

## REGIONAL FREIGHT COMMODITY PROFILE

# Pharmaceutical Drugs

### COMMODITY BUNDLE OVERVIEW

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

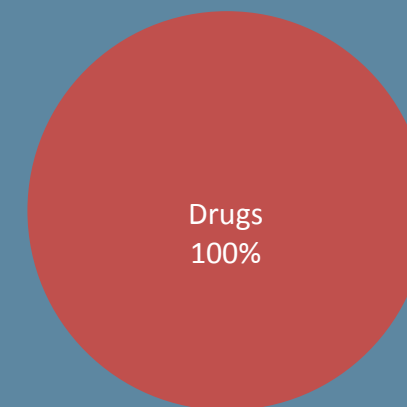
The primary data source for commodity flows reported in this profile is NJTPA's Freight Forecasting Tool, which generates commodity freight data and forecasts for a 2010 base year and 2040 forecast year. This profile describes freight flows between domestic origins and destinations.

- 2.1 million tons in 2010, increasing 36% to 2.9 million tons in 2040.
- Represents 0.3% of the goods moved in the region by weight and 0.7% by value.
- 1,015 business establishments employing 11,000 people send or receive goods in this bundle.
- More than 9 million square feet of warehousing/distribution center space dedicated to this bundle.
- 99% moves by truck, 1% moves by air, and less than 1% moves by domestic water or by rail.

# Highlights

# Composition

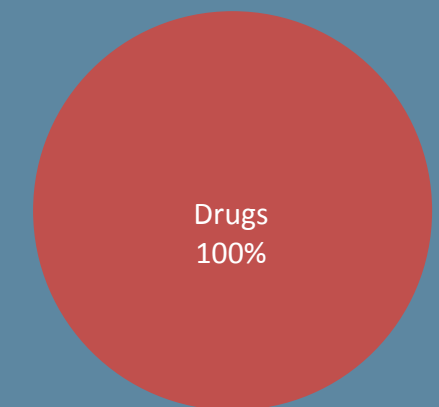
### Domestic Tons in 2010



Total Tons: 2.1 million

Source: NJTPA Freight Forecasting Tool, 2012

### Domestic Value in 2010



Total Value: \$14 billion

Source: NJTPA Freight Forecasting Tool, 2012

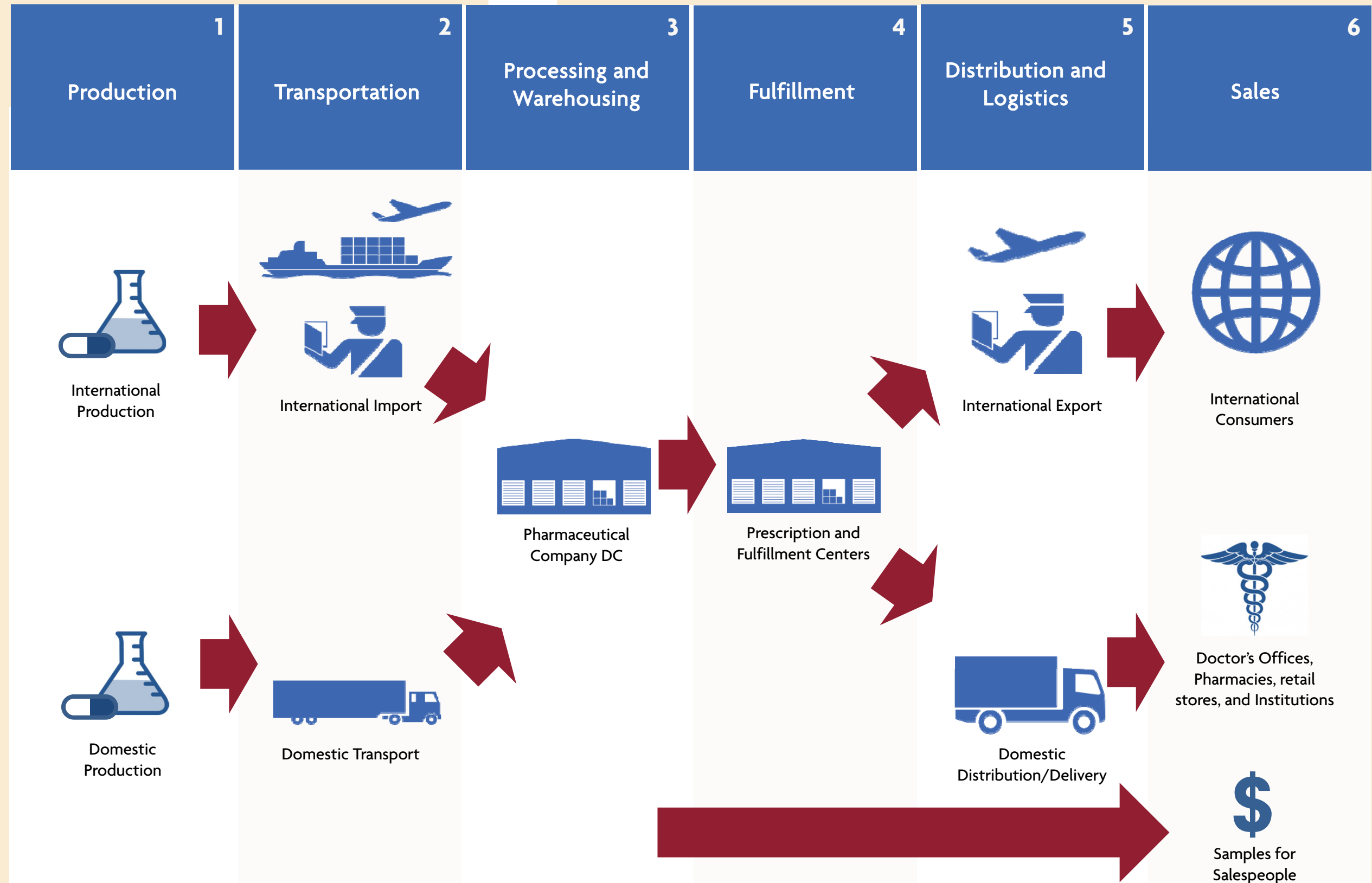
This commodity bundle consists entirely of pharmaceutical drugs.

