

REGIONAL FREIGHT COMMODITY PROFILE

Paper and Printed Materials

COMMODITY BUNDLE OVERVIEW

This bundle consists of three commodity groups: newsprint and paper; paper articles that include envelopes, packaging, paper food containers, and boxes; and printed products that include books, printed stationery, magazines, and brochures.

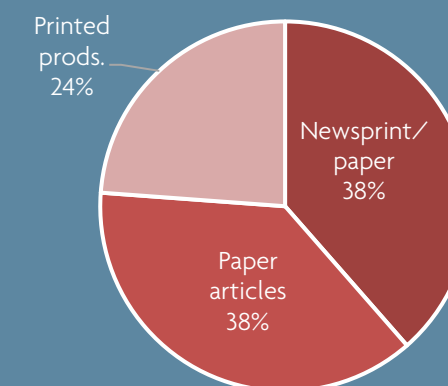
The primary data source for commodity flows reported in this profile is NJTPA's Freight Forecasting Tool, which generates commodity freight data and forecasts for a 2020 base year and 2050 forecast year. This profile describes freight flows between domestic origins and destinations.

- 7.0 million tons in 2020, increasing 21 percent to 8.4 million tons in 2050.
- Represents 2 percent of the goods moved in the region by weight and by value.
- Nearly 11 million square feet of warehousing/distribution center space dedicated to this commodity bundle.
- 89 percent moves by truck, 7 percent by rail, and 4 percent by other modes.

Highlights

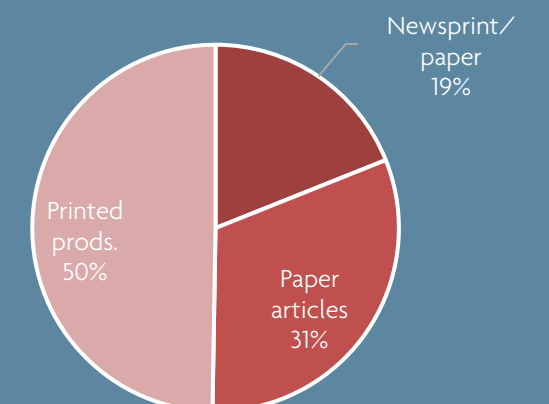
Composition

Domestic Tons in 2020



Total Tons: 7.0 million
Source: NJTPA Freight Forecasting Tool, 2020

Domestic Value in 2050



Total Value: \$16 billion
Source: NJTPA Freight Forecasting Tool, 2020

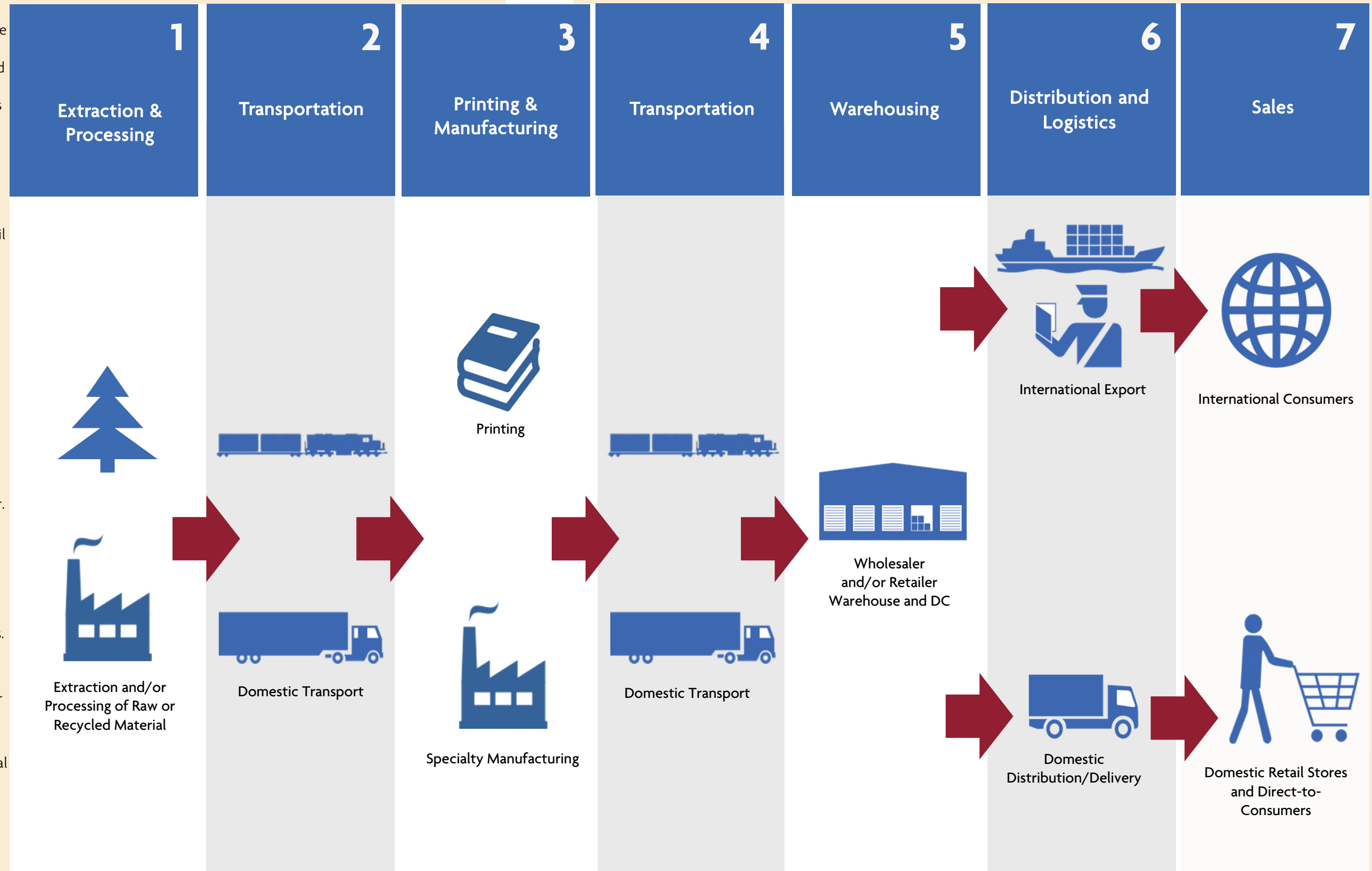
Newsprint and paper represent the largest commodity by weight in this bundle. Printed products account for the greatest percent of goods moved by value. Paper articles, including paper bags, containers and boxes, and envelopes, account for the second-largest commodity in both categories—38% of shipments by weight and 31% by value.

