vary from a loss of employment opportunities in some cases, to an increase in total transportation costs in other cases, which could in turn result in employment reductions. The majority of these related jobs, 35,630, are associated with the movement of containerized cargo at the Conley Marine Terminal, while the balance are associated with the liquid bulk and petroleum cargo moving via private terminals in the Port of Boston.

The seafood processing activity supported 6,416 jobs with related users employed in downstream logistics and retail sales operations.

The next section of this chapter is dedicated to the 9,014 jobs generated directly from maritime related activity in the Port of Boston. The induced and indirect jobs spin-off in the local and regional economy from the spending by the direct job holders and dependent businesses and the related shippers' jobs are discussed in subsequent sections of this chapter.

### **2. DIRECT JOB IMPACTS**

As a result of vessel, marine cargo, seafood processing, cruise passenger and harbor tour activities, and recreational boating in the Boston Harbor, 9,014 full-time dependent jobs were directly created by these activities at both public and private marine terminals in the Port<sup>4</sup>. Of these 9,014 direct jobs, 3,979 jobs were created by maritime activity at the public port facilities owned/operated by MASSPORT.

In this section, the direct port-dependent jobs are analyzed in terms of:

- Distribution by type of activity
- Distribution by type of jobs
- Distribution by commodity group
- Distribution by place of residence.

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<sup>4</sup> Jobs are measured in terms of full-time equivalent workers working 2,080 hours per year. If a worker is employed only 50 percent of the year, the job is reported as 0.5 direct jobs.

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## Economic Impact of the Port of Boston

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These distributions are developed in more detail below. The spin-off induced and indirect jobs, as well as the related jobs identified in this report cannot be distributed by type of job, commodity and residency.

### 2.1 Job Impacts by Type of Activity

Table 3 shows the impacts at the public and private marine terminals by type of activity – cargo, cruise, fish/seafood processing and harbor cruise/marina activity.

With respect to the activity at the MASSPORT public terminals, the cargo activity generates the majority of the economic impacts, 1,883 direct jobs, followed by 1,102 direct jobs created by the cruise activity at Flynn Cruiseport Boston. In 2018, there were 64 homeport calls, 87 ports of call, and nearly 390,000 cruise passengers. This activity included homeport cruises by Norwegian Cruise Line, Holland America Line, and Royal Caribbean Cruises, Ltd. Boston port-of-call cruises were offered by lines including Carnival Cruise Lines, Celebrity Cruises, Crystal Cruises, Cunard Cruise Line, Aida Cruises, Hurtigruten, Princess Cruises, P & O, Silversea Cruises, Seabourn Cruise Line, Oceania Cruises, Regent Seven Seas, and Viking Ocean Cruises. These operations created impacts in two key sectors of the economy – firms that provide services to the vessels while in port and firms in the local visitor industry such as hotels, restaurants and landside tours. The cruise operations at MASSPORT created 1,102 direct jobs, 490 induced jobs, and 596 indirect jobs, as well as \$116.1 million of total income and local consumption expenditures.

Fish and seafood processing by tenants of MASSPORT created the next largest economic impacts, generating 680 direct jobs, 466 induced jobs and 285 indirect jobs. The fish/seafood processing activity at MASSPORT created \$295.3 million of annual business revenue, as well as \$102.5 million of total personal income and local consumption expenditures.

MASSPORT tenants providing commercial harbor cruise activity created 314 direct jobs in the local economy, as well as 154 induced jobs and 148 indirect jobs. This includes the activities of Massachusetts Bay Lines and Spirit of Boston Harbor cruises operating out of World Trade Center Boston, and Boston Harbor Cruises sailing from Boston's Long Wharf.

With respect to the private terminals, cargo activity again generated the majority of the economic impacts, creating 3,519 of the 5,035 direct jobs in the Boston Harbor. Commercial seafood processing and fishing activity located at private facilities within Boston Harbor supported the next largest economic impact, 1,423 direct jobs.

