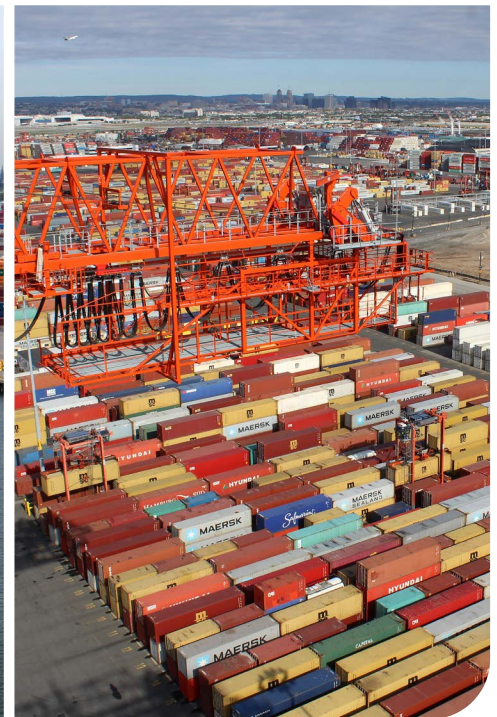


# A 21<sup>st</sup> Century Supply Chain Critical to the Region and Nation



## The 2020 Report on the Economic Value of the New York-New Jersey Port Industry

Prepared by:

**Anne Strauss-Wieder**

Director, Freight Planning

North Jersey Transportation Planning Authority

*As a member of the Council on Port Performance*



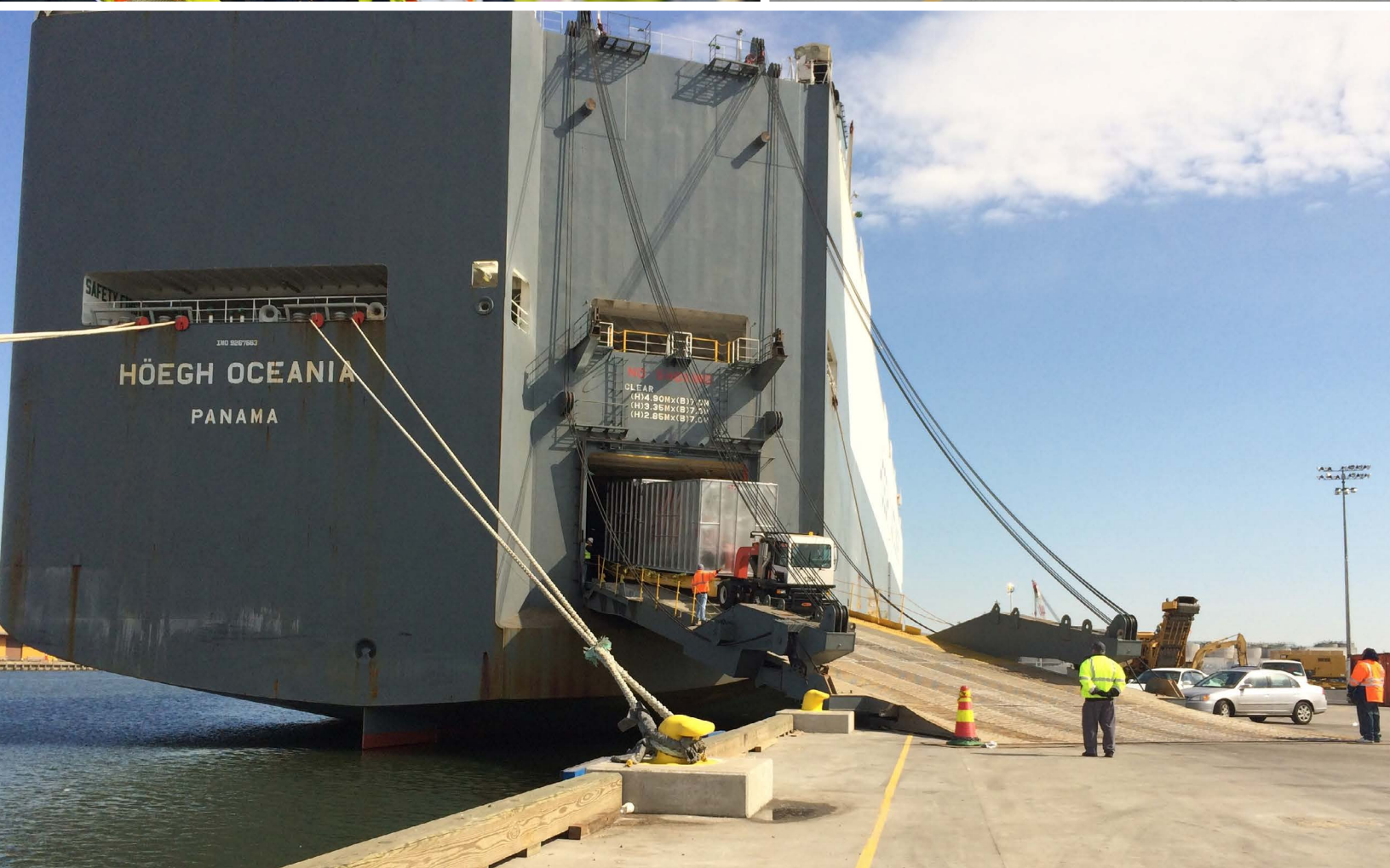
*A Collaborative Effort  
for a Collective Change*

*In collaboration with the New York Shipping Association  
and our Port Partners*



**July 2020**





# A 21<sup>st</sup> Century Supply Chain Critical to the Region and Nation

## The 2020 Report on the Economic Value of the New York-New Jersey Port Industry



**John J. Nardi**  
President

New York Shipping Association, Inc.

