

REGIONAL FREIGHT COMMODITY PROFILE

Waste

COMMODITY BUNDLE OVERVIEW

The waste commodity bundle consists of three specific commodity groups: municipal solid waste, waste or scrap material, and chemical or petroleum waste. Municipal solid waste includes household and commercial waste, waste and scrap material includes industrial and construction waste, and chemical or petroleum waste includes flammable or hazardous waste material.

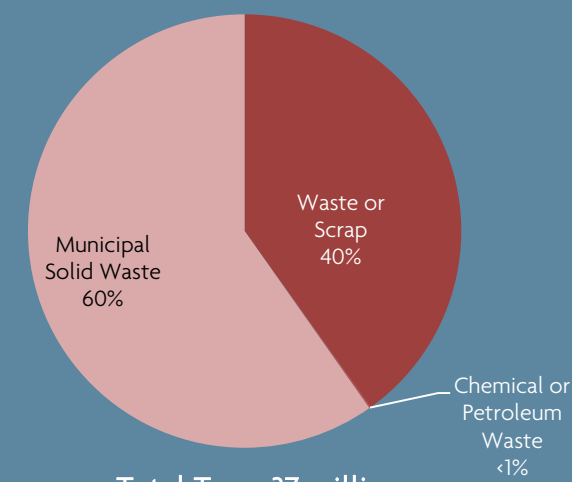
The primary data source for commodity flows reported in this profile is NJTPA's Freight Forecasting Tool, which generates commodity freight data and forecasts for a 2010 base year and 2040 forecast year. This profile describes freight flows between domestic origins and destinations.

- 37 million tons in 2010, increasing 58% to 59 million tons in 2040.
- Represents 5.6% of the freight moved in the region by weight and 0.8% by value.
- 84 business establishments employing 1,158 people send or receive waste products in this commodity bundle.
- Nearly 600,000 square feet of warehousing/distribution center space dedicated to this commodity bundle.
- 66% moves by truck, 19% by water, and 15% by rail..

