

REGIONAL FREIGHT COMMODITY PROFILE

Pharmaceutical Drugs

COMMODITY BUNDLE OVERVIEW

The pharmaceutical drugs commodity bundle represents a segment of chemical commodities. These drugs include prescription and over-the-counter consumer drugs. This commodity group includes prescription and over-the-counter consumer drugs.

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.

- 1.7 million tons in 2020, increasing 13 percent to 1.9 million tons in 2050.
- Represents 0.5 percent of the goods moved in the region by weight and 7 percent by value.
- More than 9 million square feet of warehousing/distribution center space dedicated to this bundle.
- 89 percent moves by truck, 10 percent moves by multiple modes, and 1 percent moves by rail.
- Interstate 78 carries more truckloads of goods in this bundle than any other highway in the region

Highlights

Composition

Domestic Tons in 2020



Total Tons: 1.7 million

Source: NJTPA Freight Forecasting Tool, 2020

Domestic Value in 2020



Total Value: \$49 billion

Source: NJTPA Freight Forecasting Tool, 2020

This commodity bundle consists entirely of pharmaceutical drugs.

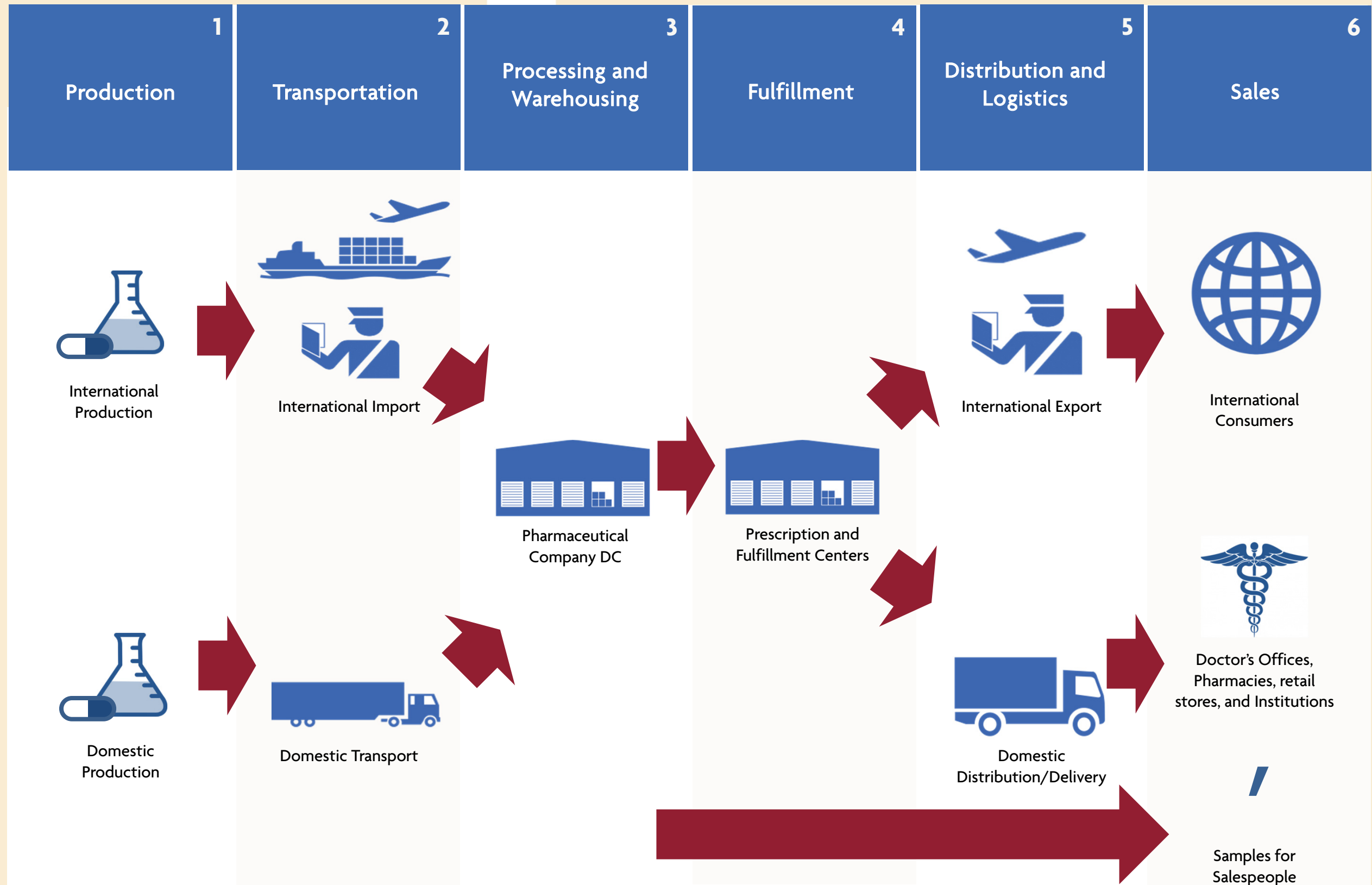
LOGISTICS SUMMARY