LOGISTICS SUMMARY

The graphic to the right represents the supply chain for the paper and printed materials commodity bundle, illustrating the process of producing books, other printed materials, and specialty paper products, and distributing those products to retail stores, institutions, and directly to consumers. This supply chain consists of seven steps:

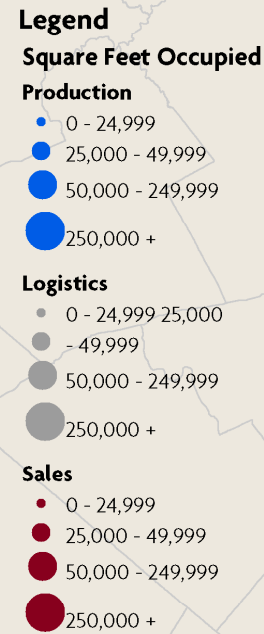
1. Raw material is extracted, or recycled pulp is produced, and sent for initial processing to produce raw paper, pulp, and allied products.
2. Products are transported by truck or rail carload.
3. Printing facilities or specialty paper product manufacturers, such as a cardboard box or cardstock manufacturer, produce finished goods.
4. Finished products are transported by truck or by rail.
5. Goods are processed through a warehouse or distribution center, and shipments are prepared for delivery to customers. The warehouse or distribution center may be owned by the publisher, a wholesaler, or a retailer.
6. Shipments are then distributed via one of the following two routes:
 - A. By truck or rail intermodal to an export distributor or freight forwarder for export by ocean vessel to international customers.
 - B. By truck directly from the distribution center to retail stores, institutional customers, or to fulfill direct-to-consumer orders.
7. Shipments are delivered to international and domestic customers, according to the customers' specifications.

Note that the e-commerce delivery supply chain is described in the e-commerce commodity bundle profile.

