

REGIONAL FREIGHT COMMODITY PROFILE

Warehouse and Terminal Moves

COMMODITY BUNDLE OVERVIEW

This bundle represents the movement of a variety of goods through intermediate steps of the supply chain between the producer and the consumer. This classification captures:

- Movement of mixed, miscellaneous, or unspecified goods from warehouses or distribution centers to retail stores or to customers; and
- Other shipments of mixed or unknown goods.

Like the e-commerce commodity bundle, this bundle consists of shipments of mixed or multiple types of goods, consisting largely of higher-value consumer products such as apparel, food, electronics, instruments, paper products, or drugs.

This bundle captures these goods while they are in transit between intermodal terminals, warehouses and distribution centers, freight forwarders, and retail centers. Some of the freight moves described in this commodity bundle are delivered to e-commerce consumers. The delivery leg of that supply chain is described in the e-commerce commodity bundle profile. Some of the moves in this bundle may also be associated with import or export shipments moving through the Port of New York and New Jersey or Newark Liberty International Airport.

Heavy or bulky goods such as construction materials, industrial chemicals, petroleum products, or livestock compose a relatively small share of the goods moved through these intermediaries.

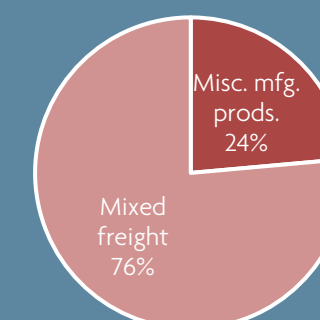
The primary data source for commodity flows reported in this profile is NJTPA's Freight Forecasting Tool, which generates commodity freight data and forecasts for a 2020 base year and 2050 forecast year. This profile describes freight flows between domestic origins and destinations.

- # Highlights
- 16.8 million tons in 2020, increasing 15 percent to 19.2 million tons in 2050.
 - Represents 7 percent of the goods moved in the region by weight and 14 percent by value.
 - More than 120 million square feet of warehousing space dedicated to this bundle.
 - 97 percent moves by truck, less than 1 percent by rail, and 3 percent by other modes.