The graphic to the right represents the supply chain for the pharmaceuticals commodity bundle from initial production of domestic and international goods through distribution of goods to international and domestic pharmacies, doctor's offices, institutions, and retail stores.

This supply chain consists of six steps:

1. International and domestic goods are produced.
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 trucks. Domestically produced goods are transported by truck.
3. Goods are delivered to a pharmaceutical company's distribution center for processing and packaging.
4. Goods are sent to a prescription and fulfillment center for storage.
5. Products are distributed via one of three routes:
 - a. By truck to an export distributor or freight forwarder for export to international customers via air.
 - b. By truck for domestic delivery to doctor's offices, institutions, and retail stores.
 - c. By truck directly from a pharmaceutical company's distribution center to salespeople.
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 Locations by Industry Type

Business Square Footage by Industry Type

Pharmaceuticals

Legend

Square Feet Occupied

Production

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

Logistics

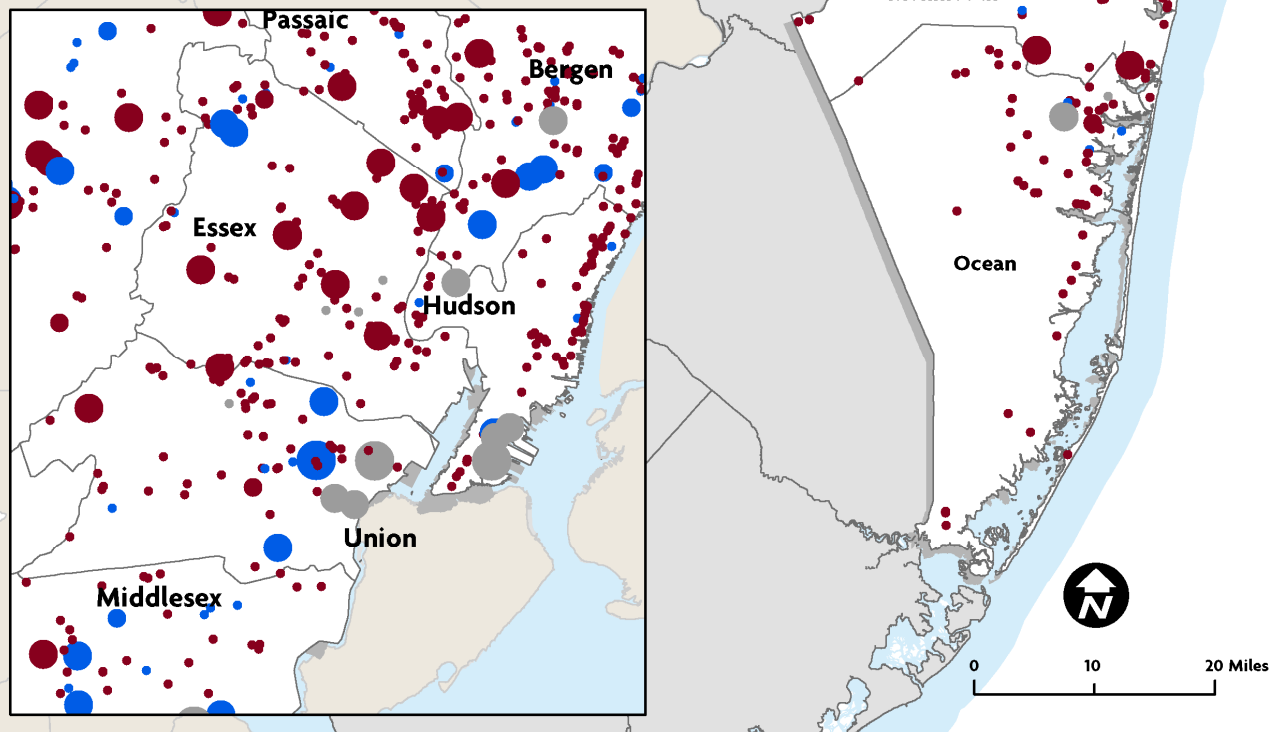
- 0 - 24,999
- 25,000 - 49,999
- 50,000 - 249,999
- 250,000 +

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 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.