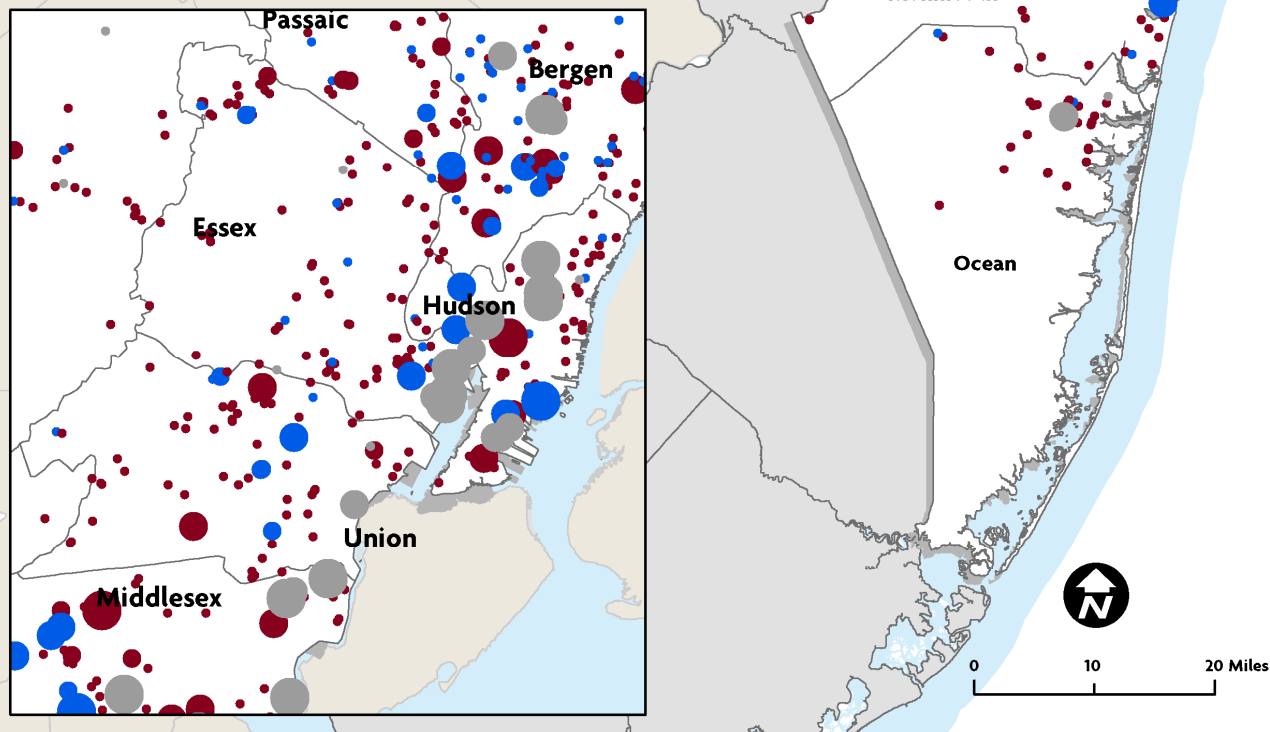


Business Square Footage by Industry Type

Paper & Printed Material



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 steps 1 and 3 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 5 and 6 on the logistics summary chart.
- Sales, represented in step 7 on the logistics summary chart, including retail, services, and institutional establishments where goods are sold.

The largest facilities are clustered near major roadway, including Interstates 95, 287, and 80 and Routes 17, 208, and 35. This reflects the supply chains' reliance on trucks for the transport of shipments throughout the supply chain, and to make connections to rail and marine terminals.