Composition

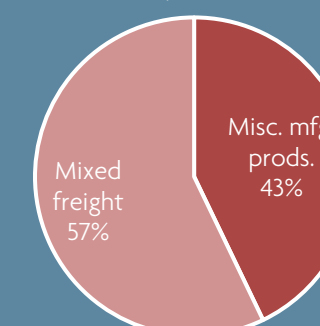
Domestic Tons in 2020

Total: 16.8 million



Domestic Value in 2020

Total: \$96.4 billion



Source: NJTPA Freight Forecasting Tool, 2020

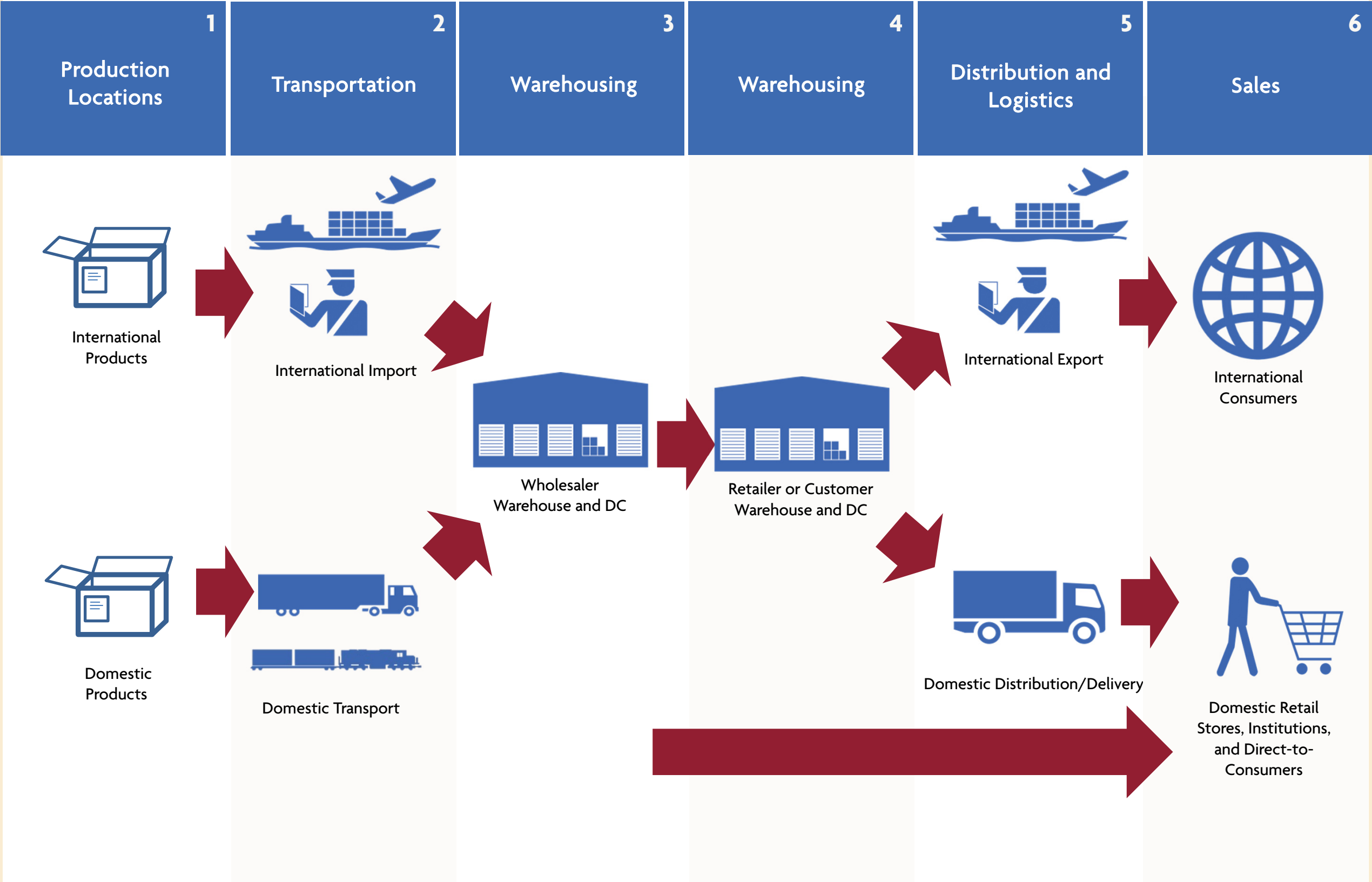
LOGISTICS SUMMARY

The graphic to the right represents the supply chain for this commodity bundle, illustrating the process of moving shipments of mixed or unspecified goods from international and domestic sources through distribution to consumers.

This supply chain consists of six steps:

- 1. International and domestic manufacturers produce finished goods.
- 2. International goods are transported by ocean vessel or air to U.S. Ports-of-Entry where they are inspected by U.S. Customs and transloaded to truck or rail carload. Domestically produced goods are transported by truck or rail intermodal.
- 3. Goods are sorted at a wholesaler warehouse or distribution center.
- 4. Products are sent by truck to a retailer or customer warehouse or distribution center.
- 5. Products are distributed via one of two routes:
 - A. By truck to an export distributor or freight forwarder for export to international customers via ocean vessel or air.
 - B. By truck for domestic delivery to retail establishments and to fulfill direct-to-consumer orders.
- 6. Shipments are delivered to international and domestic customers according to customers' specification.

Note that some products bypass retailer or customer warehousing and distribution centers and move directly from a wholesaler's warehouse to the final user. The e-commerce deliveries are described in the e-commerce commodity bundle profile.