Production and logistics facilities are clustered in portions of Somerset, Middlesex, Union, Morris, and Bergen counties. Sales establishments are clustered primarily in the most populous portions of the region.

KEY INDUSTRY TRENDS

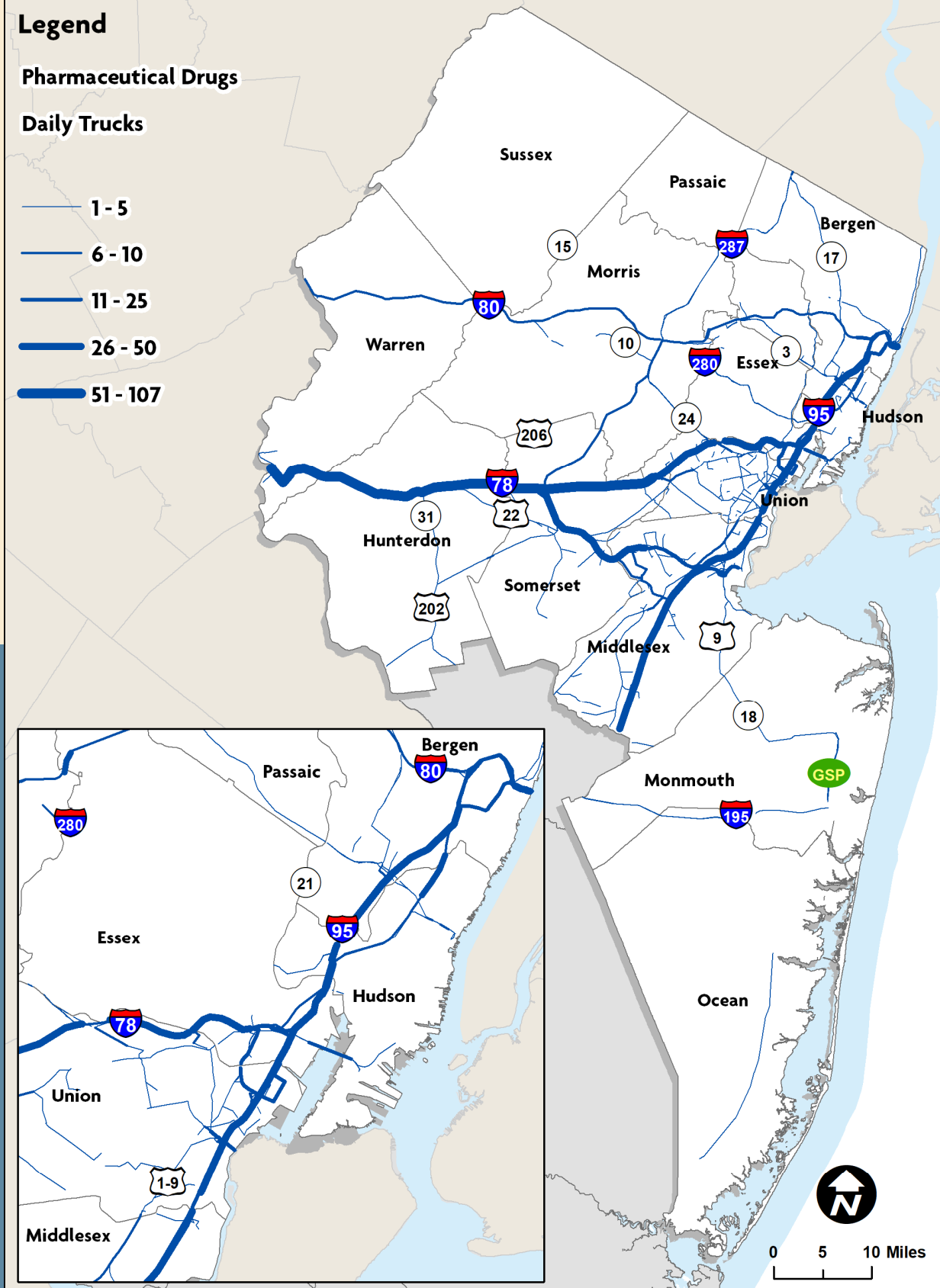
The following trends are shaping demand for pharmaceutical drugs today, and projected demand in the future:

- Pharmaceutical companies are facing cost pressures with the rise of less expensive generic drugs as patents on drugs expire.
- Changes in US tax laws, which reduced the corporate tax rate, are leading some large pharmaceutical companies to re-shore drug manufacturing. However, NJ employment in drug manufacturing has been declining while research and development has remained flat.
- With COVID-19, the state's universities, hospitals and pharmaceutical companies are actively working on clinical trials, treatments and vaccine therapies.
- The strategic supply of based materials for pharmaceutical production has become a major concern. The COVID-19 pandemic highlighted this supply chain risk. This will likely lead to changes in the raw materials and production facilities that will be in the United States. The outcome is likely an increase in domestic production capability.

Pharmaceuticals are Developed, Manufactured, and Consumed at Facilities Throughout the Region



Highway Network Utilization, 2020



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

HIGHWAY NETWORK FLOWS OF PHARMACEUTICAL DRUGS

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.

Portions of Interstate 78 in Somerset, Hunterdon, and Warren counties carry the greatest volume of truckloads of pharmaceutical drugs in the region. Up to 100 truckloads of this commodity travel on this segment in each direction, each day.

The New Jersey Turnpike, portions of Interstate 287 in Somerset County, Interstate 78 in Union and Essex counties carry 26 to 50 truckloads of pharmaceutical drugs in each direction daily.

COMMODITY FLOW SUMMARY

About 1.7 million tons of goods in this bundle, worth \$49.5 billion, moved in the NJTPA region in 2020. By 2050, nearly 1.9 million tons worth more than \$55 billion are expected to move in the region. These projections represent 13 percent growth by tons and 11 percent growth by value.

This bundle represented 0.5 percent of the goods moved in the region by weight and 7 percent by value in 2020. By 2050, these shares are expected to remain similar, at 0.4 percent by weight and 7 percent by value.

As the table below shows, pharmaceutical drugs is the only commodity included in this bundle.

Forecasted Change in Commodity Flows in the Pharmaceutical Drugs Bundle by Weight and Value, 2020 and 2050

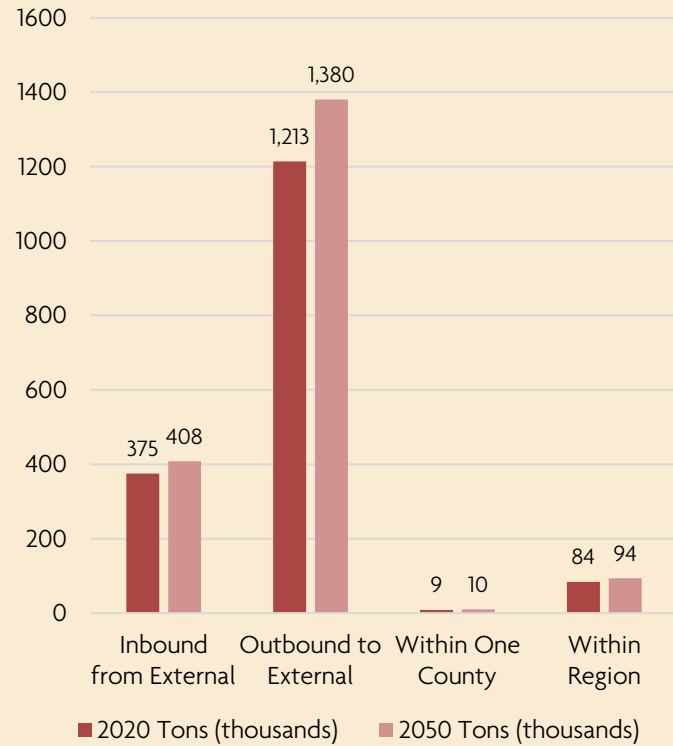
Commodity	2020 Tons (thousands)	2050 Tons (thousands)	2020 Value (millions \$)	2050 Value (millions \$)	Change in Tons, 2020-2050	Change in Value, 2020-2050
Pharmaceuticals	1,681	1,892	49,477	55,050	13%	11%

Source: NJTPA Freight Forecasting Tool, 2020

Examples of Pharmaceutical Drug Products



Domestic Tons by Direction, 2020 and 2050



About 1.2 million tons of pharmaceutical drugs (72 percent of all tons in this bundle) originate in the NJTPA region and travel outbound. About 375,000 tons (22 percent) moved inbound from outside the region. About 5 percent moved between NJTPA counties, and less than 1 percent moved within one NJTPA county alone.

