

Evolving with Rapidly Changing Supply Chains and International Trade

The 2023 Report on the Economic Value of the New York-New Jersey Port Industry



Defining the Vision. Shaping the Future.



Prepared by:

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North Jersey Transportation Planning Authority
As a member of the Council on Port Performance

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

June 2023





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Evolving with Rapidly Changing Supply Chains and International Trade

The 2023 Report on the Economic Value of the New York-New Jersey Port Industry



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 9th iteration of the Economic Impact Study of the New York-New Jersey Port Industry.

The 2023 Report summarizes the ongoing economic value of Port operations based on the 2022 cargo and passenger flows for the 31-county New Jersey-New York-Pennsylvania Region, the States of New Jersey and New York, New York City, and a four-county area in eastern Pennsylvania.

Spoiler Alert – all economic activity derived from the Port Industry was up. Rather drastically.

Unique to this report is that 2022 was the peak when considering the Covid-19 pandemic impact on cargo flows. Our last report in 2020 measured 2019 activity which was just prior to the downs and ups of cargo flow fueled by the pandemic and the influx of stimulus monies into the economy.

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 nothing more important and necessary than 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 time.

Sincerely,

John J. Nardi
President

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Executive Summary

The Port of New York and New Jersey has experienced rapid shifts in global supply chains since the 2020 Economic Impact Assessment was undertaken. The Pandemic, combined with additional international trade considerations, led to significantly higher volumes of cargo moving through the New York-New Jersey Port.

Throughout the rapid growth in cargo movements, the Port's many stakeholders worked together to tackle the evolving situation and issues that arose. In so doing, the Port of New York and New Jersey and its partners demonstrated a level of efficiency and customer service that is likely to enhance growth in the future.

The 2023 Report summarizes the ongoing economic value of Port operations based on the 2022 cargo and passenger flows for the 31-county New Jersey-New York-Pennsylvania Region, the States of New Jersey and New York, New York City, and a four-county area in eastern Pennsylvania.

In terms of container volume, in 2022, the Port was both the largest operation on the Atlantic Coast and, for several months, the largest container port in the United States. In addition, the region saw more cruise passengers, and the region's industrial space continued to increase with millions of square feet added and occupied. The region's position as an international gateway and supply chain platform solidified.

In 2022, the region's maritime facilities handled:

- ▶ Nearly 9.5 million twenty-foot equivalent containers (TEUs), an increase of almost 2 million TEUs since 2019.
- ▶ Close to 424,000 vehicles.
- ▶ Nearly 222,000 tons of breakbulk cargo.
- ▶ 270 larger capacity cruise vessels.

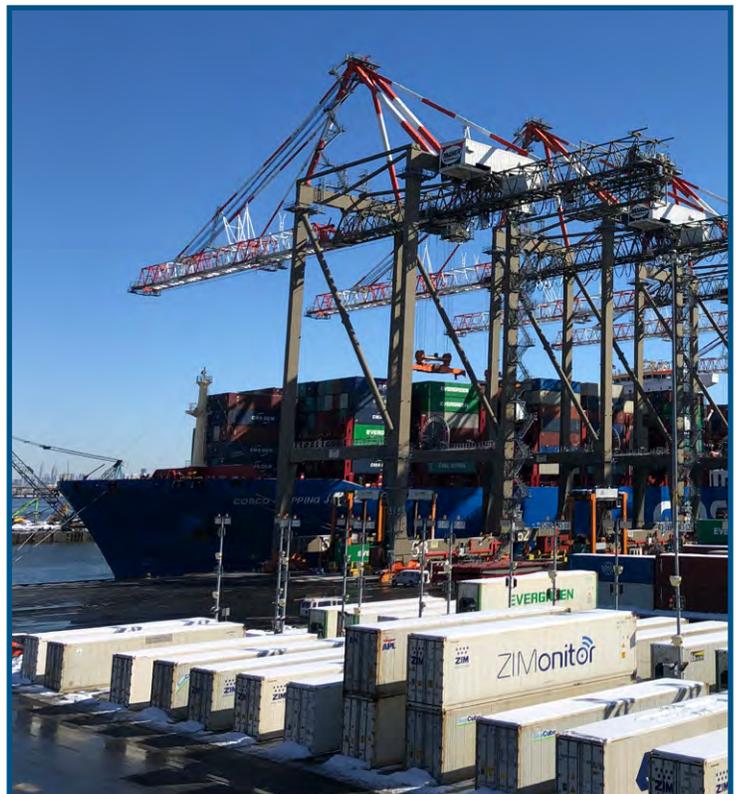
The Port Industry's total impact grew accordingly, with nearly 563,700 jobs supported compared with over 506,000 jobs supported in 2019, almost 400,000 jobs supported in 2016, the 336,600 jobs supported in 2014, and the 296,000 jobs supported in 2012.