## Economic Impact of the Port of Boston

**Table 3**  
**Economic Impacts Generated by Type of Activity**

IMPACTS	MASSPORT				Total MASSPORT	PRIVATE			Total Private	TOTAL				Port of Boston
	Cargo	Seafood	Harbor Tours	Cruises		Cargo	Seafood	Harbor Tours		Cargo	Seafood	Harbor Tours	Cruises	
<b>JOBS</b>														
<b>DIRECT</b>	1,883	680	314	1,102	3,979	3,519	1,423	92	5,035	5,402	2,104	406	1,102	9,014
<b>INDUCED</b>	1,994	466	154	490	3,105	3,405	976	45	4,426	5,400	1,442	199	490	7,531
<b>INDIRECT</b>	<u>525</u>	<u>285</u>	<u>148</u>	<u>596</u>	<u>1,554</u>	<u>981</u>	<u>597</u>	<u>43</u>	<u>1,621</u>	<u>1,506</u>	<u>882</u>	<u>192</u>	<u>596</u>	<u>3,176</u>
<b>TOTAL JOBS</b>	4,402	1,432	616	2,187	8,638	7,905	2,997	181	11,083	12,307	4,429	797	2,187	19,720
<b>PERSONAL INCOME (1,000)</b>														
<b>DIRECT</b>	\$142,454	\$37,683	\$10,990	\$34,482	\$225,609	\$236,502	\$78,850	\$3,220	\$318,571	\$378,955	\$116,533	\$14,210	\$34,482	\$544,180
<b>RE-SPENDING/CONSUMPTION</b>	\$254,508	\$50,058	\$13,005	\$40,804	\$358,375	\$422,534	\$104,744	\$3,810	\$531,088	\$677,042	\$154,802	\$16,815	\$40,804	\$889,463
<b>INDIRECT</b>	<u>\$32,668</u>	<u>\$14,716</u>	<u>\$7,412</u>	<u>\$40,804</u>	<u>\$95,600</u>	<u>\$61,067</u>	<u>\$30,793</u>	<u>\$1,708</u>	<u>\$93,567</u>	<u>\$93,735</u>	<u>\$45,509</u>	<u>\$9,119</u>	<u>\$40,804</u>	<u>\$189,168</u>
<b>TOTAL INCOME AND CONSUMPTION</b>	\$429,630	\$102,458	\$31,407	\$116,090	\$679,584	\$720,103	\$214,386	\$8,738	\$943,227	\$1,149,732	\$316,844	\$40,145	\$116,090	\$1,622,811
<b>BUSINESS REVENUE (1,000)</b>	\$350,350	\$295,303	\$55,822	\$94,681	\$796,156	\$370,939	\$621,444	\$16,356	\$1,008,739	\$721,289	\$916,748	\$72,178	\$94,681	\$1,804,895
<b>LOCAL PURCHASES (1,000)</b>	\$65,944	\$36,847	\$5,991	\$36,533	\$145,315	\$123,267	\$77,101	\$7,873	\$208,241	\$189,211	\$113,948	\$13,864	\$36,533	\$353,556
<b>STATE &amp; LOCAL TAXES (1,000)</b>	\$47,580	\$14,732	\$3,961	\$11,196	\$77,470	\$76,289	\$30,883	\$1,115	\$108,287	\$123,869	\$45,615	\$5,076	\$11,196	\$185,757
<b>FEDERAL TAXES (1,000)</b>	\$110,543	\$38,644	\$9,833	\$29,870	\$188,890	\$172,736	\$81,065	\$2,784	\$256,585	\$283,279	\$119,709	\$12,617	\$29,870	\$445,474
<b>RELATED USER IMPACTS</b>														
<b>JOBS</b>	35,630	2,012	NA	NA	37,642	4,325	4,405	NA	8,729	39,955	6,416	NA	NA	46,371
<b>PERSONAL INCOME (1,000)</b>	\$963,170	\$70,313	NA	NA	\$1,033,483	\$127,184	\$153,938	NA	\$281,122	\$1,090,354	\$224,251	NA	NA	\$1,314,605
<b>OUTPUT (1,000)</b>	\$2,965,420	\$670,453	NA	NA	\$3,635,874	\$412,855	\$1,442,917	NA	\$1,855,772	\$3,378,276	\$2,113,370	NA	NA	\$5,491,646
<b>STATE/LOCAL TAXES (1,000)</b>	\$141,523	\$13,802	NA	NA	\$155,325	\$19,028	\$29,959	NA	\$48,987	\$160,551	\$43,761	NA	NA	\$204,312
<b>FEDERAL TAXES (1,000)</b>	\$374,260	\$53,652	NA	NA	\$427,912	\$50,654	\$116,016	NA	\$166,670	\$424,914	\$169,668	NA	NA	\$594,583

Note: Totals may not add due to rounding

## Economic Impact of the Port of Boston

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### 2.2 Job Impacts by Type of Job

Table 4 presents the distribution of the 9,014 direct jobs by type of job. As this table shows, the largest job impacts are with seafood processing, followed by truckers bringing cargo to and from the private and public marine cargo terminals, as well as in seafood distribution supply chain.