Highlights

Composition

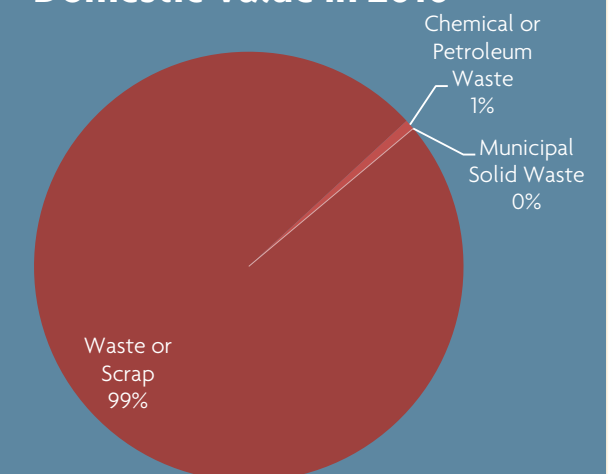
Domestic Tons in 2010



Total Tons: 37 million

Source: NJTPA Freight Forecasting Tool, 2012

Domestic Value in 2010



Total Value: \$14 billion

Source: NJTPA Freight Forecasting Tool, 2012

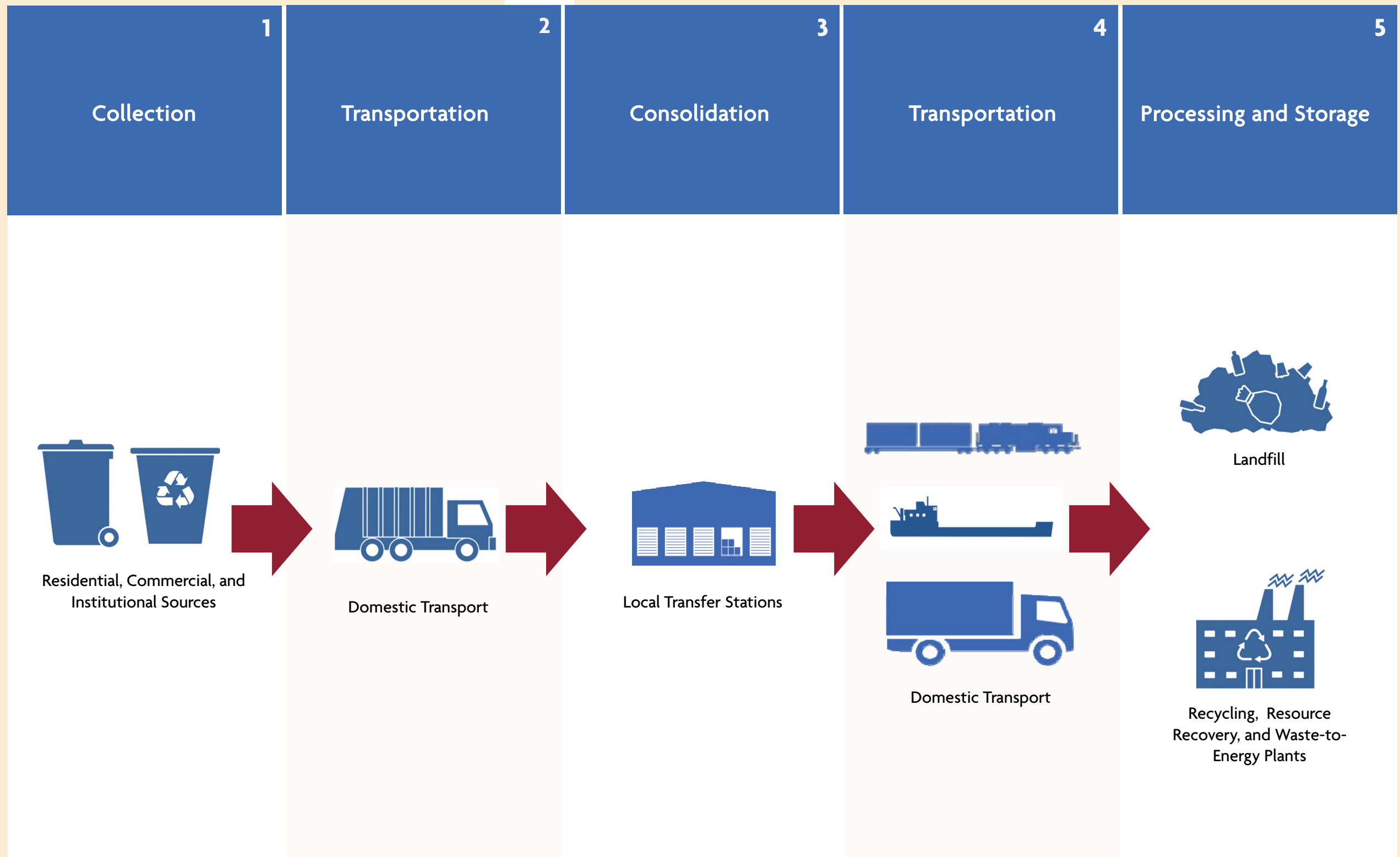
Municipal solid waste represents 60 percent of material in this commodity bundle by