About 88 percent of the goods in this bundle imported to the NJTPA region originate in one of the locations shown in the graph on the next page. Nearly one-quarter originate in portions of New Jersey outside the NJTPA region alone. Among the top origins, growth in tonnage is expected to range from 9 to 10 percent between 2020 and 2050.

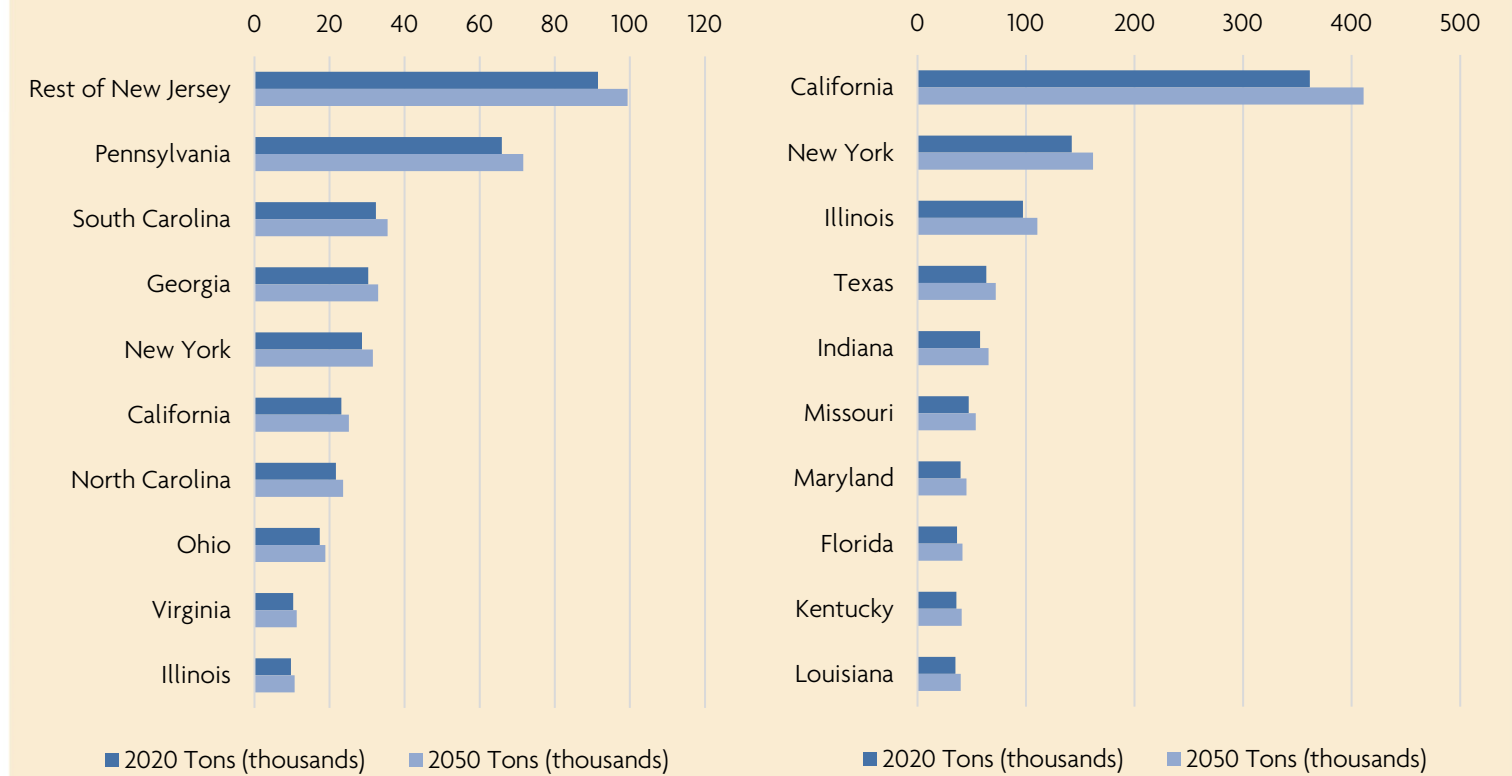
The graph on the next page also shows the destinations of more than three-quarters (76 percent) of the goods in this commodity bundle that leave the NJTPA region. About 30 percent are destined for California alone. Among the top origins, growth in tonnage is expected to range from 13 to 14 percent between 2020 and 2050.