## 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 centers 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.



# Business Locations by Industry Type

## Business Square Footage by Industry Type

### Pharmaceutical Drugs

#### Legend

#### Square Feet Occupied

##### Production

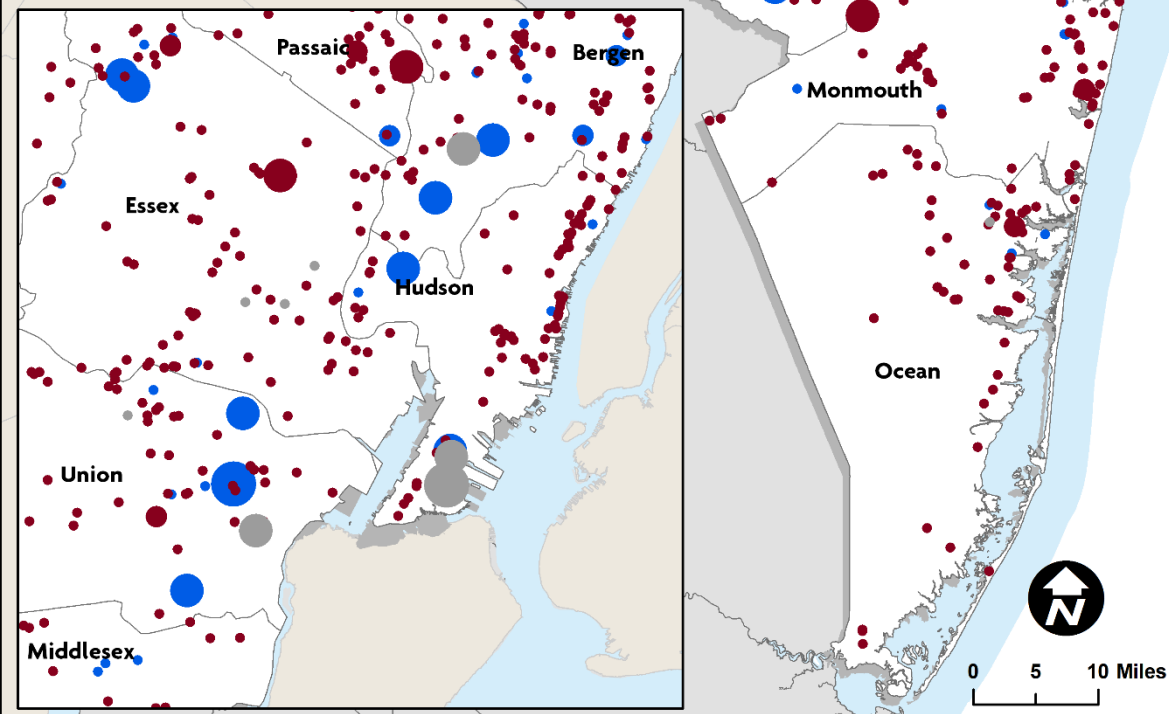
- 0 - 24,999
- 25,000 - 49,999
- 50,000 - 249,999
- 250,000 +

##### 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: Co-Star, 2014; NJOIT, 2008; Esri, 2014.

Note: "Production" includes Manufacturing, Utilities, Mining & Agriculture, corresponding to Step 1 in the Logistics Summary on Pages 2-3.

"Logistics" includes Wholesale Trade and Warehousing, corresponding to Steps 2-5 in the Logistics Summary on Pages 2-3.

"Sales" includes Retail, Health Care, and Professional Services, corresponding to Step 6 in the Logistics Summary on Pages 2-3.