weight, yet has no reported value. Waste or scrap exceeds chemical or petroleum waste by a ratio of 350:1 by weight and 132:1 by value.

LOGISTICS SUMMARY

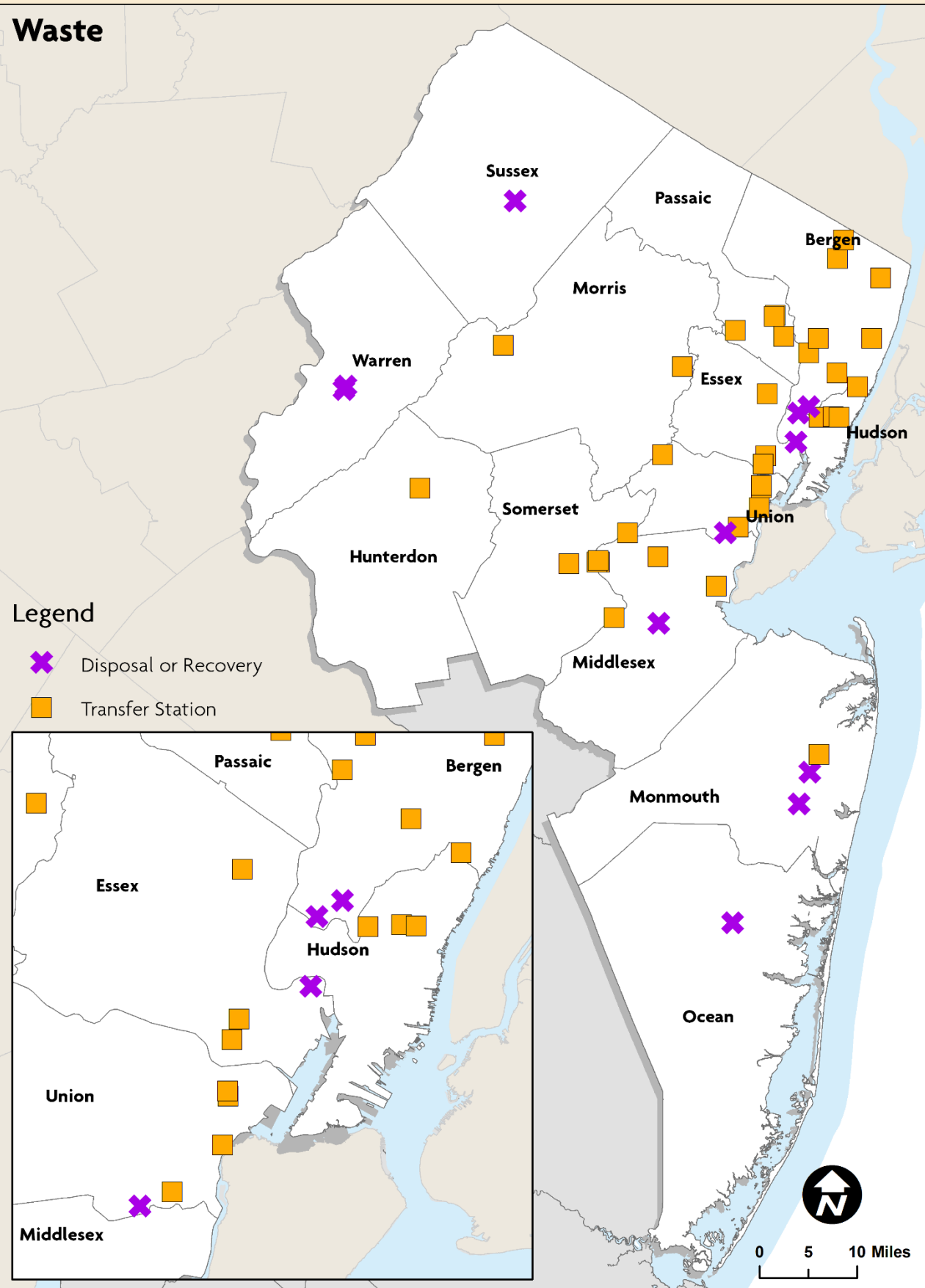
The graphic to the right represents the supply chain for the waste commodity bundle from initial recovery from residential, commercial, and institutional sources to final processing and storage.