Source: NJTPA Freight Forecasting Tool, 2020

Trucks Carry Nearly all of the Pharmaceutical Drugs Moving in the Region. About 1 Percent Move by Domestic Air



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

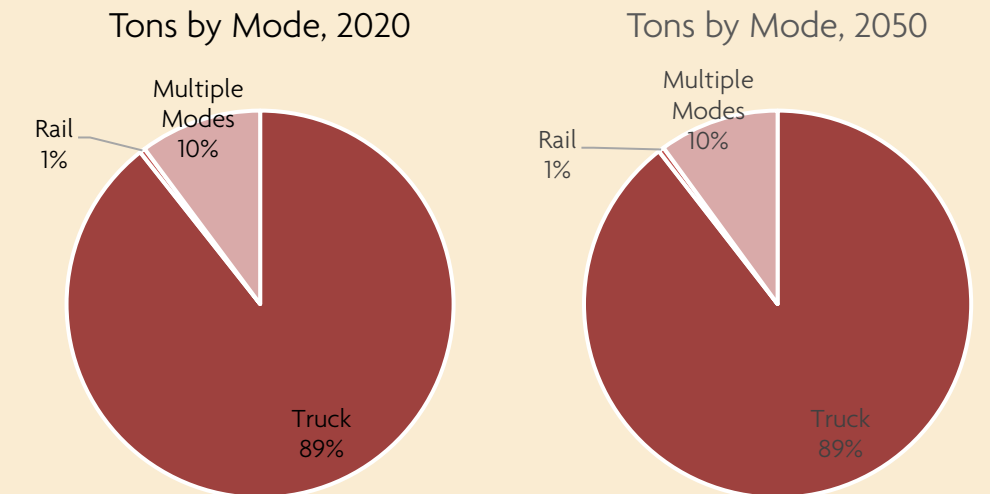


Source: NJTPA Freight Forecasting Tool, 2020

Source: NJTPA Freight Forecasting Tool, 2020

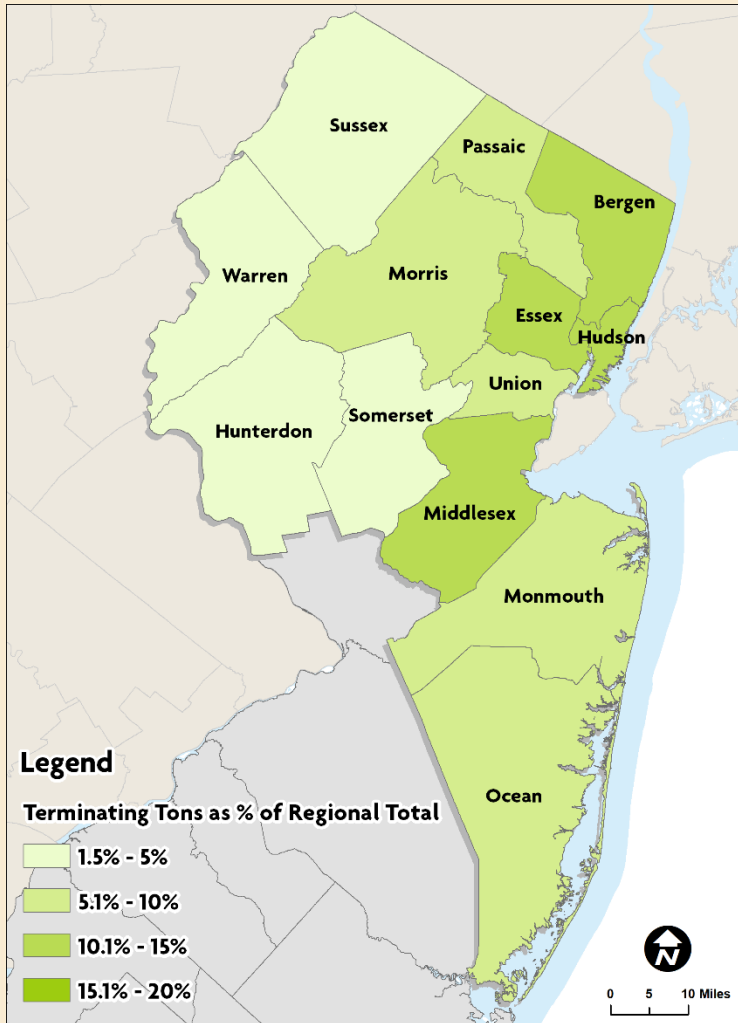