**Table 4**  
**Direct Marine Activity Employment Impacts by Job Category**

	MASSPORT DIRECT JOBS	PRIVATE DIRECT JOBS	TOTAL DIRECT JOBS
SURFACE TRANSPORTATION			
RAIL	3	9	12
TRUCK	323	1,467	1,790
MARITIME SERVICES			
TERMINAL EMPLOYEES	458	447	905
ILA/DOCKWORKERS	375	21	396
TOWING	14	40	54
PILOTS	5	14	19
AGENTS	22	23	45
MARITIME SERVICES/FREIGHT FORWARDERS	97	128	225
WAREHOUSING/CONTAINER REPAIR	129	NA	129
GOVERNMENT	30	1,229	1,259
MARINE CONSTRUCTION/DREDGING	344	134	478
BARGE	NA	7	7
CRUISE	1,102	NA	1,102
SEAFOOD PROCESSING	680	1,423	2,104
HARBOR TOURS	314	92	406
PORT AUTHORITY*	<u>84</u>	<u>NA</u>	<u>84</u>
<b>TOTAL</b>	<b>3,979</b>	<b>5,035</b>	<b>9,014</b>

\*Note: Totals may not add due to rounding. Terminal employees with private terminals also include dockworkers. The ILA jobs are expressed in full time equivalents, rather than registered workers. Jobs held by MASSPORT employees dedicated to Conley Terminal are included in terminal jobs.

### 2.3 Cargo Job Impacts by Commodity

Most of the 5,402 direct jobs created by marine cargo activity at the public and private marine terminals are generated by the handling of specific commodities or commodity groups. Employment with certain types of firms and organizations such as federal, state and local government agencies, marine construction firms and maritime service firms, cannot be assigned

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## Economic Impact of the Port of Boston

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to specific commodity groups, and if such an assignment is made, it is often done so arbitrarily. Also, impacts generated by the non-cargo tenants (fish/seafood processing, cruise service, and harbor tours/marinas) are not allocated to specific commodities, nor included in this analysis of cargo generated jobs.

Table 5 presents the employment impacts in terms of commodity/commodity group and for maritime cargo activity at the Port of Boston public and private marine facilities.

**Table 5**  
**Distribution of Direct Marine Cargo Job Impact by Commodity**

<b>CARGO</b>	<b>DIRECT JOBS</b>
<b>CONTAINERS</b>	929
<b>SALT</b>	137
<b>FOOD OILS</b>	123
<b>AUTOS</b>	458
<b>SCRAP METAL</b>	211
<b>CEMENT</b>	49
<b>LNG</b>	87
<b>PETROLEUM</b>	1,393
<b>OTHER BULK</b>	63
<b>NOT ALLOCATED</b>	<u>1,952</u>
<b>TOTAL</b>	<b>5,402</b>

Note: Totals may not add due to rounding

This table indicates that petroleum products handled at the private terminals generated the largest number of direct jobs, 1,393 jobs (the majority of which are associated with the distribution of these products regionally); followed by containerized cargo handled at Conley Container Terminal. The majority of the 1,952 non-allocated jobs are with government agencies, specifically the U.S. Coast Guard.

### 2.4 Distribution of Direct Jobs by Place of Residence

Table 6 presents the distribution of the 5,402 direct cargo generated jobs by place of residency. This distribution is based on the results of the surveys conducted from the 254 businesses contacted by Martin Associates.

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**Table 6**  
**Distribution of Direct Cargo Generated Jobs by County/State of Residency**

RESIDENCE	SHARE	DIRECT JOBS
<b>MASSACHUSETTS</b>		
Bristol	4.60%	248
Essex	12.50%	675
Middlesex	22.22%	1,201
Norfolk	11.03%	596
Plymouth	6.72%	363
Suffolk	20.88%	1,128
Worcester	3.88%	209
Other Massachusetts	<u>1.19%</u>	<u>64</u>
<b>Total Massachusetts</b>	<b>83.02%</b>	<b>4,485</b>
<b>RHODE ISLAND</b>		
Bristol	0.36%	20
Kent	0.35%	19
Newport	0.23%	13
Providence	0.82%	44
Other Rhode Island	<u>3.76%</u>	<u>203</u>
<b>Total Rhode Island</b>	<b>5.52%</b>	<b>298</b>
<b>NEW HAMPSHIRE</b>		
Rockingham	2.72%	147
Strafford	0.61%	33
Other New Hampshire	<u>4.21%</u>	<u>227</u>
<b>Total New Hampshire</b>	<b>7.54%</b>	<b>407</b>
<b>OTHER U.S.</b>	<b>3.92%</b>	<b>212</b>
<b>TOTALS</b>	<b>100.00%</b>	<b>5,402</b>

Note: Totals may not add due to rounding

As this table shows, the majority of the direct cargo generated jobs (83 percent) are held by Massachusetts residents, with the largest concentration of direct job holders in Middlesex County, followed by Suffolk County and Essex County.

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Table 7 illustrates the residency of direct employees associated with fish and seafood processors. About 84 percent of the direct jobs generated by the seafood industry in the Port of Boston reside in Massachusetts, with a concentration in Suffolk, Essex and Middlesex counties.