## 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:

- Concerns about diversion, counterfeiting and theft will drive spending on supply chain security through increased tracking and visibility. Combined with rising labor costs overseas, this may push some companies to consider on-shoring manufacturing operations.
- High barriers to entry will limit the emergence of new companies. Some smaller companies may leave the industry due to more stringent regulation and increased cost for research and development.
- Patents on some "blockbuster" drugs are expiring. This will lead to an increase in generic drugs.
- Growth in biological products will place additional pressure on supply chains. Biotech goods are more complex, have a shorter shelf-life, are more expensive, and require special handling.

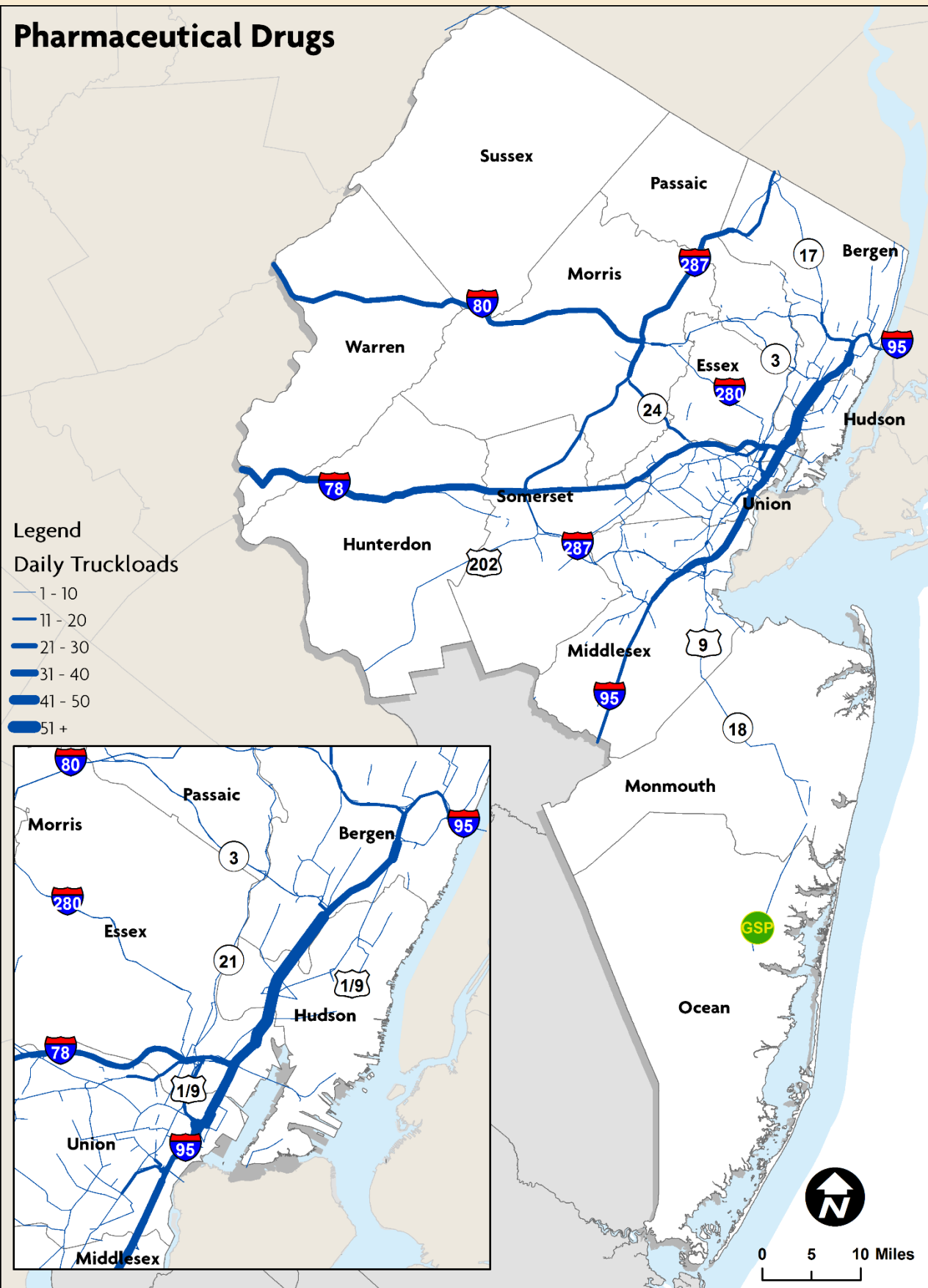
## Pharmaceuticals are Developed, Manufactured, and Consumed at Facilities Throughout the Region