Mode Splits, 2020 and 2050

In 2020, about 89 percent of the pharmaceutical drugs moving in the NJTPA region traveled by truck. About 10 percent moved by multiple modes, mostly intermodal rail and truck, though some move by air and truck. About 1 percent moved by rail. By 2050, the mode split is expected to remain similar.



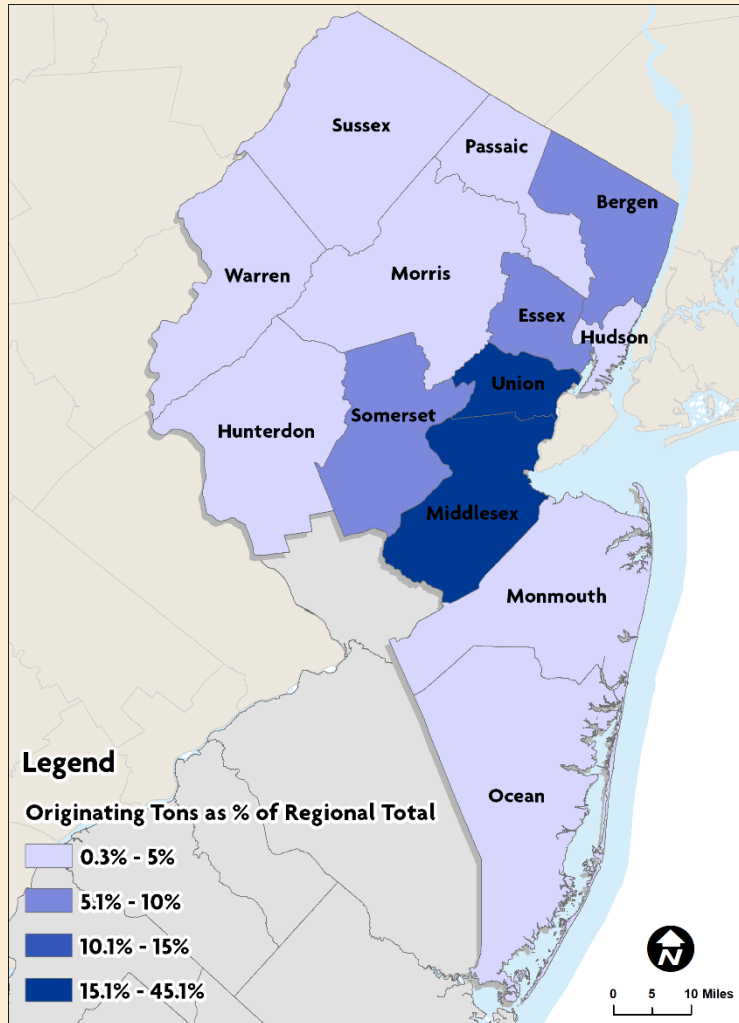
Source: NJTPA Freight Forecasting Tool, 2020