**Table 7**  
**Distribution of Direct Seafood Processing Generated Jobs**

RESIDENCE	SHARE	DIRECT JOBS
<b>MASSACHUSETTS</b>		
Bristol	4.00%	84
Essex	22.44%	472
Middlesex	17.14%	361
Norfolk	6.11%	129
Plymouth	2.83%	60
Suffolk	27.95%	588
Worcester	2.09%	44
Other Massachusetts	<u>1.05%</u>	<u>22</u>
<b>Total Massachusetts</b>	<b>83.61%</b>	<b>1,759</b>
<b>RHODE ISLAND</b>		
Bristol	0.30%	6
Kent	0.38%	8
Newport	0.13%	3
Providence	0.37%	8
Other Rhode Island	<u>13.90%</u>	<u>292</u>
<b>Total Rhode Island</b>	<b>15.08%</b>	<b>317</b>
<b>NEW HAMPSHIRE</b>		
Rockingham	0.11%	2
Strafford	0.00%	0
Other New Hampshire	<u>0.94%</u>	<u>20</u>
<b>Total New Hampshire</b>	<b>1.04%</b>	<b>22</b>
<b>OTHER U.S.</b>	<b>0.27%</b>	<b>6</b>
<b>TOTALS</b>	<b>100.00%</b>	<b>2,104</b>

Note: Totals may not add due to rounding

Residency of cruise generated jobs is not estimated due to the fact that the cruise jobs are estimated from an expenditure model, based on passenger expenditures and vessel expenditures while in port.

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## Economic Impact of the Port of Boston

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### 3. *INDUCED JOBS*

The regional purchases made by the 9,014 direct job holders with the direct income earned from port activity create additional jobs throughout the New England region. In 2018, \$544.2 million was received by those 9,014 directly employed by seaport activity at the Port of Boston. As a result of the re-spending of a portion of this income for purchases in the region, an additional 7,531 induced jobs were generated. Of these 7,531 induced jobs, the MASSPORT public maritime facilities were responsible for 3,105 induced jobs.

These induced jobs are estimated based on the current expenditure profile of residents in the Boston Metropolitan Area as estimated by the U.S. Bureau of Labor Statistics, *Consumer Expenditure Survey*. This survey provides the distribution of consumer expenditures over key consumption categories for residents of the Boston Metropolitan Area. The consumption categories are:

- Housing
- Food at Restaurants
- Food at Home
- Entertainment
- Health Care
- Home Furnishings
- Transportation Equipment and Services

The estimated consumption expenditures generated as a result of the re-spending impact is distributed across these consumption categories. Associated with each consumption category is the relevant retail and wholesale industry. Jobs-to-sales ratios in each industry are then computed for the Boston Metropolitan Area, and induced jobs are estimated for the relevant consumption categories. Induced jobs are only estimated at the retail and wholesale level, since these jobs are most likely generated initially in the Boston Metropolitan Area. Further levels of induced jobs are not estimated since it is not possible to identify with certainty where the subsequent rounds of purchasing actually occur.

The *Consumer Expenditure Survey* does not include information to estimate the job impact with supporting business, financial, legal, social and educational services. To estimate this induced impact, a ratio of Commonwealth of Massachusetts employment in these key service industries to total Massachusetts employment was developed from the U.S. Bureau of Census. This ratio is then used with the direct and induced consumption jobs to estimate induced jobs with business/financial services, legal, educational and other social services.

### 4. *INDIRECT JOBS*

The firms directly dependent upon the vessel and cargo activity, seafood processing, cruise, harbor tours and marina activity at the private and MASSPORT owned public marine terminals in the Boston Harbor made \$353.6 million of purchases from local (in-region) suppliers of parts and

## Economic Impact of the Port of Boston

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equipment, business services, maintenance and repair services, communications and utilities, office equipment, and fuel. These purchases supported 3,176 local indirect jobs. Of the \$353.6 million of purchases made, \$145.3 million of the purchases supporting 1,554 indirect jobs were created by activity at MASSPORT marine facilities, while the activity at the private facilities created \$208.2 million of the purchases, supporting 1,621 of the total 3,176 indirect jobs.

If maritime activity within Boston Harbor ceased, these indirect jobs would also be lost. To estimate these indirect jobs, actual local expenditures by port-dependent firms were estimated from the telephone surveys. These local expenditures were used as inputs into a regional input-output model developed for the Commonwealth of Massachusetts for Martin Associates by the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System, 2017.