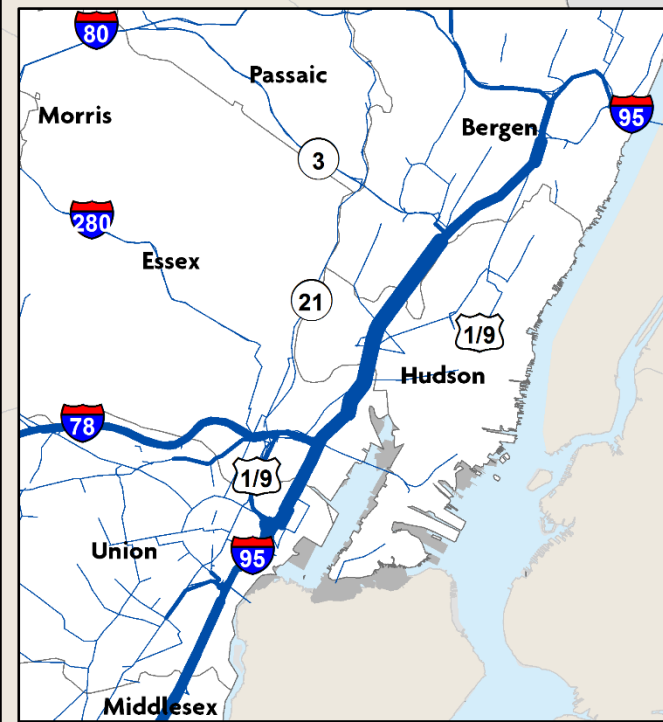
## Highway Network Utilization, 2010

### Pharmaceutical Drugs



Legend  
Daily Truckloads

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 +



Source: NJTPA Freight Forecasting Tool, 2012; NJOIT, 2008; Esri, 2014.

## HIGHWAY NETWORK FLOWS OF PHARMACEUTICAL DRUGS

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

Portions of the NJ Turnpike between Exit 14 in Essex County and Exit 17 in Hudson County carry more than 50 truckloads of pharmaceutical drugs daily. Segments of the NJ Turnpike between Exits 17 and 18, and between Exits 13A and 14, and Interstate 78 west of Interstate 287 carry 41 to 50 truckloads of pharmaceutical drugs every day. Daily truckload volumes between 31 and 40 are handled on portions of the NJ Turnpike between Exits 13A and 9 and on Interstate 78 in central Somerset County. Portions of Interstate 287 between Route 24 and Route 208, Interstate 80 west of Interstate 287, and Interstate 78 in eastern Somerset, Union, and Essex counties carry between 21 and 30 truckloads daily.

## COMMODITY FLOW SUMMARY

Collectively, about 2.1 million tons of goods in this bundle, worth \$14 billion, moved into, out of, through, or within the NJTPA region in 2010. By 2040, nearly 2.9 million tons worth more than \$18 billion will move in the region. These projections represent 36 percent growth by tons and 35 percent growth by value.

This bundle represented 0.3 percent of the goods moved in the region by weight and 0.7 percent by value in 2010. By 2040, these shares are expected to remain the same.

As the table below shows, pharmaceutical drugs is the only commodity included in this bundle. The standard transportation commodity code for drugs is 2830.

## Commodities in the Pharmaceutical Drugs Commodity Bundle

STCC4	Commodity	Tons (thousands)	Value (millions)
2830	Drugs	1,433	\$9,921

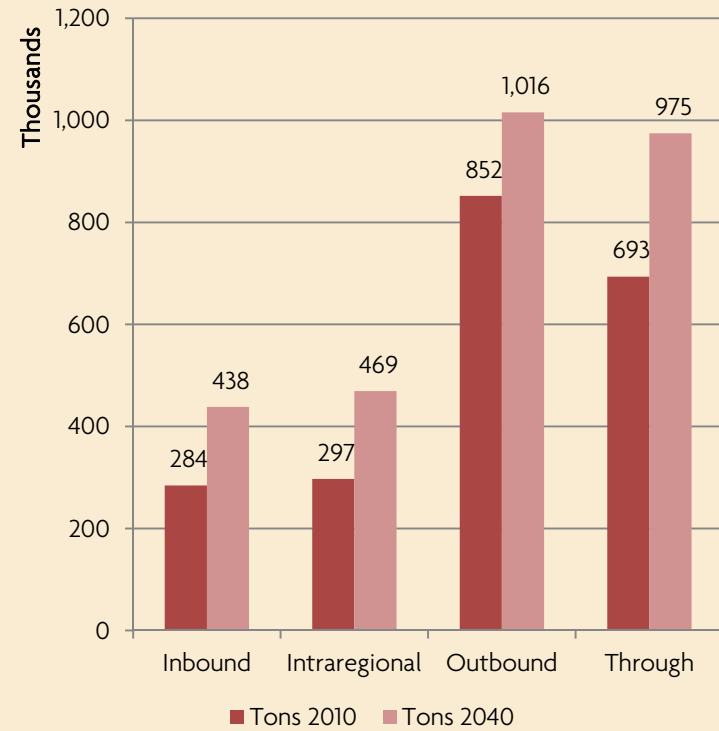
Source: NJTPA Freight Forecasting Tool, 2012

Note: "STCC4" represents the four-digit Standard Transportation Commodity Code (STCC)

## Examples of Pharmaceutical Drug Products



## Domestic Tons by Direction, 2010 and 2040



About 850,000 tons of pharmaceutical drugs (40 percent of all tons in this bundle) originate in the NJTPA region and travel outbound. About 693,000 tons (33 percent) passed through the NJTPA region, 297,000 tons (14 percent) moved within the region, and 284,000 tons (13 percent) moved inbound from outside the region.