Once again, the significant economic growth and contribution the Port of New York and New Jersey makes to this region is demonstrated in this the 8th iteration of the Economic Impact Study of the New York-New Jersey Port Industry.

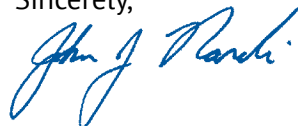
Unique to this report is that as it is being published, we are in the midst of the Covid-19 pandemic. During this time the port and the related supply chain have remained open and operating at an optimum level showing resilience to supply much needed, goods and services to the region as a whole.

The value of this study as a resource is noteworthy, especially when you hear the facts and figures often referenced in speeches or see it quoted in national and international publications. However, more importantly, these numbers provide a quantitative measurement of the jobs, incomes, production of goods and services and revenue for the respective states and federal government produced by the maritime activities taking place in the region. Clearly the regional economy is interwoven with the Port.

When decisions are being made in terms of investment in infrastructure that connects the Port to the roads, rails and bridges that facilitate the movement of cargo, there is no more important and necessary information to emphasize the critical connection.

As we look towards continued growth in cargo and port efficiencies, we will continue to evolve in the Port of New York and New Jersey to remain a substantial, lasting and stable economic driver for our regional economy, and a lifeline for goods and services in our most challenging times.

Sincerely,



John J. Nardi  
President

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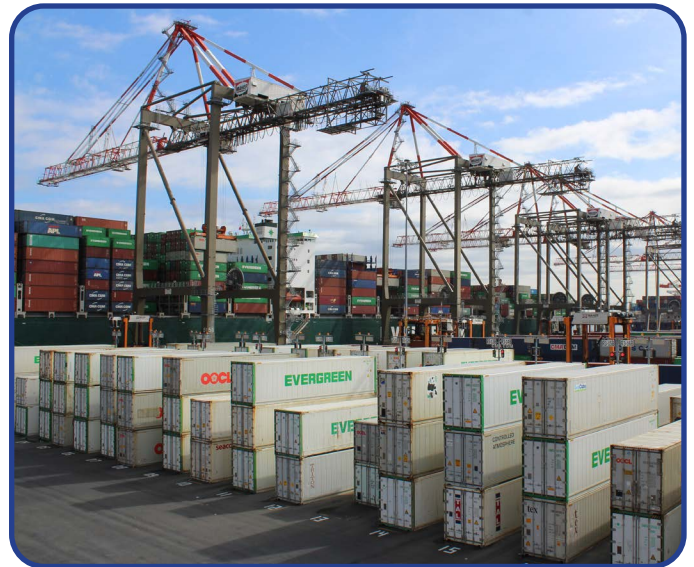
## EXECUTIVE SUMMARY

Since the analysis for this report began, the context has dramatically shifted. A pandemic has swept the globe, with significant impacts on the health and well-being of communities and significant disruptions to economies and trade. The pandemic has also highlighted the importance of supply chains to provide critical goods and to pivot as demands shift.

Without the dedication of the supply chain workforce, the many collaborations, and the public and private investments that were made, the efficient movement of goods would not happen. This report is dedicated to all the individuals who are keeping the freight flowing.

The 2020 report summarizes two regional economic impact streams generated by the port industry –

- ◆ The ongoing economic value of port operations based on the 2019 cargo and passenger flows
- ◆ The economic value associated with the billions of public and private dollars invested in port-related infrastructure from 2014 through 2019



### Generating Value for the Region

In 2019, the New York-New Jersey port industry fully solidified the region's position as one of the leading distribution platforms for North America. In terms of container volume, in 2019, the Port was both the largest operation on the Atlantic Coast and the second largest container port in the United States. In addition, more cruise vessels called, and the region's industrial space continued to increase with millions of square feet added and fully occupied. What was glimpsed at in 2014 and more evident in 2016 became fully realized in 2019.

In 2019, the region's maritime facilities handled:

- ◆ Nearly 7.5 million twenty-foot equivalent containers (TEUs)
- ◆ Close to 578,000 vehicles
- ◆ Nearly 50 million tons of bulk cargo
- ◆ Nearly 102,000 tons of breakbulk cargo
- ◆ 304 cruise vessels

The port industry's total impact grew substantially, with over 506,000 jobs supported, an increase over the nearly 400,000 jobs supported in 2016, the 336,600 supported in 2014, and the 296,000 jobs supported in 2012. The impacts generated by port industry operations included:

- ◆ 239,100 direct jobs
- ◆ 506,350 total jobs in the region
- ◆ Over \$36.1 billion in personal income
- ◆ More than \$99.5 billion in business activity
- ◆ Close to \$12 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$4.4 billion and federal tax revenues of nearly \$7.6 billion

The Port Industry's impact grew from 400,000 jobs in 2016 to 506,350 jobs in 2019

## Investments that Set the Stage

The cargo and passenger flows efficiently handled in 2019 would not have been possible without the significant investments made in the Port. From 2014 through 2019, public agencies and private port operations invested close to \$2.9 billion in waterside, terminal and landside infrastructure and equipment. The investments reshaped and repositioned the Port to meet 21st century needs. The largest single investment was the raising of the Bayonne Bridge. Additional significant investments were made in terminal buildings and berths, cargo handling equipment, intermodal rail infrastructure, roadways, security, and information systems.

