

SUBREGIONAL FREIGHT PROFILE

Middlesex County

ABOUT THIS PROFILE

The North Jersey Transportation Planning Authority (NJTPA) has developed a set of alternative freight forecasts to support transportation, land use, and economic development decisions. This Freight Profile is an update to a previous version published in 2012, and offers a snapshot of key metrics – Economy and Land Uses, Freight Flows, and Freight Transportation Networks in 2020 and in the forecast year, 2050.

ECONOMY AND LAND USES

With a 2018 population of 829,685, Middlesex is the 2nd most-populous County in the State of New Jersey. Middlesex County has historically outpaced the state in population growth and household income, two key drivers of demand for consumer goods. Similar to the state overall, Middlesex saw its growth rate slow over the last two decades. Median household income is about 16 percent higher than the statewide median.

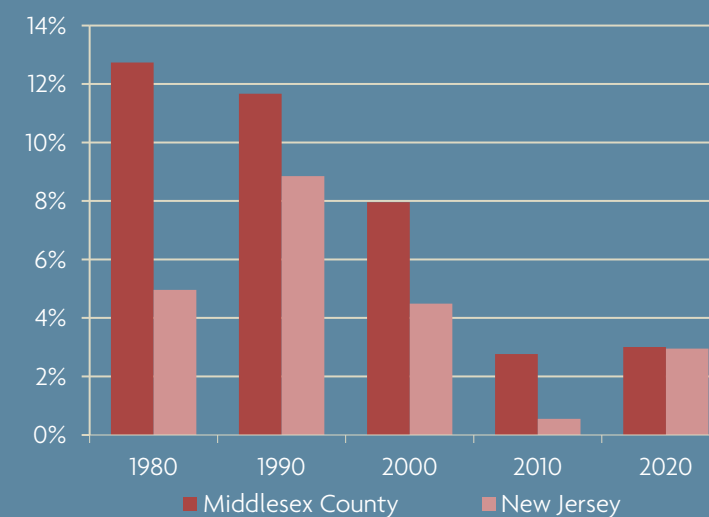
Middlesex County is home to:

- 829,685 people
- More than 22,000 businesses that employ 429,600 people; about 37 percent of these jobs are in industry sectors that are highly dependent on freight movement
- About 55.6 million tons of domestic freight shipped or received annually
- More than 6.5 million e-commerce packages delivered annually
- Interstate, State, and County highways used by tens of thousands of trucks every day
- The Conrail Lehigh Line and several secondary freight rail lines
- The greatest warehousing square footage of any NJTPA subregion