Business Square Footage by Industry Type

Warehouse & Distribution

Legend

Square Feet Occupied

Production

- 0 - 24,999
- 25,000 - 49,999
- 50,000 - 249,999
- 250,000 +

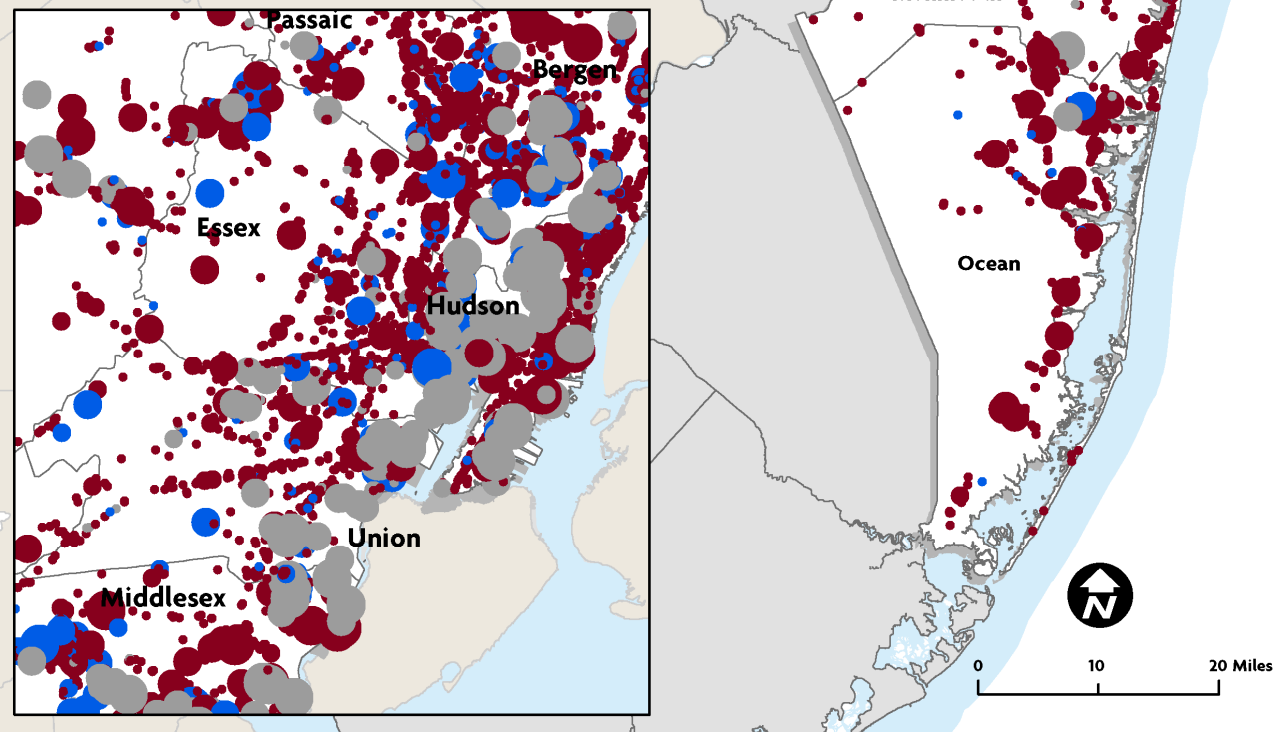
Logistics

- 0 - 24,999
- 25,000 - 49,999
- 50,000 - 249,999
- 250,000 +

Sales

- 0 - 24,999
- 25,000 - 49,999
- 50,000 - 249,999
- 250,000 +

Source: Source: CoStar, 2015; InfoGroup, 2019; Cambridge Systematics, 2020; NJOIT, 2008; Esri, 2014
Note:
"Production" includes Manufacturing, Utilities, Mining, & Agriculture
"Logistics" includes Transportation and Distribution
"Sales" includes all other categories



BUSINESS LOCATIONS SUMMARY

The map on the previous page illustrates the locations of facilities that ship, handle, or receive commodities in this bundle, including:

- Production facilities such as mining, agriculture, and manufacturing businesses where goods are produced, and correspond to Step 1 in the logistics summary chart on pages 2 and 3.
- Logistics facilities, including warehousing and transportation facilities through which goods are distributed, and correspond to steps 2 through 5 on the logistics summary chart.
- Sales, represented in Step 6 on the logistics summary chart, including retail, services, and institutional establishments where goods are sold.

Clusters of establishments are located in the urban areas of the region, including southern Bergen, Hudson, eastern Essex and Union, and Middlesex counties. Clusters are also arranged parallel to Interstate 80 in Morris County, Routes 22 and 202 in Somerset County, Routes 9 and 35 in Monmouth County, and Route 9 in Ocean County.

KEY INDUSTRY TRENDS

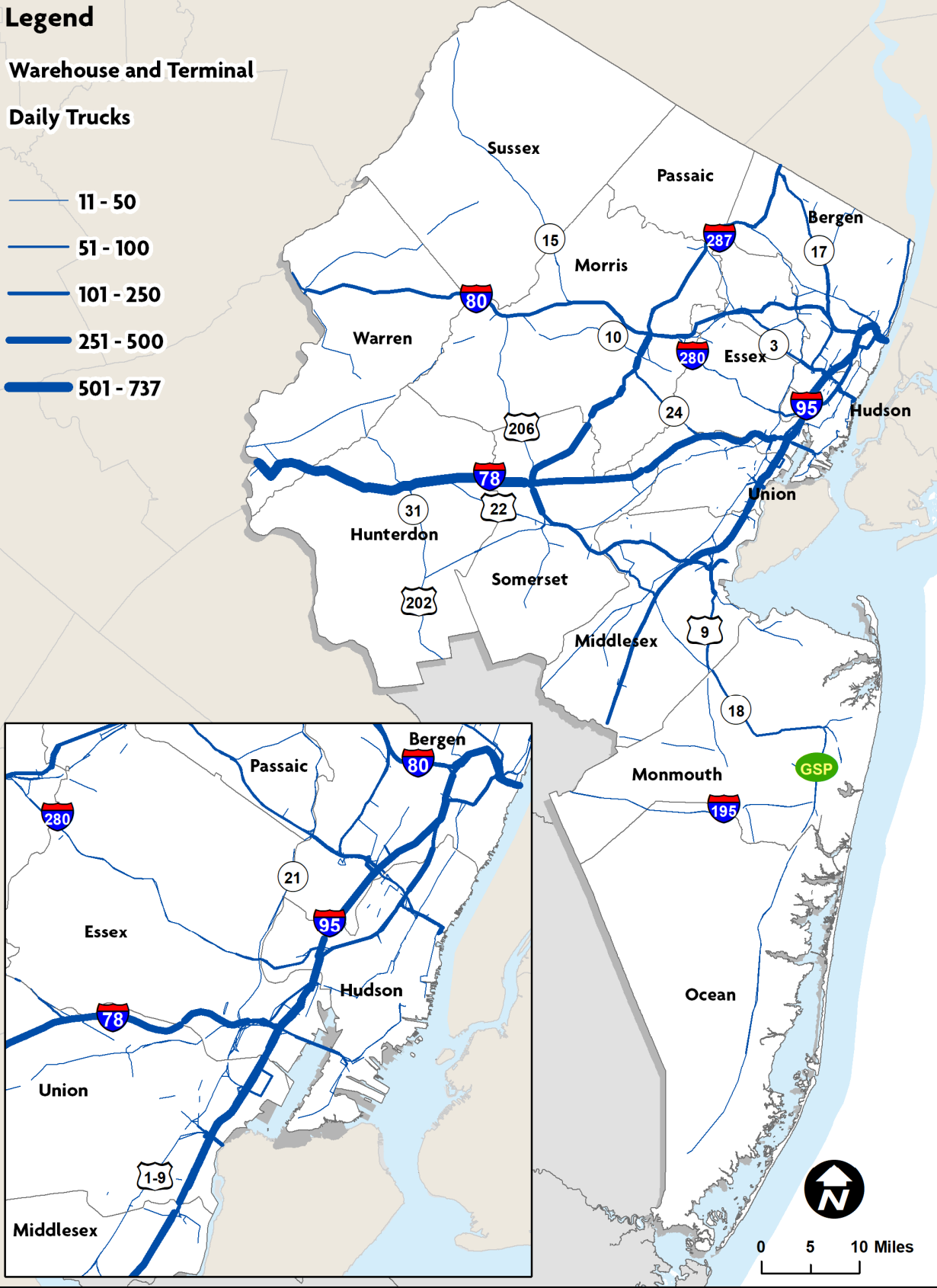
The following trends are shaping demand for warehouse and terminal moves today, and projected demand in the future:

- In the wake of the COVID-19 crisis, businesses and organizations may increase the levels of inventory held for safe business practices, which will increase demand for warehouse space.
- Companies may seek to mitigate risk of supply chain interruptions with faster adoption of automation such as robotic picking in warehouses and distribution centers. This would mitigate the need to for wholesale shut down of operations due to sick or quarantined workers.
- The growth of e-commerce, which may only accelerate post-pandemic, will fuel demand for warehouse and distribution space in North Jersey, particularly as consumers continue to expect fast delivery times on a wider array of products. Some companies are developing constellations of smaller distribution or fulfillment facilities close to population centers, supplied by a network of larger distribution centers.
- Information technology continues to advance in order to support quick movement of product through the logistics chain.

Managing Inventory Inside a Distribution Center



Highway Network Utilization, 2020



Source: NJTPA Freight Forecasting Tool, 2020; NJRTM-E, 2019; NJOIT, 2008; Esri, 2014.

HIGHWAY NETWORK FLOWS OF WAREHOUSE AND TERMINAL MOVES

The map on the previous page shows the volume of truckloads of goods in this bundle traveling on highway segments in the NJTPA region every day.

Interstate 78 carries the greatest volume of warehouse and terminal moves truck trips, with more than 500 daily trucks, in each direction, on the segment between Interstate 287 in Somerset County and the Pennsylvania border in Warren County.

Portions of Interstate 78 east of Interstate 287, the New Jersey Turnpike/Interstate 95 between Exit 12 in Middlesex County and the George Washington Bridge in Bergen County, and Interstate 287 in Morris and Somerset counties carry between 251 and 500 daily truckloads of warehouse and terminal moves in each direction.

COMMODITY FLOW SUMMARY

Collectively, nearly 16.8 million tons of goods worth \$96.4 billion moved in the NJTPA region in 2020. By 2050, 19.2 million tons worth \$114.4 billion are expected to move in the region. These projections represent 15 percent growth by weight and 19 percent growth by value.

This bundle represented 7 percent of the goods moved in the region by weight and 14 percent by value in 2020 and are expected to represent the same shares of weight and value of goods moved in the region in 2050.

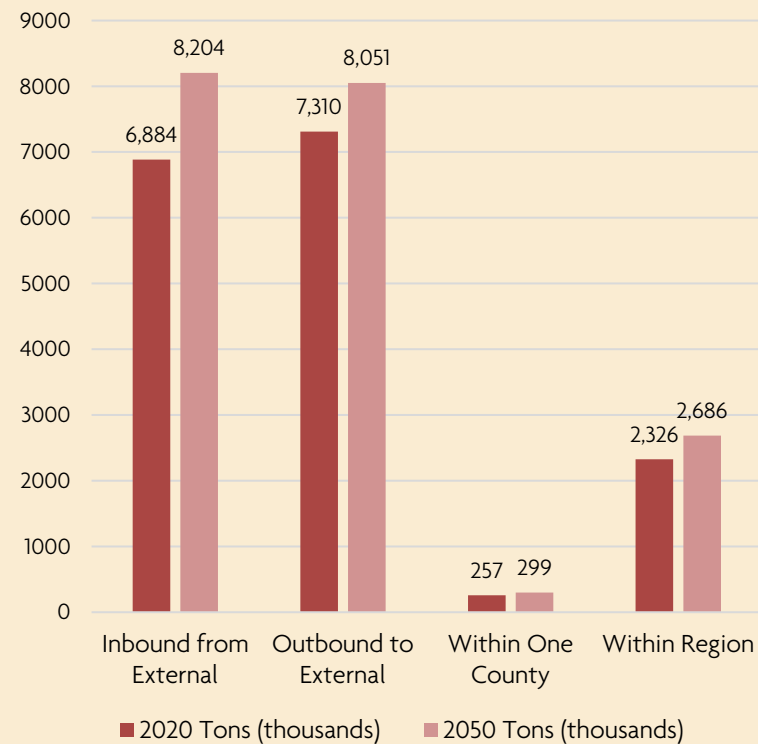
Mixed freight was 75 percent of the composition of this bundle by weight in 2020 and 76 percent by weight in 2050. By value, mixed freight represented 57 percent of this bundle in 2020 and is expected to represent 55 percent of the bundle’s value by 2050.