The ongoing value associated with making these investments is exemplified in the ability of the Port to handle the new larger neo-Panamax vessels and expedite the efficient movement of cargo between the vessels and locations throughout the region and North America, as well as the associated economic impacts for the region. Please note that 2019 was not the conclusion of the investments in the Port; additional significant investments continue to be made, such as new gates at some terminals.

At the same time, the investments generate one-time economic impacts within the region through the purchase of materials and labor. “One-time” refers to the fact that once construction is completed, the workers move on to their next project; the work is not ongoing. Equipment is a one-time purchase, similar to purchasing a private car.

The total one-time economic impact over the 2014-2019 construction and investment period for the 31-county region was:

- ◆ Nearly 14,400 direct jobs
- ◆ Close to 25,200 total jobs in the region
- ◆ \$2 billion in personal income
- ◆ \$4.9 billion in business activity
- ◆ \$607 million in federal, state, and local tax revenues, with local and state tax revenues of \$207 million and federal tax revenues of \$400 million

“Total” refers to the cumulative impacts for the five years.

The pandemic has changed the world. As we move towards recovering and renewing, the criticality of supply chains and the value of the investments that have been made in the region’s freight infrastructure have been proven during the crisis and provide a strong foundation as we move forward.

The 2014–2019  
construction and  
investment period  
resulted in \$4.9 billion  
in business activity



## INTRODUCTION

The world has changed since this analysis began. A global pandemic has affected millions of people, altered the economic and international trade context, and placed new demands on our supply chains. The New York-New Jersey Port, which has been investing in improvements and fully utilizing the collaborations started following Superstorm Sandy, took on a key role in ensuring the flow of critical supplies as well as maintaining operations in a highly disruptive situation. As the region and nation move towards recovery and a new context, the economic analysis of the Port highlights the critical role that the maritime industry plays in ensuring the continued momentum of the region and creating opportunities for the future.

The 2020 report summarizes two regional economic impact streams generated by the port industry –

- ◆ The ongoing economic value of port operations based on the 2019 cargo and passenger flows
- ◆ The economic value associated with the billions of public and private dollars invested in port-related infrastructure from 2014 through 2019

The report is the latest in a continuing series of economic impact assessments produced by the New York Shipping Association, Inc., with the input and the support of the port community. The North Jersey Transportation Planning Authority, a member of the Council on Port Performance, performed the current assessment, continuing the consistent methodology used for nearly 40 years.

The 2020 analysis continues using the regional definition that includes counties in Southern New Jersey and Eastern Pennsylvania where warehouses and distribution centers are closely tied to the New York-New Jersey Port. The 31-County region includes:

- ◆ 12 counties in New York State: Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, and Westchester
- ◆ 15 New Jersey counties: Bergen, Burlington, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren
- ◆ Four PA counties: Northampton, Lehigh, Monroe, and Pike Counties

The 2020 assessment also uses the latest economic impact model base from IMPLAN. Similar to previous assessments, a Multi-Region Input-Output (MRIO) model was built on this IMPLAN platform for this analysis. The version of the IMPLAN platform used, as described in the Appendix, is based on 2018 economic data, and uses 2020 dollars. In addition, detailed information was collected from port organizations and other sources for this assessment. Accordingly, the report reflects how the industry operated in 2019.

### The 31-County New York-New Jersey-Pennsylvania Region





## THE ECONOMIC VALUE GENERATED IN 2019

By 2019, the significant improvements to the waterside, terminal and landside infrastructure of the Port were completed and online. With these investments and the collaborations that proactively worked on enhancing performance and opportunities, the New York-New Jersey port industry fully solidified the region's position as one of the leading distribution platforms for North America.

For example, in terms of container volume, the Port was not only the largest operation on the Atlantic Coast in 2019. The New York-New Jersey maritime facilities also became the second largest container port in the United States. In addition, more cruise vessels called, and the region's industrial space continued to increase with millions of square feet added and fully occupied. What was glimpsed at in 2014 and more evident in 2016 became fully realized in 2019.

The economic impact assessment of ongoing port-related activities in 2019 provides a snapshot of the contributions made by the industry as measured in jobs, personal and business income and tax revenues supported. This economic value is ongoing, which means that the jobs and revenues generated are sustained by the continuing activities of the port industry. As those activities grow and change, the economic value generated reflect the new conditions.