This supply chain consists of five steps:

1. Collection of waste from sources including residential, commercial, and institutional locations.
2. Transport of waste by garbage trucks.
3. Consolidation of waste at local consolidation centers or transfer stations.
4. Transport of consolidated waste by container truck. Limited amounts of waste are transported by rail, mainly to locations outside of the NJTPA region.
5. Storage of waste in landfills, or processing of materials by recycling and resource recovery centers.



Waste Processing and Disposal Facility Locations by Type



Source: NJDEP, 2011; NJOIT, 2008; Esri, 2014.

BUSINESS LOCATIONS SUMMARY

The map on the previous page illustrates the locations of waste transfer stations, where residential and commercial municipal solid waste, some construction and demolition waste and debris, and other permitted types of waste are sorted and/or consolidated. Waste transfer stations are clustered near some of the most densely-populated areas of the region, close to residential and commercial sources of waste.

Shipments of waste departing the transfer stations are moved to recycling, waste-to-energy plants, or to landfills for disposal. Many of these facilities are located in the region, as the map shows.

Most of the waste received at Northern New Jersey resource recovery facilities originated in New Jersey or in New York. Northern New Jersey also exports waste for disposal in other parts of New Jersey and in other states.

KEY INDUSTRY TRENDS

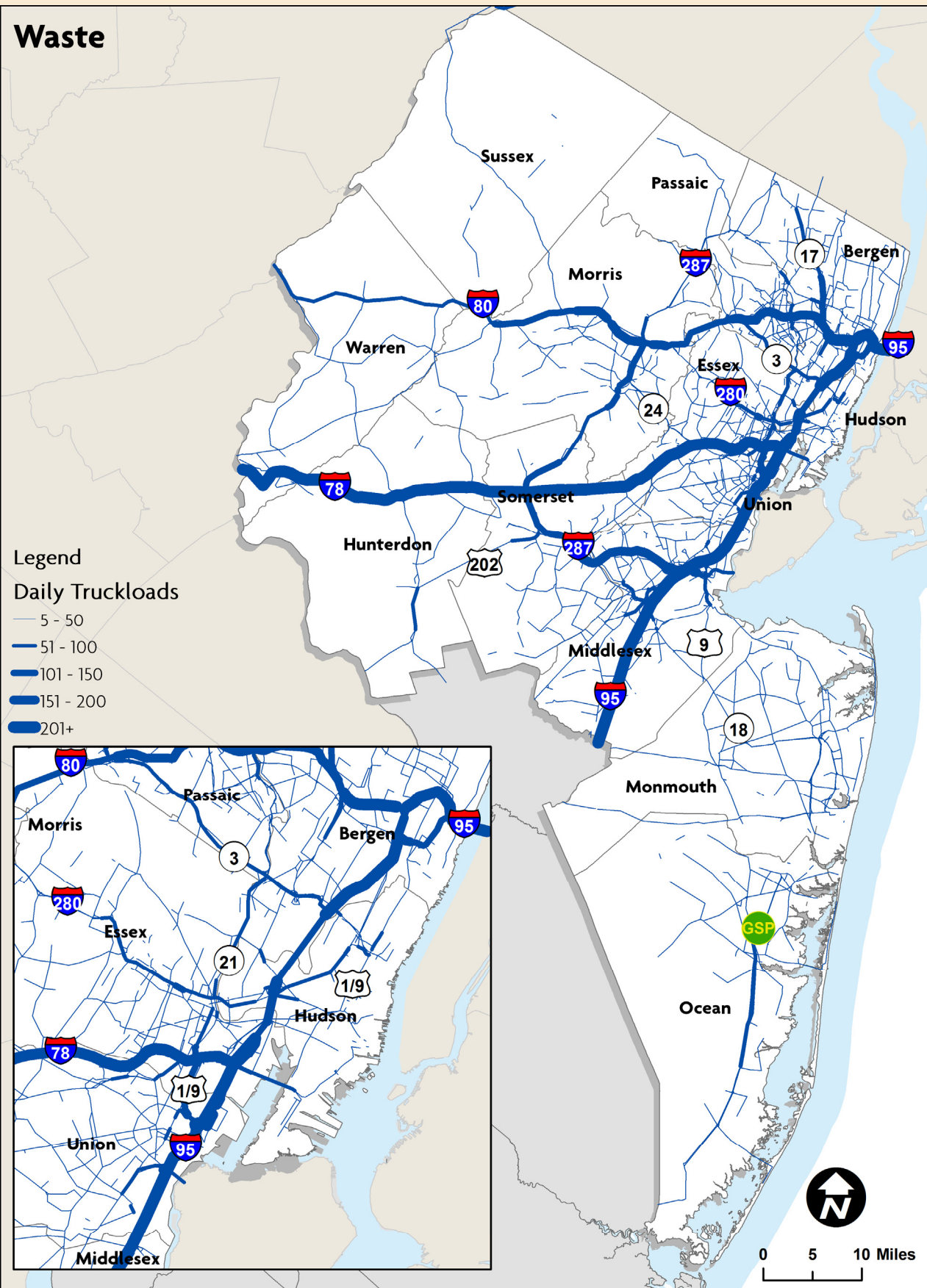
The following trends are shaping demand for waste commodities today, and projected demand in the future:

- Waste generation is closely tied with population and economic growth.
- Recycling and re-use are growing in volume and share of waste generated. A smaller share of waste disposed in landfills can be expected in the future.
- More efficient manufacturing processes; packaging of consumer products, construction materials, and other goods; and reduced food waste in restaurants and households is expected to reduce source production of some waste types over time.
- Initiatives such as New York City's Solid Waste Management Plan, which aims to shift waste export to alternative modes such as barge and rail, could potentially reduce the volume of waste passing through Northern New Jersey.

A Recycling Facility (Left) and the Essex County Resource Recovery Facility (Right)



Highway Network Utilization, 2010



HIGHWAY NETWORK FLOWS OF WASTE

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

The NJ Turnpike/Interstate 95 south of Exit 15E in Essex County and north of Exit 17 in Hudson County and Interstate 78 between the NJ Turnpike in Essex County and the Pennsylvania border carry more than 200 truckloads of waste every day. Interstate 80 between the NJ Turnpike and Route 17 in Bergen County and between Interstate 287 and Route 15 in Morris County, the NJ Turnpike in the vicinity of Kearny and Secaucus in Hudson County, and Interstate 287 in Middlesex County each carry between 150 and 200 daily truckloads of waste. Several segments of Interstate 287, Interstate 80, Routes 1/9, and Route 17 carry between 100 and 150 truckloads of waste daily.

COMMODITY FLOW SUMMARY

Collectively, more than 37 million tons of waste commodities, worth \$14 billion, moved into, out of, through, or within the NJTPA region in 2010. By 2040, 59 million tons worth nearly \$23 billion will move in the region. These projections represent 58 percent growth by tons and 66 percent growth by value.

Waste represented 5.6 percent of the freight moved in the region by weight and 0.8 percent by value in 2010. These shares are expected to grow to 6.2 percent by weight and 0.9 percent by value by 2040.

As the table below shows, the top five commodities in this bundle are municipal solid waste, miscellaneous waste or scrap, metal scrap or tailings, paper waste or scrap, and ashes. Together they represent 99 percent of all of the waste materials moved into, out of, or within the NJTPA region by weight.