Highlights

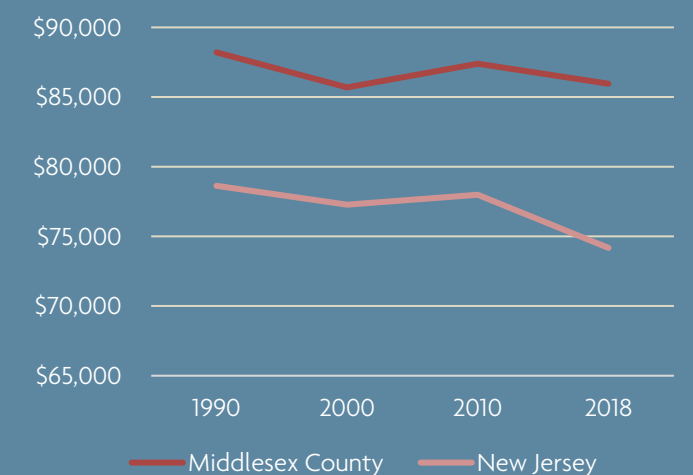
Population Growth by Decade

Source: U.S. Census Bureau



Median Household Income, Constant 2018 Dollars

Source: U.S. Census Bureau



EMPLOYMENT

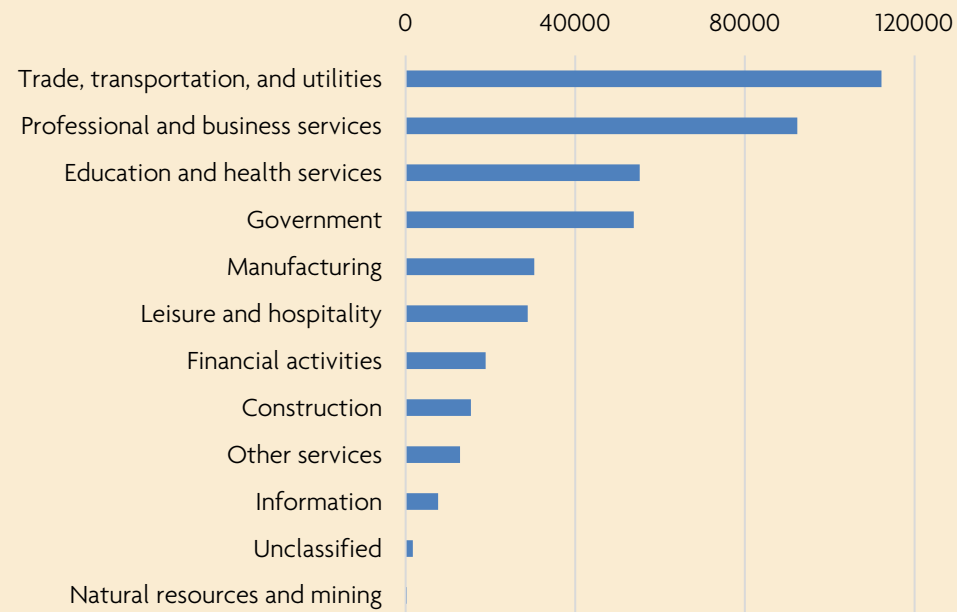
The County's economy employs 48,000 people in more than 4,000 establishments. About 37 percent are employed in "freight-intensive" industries, such as construction, manufacturing, mining and extraction, retail trade, wholesale trade, and logistics. About 63 percent are employed in industries that may generate freight but are less dependent on freight movement.

FREIGHT FLOWS

In 2020, an estimated 55.6 million tons of domestic freight will move into, out of, or within Middlesex County, by all modes of transportation (truck, rail, water, pipeline, and air). This figure includes commodities moving into or out of Middlesex County, but excludes pass-through tonnage. (The movement of international cargo to and from seaports, airports, and border crossings is captured and counted as domestic tonnage).

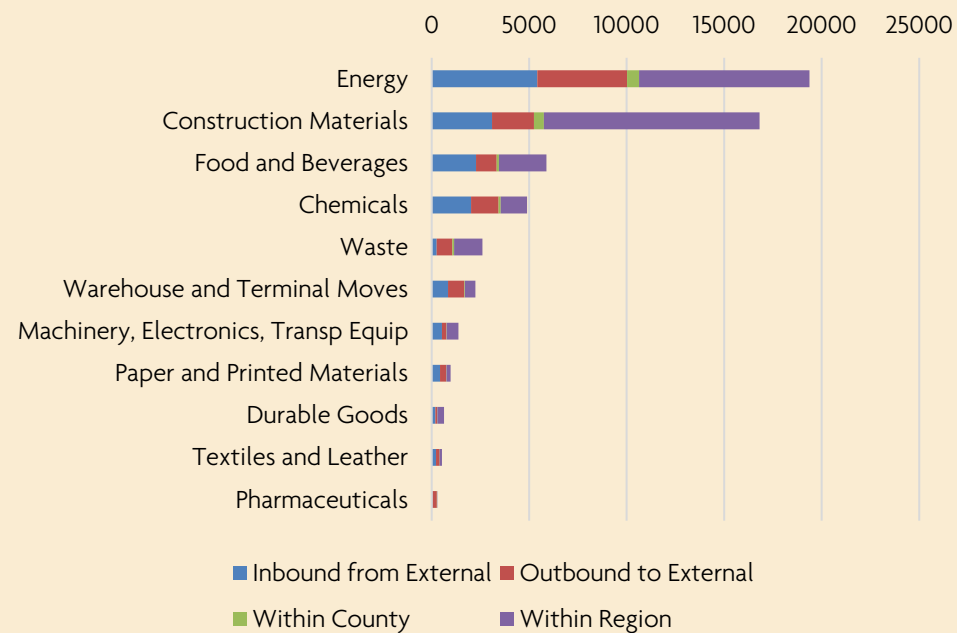
For domestic tonnage with an origin and/or destination in the County, around 35 percent consists of energy products, and 30 percent consists of construction materials. Other leading commodities in Middlesex County include moves of food and beverages, chemicals, waste, and movement of mixed or unspecified freight from warehouses and/or terminals.