KEY INDUSTRY TRENDS

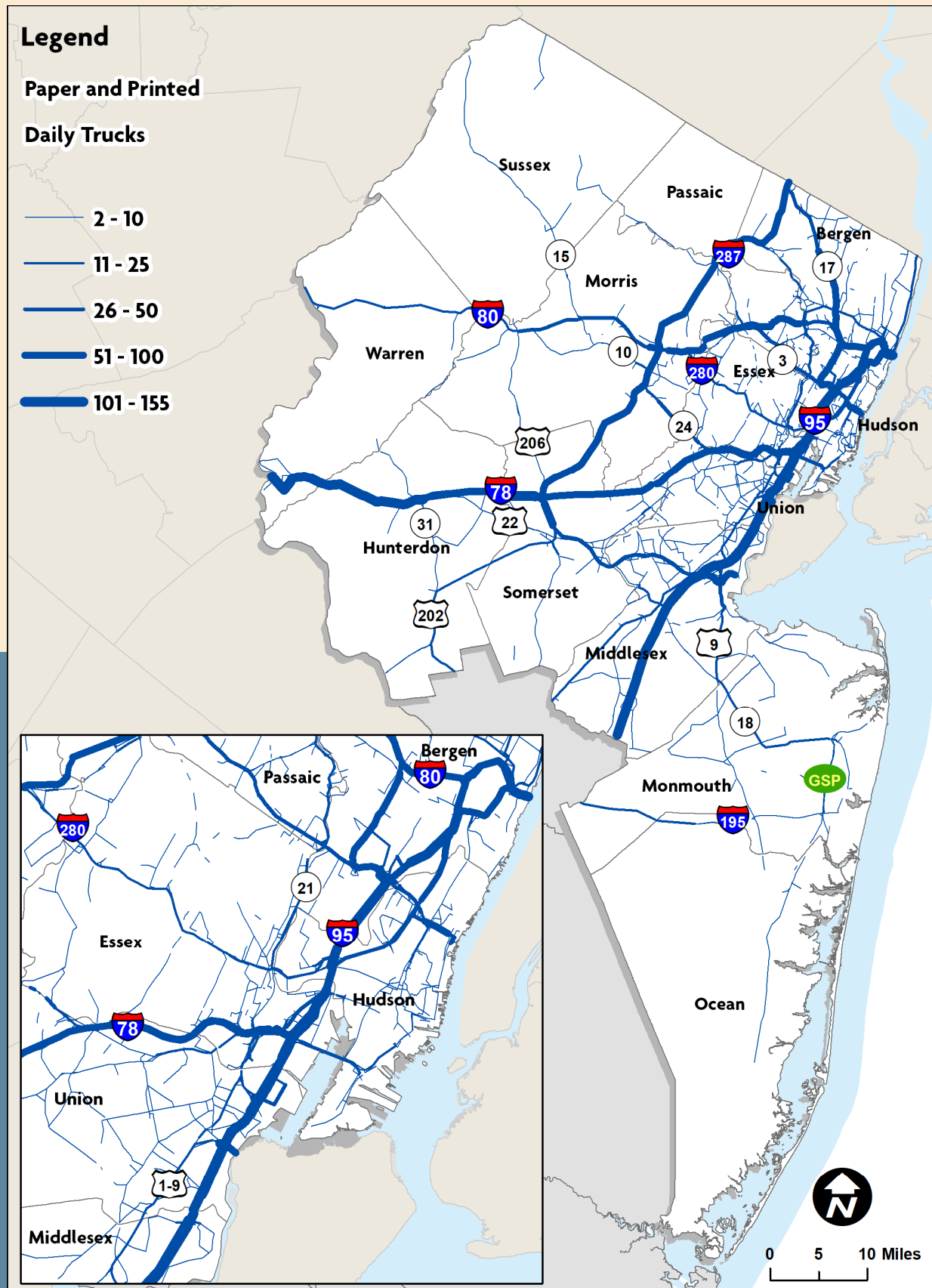
As described below, some segments of this industry are projected to grow, while others decline, which may change the composition of this bundle in the future:

- Packaging for food is on the rise, particularly thermal packaging and the increase of the food market and e-commerce.
- Consumer focus towards more recycling-friendly materials is prompting growth of paper packaging over plastic.
- There continues to be growth in the tissue and hygiene paper for personal use which tracks with population growth.
- The print graphic paper market, which constitutes newsprint and office paper, is declining worldwide due to digitization of news and written communication.
- While the packaging side of the market should be strong, the COVID-19-induced recession could dampen demand from both consumers and businesses for other paper and printed products.

Examples of Printed Goods Manufacturing Processes



Highway Network Utilization, 2020



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

HIGHWAY NETWORK FLOWS OF PAPER AND PRINTED MATERIALS

The map on the previous page shows the volume of truckloads of paper and printed materials traveling on highway segments in the NJTPA region every day.

The portion of the New Jersey Turnpike/Interstate 95 between the border of Middlesex and Mercer counties and the George Washington Bridge, and Interstate 78 between Interstate 287 and the Pennsylvania border carry between 101 and 155 truckloads of paper and printed materials products daily in each direction.

The daily volume of truckloads carrying paper and printed materials on portions of Interstate 287 between Bridgewater in Somerset County and the New York State border, Interstate 78 east of Interstate 287, Interstate 80 between Interstate 287 and Route 20, and portions of Route 17 in Bergen County each ranges between 51 and 100 in each direction.

COMMODITY FLOW SUMMARY

Collectively, approximately 7 million tons of paper and printed materials worth \$16 billion moved in the NJTPA region in 2020. By 2050, more than 8.4 million tons worth almost \$21 billion are expected to move in the region. These projections represent 21 percent growth by tons and 32 percent growth by value.

Paper and printed materials represented 2 percent of the region's goods by tonnage and value in 2020. In 2050, this commodity bundle is expected to represent 2 percent of the tonnage and 3 percent of the value of goods in the region.