About 72 percent of the goods in this bundle imported to the NJTPA region originate in one of the locations shown in the graph to the right. More than one-quarter originate in the Miami region of Florida alone. Among the top origins, growth in tonnage is expected to range from 50 to 58 percent between 2010 and 2040.

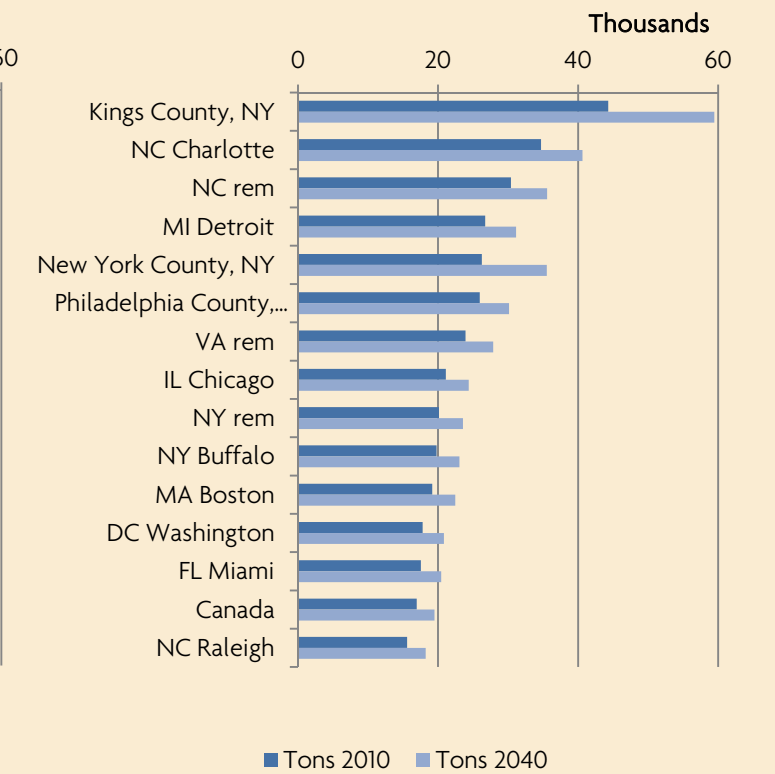
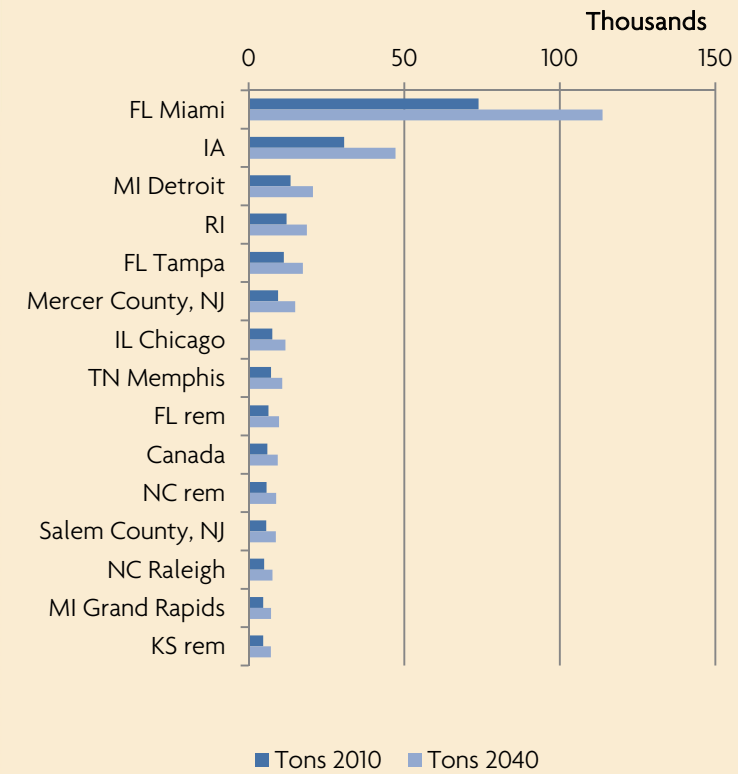
The locations shown in the far-right graph are the destinations of 42 percent of the goods in this commodity bundle that leave the NJTPA region. Kings County in NY (Brooklyn) and portions of North Carolina are the top destinations. Among the destinations shown in the graph, flows to New York County, NY (Manhattan) are expected to grow fastest (35 percent) and flows to Canada are expected to grow slowest (15 percent) through 2040.