Employment by Industry, 2019



Source: U.S. Bureau of Labor Statistics

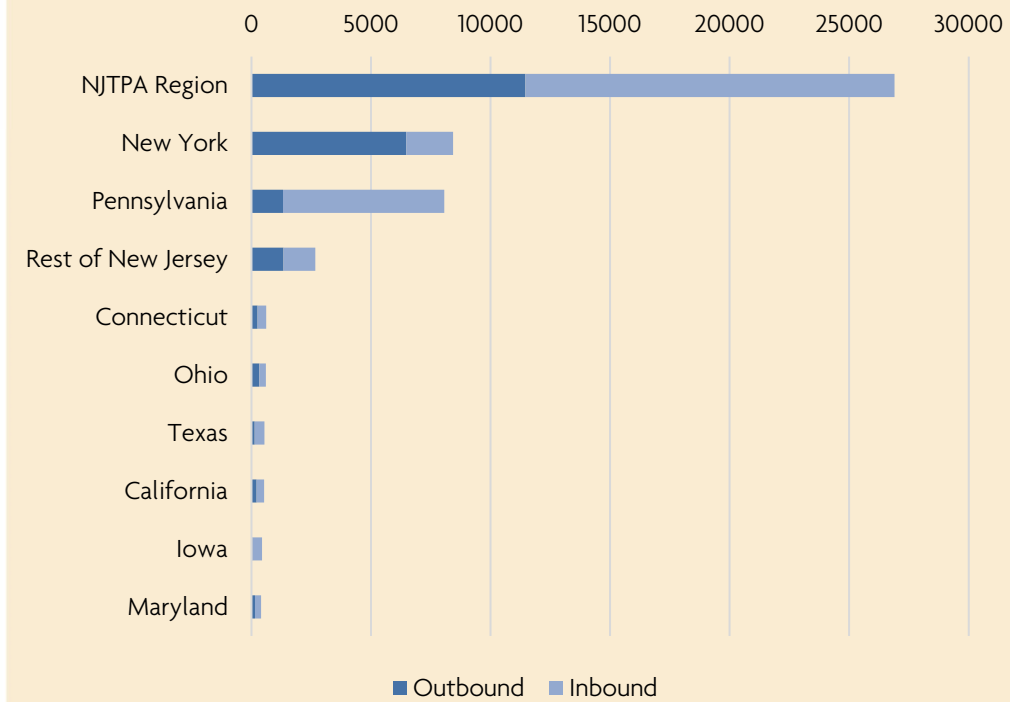
Thousands of Tons by Commodity by Direction, 2020



Source: NJTPA Freight Forecasting Tool, 2020

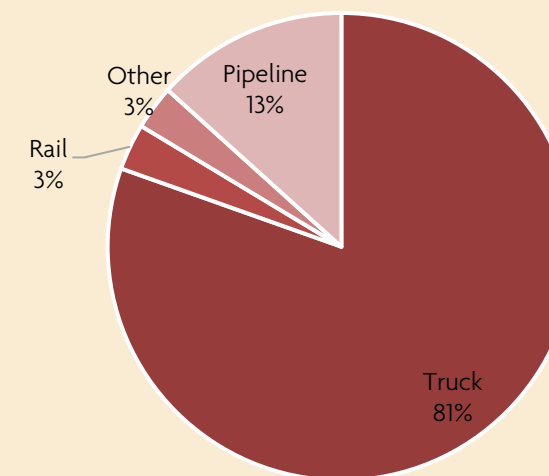
E-commerce has a growing presence in the retail landscape. Some of the freight shipments described in this profile include goods that are ultimately delivered to consumers who shop online. In 2019, about 6.5 million e-commerce shipments containing 9.6 million items were delivered to consumers in Middlesex County.