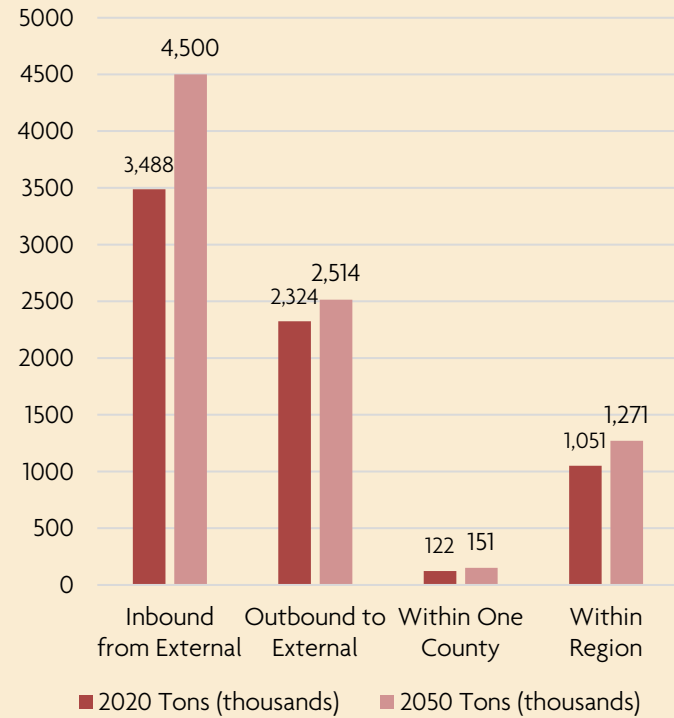
Printed products is expected to increase by the greatest rate (49 percent by weight and 51 percent by value of goods), though newsprint and paper articles are expected to remain the top two commodities in this bundle by weight. Printed products, which represent 50 percent of the paper and printed materials bundle by value in 2020, is expected to represent 57 percent of the bundle by value in 2050.

Forecasted Change in Commodity Flows in the Paper and Printed Materials 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
Newsprint/paper	2,693	3,008	2,989	3,337	12%	12%
Paper articles	2,627	2,945	4,937	5,568	12%	13%
Printed products.	1,664	2,484	7,843	11,841	49%	51%
Grand Total	6,984	8,436	15,769	20,746	21%	32%

Source: NJTPA Freight Forecasting Tool, 2020

Domestic Tons by Direction, 2020 and 2050



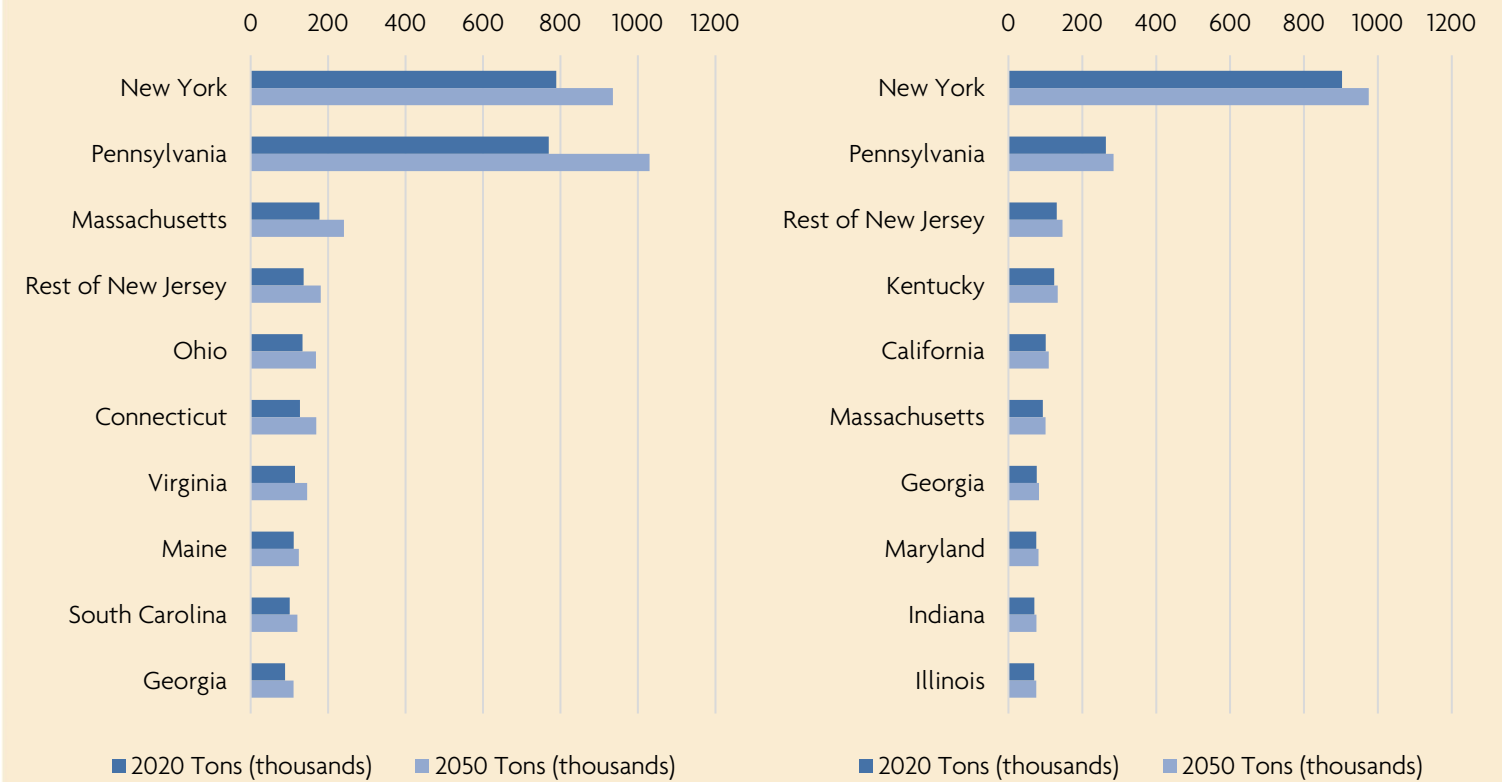
About 3.5 million tons (50 percent) of the paper and printed materials moving in the NJTPA region are moving inbound, from points of origin outside the region. About 2.3 million tons originated in the NJTPA region and traveled to destinations outside the region. About 1.1 million tons moved between counties in the region, and 122,000 tons moved within a single county in the region.