The impacts generated by the Port Industry, based on 2022 international activity, in the 31-county region included:

- ▶ 266,200 direct jobs
- ▶ 563,700 total jobs
- ▶ Over \$47.2 billion in personal income
- ▶ Close to \$135.3 billion in business activity
- ▶ Nearly \$15.7 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$5.8 billion and federal tax revenues of nearly \$9.9 billion

While the Pandemic generated a "supercycle" of product demand, and shifts in the global marketplace continue to evolve, the Port's management of the increased activity sets the stage for future growth.

The Port Industry's
impact grew from
506,000 jobs in 2019
to nearly
563,700 jobs in 2022



I. Introduction

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

Since 2019, the basis of the previous assessment, the region, nation, and world have experienced significant events. These include the COVID Global Pandemic and the Ukraine War. The filling of order backlogs, increased consumer purchasing of goods, shifting production locations, and continuing issues on the U.S. West Coast were among the factors that contributed to a significant increase in international maritime movements through the Port of New York and New Jersey in 2022.

The 2023 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 New York counties: 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 Pennsylvania counties: Northampton, Lehigh, Monroe, and Pike

The 2023 assessment continues to use as a base, a Multi-Region Input-Output (MRIO) model built on this IMPLAN platform for this analysis. The version of the IMPLAN platform used, as

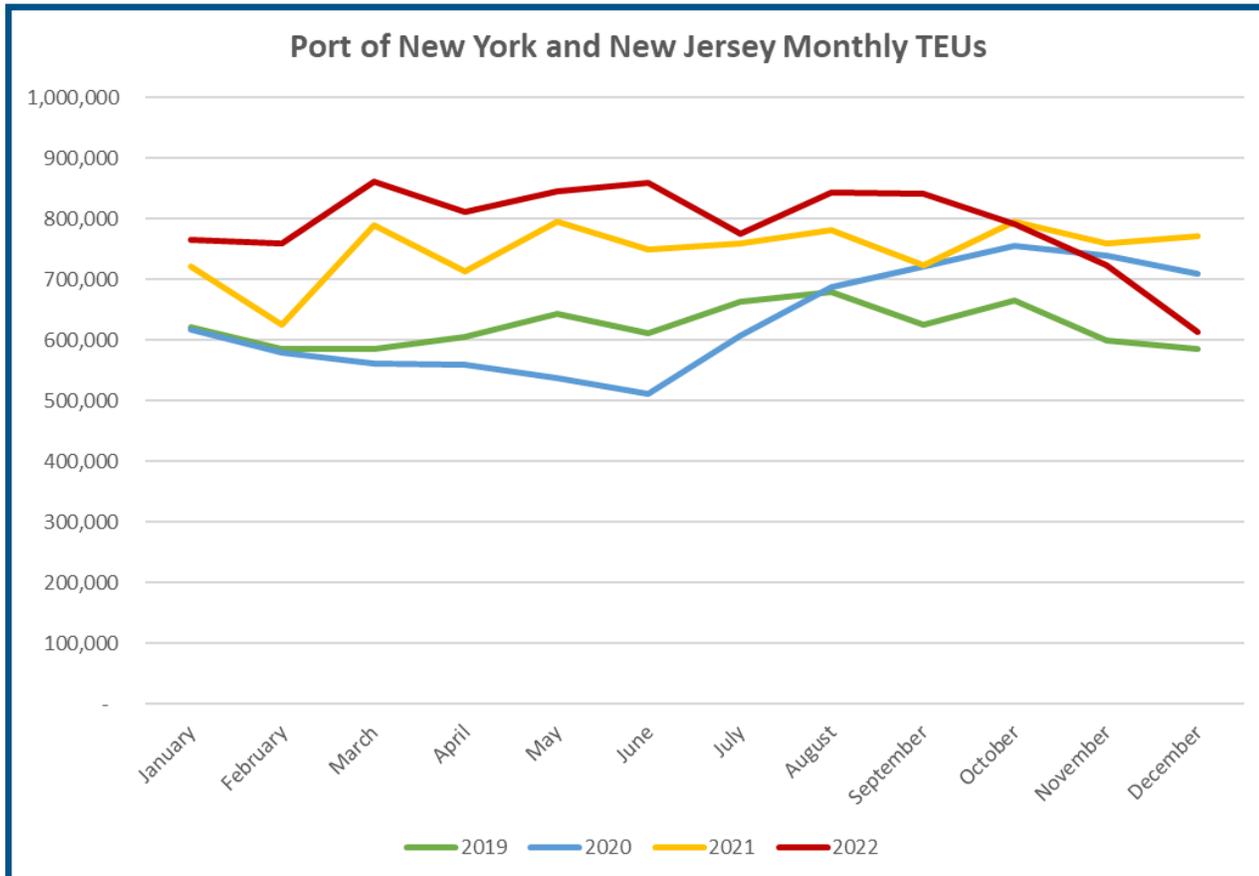
described in the Appendix, is based on 2018 economic data with outputs generated in 2020 dollars. Given the unique level of inflation that has occurred since 2020, dollar figures for this analysis were separately updated to 2023 dollars using the national Producer Price Index for Transportation and Warehousing as well as the Consumer Price Index for the New York-Newark-Jersey City, New York-New Jersey-Pennsylvania Region. The 2023 analysis assumes, based on discussions with Port partners, that the industry's technological structure has largely remained the same as in 2019. Additional information specific to the 2022 levels of international cargo and passenger operations was also supplied for this analysis by Port partners.