Commodities in the Waste Commodity Bundle

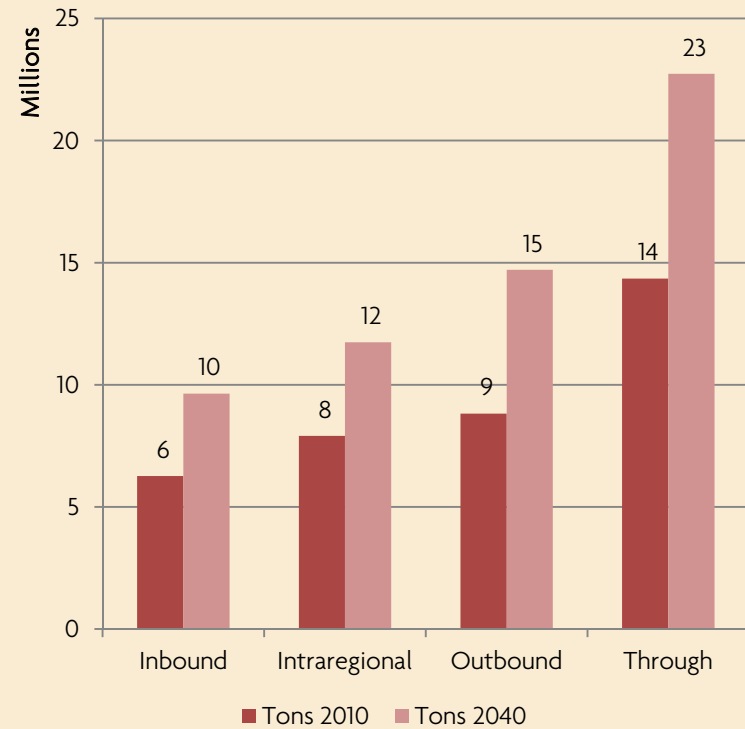
STCC4	Commodity	Tons (thousands)	Value (millions)
N/A	Municipal Solid Waste	13,744	\$0
4029	Misc Waste or Scrap	8,026	\$10,704
4021	Metal Scrap or Tailings	883	\$525
4024	Paper Waste or Scrap	108	\$17
4011	Ashes	78	\$5
4020	Waste or Scrap	66	\$27
4026	Rubber or Plastic Scrap	33	\$20
4025	Chemical or Petroleum Waste	26	\$86
4022	Textile Scrap or Sweepings	24	\$22
4027	Stone, Clay or Glass Scrap	6	\$2

Source: NJTPA Freight Forecasting Tool, 2012

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

Note: Commodities assigned a value of \$0 indicate the absence of sales or commercial value

Domestic Tons by Direction, 2010 and 2040



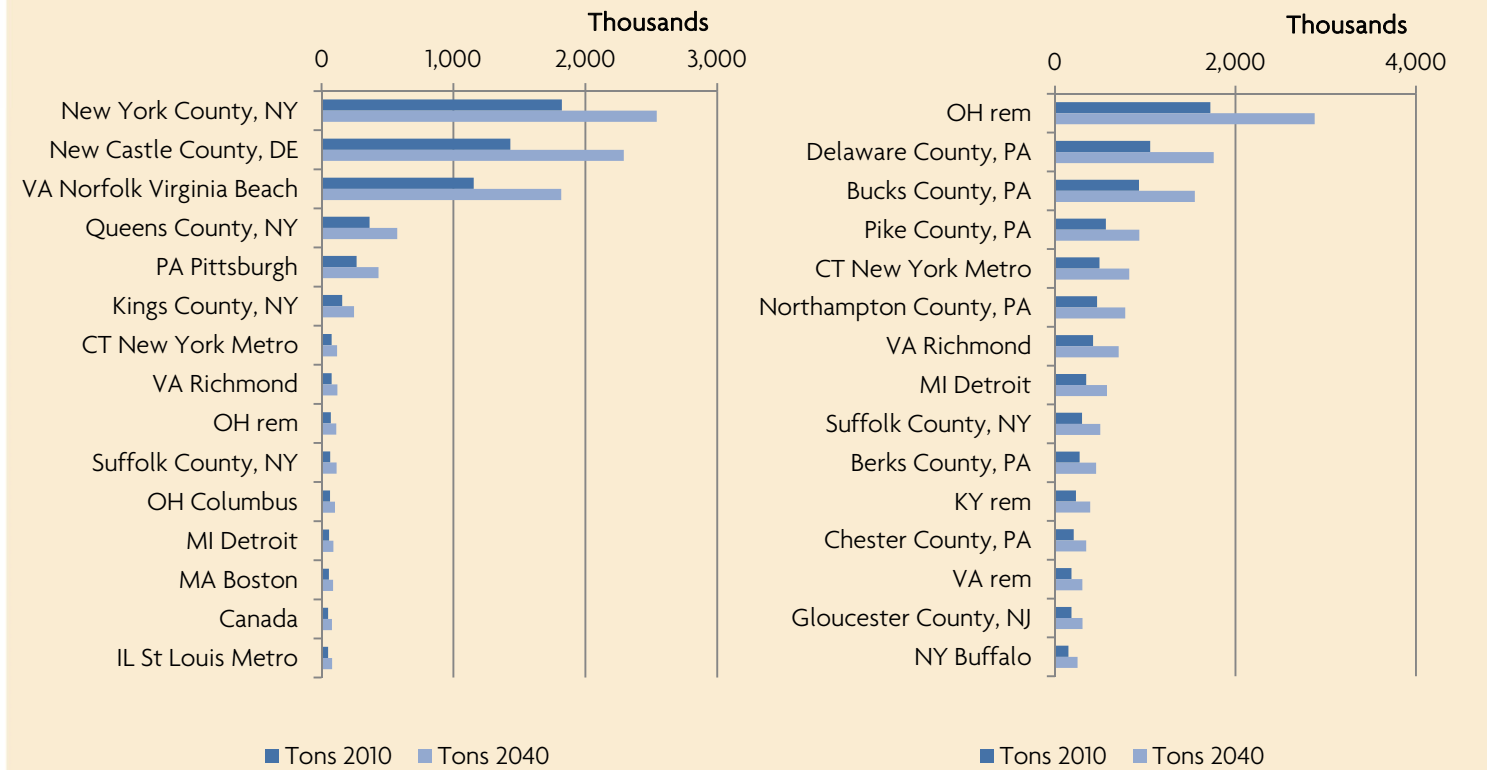
Source: NJTPA Freight Forecasting Tool, 2012