About 73 percent of the paper and printed materials imported to the NJTPA region originate in one of the locations shown in the graph on the next page. New York was the top origin in 2020, but Pennsylvania is expected to become the top origin by 2050. Among the top origins, flows from Pennsylvania are expected to grow fastest (34 percent) and flows from Maine are expected to grow slowest (12 percent).

The graph on the next page also shows the destinations of 82 percent of the paper and printed material that leave the NJTPA region. About 900,000 tons are destined for New York, and 300,000 tons to Pennsylvania. Among the top destinations, growth in tons is expected to range between 8 and 12 percent between 2020 and 2050.

Source: NJTPA Freight Forecasting Tool, 2020

Top Origins of Inbound Paper and Printed Materials (Left) and Top Destinations of Outbound Paper and Printed Materials (Right), 2020 and 2050



Source: NJTPA Freight Forecasting Tool, 2020

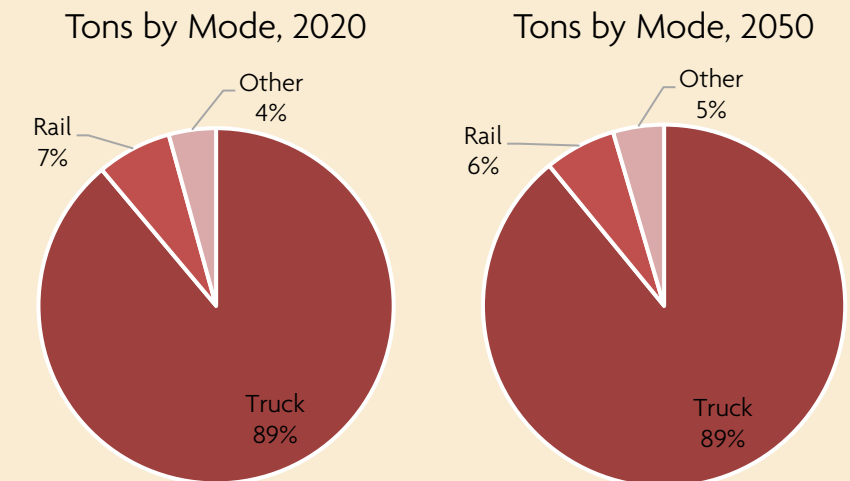
Source: NJTPA Freight Forecasting Tool, 2020

Nearly All of the Paper and Printed Materials in the Region Travel by Truck or Rail