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



II. The Economic Value Generated in 2022

The investments and collaborations articulated in the 2020 report became critical components to respond to the rapidly evolving cargo growth and changes in international trade that occurred between 2019 and 2022. The figure below illustrates the rapid growth in container volumes depicted in twenty-foot equivalent units (TEUs), as well as the shift away from typical cargo seasonality. The flows represent the dynamic changes and “supercycle” of demand as backlogged orders were fulfilled, production locations shifted, and issues continued at ports on the U.S. West Coast.



Source: Port Authority of New York and New Jersey

The economic impact assessment of ongoing Port-related activities in 2022 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 on-going, which means that the jobs and revenues generated are sustained by the continuing activities of the Port Industry. As those activities continue to evolve, the economic value generated will reflect the emerging conditions.



A Leading Supply Chain Platform for North America

In 2022, the New York-New Jersey Port handled:

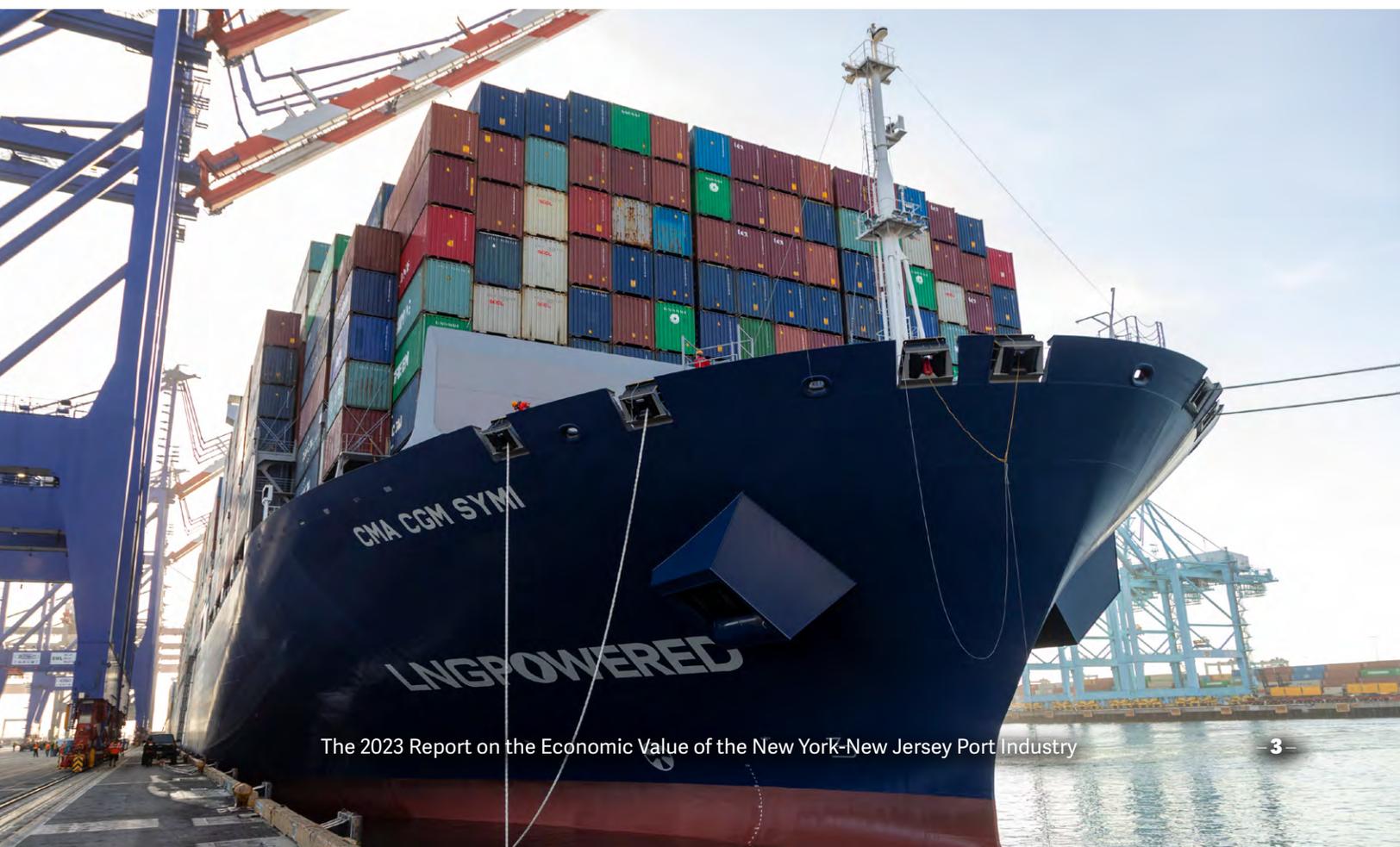
- ▶ Nearly 9.5 million TEUs, an increase of almost 2 million TEUs since 2019.
- ▶ Close to 424,000 vehicles.
- ▶ Nearly 222,000 tons of breakbulk cargo.
- ▶ 270 larger capacity cruise vessels.

While the number of cruise vessels declined, the number of passengers increased. This reflected the increased calls of larger cruise vessels with larger passenger accommodations at the Port's three cruise terminals.

At the same time, industrial real estate grew substantially between 2019 and 2022 as companies, responding to the need for keeping more inventory on hand, heightened demand levels, and increased use of ecommerce. In the NJTPA portion of the region alone, overall industrial space capacity grew to 864 million square feet, with more than 34 million square feet added since the end of 2019. The Lehigh Valley portion of the region had over 151 million of industrial space at the end of 2022 (up from 130 million square feet in 2019 and 98 million square feet of total industrial space at the end of 2016).

Not all of the new space is related to the Port. Ecommerce fulfillment, retail and wholesale users, and third-party logistics companies 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.

The Port Industry's total impact grew accordingly, with nearly 563,700 jobs supported compared with over 506,000 jobs supported in 2019, almost 400,000 jobs supported in 2016, the 336,600 jobs supported in 2014, and the 296,000 jobs supported in 2012.



The impacts generated by Port Industry, based on 2022 international activity, in the 31-county region included:

- ▶ 266,200 direct jobs
- ▶ 563,700 total jobs
- ▶ Over \$47.2 billion in personal income
- ▶ Close to \$135.3 billion in business activity
- ▶ Nearly \$15.7 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$5.8 billion and federal tax revenues of nearly \$9.9 billion.



The detailed economic impacts are shown in the figure below:

The 2022 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	2,990	16,714	\$ 1,933.8	\$ 6,421.8	\$ 276.1	\$ 419.9	\$ 696.0
Breakbulk	438	1,587	\$ 165.4	\$ 535.8	\$ 23.2	\$ 36.0	\$ 59.2
Roll On-Roll Off	893	3,688	\$ 403.4	\$ 1,311.6	\$ 57.4	\$ 53.6	\$ 111.0
Container	36,840	110,354	\$ 11,208.5	\$ 34,885.8	\$ 1,616.3	\$ 2,419.1	\$ 4,035.5
Cruise	3,423	5,761	\$ 448.7	\$ 1,298.1	\$ 98.3	\$ 95.2	\$ 193.6
Warehousing	196,585	356,395	\$ 25,110.7	\$ 66,543.9	\$ 2,687.8	\$ 5,199.5	\$ 7,887.4
Freight Forwarding	10,481	23,470	\$ 2,166.7	\$ 6,089.8	\$ 259.1	\$ 453.5	\$ 712.6
HQ and other maritime fcn's	4,800	16,504	\$ 1,916.4	\$ 5,897.6	\$ 268.8	\$ 400.4	\$ 669.3
Govt	2,752	6,644	\$ 752.9	\$ 1,984.6	\$ 15.5	\$ 149.9	\$ 165.4
Insurance	4,070	14,533	\$ 1,804.2	\$ 6,590.8	\$ 285.3	\$ 396.3	\$ 681.6
Banking	2,897	8,044	\$ 1,275.4	\$ 3,732.5	\$ 168.0	\$ 274.0	\$ 442.0
TOTAL ECONOMIC IMPACT	266,170	563,694	\$ 47,186.0	\$ 135,292.4	\$ 5,755.8	\$ 9,897.7	\$ 15,653.5

In millions of 2023 dollars

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

Economic Value Generated Throughout the Area

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, first place of rest or origin locations directly handling international maritime cargo (assumed to be industrial property for the analysis), and governmental agencies. These activities are throughout New York and New Jersey and extend into Pennsylvania, primarily in the Lehigh Valley area.

In the State of New Jersey, the Port Industry in 2022 supported:

- ▶ Nearly 225,000 direct jobs
- ▶ Over 470,000 total jobs in the State
- ▶ More than \$38 billion in personal income
- ▶ Nearly \$108 billion in business activity
- ▶ Nearly \$13 billion in federal, state, and local tax revenues, with local and state tax revenues of over \$4.5 billion and federal tax revenues of over \$8.1 billion

**Over 470,000
total jobs
in the State**

The State of New Jersey impacts includes the portion of the 31-county region in the State, as well as the other counties within New Jersey.

In New York City, the Port Industry supported in 2022:

- ▶ Close to 19,500 direct jobs
- ▶ Almost 51,500 total jobs in the City
- ▶ Nearly \$6.4 billion in personal income
- ▶ Almost \$20 billion in business activity
- ▶ Over \$2.2 billion in federal, state, and local tax revenues, with local and state tax revenues of nearly \$1 billion and federal tax revenues of over \$1.2 million

Almost \$20 billion in business activity

The increase in New York City's economic impact is primarily a result of increased cargo movements through the maritime terminals in the City in 2022.

In the State of New York (including New York City), the Port Industry supported in 2022:

- ▶ Over 26,200 direct jobs
- ▶ Almost 67,400 total jobs in the State
- ▶ Nearly \$7.6 billion in personal income
- ▶ More than \$23.7 billion in business activity
- ▶ Close to \$2.7 billion in federal, state, and local tax revenues, with local and state tax revenues of close to \$1.2 billion and federal tax revenues of over \$1.5 billion

Over 67,000 total jobs in the State

In the Lehigh Valley area of Pennsylvania, which consists of four counties, the New York-New Jersey Port Industry supports warehousing and distribution center activities estimated to include:

- ▶ Close to 28,700 direct jobs
- ▶ Nearly 53,100 total jobs in the four counties included in the Lehigh Valley area of the region
- ▶ Nearly \$3.3 billion in personal income
- ▶ More than \$8.7 billion in business activity
- ▶ Close to \$930 million in federal, state, and local tax revenues, with local and state tax revenues of nearly \$290 million and federal tax revenues of nearly \$640 million.

Nearly \$3.3 billion in personal income



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.

The Port Industry definition used is *any activity directly related to the movement of maritime cargo and passengers*. This definition, as shown in the figure below, includes vessel, terminal, transactions, inland movement, and first place origin/destination activities. For the purposes of this assessment, first place of rest is considered to consist of industrial space directly tied to cargo that moved internationally through the Port.

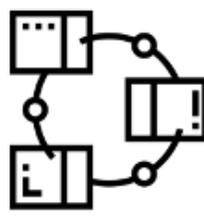
Maritime Cargo Activities



Vessel Activities



Terminal Activities



Transaction Activities



Inland Movement Activities



First Place Origin/Destination Activities

Vessel activities include pilots, tugs, provisions, fuel, and crew activities. Terminal activities include cranes, stevedoring, yard handling, cargo manipulation, inspections, and other operations. Transaction activities include banking, insurance, data processing, freight forwarders, and customhouse brokers.

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.