### **5. RELATED USER JOBS**

Related user jobs are jobs with shippers and consignees of containerized cargo moving via the MASSPORT cargo terminals as well as the private terminals and the seafood processors in the Boston Harbor. This impact incorporates the distribution and supply chain aspects of the shipper and consignee operations as well as value added services. It is to be emphasized that these users are related to the Port of Boston marine terminals in that if these facilities were not available, the users could ship and receive cargo via other ports. In fact, the majority of these users currently use multiple ports for export and import. Furthermore, the level of employment with the related users is driven by the demand for the products produced by these firms, and not as the result of providing cargo handling or vessel support services at the marine terminals. In contrast, the level of direct jobs generated by the public and private marine terminals is driven by the vessel and cargo activity. It is to be emphasized that in the long run, the fact that these users could no longer use the Port of Boston marine terminals would result in an increase in logistics costs. Therefore, it is possible that these importers and exporters in the Boston region could be lost from the region, as the importers and exporters move to areas nearby the other ports that are used.

To estimate the related user impact, Martin Associates identified the types of containerized cargo moving via the Port's terminals and the average value per ton of the specific key commodities. The data was developed from the U.S. Census Bureau's Foreign Trade Statistics. Based on interviews with the carriers serving the terminal, it is assumed that 95 percent, of the containerized cargo originates in, or is destined for, the New England area. A weighted average dollar value per ton of containerized cargo moving via the Port was next developed from this data for both imported and exported international containerized cargo.

For containerized cargo, employment to value of output coefficients for the sector in the New England region was computed from the Bureau of Economic Analysis, Regional Input-Output Model for the Massachusetts/New Hampshire/Rhode Island region. This coefficient includes direct, indirect and induced jobs required to deliver one dollar of containerized cargo

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through MASSPORT's Conley Terminal. Next, the average value per ton of containerized cargo was multiplied by the tons of containerized cargo handled at Conley Container Terminal and the share of containerized cargo that originated in or was destined for the region. The corresponding job, income and output coefficients associated with each type of containerized import or export commodity were developed from the U.S. Bureau of Economic Analysis RIMS II model data. Weighted average related jobs, income and output coefficients were developed for export containers and import containers to reflect the composition of containerized cargo moving via the Port of Boston. These coefficients were multiplied by the value of the containerized cargo for import and export containers) moving via the Port's container terminal (originating/destined in the region) to estimate the related jobs, income and output for containerized cargo. For imported retail cargo it is important to note that the retail margin was applied to the value of the imported products as it is the "value added" to the commodity that supports the related jobs in the regional economy. The job coefficients also account for the various stages involved in the wholesale process, including warehousing and distribution activities associated with the imported cargo.

Related jobs were also estimated for the petroleum products moving via the private marine terminals. This was based on the employment multiplier for petroleum products distribution in the Commonwealth of Massachusetts, as developed by the U.S. Bureau of Economic Analysis, RIMS II model and applied to the direct jobs. No related jobs were estimated for the automobiles since the exports are produced outside the New England region and hence no related jobs would be supported in the region.

Finally, the direct, induced and indirect job impacts associated with the international and domestic containerized cargo movements were subtracted from the total related jobs to avoid double counting, since the related jobs include job impacts at each stage of handling the imported and exported cargo, such as the port activity and the trucking and rail activity to move the cargo to and from the port and the induced and indirect jobs associated with the direct port activity.

Using this methodology, it is estimated that about 39,955 jobs are related to the cargo moving via the marine terminals at the Port of Boston. The majority of the related user jobs, 35,630, are associated with the containerized cargo moving via the Conley Container Terminal. The balance, 4,325 jobs, are related to the petroleum products moving via the private marine terminals.

Another 6,416 jobs are classified as related jobs and include downstream logistics operations involved in the seafood processing industry in 2018, such as the final delivery and sales at the wholesale and retail levels. The direct, induced and indirect jobs generated by the seafood industry in Boston are not included in this number of related jobs.

### III. REVENUE, INCOME AND TAX IMPACTS

The maritime activity at public and private marine terminals located in the Port of Boston generates revenue for the directly dependent firms. For example, revenue is received by surface transportation firms as a result of moving export cargo to the marine terminals and then distributing the imported commodities inland after receipt at the terminals. The firms in the maritime service sector receive revenue from arranging for transportation services, cargo handling, and providing services to vessels in port. Ship repair yards and marine construction firms receive revenue by providing repair services to vessels and new construction and repair work at the marine terminals. MASSPORT receives revenue from operations, user fees and leases at its properties. In addition, shippers/consignees receive revenue from the sales of cargo shipped or received via the Port of Boston marine cargo facilities and from the sales of products made with raw materials received through the Port. Since this chapter is concerned with the revenue generated from providing maritime services, the shipper/consignee revenue (i.e., the value of the cargo shipped or received through the Port) will be excluded from the remaining discussion. Similarly, steamship lines' revenue from the ocean line haul portion of the cargo movements is excluded from the revenue impact, since very few vessels calling the Port are American flag vessels, and it is not likely that a large portion of the revenue from ocean transportation remains in the local or even national economy.