Source: NJTPA Freight Forecasting Tool, 2012

## 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), 2010 and 2040

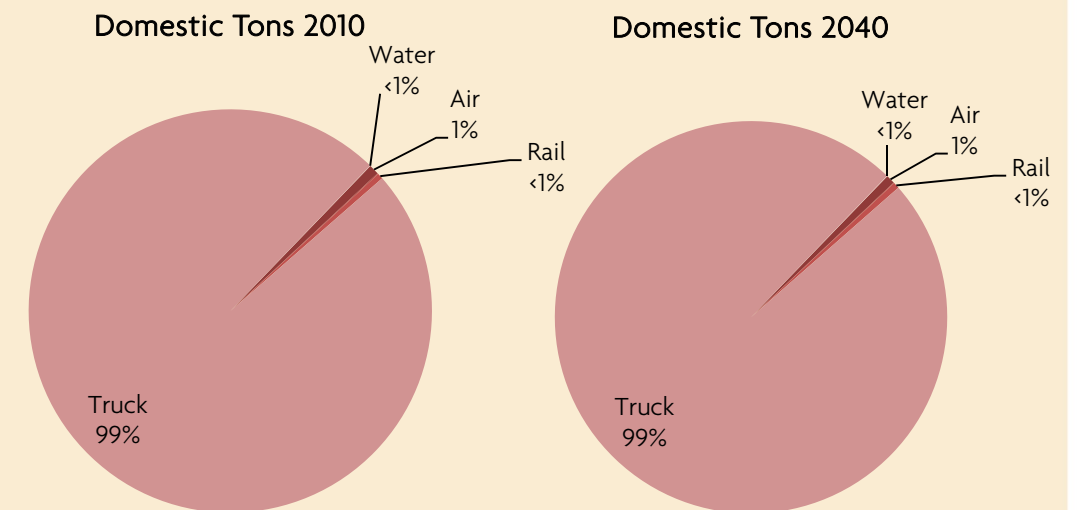


Source: NJTPA Freight Forecasting Tool, 2012  
Note: "rem" stands for "remainder," which refers to the portions of a state outside major metropolitan regions.

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## Mode Splits, 2010 and 2040

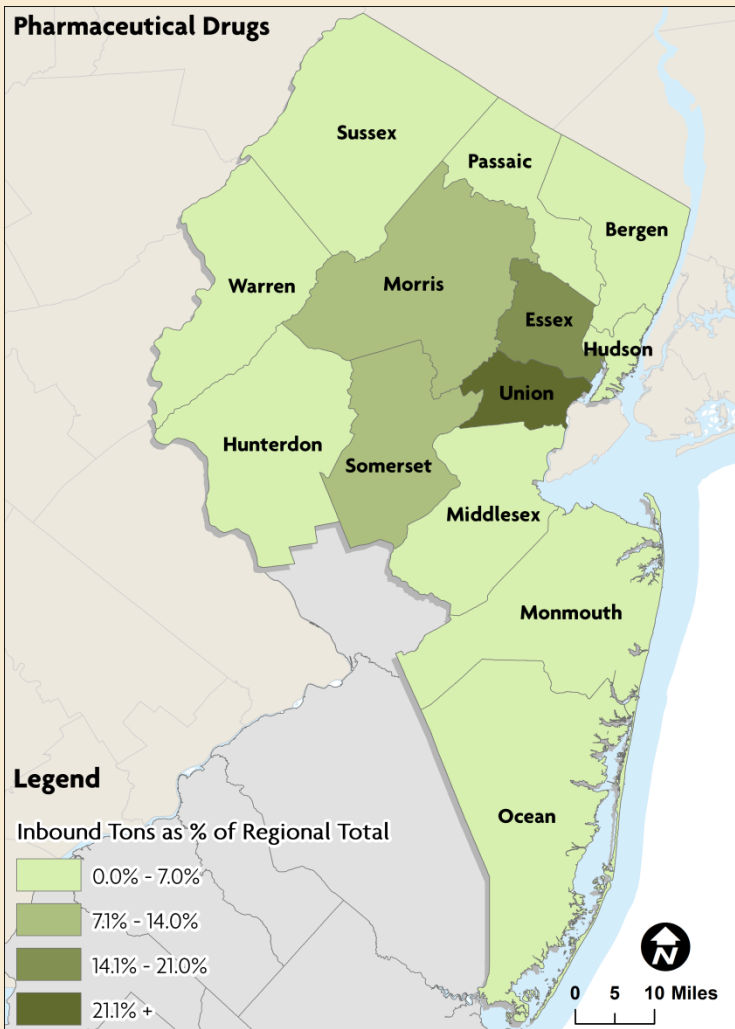
In 2010, about 99 percent of the pharmaceuticals moving in the NJTPA region traveled by truck. About 1 percent moved by air. Less than 1 percent were transported by domestic water or by rail. By 2040, the mode split is expected to remain similar.