Forecasted Change in Commodity Flows in the Warehouse and Terminal Moves Bundle by Weight and Value, 2020 and 2050

| Commodity | 2020 Tons (thousands) | 2050 Tons (thousands) | 2020 Value (millions \$) | 2050 Value (millions \$) | Change in Tons, 2020-2050 | Change in Value, 2020-2050 |
|-------------------------------------|-----------------------|-----------------------|--------------------------|--------------------------|---------------------------|----------------------------|
| Miscellaneous manufactured products | 3,954 | 4,741 | 41,340 | 51,423 | 20% | 24% |
| Mixed freight | 12,823 | 14,499 | 55,102 | 62,990 | 13% | 14% |
| Grand Total | 16,777 | 19,240 | 96,442 | 114,413 | 15% | 19% |

Source: NJTPA Freight Forecasting Tool, 2020
Note: Commodities assigned a value of \$0 indicate the absence of sales or commercial value

Domestic Tons by Direction, 2020 and 2050



Source: NJTPA Freight Forecasting Tool, 2020

About 44 percent of warehouse and terminal moves travel from the NJTPA region to locations outside the region, while 41 percent move inbound. Flows between NJTPA counties or within a single county in the region together represent 15 percent of these moves. Inbound flows are expected to grow slightly greater rate than outbound and intraregional moves through 2050.

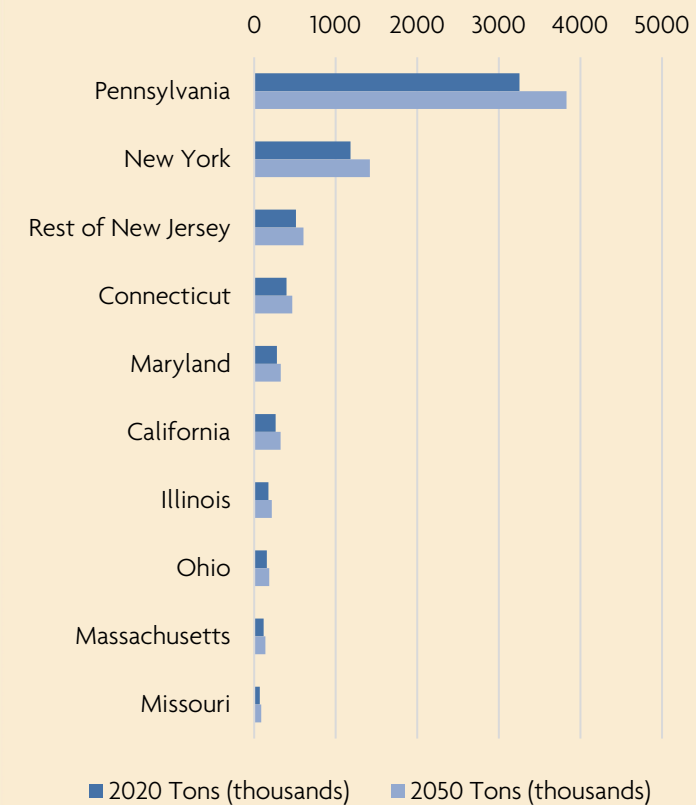
More than 90 percent of the inbound warehouse and terminal moves originate in one of the locations shown in the graph on the next page. About 3.3 million tons come to the region from Pennsylvania and about 1.2 million tons come from New York. Among the top origins, flows from Missouri are expected to grow fastest, at 25 percent, and Maryland slowest, at 17 percent, through 2050.

The graph on the next page also shows the destinations of 86 percent of the goods in this commodity bundle that leave the NJTPA region. About 3.5 million tons travel to New York. Among the top destinations, trade with Ohio and Georgia are expected to grow fastest (17 percent) through 2050.