The revenue generated by port activity consists of many components. For example, gross revenue is used to pay employee salaries and taxes, it is distributed to stockholders, and it is used for the purchases of equipment and maintenance services. Of these components, only three can be isolated geographically with any degree of accuracy. The personal income component of revenue can be traced to geographic locations based on the residence of those receiving the income. The local purchases by firms dependent upon maritime activity at marine terminals in Boston Harbor are identified through the interviews and used to estimate the indirect job impacts. Finally, state and local taxes paid by individuals and businesses can be traced to a geographic location based on the residency of the individuals directly employed and the location of the firms dependent on maritime activity. The balance of the revenue is distributed in the form of non-local payments to firms providing goods and services to the six sectors, for the distribution of company profits to shareholders and to payment of federal taxes. Many of these firms and owners are located outside of the New England region, and, thus, it is difficult to trace the ultimate location of the distributed revenue (other than personal income, taxes and local purchases).

#### 1. ***TOTAL ECONOMIC ACTIVITY***

The revenue impact is a measure of the ***total economic activity*** in the Commonwealth that is ***related to*** the maritime activity at the MASSPORT marine facilities, as well as the private facilities within the Boston Harbor. In 2018, a total of \$8.2 billion of economic activity in the region was related to the maritime activity at the public and private marine terminals in the Boston

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Harbor. Of the \$8.2 billion, \$1.8 billion is the direct business revenue received by the firms directly dependent upon the Port and providing maritime services and inland transportation services to the cargo handled at the marine terminals and the vessels calling the port, as well as the cruise activity, seafood processing and harbor tours. The second component is the \$889.5 million, which is the re-spending of personal income/local consumption impact generated by the maritime activity at the public and private terminals. The remaining nearly \$5.5 billion represents the value of the output to the New England Region that is created due to the maritime activity at the public and private marine cargo terminals. This includes the value added at each stage of producing an export cargo and the value added at each stage of production for the firms using imported raw materials and intermediate products, as well as consumer products that flow via the marine terminals and are consumed by industries and individuals within the region. Also included in the value of output is the distribution and support activity, including retail and wholesale activity associated with the seafood processing operations at the Port of Boston.

The balance of the discussion focuses on the more than \$1.8 billion of direct business revenue generated from the provision of services to the cargo, cruise, seafood processing and harbor tours/marinas at the MASSPORT public and private marine terminals.

### **2. *DIRECT REVENUE IMPACT***

In 2018, maritime activity at public and private facilities in the Boston Harbor generated \$1.8 billion of total revenue in the New England region. Activity at the MASSPORT public facilities generated \$796.2 million of revenue, while activity at the private terminals created \$1.0 billion of revenue.

Table 8 presents the revenue impact generated by impact category for maritime activity at public and private terminals.

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**Table 8**  
**Total Revenue Generated by Port Activity**  
**(Thousands of Dollars)**

	MASSPORT	PRIVATE	REVENUE (1,000)
SURFACE TRANSPORTATION			
RAIL	\$4,192	\$11,122	\$15,314
TRUCK	\$109,143	\$233,006	\$342,149
MARITIME SERVICES			
TERMINAL	\$94,786	\$66,856	\$161,642
TOWING	\$1,888	\$5,568	\$7,455
PILOTS	\$3,037	\$5,814	\$8,851
AGENTS	\$1,243	\$3,665	\$4,908
MARITIME SERVICES/FREIGHT FORWARDERS	\$17,538	\$16,676	\$34,214
WAREHOUSING/CONTAINER REPAIR	\$22,488	\$2,285	\$24,773
GOVERNMENT	NA	NA	NA
MARINE CONSTRUCTION/DREDGING	\$96,037	\$24,744	\$120,781
BARGE	NA	\$1,202	\$1,202
CRUISE	\$94,681	NA	\$94,681
SEAFOOD PROCESSING	\$295,303	\$621,444	\$916,748
HARBOR TOURS	\$55,822	\$16,356	\$72,178
<b>TOTAL</b>	<b>\$796,156</b>	<b>\$1,008,739</b>	<b>\$1,804,895</b>

Note: Totals may not add due to rounding. MASSPORT revenue received from cruise operations, marine cargo terminal operations and from seafood tenants are included with the total revenues from cruise operations, marine cargo terminal operations, and seafood tenants, respectively.

Seafood processing operations generated the largest revenue impact followed by trucking, terminal operations, marine construction and cruise operations.

The revenue generated by the surface transportation sector is based on the relevant modal rate for a commodity multiplied by the tonnage of that commodity moved to and from the marine terminals by the specified mode. The share of each commodity transported by each mode was estimated from interviews with the terminal operators handling the respective commodities. The relative modal shares were then applied to the port tonnage (or units) of the specific cargo. Average truck, rail and pipeline rates were obtained from the steamship lines, automobile processors and transporters, and shippers/consignees.