### A Leading Supply Chain Platform for North America

In 2019, the New York-New Jersey Port handled:

- ◆ Nearly 7.5 million twenty-foot equivalent containers (TEUs)
- ◆ Close to 578,000 vehicles
- ◆ Over 49.8M tons of bulk cargo
- ◆ Nearly 140,000 tons of breakbulk cargo
- ◆ 304 cruise vessels

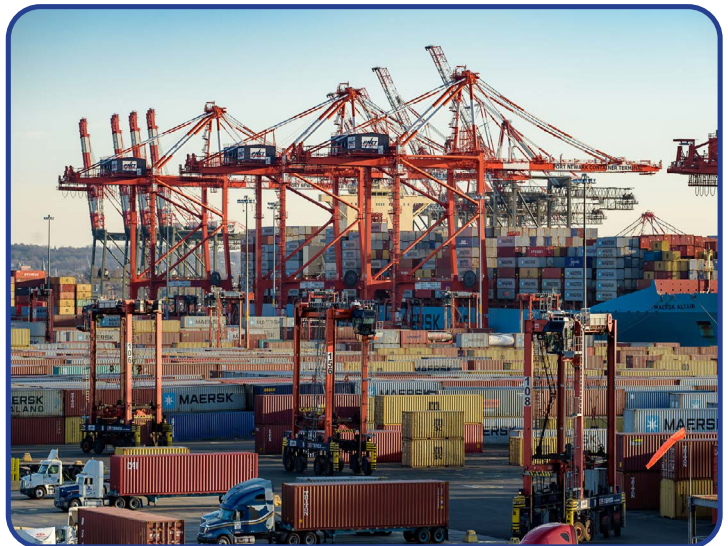
In general, maritime operations through the Port have increased since 2016 with:

- ◆ Nearly 1.2 million additional TEUs handled
- ◆ Over 2 million additional tons of bulk cargo
- ◆ More than 40 more cruise vessel calls

Cruise vessel calls and passenger growth were particularly strong in New Jersey, with a nearly 25% growth in vessel calls and over 35% growth in passenger volumes. Pre- and post-cruise spending by passengers and crew also declined. Both these trends affect the economic impacts within the region.

At the same time, the industrial real estate grew substantially between 2016 and 2019. In the New Jersey portion of the region alone, overall industrial space capacity grew by 19 million square feet to 830 million square feet with more than 10 million additional square feet under construction at the end of 2019.<sup>1</sup> The Lehigh Valley portion of the region had nearly 130 million of industrial space at the end of 2019 (up from 98 million square feet of total industrial space at the end of 2016), with 4 million additional square feet under construction.<sup>2</sup>

Not all of the new space is related to the Port. E-commerce fulfillment and food and beverage product distribution were among the major occupiers of the space. While this economic impact assessment took a conservative approach to identifying and including port-related industrial space, it was clear that many of these occupiers made use of the Port as evidenced by the growth in container volumes and the 85% market share of trucks moving containers between the Port and their first place of rest.



<sup>1</sup> Source: CBRE

<sup>2</sup> Ibid



The port industry's total impact grew substantially, with over 506,000 jobs supported, an increase over the nearly 400,000 jobs supported in 2016, the 336,600 supported in 2014, and the 296,000 jobs supported in 2012. The impacts generated by port industry operations included:

- ◆ 239,100 direct jobs
- ◆ 506,350 total jobs in the region
- ◆ Over \$36.1 billion in personal income
- ◆ More than \$99.5 billion in business activity
- ◆ Close to \$12 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$4.4 billion and federal tax revenues of nearly \$7.6 billion

The detailed economic impacts are shown in the figure below:

### The 2019 On-Going Regional Economic Value of the Port in the 31-County Region

Use	Direct Employment	Total Employment	Personal Income	Business Activity	State and Local Taxes	Federal Tax Revenue	Total Tax Revenues
Bulk	3,417	19,110	\$ 1,960.0	\$ 6,011.6	\$ 268.5	\$ 408.8	\$ 677.3
Breakbulk	210	760	\$ 70.2	\$ 210.4	\$ 9.5	\$ 14.6	\$ 24.2
Roll-On/Roll-Off	1,224	5,059	\$ 490.5	\$ 1,472.5	\$ 67.0	\$ 62.4	\$ 129.4
Container	29,180	88,156	\$ 7,958.5	\$ 22,782.0	\$ 1,096.3	\$ 1,654.1	\$ 2,750.4
Cruise	2,469	4,100	\$ 287.5	\$ 762.4	\$ 60.6	\$ 57.9	\$ 118.5
Warehousing	178,731	323,610	\$ 18,705.7	\$ 49,554.7	\$ 2,086.4	\$ 4,030.6	\$ 6,117.0
Freight Forwarding	10,078	22,367	\$ 1,834.5	\$ 4,762.1	\$ 212.9	\$ 366.9	\$ 579.8
HQ and other maritime fcns	4,800	16,504	\$ 1,698.8	\$ 4,829.3	\$ 228.9	\$ 340.9	\$ 569.8
Government	2,752	6,644	\$ 667.4	\$ 1,625.1	\$ 13.2	\$ 127.6	\$ 140.8
Insurance	3,323	11,923	\$ 1,305.3	\$ 4,402.5	\$ 197.8	\$ 275.9	\$ 473.7
Banking	2,932	8,118	\$ 1,153.8	\$ 3,131.7	\$ 146.6	\$ 237.8	\$ 384.4
<b>TOTAL ECONOMIC IMPACT</b>	<b>239,116</b>	<b>506,350</b>	<b>\$ 36,132.1</b>	<b>\$ 99,544.4</b>	<b>\$ 4,387.6</b>	<b>\$ 7,577.5</b>	<b>\$ 11,965.2</b>

*In millions of 2020 dollars*

**Note that the total impacts include direct, indirect, and induced effects**

The decline in direct employment in headquarter and other maritime functions, along with a slight decline in the direct employment in containerized cargo largely stemmed from the business changes that occurred between 2016 and 2019 including consolidations, restructuring of operations and bankruptcies. Examples include:

- ◆ The May 2017 consolidation of Kawasaki Kisen Kaisha, Ltd. (Kline), Mitsui O.S.K. Lines, Ltd. (MOL), and Nippon Yusen Kabushiki Kaisha (NYK) ocean carriers with the joint venture selecting Richmond, VA for its North Atlantic headquarters.<sup>3</sup>
- ◆ Repercussions from the Hanjin Shipping bankruptcy, which became final in February 2017 with the company then liquidated.<sup>4</sup> Hanjin's office was located in Paramus, NJ.