About 14 million tons of waste (38 percent of all tons in this bundle) passed through the NJTPA region. About 24 percent of tons are moving outbound, 21 percent are moving within the region, and 17 percent are inbound movements.

About 92 percent of the waste commodities imported to the NJTPA region originate in one of the locations shown in the graph to the right. More than 1 million tons originate from each of the following: New York County, NY (Manhattan); New Castle County, Delaware; and the Norfolk-Virginia Beach metropolitan area in Virginia. Among the top origins, flows from Suffolk County, NY are expected to grow fastest (73 percent) and flows from Manhattan slowest (40 percent) through 2040.

The locations shown in the far-right graph are the destinations of 85 percent of the waste products in this commodity bundle that leave the NJTPA region. Locations in Ohio, eastern Pennsylvania, Connecticut, and Virginia are among the top destinations for outbound waste commodities. Outbound flows to all of the top destinations are expected to grow by 66 to 67 percent through 2040.

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.

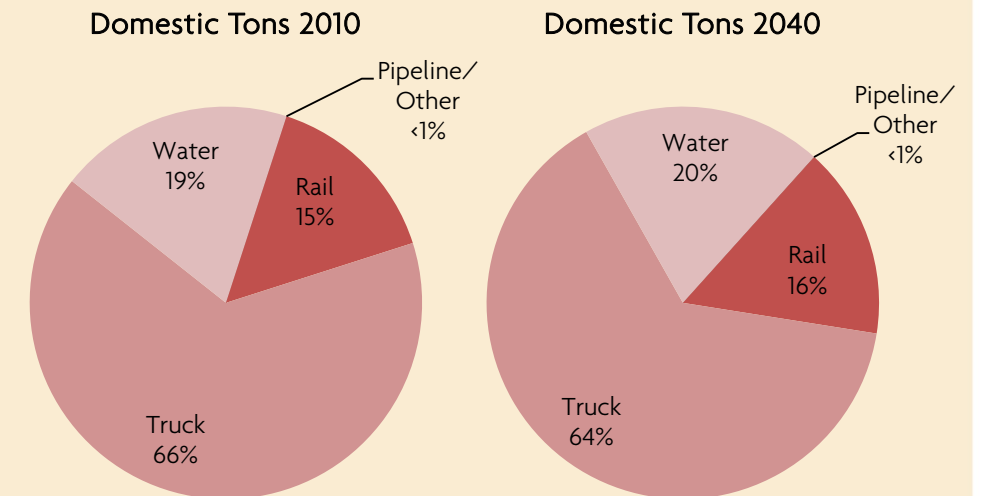
Source: NJTPA Freight Forecasting Tool, 2012
 Note: "rem" stands for "remainder," which refers to the portions of a state outside major metropolitan regions.