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The stevedores and terminal operators including MASSPORT received \$161.6 million in revenue from handling the cargo and loading and discharging ships, while the marine construction firms received \$120.8 million.

### **3. PERSONAL INCOME IMPACTS**

The direct job holders received \$544.2 million of direct income. The income impact is estimated by multiplying the average annual earnings of each port participant, i.e., railroad employees, truckers, steamship agents, freight forwarders, etc., by the corresponding number of jobs in each category. Of the \$544.2 million of income received, \$225.6 million was generated by cargo, cruise, seafood processing and harbor tours at MASSPORT facilities.

Based on data developed by the U.S. Bureau of Economic Analysis<sup>5</sup>, a separate income multiplier was developed for each maritime line of business. Overall, for every dollar of direct personal income earned, an additional \$1.634 of income would be created as a result of re-spending the direct income for purchases of goods and services in the region. This multiplier effect results in a re-spending/local consumption impact of \$889.5 million of personal income and consumption expenditures with business and service providers located throughout the New England region. This additional re-spending of the direct income generates the induced job impact of 7,531 jobs described in the previous chapter.

The indirect job holders received \$189.2 million of personal wages and salaries. Combining the direct, induced and indirect income impacts, maritime activity in Boston Harbor created \$1.6 billion of wages and salaries and local consumption expenditures. The MASSPORT owned and leased marine terminals created \$679.6 million of the total \$1.6 billion personal total income/local consumption impact.

### **4. LOCAL PURCHASES**

The firms directly dependent upon the maritime activity at the public and private terminals in the Boston Harbor made \$353.6 million of purchases locally. These purchases were for maintenance and repair services, utilities, communications services, office products, parts and equipment, fuel, etc. The \$353.6 million of purchases generated the 3,176 indirect jobs.

### **5. TAX IMPACTS**

Federal, state and local tax impacts are based on state and local tax burdens for the Commonwealth of Massachusetts, which are developed from data provided by the Tax Foundation and the U.S. Bureau of Census State and Local Government Finances.<sup>6</sup> Maritime activity at the

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<sup>5</sup> U.S. Department of Commerce, Bureau of Economic Analysis, RIMS II. 2017/2007.

<sup>6</sup> The Tax Foundation is an educational organization formed in 1937 to provide American citizens with a better

## Economic Impact of the Port of Boston

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public and private marine terminals in the Boston Harbor generated nearly \$185.8 million of state and local taxes, and \$445.5 million of federal taxes. Of the total state and local taxes generated, about 61.8 percent were collected at the state level, while the balance was collected at the local level. Of the total tax impact, about 33 percent consists of personal state income tax revenue, while 5.3 percent consists of state corporate tax revenue.

In addition to the state and local tax payments generated by seaport activity, \$2.2 million in payments in lieu of taxes were made by MASSPORT to local cities and towns.

#### **IV. COMPARISON WITH 2012 ECONOMIC IMPACTS**

The last economic impact study conducted for the maritime activities at the public and private marine terminals in the Boston Harbor was conducted in 2013 by Martin Associates. This study was based on 2012 Port of Boston cargo, cruise, harbor tours and seafood processing activity levels at both MASSPORT and private facilities within Boston Harbor. The same methodology was used on this current study as was used in the previous study, thus facilitating direct comparisons.

Table 9 presents a summary of the changes in economic impacts between 2018 and 2012. As this table demonstrates, total direct, induced and indirect jobs increased by 3,364 jobs over the six-year period. Direct business revenue grew by \$559.2 million, while total direct, induced and indirect income and local consumption expenditures grew by \$497.0 million. Local purchases made by firms directly dependent on the public and private marine terminals increased by \$91.8 million. State and local taxes grew by \$49.5 million while federal taxes grew by \$242.8 million. The growth in federal taxes reflects the inclusion of federal corporate income tax that was not included in the 2013 study, which added an additional 7 percent to the federal tax index.

Direct cargo jobs grew by 828 direct jobs, reflecting the growth in containerized cargo, autos, scrap and salt handled at the Port. Seafood impacts increased significantly due to growth in activity and employment levels at these operations, and the inclusion of a downstream logistics impacts, particularly the trucking distribution activity of the processors, both MASSPORT tenants as well as non-tenant seafood processors located in Boston.

Cruise impacts grew slightly by about 130 direct jobs, as cruise passengers increased to nearly 390,000 passengers in 2018. The number of sailings increased from 117 to 151. In 2012, the majority of vessel calls were by smaller coastal ships, and these vessels typically made Boston a port of call, rather than a homeport. In 2018, the cruise vessels increased in size and the number of homeport calls increased.