Thousands of Tons by Domestic Trading Partner, 2020



Source: NJTPA Freight Forecasting Tool, 2020

Tons by Mode, 2020



Source: NJTPA Freight Forecasting Tool, 2020

TRADING PARTNERS

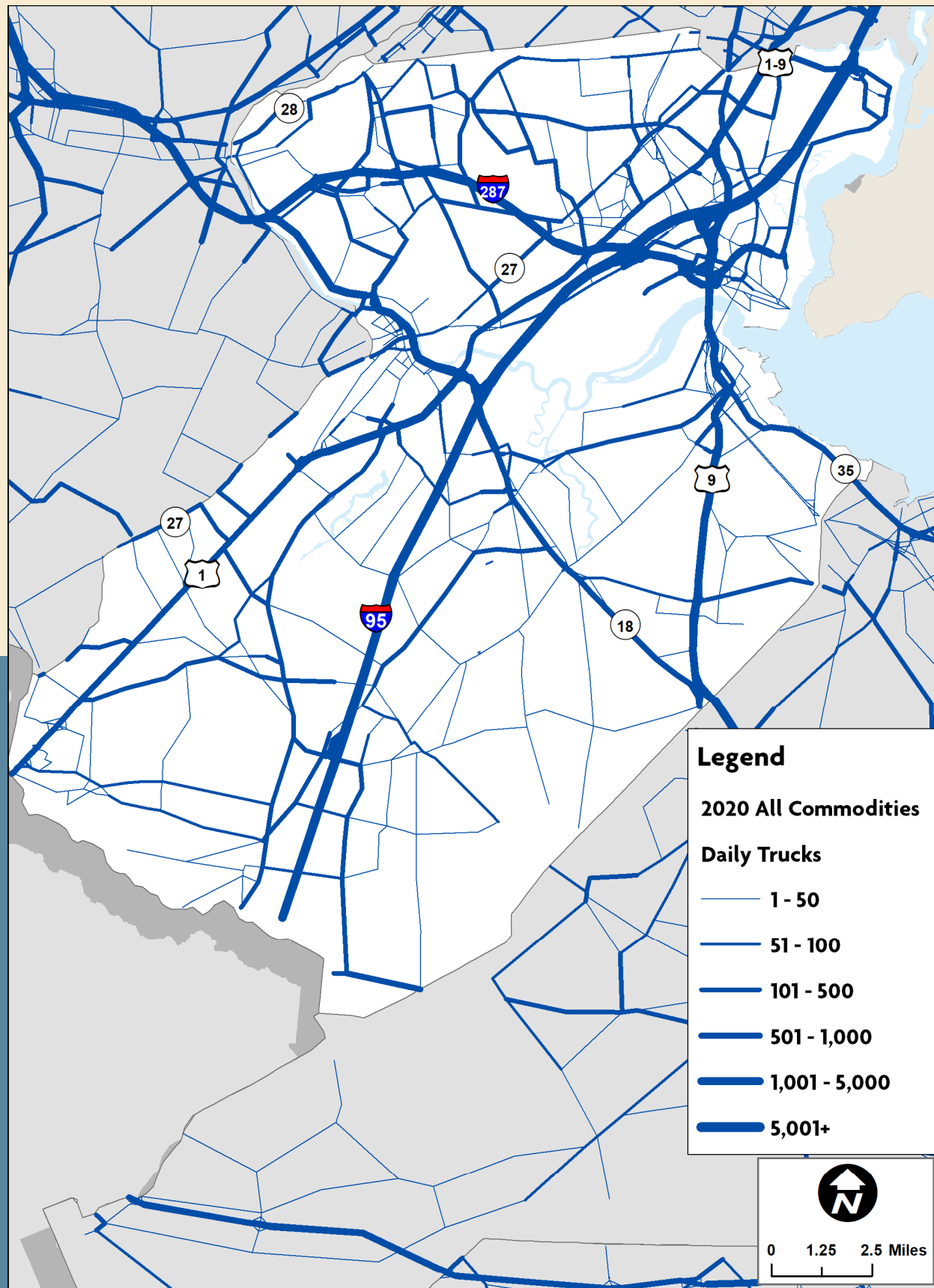
Middlesex County's major trading partners are, not surprisingly, its neighbors. As illustrated to the left, locations in the NJTPA region are the greatest origins of inbound freight and destinations for outbound freight. New York, Pennsylvania, and the portions of New Jersey outside the NJTPA region are also among the top origins and destinations for freight traded with Middlesex County.

FREIGHT TRANSPORTATION NETWORKS

Freight can be handled by truck, rail, pipelines, air, or water. The choice of mode depends on a variety of factors, including: length of trip (rail and air are more competitive at longer distances), commodity type (rail and water are more competitive for heavy materials, and pipelines are suited for moving energy products), time sensitivity (truck and air are most competitive), need for door-to-door service (trucking is needed unless the customer has a dock or rail connection).

For domestic freight traveling to, from, or within Middlesex County, 81 percent travels by truck, 13 percent by pipeline, 3 percent by rail, and 3 percent by other modes.

Highway Network Utilization, 2020



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

HIGHWAY NETWORK UTILIZATION

Middlesex County's highway network serves to connect its major freight activity centers with key trading partners elsewhere in the County, in the State of New Jersey, in other parts of North America, and – via international seaports and airports – the world.

Not all trucks on the road are carrying freight. Some are moving empty. Others are providing municipal services (waste transfer, utility services, etc.) or commercial services (contractors, lumber, landscapers, etc.).

The map on the previous page illustrates the flows of commodity trucks, or trucks loaded with freight, on the highway network.

Portions of the New Jersey Turnpike/Interstate 95 north of Exit 10 carry more than 6,000 commodity trucks in each direction each day. Portions of the Turnpike south of Exit 10 and Interstate 287 each carry between 4,000 and 6,000 commodity trucks in each direction each day. More than 1,000 commodity trucks travel in each direction daily on portions of Routes 1, 9, and 18.

BUSINESS ESTABLISHMENTS

The map on the next page illustrates the locations of facilities that ship, handle, or receive freight, including:

- Production facilities such as manufacturing businesses or mining and quarrying facilities where goods are produced or raw materials are extracted;
- Logistics facilities, including warehousing and transportation facilities through which goods are distributed; and
- Sales, including retail, services, and institutional establishments where goods are sold.

The largest clusters of production and logistics facilities are located along the Interstate 287 corridor in the northern part of the County and in the vicinity of New Jersey Turnpike Exit 8A in Cranbury and Monroe townships. Sales establishments are clustered along major retail corridors such as Route 1 and Route 18 and scattered elsewhere throughout the County.