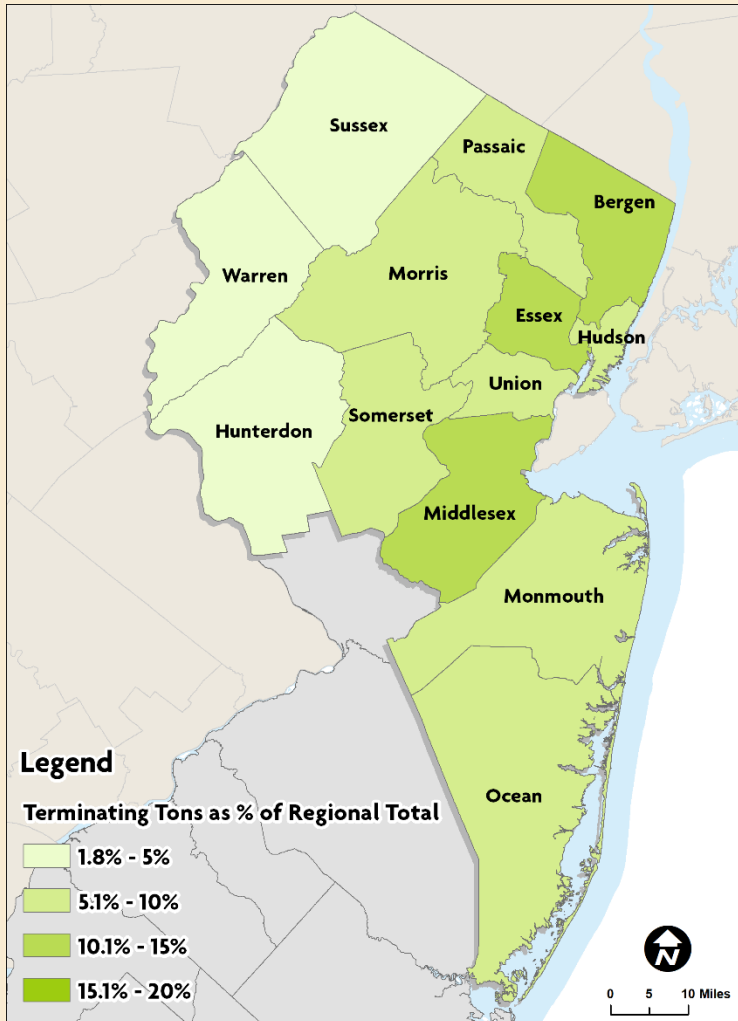
Mode Splits, 2020 and 2050

In 2020, about 89 percent of the paper and printed materials moving in the NJTPA region traveled by truck. Rail carried about 7 percent of goods in this commodity bundle. About 4 percent moved by other modes. By 2050, the share of tons moving by each mode is expected to remain similar, with 89 percent traveling by truck, 6 percent by rail, and 5 percent on other modes.



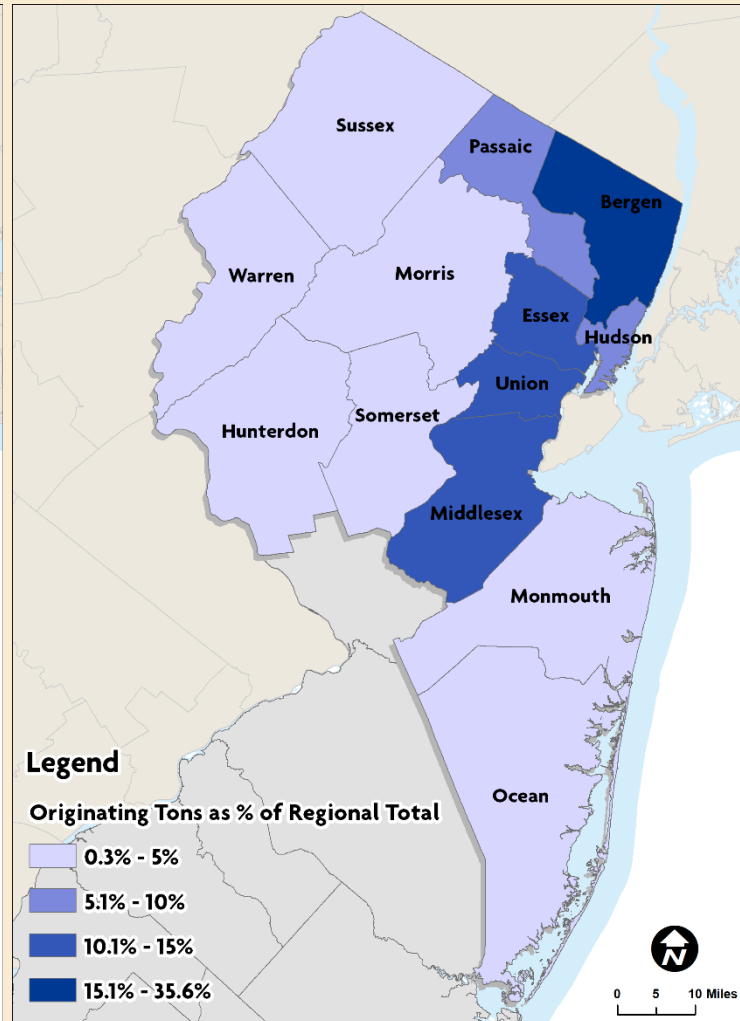
Source: NJTPA Freight Forecasting Tool, 2020