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**Table 9**  
**Comparison of Economic Impacts**

	Total 2018	Total 2012	Change
<b>JOBS</b>			
DIRECT	9,014	7,091	1,923
INDUCED	7,531	6,665	866
INDIRECT	<u>3,176</u>	<u>2,601</u>	<u>575</u>
TOTAL JOBS	19,720	16,356	3,364
<b>PERSONAL INCOME (1,000)</b>			
DIRECT	\$544,180	\$335,952	\$208,229
RE-SPENDING/CONSUMPTION	\$889,463	\$657,872	\$231,590
INDIRECT	<u>\$189,168</u>	<u>\$131,989</u>	<u>\$57,179</u>
TOTAL INCOME AND CONSUMPTION	\$1,622,811	\$1,125,813	\$496,998
<b>BUSINESS SERVICES REVENUE (1,000)</b>	\$1,804,895	\$1,245,700	\$559,195
<b>LOCAL PURCHASES (1,000)</b>	\$353,556	\$261,709	\$91,847
<b>STATE &amp; LOCAL TAXES (1,000)</b>	\$185,757	\$136,223	\$49,533
<b>FEDERAL TAXES (1,000)</b>	\$445,474	\$202,646	\$242,828

Note: Totals may not add due to rounding

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**Table 10**  
**Comparison of Economic Impacts by Line of Business**

	Marine Cargo 2018	Marine Cargo 2012	Change	Cruise 2018	Cruise 2012	Change	Seafood 2018	Seafood 2012	Change	Harbor/ Marina 2018	Harbor/ Marina 2012	Change	Total 2018	Total 2012	Change	
<b>JOBS</b>																
DIRECT	5,402	4,574	828	1,102	971	130	2,104	1,454	650	406	91	315	9,014	7,091	1,923	
INDUCED	5,400	5,052	347	490	480	10	1,442	1,066	376	199	66	133	7,531	6,665	866	
INDIRECT	<u>1,506</u>	<u>1,284</u>	<u>222</u>	<u>596</u>	<u>510</u>	<u>86</u>	<u>882</u>	<u>780</u>	<u>102</u>	<u>192</u>	<u>26</u>	<u>166</u>	<u>3,176</u>	<u>2,601</u>	<u>575</u>	
TOTAL JOBS	12,307	10,910	1,397	2,187	1,962	225	4,429	3,301	1,128	797	184	613	19,720	16,356	3,364	
<b>PERSONAL INCOME (1,000)</b>																
DIRECT	\$378,955	\$254,937	\$124,018	\$34,482	\$27,228	\$7,254	\$116,533	\$49,462	\$67,071	\$14,210	\$4,324	\$9,886	\$544,180	\$335,952	\$208,229	
RE-SPENDING/CONSUMPTION	\$677,042	\$524,814	\$152,228	\$40,804	\$35,475	\$5,329	\$154,802	\$91,950	\$62,852	\$16,815	\$5,634	\$11,181	\$889,463	\$657,872	\$231,590	
INDIRECT	<u>\$93,735</u>	<u>\$75,086</u>	<u>\$18,649</u>	<u>\$40,804</u>	<u>\$16,840</u>	<u>\$23,964</u>	<u>\$45,509</u>	<u>\$38,649</u>	<u>\$6,860</u>	<u>\$9,119</u>	<u>\$1,413</u>	<u>\$7,706</u>	<u>\$189,168</u>	<u>\$131,989</u>	<u>\$57,179</u>	
TOTAL INCOME AND CONSUMPTION	\$1,149,732	\$854,838	\$294,895	\$116,090	\$79,543	\$36,547	\$316,844	\$180,061	\$136,783	\$40,145	\$11,371	\$28,773	\$1,622,811	\$1,125,813	\$496,998	
<b>BUSINESS SERVICES REVENUE (1,000)</b>	\$721,289	\$476,399	\$244,890	\$94,681	\$55,999	\$38,682	\$916,748	\$695,012	\$221,736	\$72,178	\$18,291	\$53,887	\$1,804,895	\$1,245,700	\$559,195	
<b>LOCAL PURCHASES (1,000)</b>	\$189,211	\$139,275	\$49,936	\$36,533	\$27,739	\$8,794	\$113,948	\$86,224	\$27,724	\$13,864	\$8,472	\$5,392	\$353,556	\$261,709	\$91,847	
<b>STATE &amp; LOCAL TAXES (1,000)</b>	\$123,869	\$103,435	\$20,434	\$11,196	\$9,625	\$1,572	\$45,615	\$21,787	\$23,828	\$5,076	\$1,376	\$3,700	\$185,757	\$136,223	\$49,533	
<b>FEDERAL TAXES (1,000)</b>	\$283,279	\$153,871	\$129,408	\$29,870	\$14,318	\$15,553	\$119,709	\$32,411	\$87,298	\$12,617	\$2,047	\$10,570	\$445,474	\$202,646	\$242,828	

## Economic Impact of the Port of Boston

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