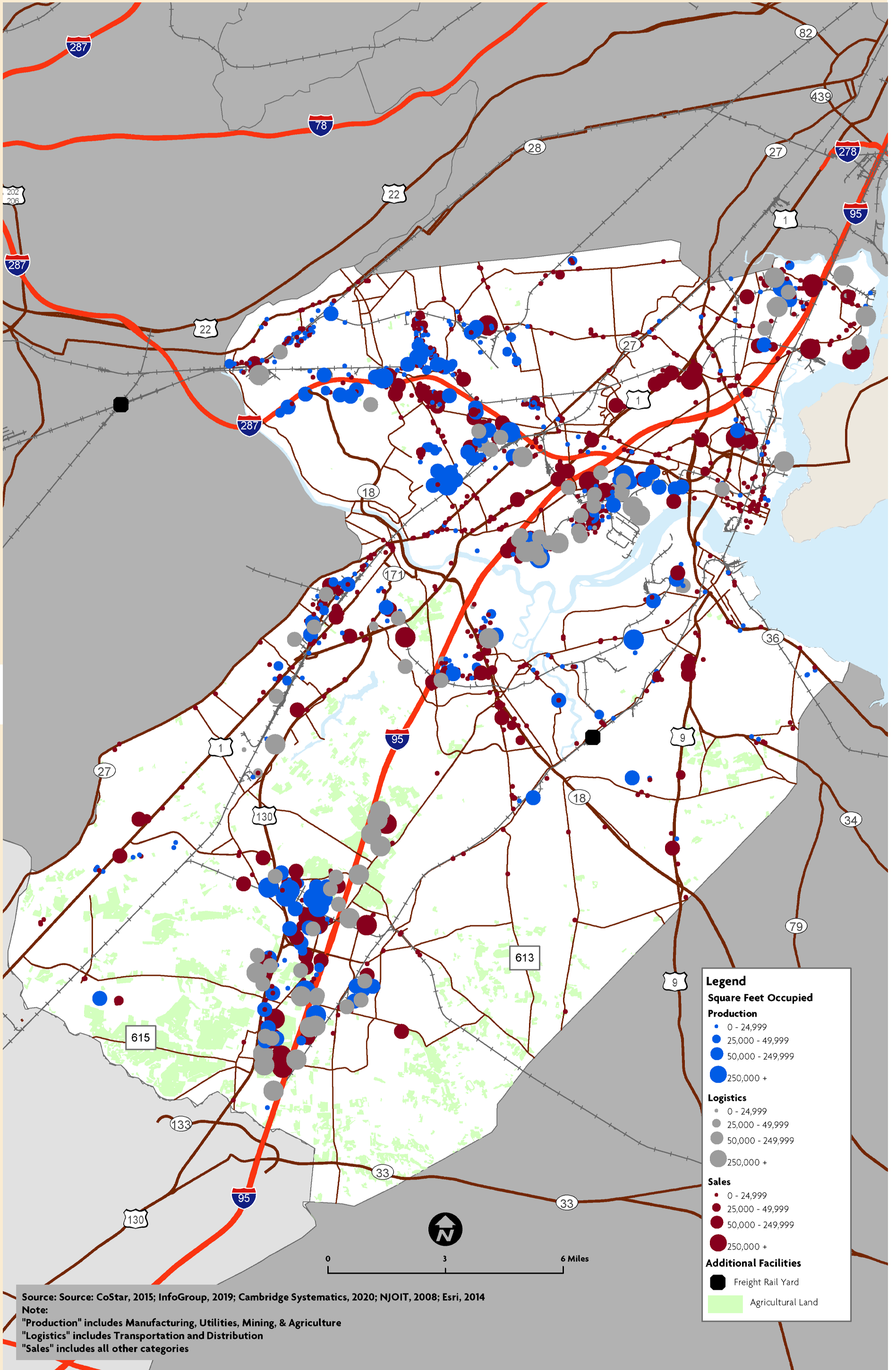
Top 5 Business Establishments in Freight-Generating Industry Sectors, by Size

| Company | Square Footage | Municipality | Business Type |
|-------------------------------------|----------------|--------------------------|---------------|
| Williams-Sonoma Distribution Center | 1,350,000 | South Brunswick Township | Logistics |
| Wayfair Distribution Center | 1,200,000 | Cranbury Township | Logistics |
| Barnes & Noble Distribution Center | 1,145,000 | Monroe Township | Logistics |
| Amazon (EWR9) | 1,000,000 | Carteret Borough | Logistics |
| Best Buy Warehouse | 1,000,000 | Piscataway Township | Logistics |

Source: Infogroup, 2019; CoStar, 2015

Note: Some companies may have multiple locations in the county and/or region.