Maritime Cruise Activities



Vessel Activities



Terminal Activities



Pre- and Post-
Visitor
Activities



Inland Movement
Activities

Appendix B: Background on the Economic Impact Methodology

The information used in this assessment was provided by Shipping Association of New York and New Jersey, 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, Newmark, and Cushman and Wakefield.

Total bulk tonnage was not available for this analysis. As a proxy of the change in activity, the employment numbers associated with bulk tonnage in 2019 and 2022 were compared, with the change used to generate the bulk impact in this report.

The 2023 assessment continues to use as a base, a Multi-Region Input-Output (MRIO) model built on this IMPLAN platform for this analysis. The MRIO model was customized to reflect the New York-New Jersey-Pennsylvania region. The approach is consistent with previous analyses. The version of the IMPLAN platform used is based on 2018 economic data with outputs generated in 2020 dollars. Given the unique level of inflation that has occurred since 2020, dollar figures for this analysis were independently updated to 2023 dollars using the national Producer Price Index for Transportation and Warehousing as well as the Consumer Price Index for the New York-Newark-Jersey City, New York-New Jersey-Pennsylvania Region. The 2023 analysis assumes, based on discussions with Port partners, that the industry's technological structure has largely remained the same as in 2019.

Please note that some definitions and impacts will differ from Port Industry economic impact assessments which, prior to 2012, 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 US, including transportation authorities in the New York-New Jersey region.

MRIO models 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 does not overlap. The SANYNJ 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

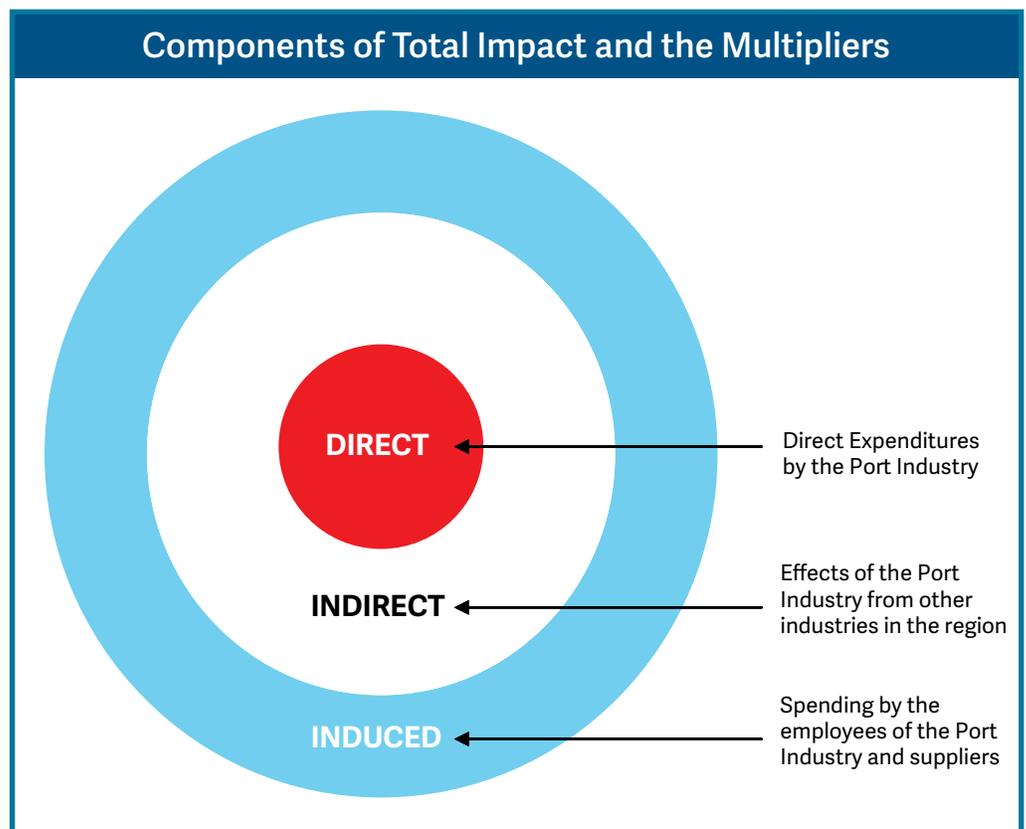
The economic impact assessment estimates the total impacts, which are defined to include:

- ▶ **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.

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 Quesnay published *Tableau Economique* in 1758. Quesnay'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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