Source: NJTPA Freight Forecasting Tool, 2012

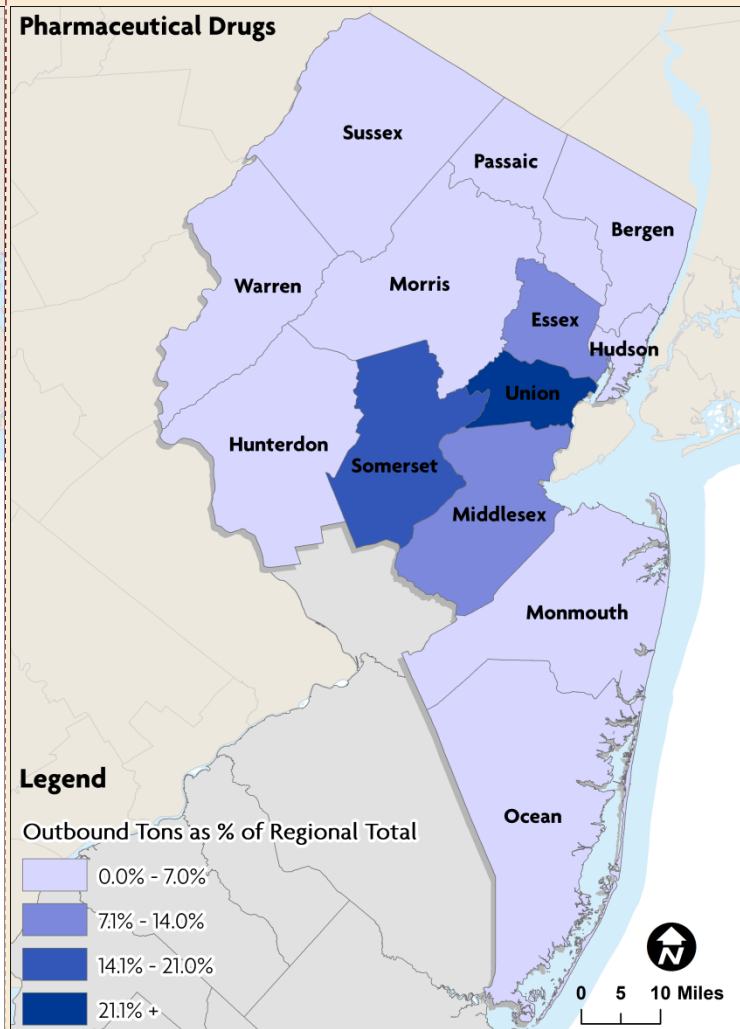


### Inbound Domestic Tons by County, 2010



Source: NJTPA Freight Forecasting Tool, 2012; NJOIT, 2008; Esri, 2014.

### Outbound Domestic Tons by County, 2010



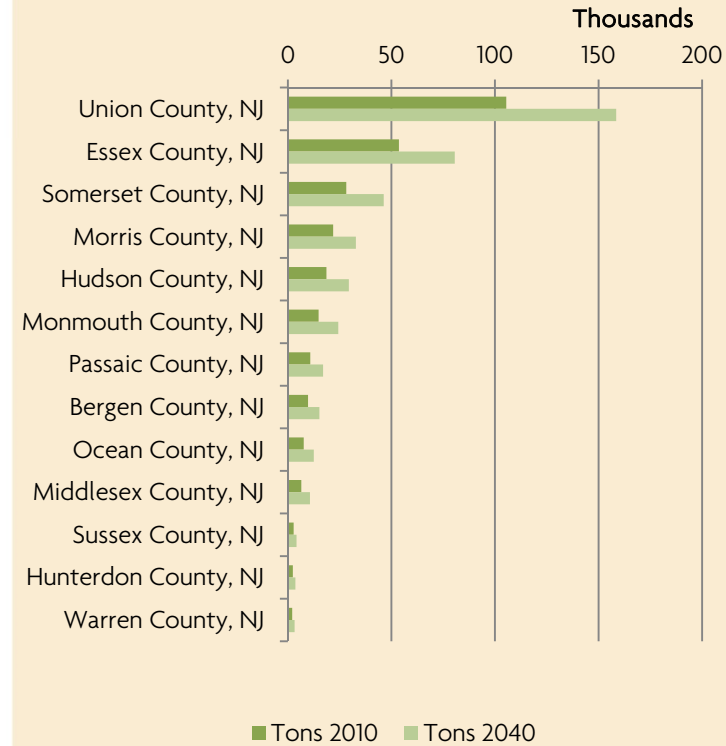
Source: NJTPA Freight Forecasting Tool, 2012; NJOIT, 2008; Esri, 2014.

The maps above and the graphs on the opposite 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.

About 37 percent of inbound goods in the pharmaceutical drugs commodity bundle are destined for Union County alone. Projected growth rates in inbound tonnage of pharmaceutical drugs range from 50 percent (Union, Essex, Morris, Sussex, and Hunterdon counties) to 65 percent (Middlesex County) between 2010 and 2040.