About Two-Thirds of Waste Moved in the NJTPA Region Travels by Truck



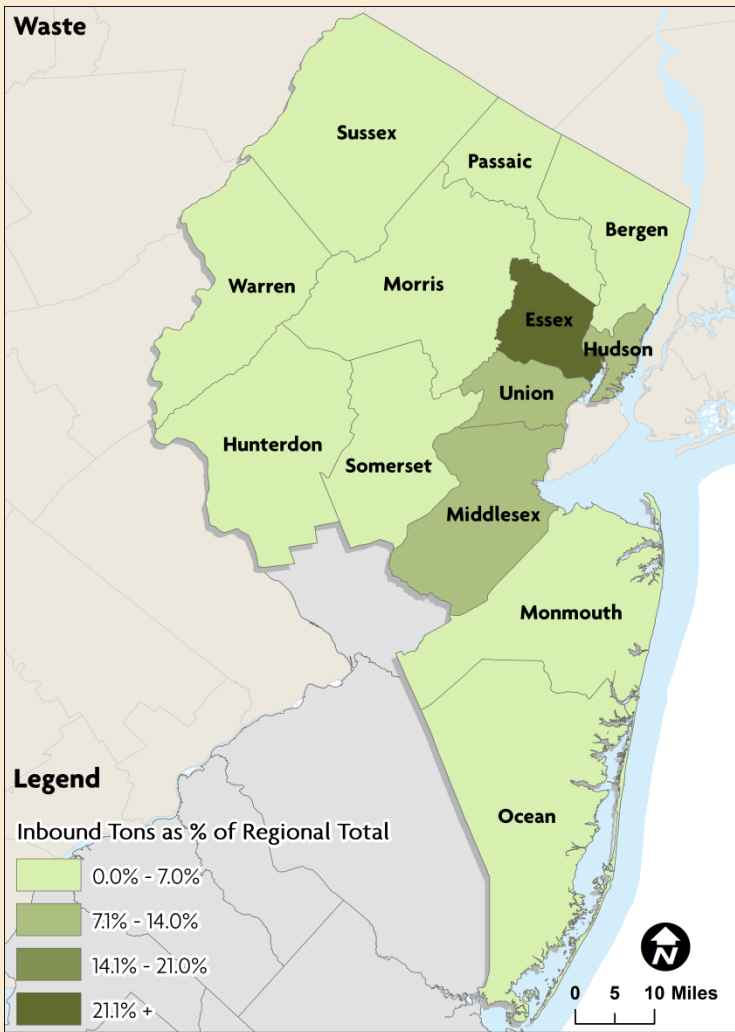
Mode Splits, 2010 and 2040

In 2010, about two-thirds of the waste commodities moving in the NJTPA region traveled by truck. Water carried about 19 percent, and 15 percent moved by rail. "Other" modes carried less than 1 percent, and air carried no significant volume of waste products in this commodity bundle. By 2040, the share of tons moving by each mode is expected to remain similar, with water and rail achieving slightly larger mode shares.



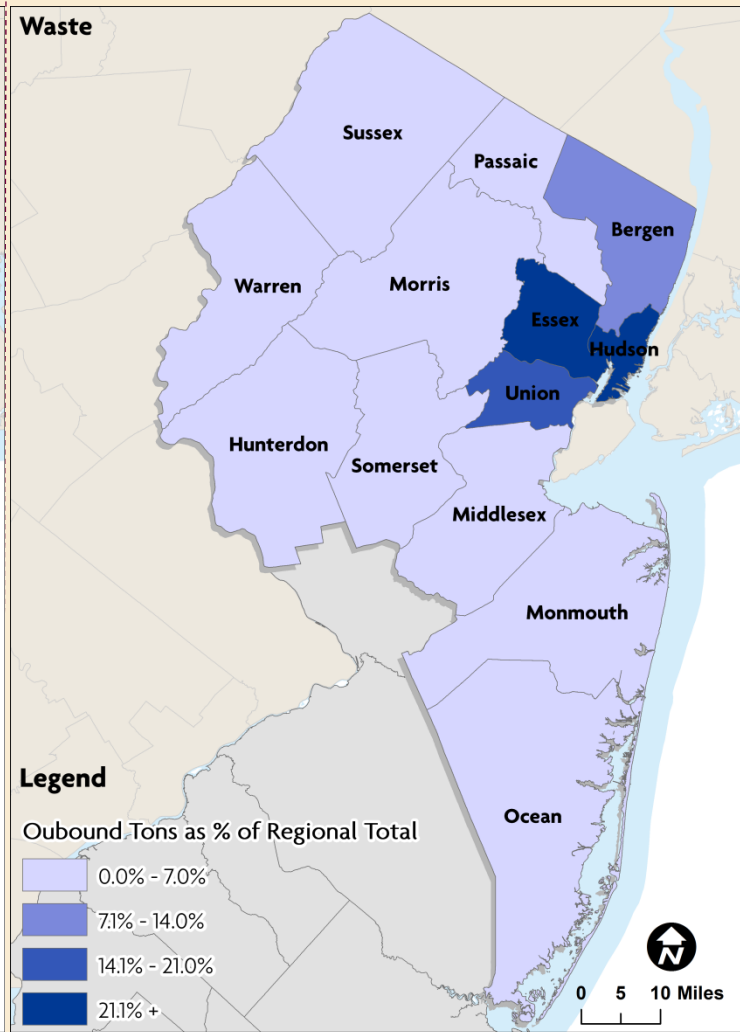
Source: NJTPA Freight Forecasting Tool, 2012