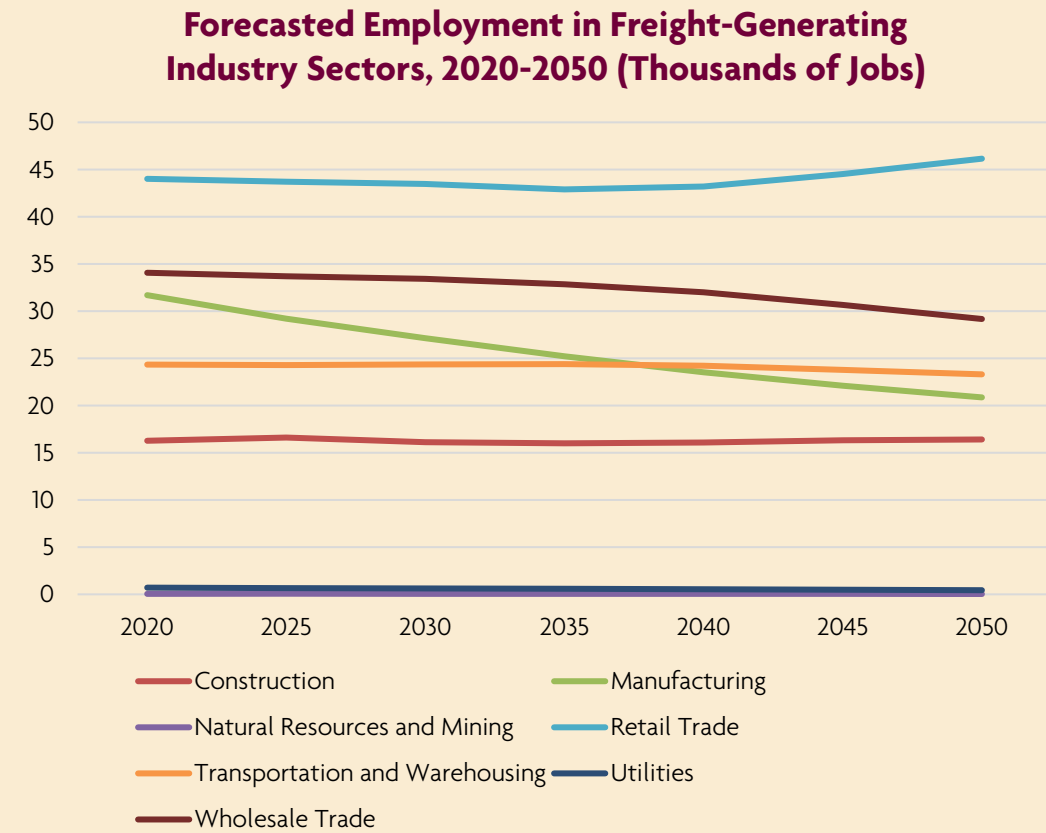
Business Square Footage by Industry Type



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

EMPLOYMENT FORECAST

Employment in freight-intensive industries is expected to decrease by about 10 percent during the forecast period. The manufacturing, utilities, and natural resources sectors are expected to experience the greatest reductions in employment. Retail trade employment, however, is expected to increase by 5 percent, and construction employment is expected to increase by 1 percent between 2020 and 2050.