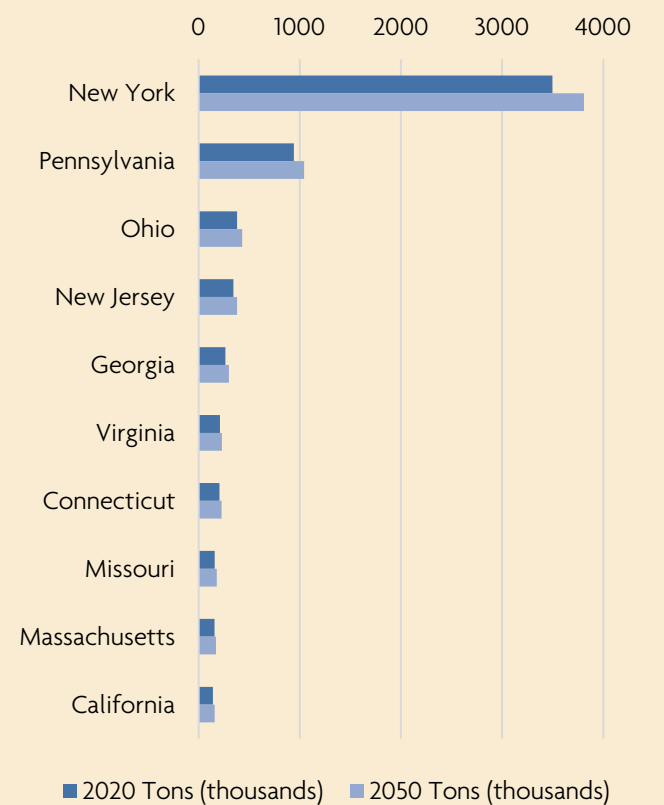
Nearly All of the Warehouse and Terminal Moves are Carried by Truck (Left) or Intermodal Rail (Right)



Top Origins of Inbound Domestic Commodities (Left) and Top Destinations of Outbound Domestic Commodities (Right), 2020 and 2050



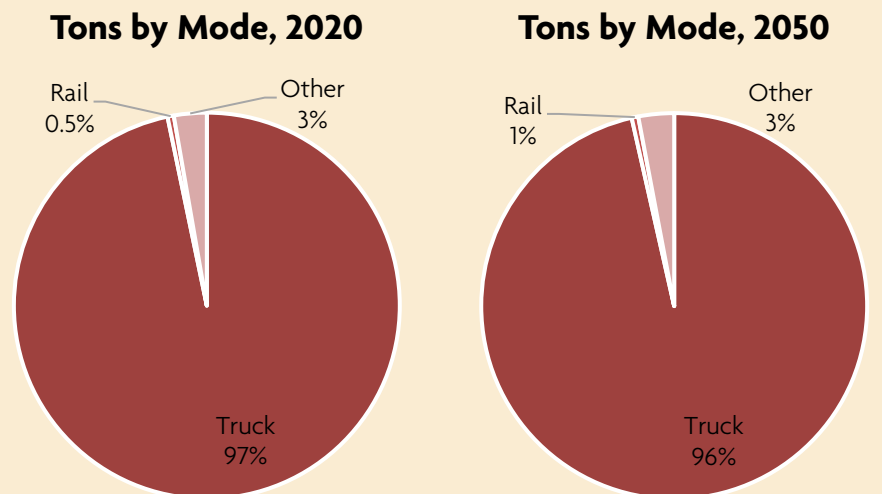
Source: NJTPA Freight Forecasting Tool, 2020



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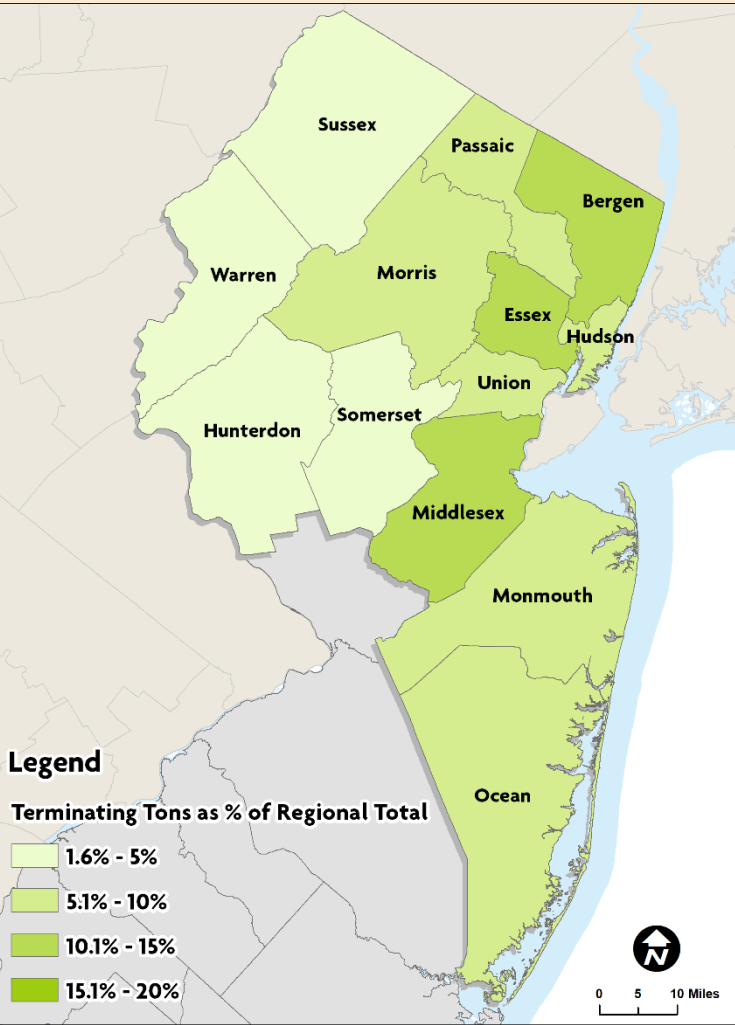
Mode Splits, 2020 and 2050

In 2020, about 97 percent of the goods in this bundle traveled by truck in the NJTPA region. Rail carried about 0.5 percent of goods in this commodity bundle. Other modes carried about 3 percent. By 2050, the share of tons moving by each mode is expected to remain similar, with trucks carrying 96 percent, rail 1 percent, and other modes 3 percent of the goods in this bundle.