Inbound Domestic Tons by County, 2010



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

Outbound Domestic Tons by County, 2010



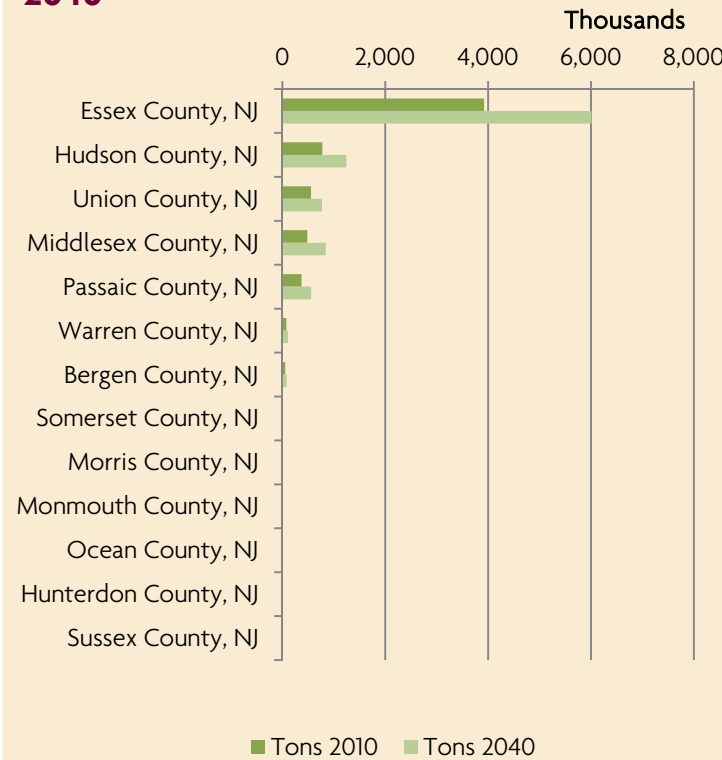
Source: NJTPA Freight Forecasting Tool, 2012; NJOIT, 2008; Esri, 2014.

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

More than 62 percent of all waste traveling into the NJTPA region terminate in Essex County alone. Projected growth rates in inbound waste tonnage between 2010 and 2040 range from 41 percent (Passaic County) to 74 percent (Middlesex County).

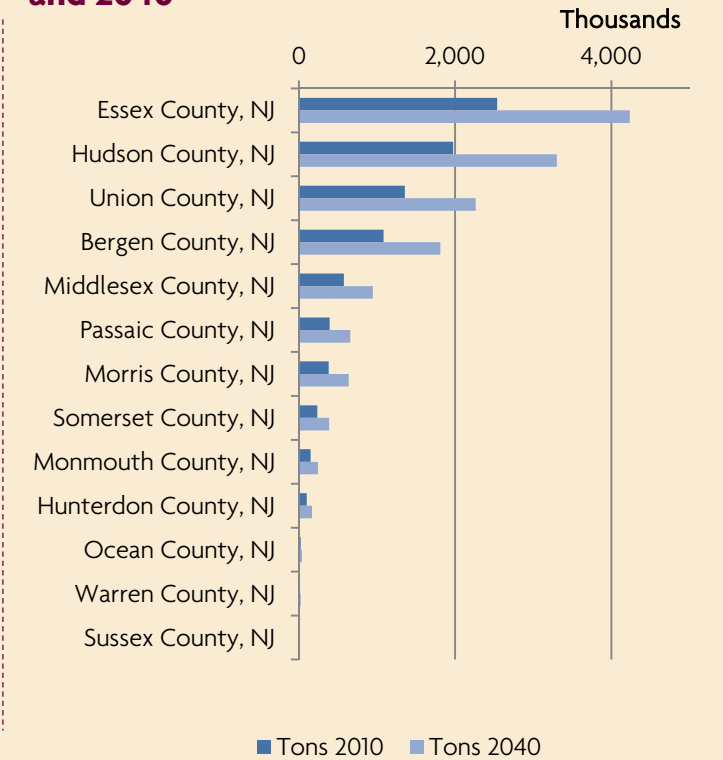
Close to 29 percent of all waste shipped outbound originate in Essex County. More than 1 million tons originate in each of the following: Hudson, Union, and Bergen counties. Projected growth rates in outbound tonnage between 2010 and 2040 range from 64 percent (Middlesex, Somerset, Monmouth, and Ocean counties) to 69 percent (Warren County).

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 waste commodity flows and logistics in the North Jersey region and elsewhere, consult the following sources:

- Solid Waste Association of North America, www.swana.org
- Air and Waste Management Association, Northern & Central New Jersey, www.mass-awma.net/NCNJ.html
- State of New Jersey Department of Environmental Protection, www.state.nj.us/dep/
- National Waste & Recycling Association, www.wasterecycling.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 6.6 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 waste commodities 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. 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.