Source: Moody's, 2020

Commodity Flow Forecast, 2020-2050

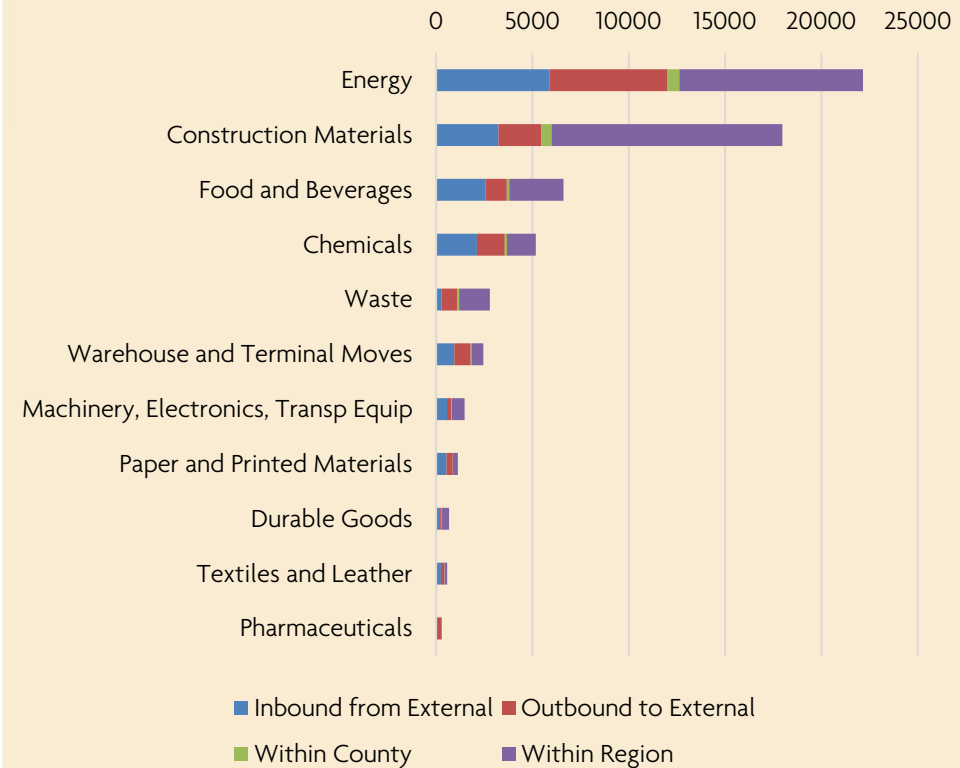
By 2050, commodity flows into, out of, and within Middlesex County are expected to have increased by about 10 percent, from 55.6 million tons to 61.3 million tons (a difference of about 5.7 million tons). Energy products is expected to remain the number one commodity transported by tonnage, followed construction materials and food and beverages. Chemicals and machinery, electronics, and transportation equipment are the top commodity bundles by value of goods and are expected to remain the top two bundles by value through 2050.

| Commodity Bundle | 2020 Tons (thousands) | 2050 Tons (thousands) | 2020 Value (millions \$) | 2050 Value (millions \$) | Change in Tons | Change in Value |
|--------------------------------------|-----------------------|-----------------------|--------------------------|--------------------------|----------------|-----------------|
| Chemicals | 4,897 | 5,180 | 18,523 | 19,561 | 6% | 6% |
| Construction Materials | 16,817 | 17,972 | 6,151 | 6,457 | 7% | 5% |
| Durable Goods | 637 | 679 | 4,817 | 5,149 | 7% | 7% |
| Energy | 19,380 | 22,155 | 13,374 | 14,883 | 14% | 11% |
| Food and Beverages | 5,890 | 6,610 | 10,787 | 11,914 | 12% | 10% |
| Machinery, Electronics, Transp Equip | 1,376 | 1,481 | 15,544 | 16,780 | 8% | 8% |
| Paper and Printed Materials | 973 | 1,133 | 2,111 | 2,692 | 16% | 28% |
| Pharmaceuticals | 293 | 304 | 8,035 | 8,342 | 3% | 4% |
| Warehouse and Terminal Moves | 2,250 | 2,452 | 11,819 | 13,296 | 9% | 12% |
| Waste | 2,605 | 2,796 | 722 | 768 | 7% | 6% |
| Textiles and Leather | 529 | 582 | 4,428 | 4,906 | 10% | 11% |
| Grand Total | 55,648 | 61,345 | 96,312 | 104,746 | 10% | 9% |

Source: NJTPA Freight Forecasting Tool, 2020

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

Thousands of Tons by Commodity by Direction, 2050



Source: NJTPA Freight Forecasting Tool, 2020

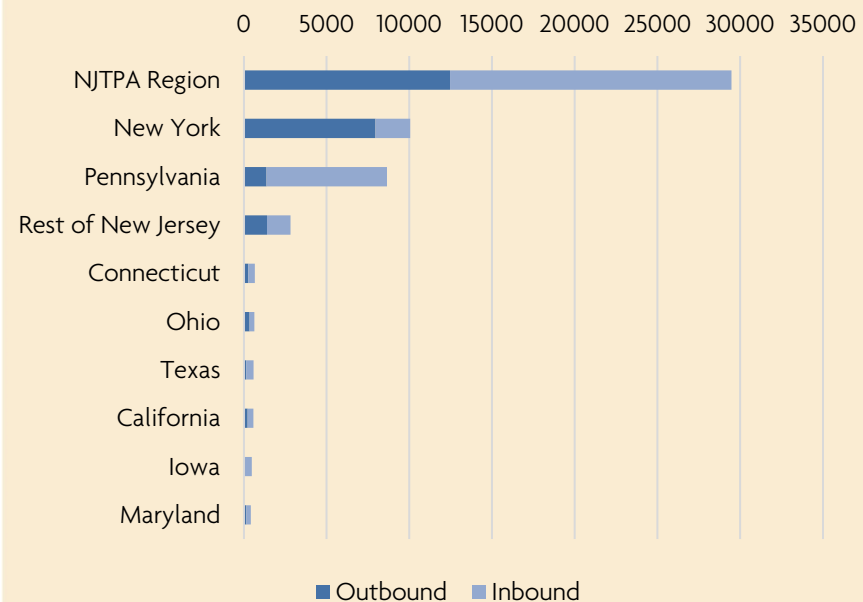
COMMODITY VOLUMES AND DIRECTION

The directional movement of shipments containing the top 10 commodities are expected to remain nearly constant as well. In 2050, like 2020, most construction materials moves will be within the NJTPA region. Intraregional moves are expected to remain the predominant travel pattern across most of the other commodity bundles as well.