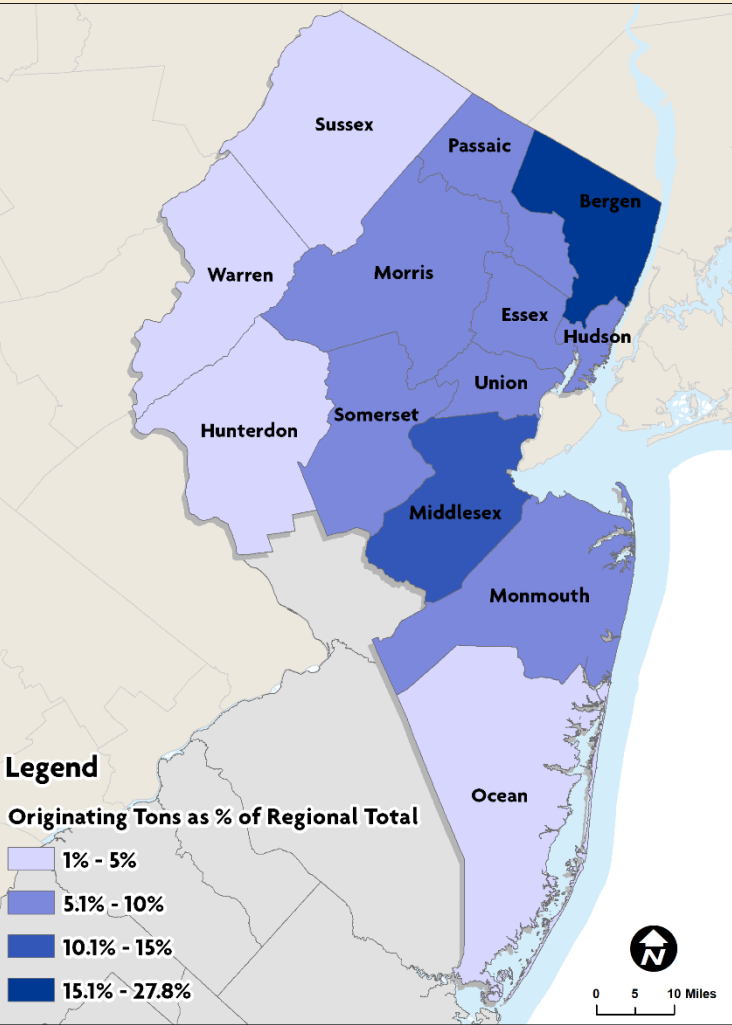


Source: NJTPA Freight Forecasting Tool, 2020

Inbound Domestic Tons by County, 2020



Outbound Domestic Tons by County, 2020

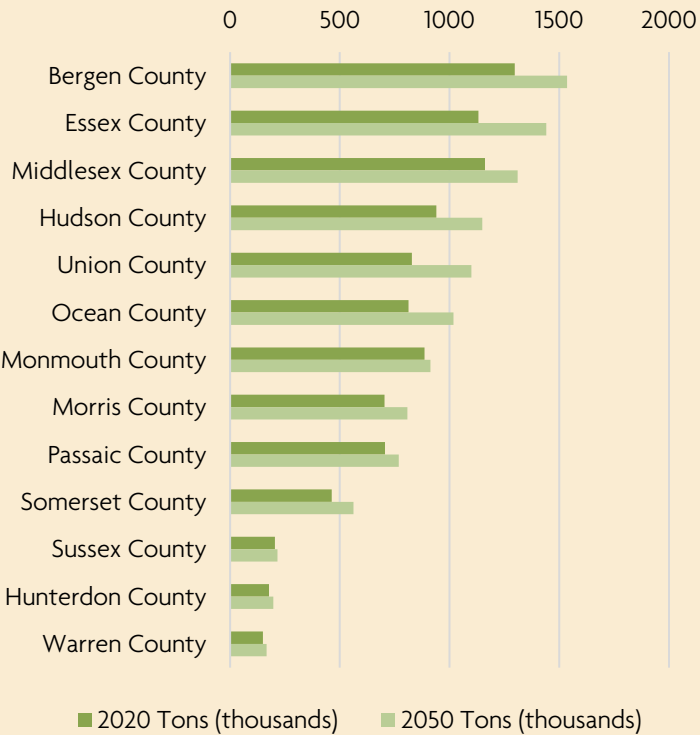


The maps above and the graphs on the next page show the top counties of origin and top counties of destination for goods in this commodity bundle traveling to or from the NJTPA region.