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



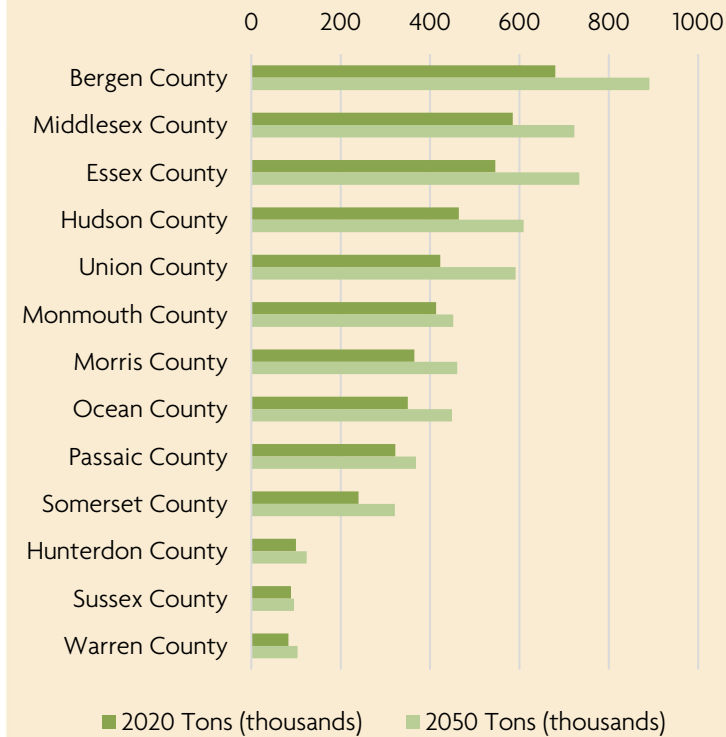
Source: NJTPA Freight Forecasting Tool, 2020; NJRTM-E, 2019; NJOIT, 2008; Esri, 2014.

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.

Bergen County is the top destination for tons of paper and printed material that move into the NJTPA region. Inbound paper and printed materials are distributed to businesses, homes, and institutions throughout each of the counties in the region. Bergen, Middlesex, and Essex counties together receive about 40 percent of the region's inbound paper and printed materials. Projected growth rates in inbound tonnage between 2020 and 2050 range from 8 percent (Sussex County) to 40 percent (Union County).

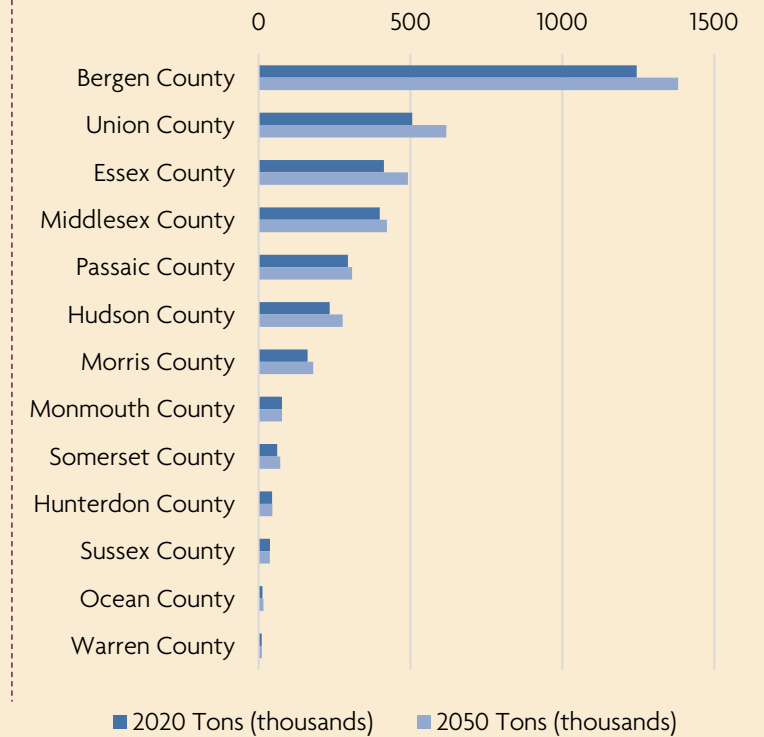
Shipments of outbound paper and printed materials originate at wholesalers and distributors concentrated primarily in five of the region's counties, as shown in the graph to the upper right. Seventy-three percent of all outbound paper and printed materials originate in one of those top four counties. Projected growth rates in outbound tonnage between 2020 and 2050 range from -2 percent (Sussex County) to 24 percent (Ocean 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 paper and printing commodity flows and logistics in the North Jersey region and elsewhere, consult the following sources:

- National Paper Trade Association, www.gonpta.com.
- Association of American Publishers, www.publishers.org.
- News Media Alliance, www.newsmediaalliance.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.