However, since 2016, hundreds of additional workers were also hired at the Port to handle the large increase in containerized cargo.

<sup>3</sup> Notice of Trade Name and Location of New Container Shipping Joint Venture, May 31, 2017. Available at: <https://www.mol.co.jp/en/pr/2017/img/17035.pdf>

<sup>4</sup> The end of Hanjin Shipping - officially declared bankrupt, February 17, 2017. Available at: <https://www.seatrade-maritime.com/americas/end-hanjin-shipping-officially-declared-bankrupt>

## ECONOMIC VALUE GENERATED THROUGHOUT THE REGION

The wide range of activities directly involving cargo and passenger movements through the region's port include physical activities, information and financial flows, transportation arrangements, and governmental agencies. These activities are throughout New York and New Jersey and extend into Pennsylvania, primarily in the Lehigh Valley area.

### State of New Jersey

In the State of New Jersey, the port industry in 2019 supported:

- ◆ Nearly 205,000 direct jobs
- ◆ Over 428,300 total jobs in the State
- ◆ More than \$29.3 billion in personal income
- ◆ Nearly \$80.4 billion in business activity
- ◆ Nearly \$9.8 billion in federal, state, and local tax revenues, with local and state tax revenues of close to \$3.5 billion and federal tax revenues of nearly \$6.3 billion

Over 428,300  
total jobs  
in the State

### New York City

In New York City, the port industry supported in 2019:

- ◆ Nearly 17,000 direct jobs
- ◆ 44,800 total jobs in the City
- ◆ More than \$4.9 billion in personal income
- ◆ \$14.2 billion in business activity
- ◆ \$1.65 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$720 million and federal tax revenues of over \$930 million

\$14.2 billion in  
business activity

### State of New York

In the State of New York (including New York City), the port industry supported in 2019:

- ◆ 23,300 direct jobs
- ◆ 59,700 total jobs in the State
- ◆ \$5.9 billion in personal income
- ◆ Nearly \$17.2 billion in business activity
- ◆ Over \$2 billion in federal, state, and local tax revenues, with local and state tax revenues of close to \$890 million and federal tax revenues of over \$1.1 billion

59,700 total  
jobs in the State

### Lehigh Valley

In the Lehigh Valley Area of Pennsylvania, the New York-New Jersey port industry supports warehousing and distribution center activities estimated to include:

- ◆ 23,000 direct jobs
- ◆ 42,800 total jobs in the four counties included in the Lehigh Valley area of the region
- ◆ Nearly \$2.2 billion in personal income
- ◆ Nearly \$5.8 billion in business activity
- ◆ Close to \$638 million in federal, state, and local tax revenues, with local and state tax revenues of nearly \$199 million and federal tax revenues of nearly \$439 million.

Nearly  
\$2.2 billion in  
personal income

# THE STAGE SET WITH MULTIMODAL INVESTMENTS

The cargo and passenger flows efficiently handled in 2019 would not have been possible without the significant investments made in the Port. From 2014 through 2019, public agencies and private port operations invested close to \$2.9 billion in waterside, terminal and landside infrastructure and equipment. The largest single investment was the raising of the Bayonne Bridge to enable neo-Panamax vessels to call on all the container terminals in the harbor. Additional significant investments were made in terminal buildings and berths, cargo handling equipment, intermodal rail infrastructure, roadways, security, and information systems. The cumulative investments during the five years are summarized in the figure below:

## Port Investments Made in 2014 through 2019

Investment Type	Amount Spent 2014-2019
Waterside Investments	\$131.8
Terminal Investments	\$1,050.0
Roadway Improvements	\$1,480.2
Rail Improvements	\$224.0
<b>Total Port Investment 2014-2019</b>	<b>\$2,886.0</b>



*In millions of 2020 dollars*

The long-term economic value associated with making these investments is fully evident in the ability of the Port to handle the new larger neo-Panamax vessels, each carrying substantially more containers, as well as expediting the efficient multimodal movement of cargo between the vessels and locations throughout the region and North America. These investments reshaped and repositioned the Port to meet 21st century needs. Please note that 2019 was not the conclusion of the investments in the Port; additional significant investments continue to be made, such as new gates at some terminals.

At the same time, the investments generate one-time economic impacts within the region through the purchase of materials and labor for on-site work. “One-time” refers to the fact that once construction is completed, the workers move on to their next project; the work is not ongoing. Equipment is a one-time purchase, similar to purchasing a private car. The ongoing maintenance associated with the new infrastructure and equipment does become part of the ongoing economic impact and was included in the 2019 operations analysis in the preceding chapter.