Inbound Domestic Tons by County, 2020



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

Outbound Domestic Tons by County, 2020



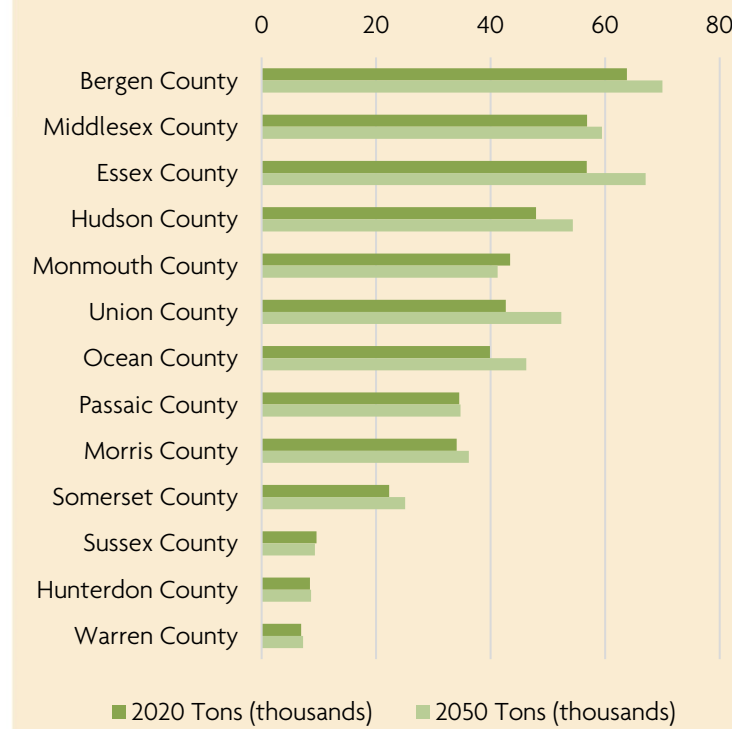
Source: NJTPA Freight Forecasting Tool, 2020; NJRTM-E, 2019; NJOIT, 2008; Esri, 2014.

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.

Nearly 40 percent of terminating tonnage terminates in Bergen, Middlesex, or Essex counties, each of which received more than 50,000 tons in 2020. Projected growth rates in inbound tonnage of pharmaceutical drugs range from -5 percent (Monmouth County) to 23 percent (Union County) between 2020 and 2050.

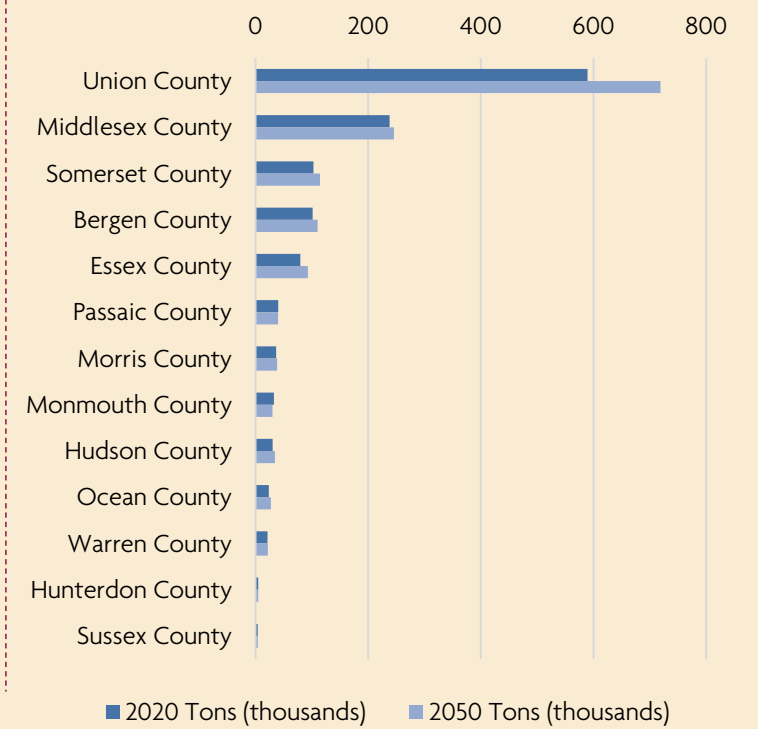
About 45 percent of the region's originating tonnage originates in Union County alone. Projected growth rates in originating tonnage between 2020 and 2050 range from -7 percent (Monmouth County) to 22 percent (Union County).

Inbound Domestic Tons by County, 2020 and 2050



Source: NJTPA Freight Forecasting Tool, 2020

Outbound Domestic Tons by County, 2020 and 2050



Source: NJTPA Freight Forecasting Tool, 2020

References

For more information on pharmaceutical drugs commodity flows and logistics in the North Jersey region and elsewhere, consult the following sources:

- Pharmaceutical Trade Association, www.pdetrade.org
- Pharmaceutical Research and Manufacturers of America, www.phrma.org
- New Jersey Pharmaceutical Association for Science and Technology, www.njphast.org
- U.S. Pharmacopeia, www.usp.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.