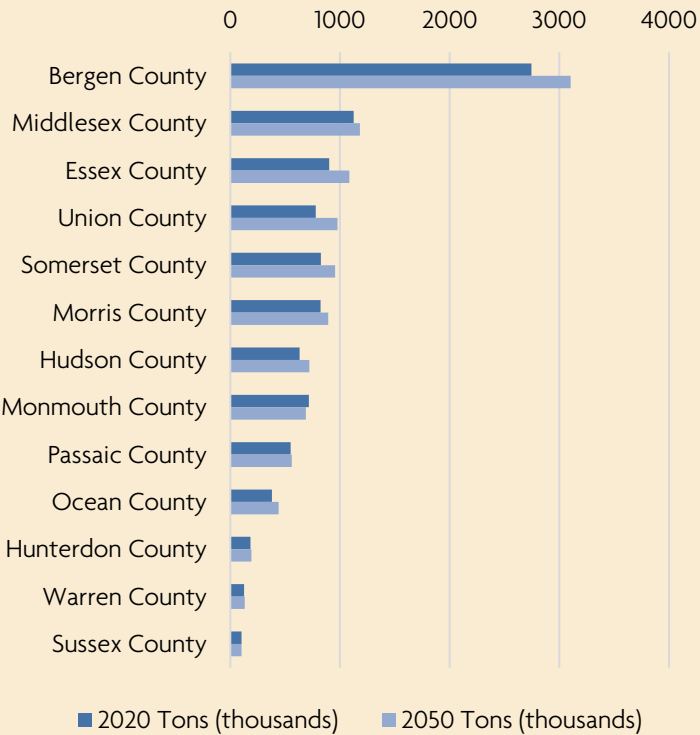
Bergen, Essex, and Middlesex are the top three destination counties in the region by tons of goods moved inbound, and are the destination of 38 percent of all of the region’s inbound goods in this bundle. Projected growth rates in inbound tonnage of warehouse and terminal moves between 2020 and 2050 range from 3 percent (Monmouth County) to 33 percent (Union County).

Bergen, Middlesex, and Essex are also the top origins of outbound shipments of these goods. Nearly half (48 percent) of all outbound warehouse and terminal moves originate in these three counties. Projected growth rates in outbound tonnage between 2020 and 2050 range from -4 percent (Monmouth County) to 26 percent (Union County).

Inbound Domestic Tons by County, 2020 and 2050



Outbound Domestic Tons by County, 2020 and 2050



References

- For more information on warehouse and terminal moves commodity flows and logistics in the North Jersey region and elsewhere, consult the following sources:
- National Association of Wholesaler-Distributors, www.naw.org
 - Association for Supply Chain Management, www.apics.org
 - New York New Jersey Foreign Freight Forwarders and Brokers Association, www.nynjforwarders-brokers.org
 - Warehousing Education and Research Council, www.werc.org
 - Council on Supply Chain Management Professionals New York/New Jersey Roundtable, www.cscmpnynj.org
 - National Association for Industrial and Office Parks, www.naiop.org
 - Bureau of Labor Statistics, U.S. Department of Labor, www.bls.gov

ABOUT THE NJTPA

The North Jersey Transportation Planning Authority (NJTPA) is the federally authorized Metropolitan Planning Organization for 6.7 million people in the 13-county northern New Jersey region. Each year, the NJTPA oversees the investment of more than \$1 billion in federal funding for transportation projects and provides a forum for interagency cooperation and public input into funding decisions. It also sponsors and conducts studies, assists county planning agencies and monitors compliance with national air quality goals.

The NJTPA Board of Trustees includes 15 local elected officials, including one representative from each of the 13 northern New Jersey counties – Bergen, Essex, Hudson, Hunterdon, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren – as well as from the cities of Newark and Jersey City. The Board also includes the Commissioner of the New Jersey Department of Transportation (NJDOT), the Executive Director of NJ TRANSIT, the Chairman of the Port Authority of New York and New Jersey, a Governor’s Representative and a Citizens’ Representative appointed by the Governor.

ABOUT THE STUDY

Conditions in the goods movement industry have changed over the last several years. The 2050 Freight Industry Level Forecasts Study developed updated information on current and projected freight demand through 2050 for the NJTPA to use in its freight planning activities. This effort built on two previous NJTPA freight planning studies: the 2040 Freight Industry Level Forecasts Study (completed in 2012) and the Regional Freight Commodity Profiles Study (completed in 2015).

This study helps identify locations with concentrations of goods movement activity and where they will occur in the future; the types of commodities that are and will be moving through the region; and where strategic investments should be considered to support economic growth and enhance regional resiliency. The results of this work will serve as background for the NJTPA’s next Long Range Transportation Plan as well as freight planning and subregional planning studies.

For further information, please contact Jakub Rowinski, NJTPA Project Manager, at jrowinski@njtpa.org.

This Freight Profile is one of a series of profiles, representing 12 freight commodity bundles in the 13-county NJTPA region.

This document was prepared by the NJTPA with funding from the Federal Transit Administration and the Federal Highway Administration. The NJTPA is solely responsible for its contents.