The total one-time economic impact over the 2014-2019 construction and investment period for the 31-county region was:

- ◆ Nearly 14,400 direct jobs
- ◆ Close to 25,200 total jobs in the region
- ◆ \$2 billion in personal income
- ◆ \$4.9 billion in business activity
- ◆ \$607 million in federal, state, and local tax revenues, with local and state tax revenues of \$207 million and federal tax revenues of \$400 million



“Total” refers to the cumulative impacts for the five years. To estimate the annual impacts, these numbers should be divided by five. However, please note that different investments were made in different years and occur over different time periods between 2014 and 2019. The analysis also considered that certain equipment is manufactured outside of the 31-county area, with the regional impact largely limited to the on-site related installation in some cases.

**In the State of New Jersey**, the total one-time economic impacts over the 2014-2019 period included:

- ◆ 13,500 direct jobs
- ◆ 23,300 total jobs in the State
- ◆ Nearly 1.9 billion in personal income
- ◆ Over \$4.5 billion in business activity
- ◆ Nearly \$559 million in federal, state, and local tax revenues, with local and state tax revenues of close to \$188 million and federal tax revenues of nearly \$370 million

**In New York City**, the total one-time economic impacts over the 2014-2019 period included:

- ◆ 840 direct jobs
- ◆ 1,560 total jobs in the City
- ◆ \$146 million in personal income
- ◆ Nearly \$285 million in business activity
- ◆ Over \$41 million in federal, state, and local tax revenues, with local and state tax revenues of more than \$16 million and federal tax revenues of over \$25 million

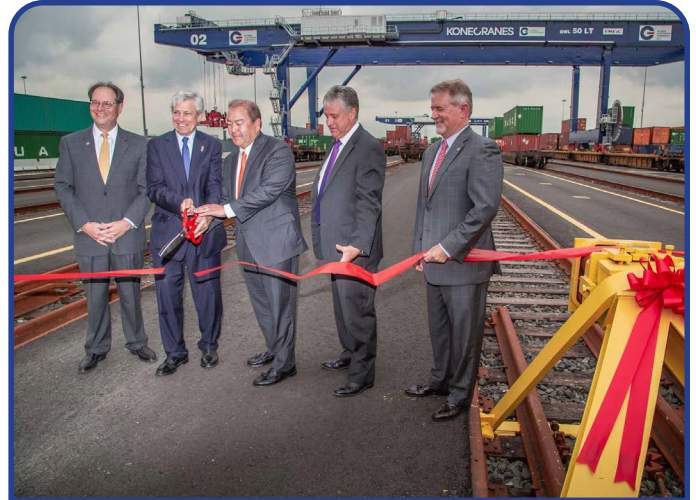
**In the State of New York** (including New York City), the total one-time economic impacts over the 2014-2019 period included:

- ◆ 840 direct jobs
- ◆ 2,000 total jobs in the State
- ◆ More than \$176 million in personal income
- ◆ Close to \$386 million in business activity
- ◆ Nearly \$55 million in federal, state, and local tax revenues, with local and state tax revenues of almost \$23 million and federal tax revenues of close to \$32 million

**In the four-county area of Pennsylvania in the region**, the total one-time economic impacts over the 2014-2019 period included:

- ◆ 190 total jobs
- ◆ Over 11 million in personal income
- ◆ \$40 million in business income
- ◆ Nearly \$4 million in federal, state, and local tax revenues, with local and state tax revenues of close to \$2 million and federal tax revenues of over \$2 million

The impacts in Pennsylvania do not include any direct, on-site job and other impacts as all of the investments were made in port operations in New York and New Jersey.



## APPENDIX A: PORT INDUSTRY DEFINITIONS

This section provides definitions for the Port Industry Terminology.

### A. Port Cargo Movements

- ◆ **Containerized cargo handling** refers to the handling of cargo loaded in maritime containers. Each container, which can accommodate a nearly complete range of commodities, is handled as a single unit. The most commonly used types of containers are either 20 or 40 feet in length. A common measure used in the maritime industry refers to a “twenty-foot equivalent unit” or TEU. A TEU equals one 20-foot container. A 40-foot container would equate to two TEUs.
- ◆ **Breakbulk cargo handling** is the traditional means of handling general cargo. It describes the handling of a broad variety of commodities as individual pieces or as palletized cargo. Breakbulk handling techniques are used to move such commodities as forest products, paper, bananas, fresh fruit, steel, and cocoa beans.
- ◆ **Bulk cargo handling** refers to the handling, in a continuous operation, of dry and liquid uniform commodities, such as petroleum, petrochemicals, grain and coal. The cargo is not divided into individual units.
- ◆ **Auto and vehicle transport** describes the waterborne movement of motorized, wheeled units. Typically, these vehicles are “rolled on and rolled off” (RO/RO) vessels with multiple decks by terminal workers.

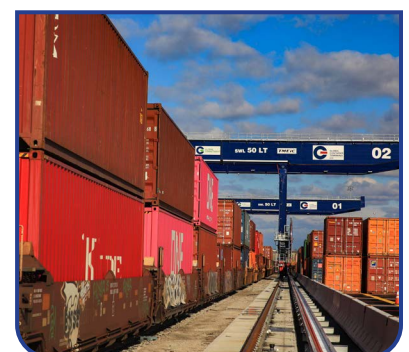
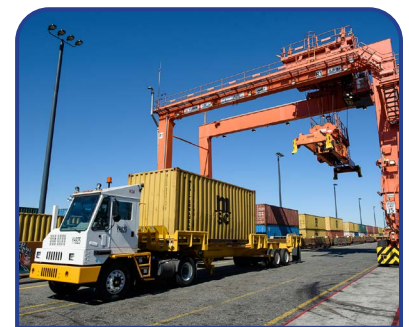