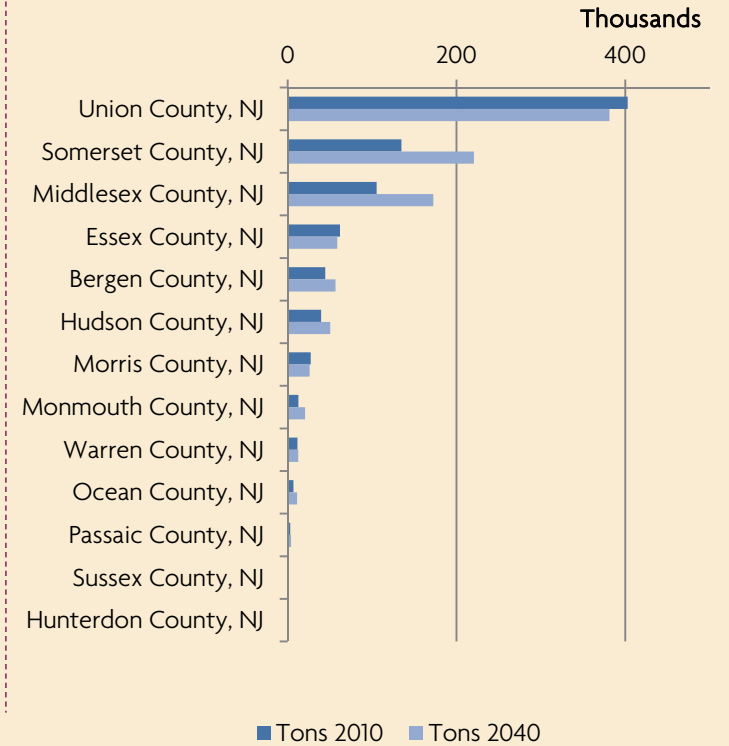
About 47 percent of all goods in the pharmaceutical drugs commodity bundle traveling outbound from the NJTPA region originate in Union County. Projected growth rates in outbound tonnage between 2010 and 2040 range from -4 percent (Sussex County) to 64 percent (Somerset, Middlesex, Monmouth, and Ocean counties).

### Inbound Domestic Tons by County, 2010 and 2040



Source: NJTPA Freight Forecasting Tool, 2012

### Outbound Domestic Tons by County, 2010 and 2040



Source: NJTPA Freight Forecasting Tool, 2012

## 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](http://www.pdetrade.org)
- Pharmaceutical Research and Manufacturers of America, [www.phrma.org](http://www.phrma.org)
- New Jersey Pharmaceutical Association for Science and Technology, [www.njphast.org](http://www.njphast.org)
- Bureau of Labor Statistics, U.S. Department of Labor, [www.bls.gov](http://www.bls.gov)

## ABOUT THE NJTPA

The North Jersey Transportation Planning Authority (NJTPA) is the federally authorized Metropolitan Planning Organization for 6.6 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

The NJTPA regional Freight Commodity Profiles study enhanced the NJTPA’s freight modeling tools, analyzed, and identified gaps in existing freight and industry data, collected data and information to fill those gaps, and prepared summary data products, including a set of Regional Commodity Profile documents. In addition to supporting freight planning, these profiles will be used in stakeholder outreach and education. Key work tasks included:

- Enhancement of the NJTPA’s Freight Forecasting Tool to produce commodity-specific truck trip tables.
- Identification of “Top 11 Regional Commodity Groups” based upon economic and commodity flow data.
- Collection and analysis of data on each of the commodity groups, including: direction of movement; locations of production, shipping, handling, and receiving centers; modes and routes used to transport the commodities.
- Production of “Regional Commodity Profile” documents for each of the Top 11 Regional Commodity Groups, which summarize the data analysis findings using charts, graphs, maps, and descriptive text.

## ABOUT THIS PROFILE

The NJTPA developed a Freight Forecasting Tool (FFT) in 2012, which generates alternative domestic freight forecasts to support transportation, land use, and economic development decisions. The FFT was built by Cambridge Systematics, Inc., using commodity flow data from IHS Global Insight and econometric forecasts from the R/ECON model, produced and managed by the Center for Urban Policy Research at Rutgers University. Cambridge Systematics and Parsons Brinckerhoff enhanced the FFT in 2015 to produce commodity group-specific forecast tables.

The NJTPA conducted research on commodity flows and logistics chains for 11 key “commodity bundles,” that move in the North Jersey region, including warehouse and terminal moves, food, apparel, paper and printed materials, waste, construction materials, machinery and transportation equipment, other durable goods, pharmaceuticals, chemicals, and hazardous materials. This profile offers an overview of the components, freight demand, and logistics chain for pharmaceutical drugs moving into, out of, through, and within the North Jersey region.

**For further information,** please contact Jakub Rowinski, NJTPA Project Manager, at [jrowinski@njtpa.org](mailto:jrowinski@njtpa.org). This document was prepared by the North Jersey Transportation Planning Authority, Inc. with funding from the Federal Transit Administration and the Federal Highway Administration. The NJTPA is solely responsible for its contents.