### Cargo Movement Activities

VESSEL ACTIVITIES	TERMINAL ACTIVITIES	TRANSACTION ACTIVITIES	INLAND MOVEMENT ACTIVITIES
Pilotage, Tugs, Provisions, Fuel, Crew Shore Leave, etc.	Cranes, Stevedoring, Yard Handling, Cargo Manipulation, Inspections, etc.	Banking, Insurance, Data Processing, Freight Forwarding, Customhouse Brokers, etc.	Trucking, Rail, Barge and/or Pipeline

Cargo moves inland in a variety of ways, including:

- ◆ Long Distance Truck – the fee charged by trucking firms for the inland movement of the cargo beyond the port region. Usually, long distance trucking rates are developed, and drivers compensated on a mileage basis.
- ◆ Short Distance Truck – the fee charged by trucking firms for the inland movement of cargo to a destination or from an origin within the port region (such as a warehouse or manufacturing facility). Usually, shorter distance trucking rates are quoted, and drivers compensated on a flat-rate basis.
- ◆ Barge – Barges are a means used for conveying cargo between vessels and ports/terminals other than the one where the vessel is docked.
- ◆ Rail – Inland rail movements are defined as including the truck drayage fee associated with moving the cargo from the terminal to the rail yard, along with the costs incurred by the railroad(s) for moving the shipment. Rail costs include expenditures associated with rail terminal operations, switching and line haul movements.
- ◆ Pipeline – Pipeline movements are generally associated with the movement of liquid bulk commodities.



## B. Cruise Passenger Movements

- ◆ Cruise passenger movements include the vessels that carry passengers on recreational cruises of various durations.
- ◆ Cruise passengers may also spend time in the region before or after their voyages, generating additional economic impacts through their visitor expenditures. The cruise operations, based on surveying, reflect the various characteristics of the three terminals in New York and New Jersey and the cruise lines that call on this region.
- ◆ Inland transportation involving cruise passengers includes air, private car, bus, transit, limousines, taxis, and walking.



## Passenger Movement Activities

VESSEL ACTIVITIES	TERMINAL ACTIVITIES	PRE- AND POST-CRUISE VISITOR ACTIVITIES	INLAND MOVEMENT ACTIVITIES
Pilotage, Tugs, Provisions, Fuel, Crew Shore Leave, etc.	Stevedoring, Passenger Services, Inspections, Immigration, etc.	Hotels, Restaurants, Local Attractions and other visitor activities in the port area	Private Car, Taxi/Limo, Bus/Transit, Airline, Walking, etc.



## APPENDIX B: BACKGROUND ON THE ECONOMIC IMPACT METHODOLOGY

The information used in this assessment was provided by New York Shipping Association, the Port Authority of New York and New Jersey, New York City Economic Development Corporation, and many port partners. Additional data from the most current US Census County Business Patterns for such sectors as freight forwarding, finance and insurance was used along with industrial space information from CBRE, NAI and field work.

The 2020 port industry analysis continues the use of an IMPLAN multi-region (MRIO) economic impact model customized to reflect the New York-New Jersey-Pennsylvania region. The approach is consistent with previous analyses, though it should be noted that the 2020 assessment makes use of the most recent IMPLAN platform which contains 2018 economic data in 2020 dollars. IMPLAN has been used since the 2012 analysis. The current analysis and results are in 2020 (current year) dollars. Please note that some definitions and impacts will differ from port industry economic impact studies prior to 2012, which used a different input-output model as a base.

The IMPLAN model includes economic data, enables multi-regional and county-level assessments, and is used by public agencies throughout the U.S., including transportation authorities in the New York-New Jersey region. Implan is a complete economic assessment package including data and software. More information on Implan can be found at [www.implan.com](http://www.implan.com)

Multi-Regional Input-Output models (MRIO) capture the economic impacts occurring in several connected economic regions, along with “trade flows.” Trade flows are defined as the purchase of goods and services among each of the identified regions. In addition to the trade flows, the models consider and reflect the purchase of goods and services from sources outside the identified regions. These leakages reduce impacts. For example, some suppliers and workers may come from outside of New Jersey. The impacts associated with these expenditures accrue to the locations outside of the state rather than to New Jersey.

The economic impacts were identified for:

- ◆ The 31-county New York-New Jersey-Pennsylvania region
- ◆ The State of New Jersey
- ◆ New York City
- ◆ The State of New York (including New York City)
- ◆ The 4-County Pennsylvania portion of the region

The impacts shown are total impacts at each geographical level, with the impacts originating in the various regions. For example, maritime cargo and passenger operations originate at the terminals where the vessels call. Distribution facility locations are found throughout the 31-County region, with key clusters along the New Jersey Turnpike, the Lehigh Valley area of Pennsylvania and in the immediate vicinity of port terminals.



MRIO analyses require several considerations and reviews beyond single region economic impact models:

- ◆ Each region within a MRIO model is separate and do not overlap. The NYSA MRIO model has separate regions for:
  - New York City
  - The rest of the New York counties in the 31-county region
  - The rest of New York State
  - The New Jersey counties in the 31-county region
  - The rest of New Jersey
  - The four Pennsylvania counties in the 31-county region

Without the creation of separate regions, a duplication of impacts would occur.

- ◆ In general, the economic characteristics within each region in a MRIO model will vary, which reflects the differences in costs and other considerations in each area. Indeed, costs can be different between locations in New York City and the Lehigh Valley area of Pennsylvania. These differences (such as in employee/output ratios) are considered in developing the inputs for the model.





## Definitions

The economic impact assessment estimates the total impacts, which are defined to include:

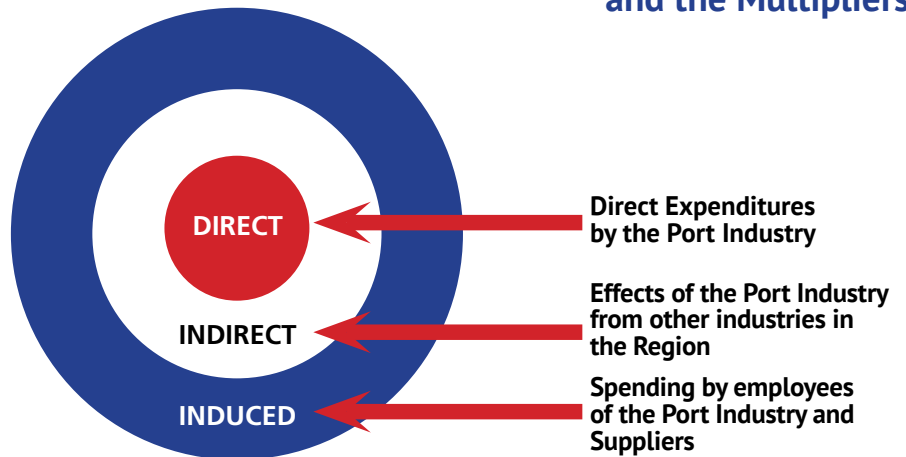
- ◆ **Direct** – the spending at the site of the economic activity. Direct effects are the focal point of an impact analysis.
- ◆ **Indirect** – the purchases of goods and services by suppliers. By definition, the first round of indirect impacts includes the purchase of supplies and services that are required to produce the direct effects. Subsequent purchases of supplies and services generate other rounds of indirect impacts. Such purchases continue to ripple through the economies of each of the regions in the MRIO model.
- ◆ **Induced** – the purchases (of such items as food, clothing, personal services, vehicles, etc.) that arise, in turn, from the increase in the aggregate labor income of households.

The total economic impact consists of the direct, indirect, and induced effects as shown above.

The economic measurements included in this analysis are:

- ◆ **Employment Effects** – Jobs generated or supported, including:
  - Direct employment: onsite full- and part-time equivalent jobs or jobs in the initial industry/business development.
  - Total employment: The total number of full-time equivalent jobs (direct, indirect, and induced) generated in each of the geographically defined regions.
- ◆ **Business Activity/Income Effects** – Business activity represents the value of industry production. In IMPLAN, these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production = sales. For Retail and wholesale trade, output = gross margin and not gross sales.
- ◆ **Personal Income Effects** – Includes all forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.
- ◆ **State and Local Tax Effects** – Defined as revenues collected by state and sub-state governments. The taxes include employee, personal, proprietor, business, household, and corporate taxes.
- ◆ **Federal Tax Effects** – Defined as revenues collected by the federal government from corporate income, personal income, social security, and excise taxes.

## Components of Total Impact and the Multipliers



## Background on Input-Output Analysis

Input-output (I-O) modeling is among the most accepted means for assessing economic impacts. The approach provides a concise and accurate means for articulating the interrelationships among industry sectors. I-O modeling focuses on the interrelationships among sectors in an economy. Within the I-O model, the economy of an area is mapped out in table form, with each industry listed across the top as a consuming sector (or market) and down the side as a producing sector.

The basic framework for I-O analysis originated over 250 years ago when François Quesenay published *Tableau Economique* in 1758. Quesenay's "tableau" graphically and numerically portrayed the relationships between sales and purchases of the various industries of an economy. More than a century later, his description was adapted by Leon Walras, who advanced input-output (I-O) modeling by providing a concise theoretical formulation of an economic system (including consumer purchases and the economic representation of "technology").

Wassily Leontief greatly advanced Walras's theoretical formulation and was awarded the Nobel Prize in 1973. Leontief first used his approach in 1936 when he developed a model of the 1919 and 1929 U.S. economies to estimate the effects of the end of World War I on national employment. Recognition of his work awaited wider acceptance and use of the approach. This meant development of a standardized procedure for compiling the requisite data (today's national economic census of industries) and enhanced capability for calculations (i.e., the computer). The federal government immediately recognized the importance of Leontief's development and has been publishing input-output tables of the U.S. economy since 1939.

The models can be quite detailed. The current U.S. and IMPLAN models have more than 400 sectors. This level of detail provides a consistent and systematic approach, as well as a more accurate means for assessing the multiplier effects of changes in economic activity.

I-O Analysis makes several key assumptions. First, the information used to create an input-output model is for a given point in time. The information in the model reflects a "snapshot" of the technical requirements and industry relationships at a given point in time. Because of this, input-output models are regularly updated.

Regional input-output models, such as the one used in this economic impact assessment, need to account for the percentage of the demand for an industry's output or the requirements for a transportation project that can be readily supplied by firms within the specified region. Firms within the specified region may not be able to supply all the products needed. Therefore, goods and services may need to be purchased from outside of the specified region. The default "regional purchase" coefficients within the IMPLAN model were used for this analysis.





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