FUTURE TRADING PARTNERS

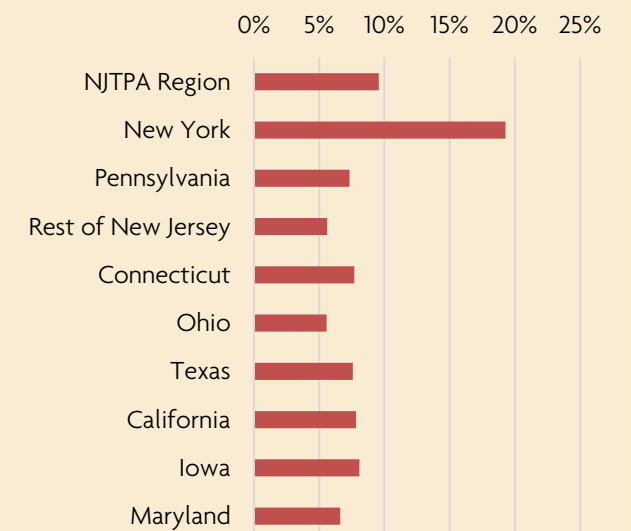
Middlesex County's largest trading partners will continue to be other counties in the NJTPA region, followed by New York, Pennsylvania, and portions of New Jersey outside the NJTPA region. The volume of trade with New York is expected to grow at a greater rate (19 percent) than trade with other top trading partners between 2020 and 2050.

Thousands of Tons by Domestic Trading Partner, 2050



Source: NJTPA Freight Forecasting Tool, 2020

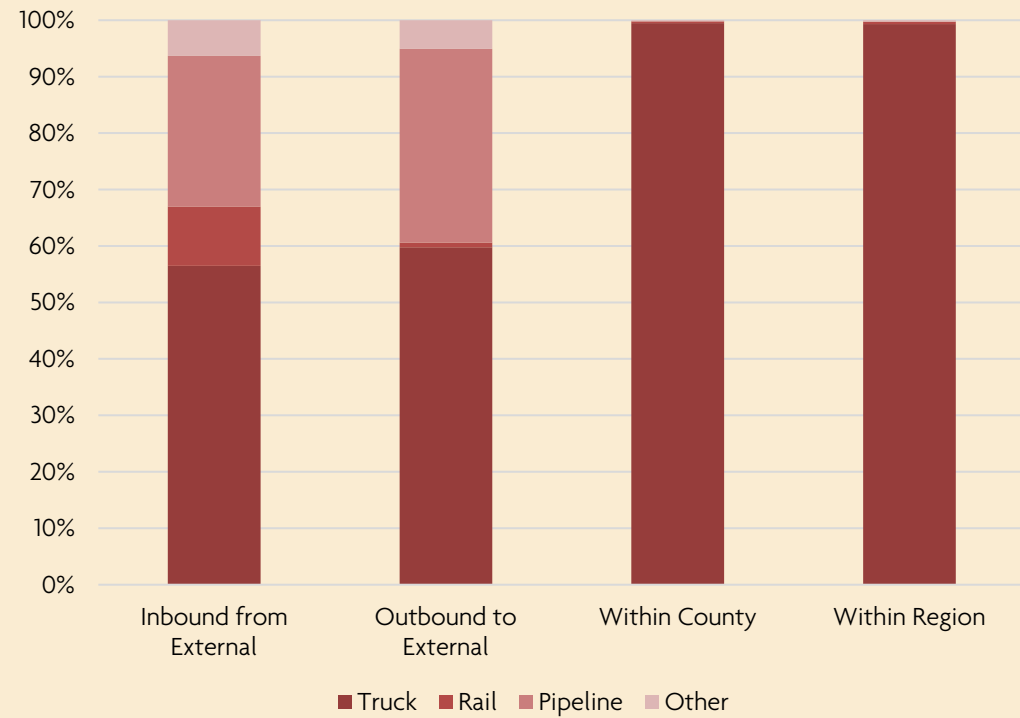
Growth, 2020-2050



Source: NJTPA Freight Forecasting Tool, 2020

FUTURE MODE UTILIZATION

The forecast anticipates that freight mode splits in 2050 will be similar to 2020 mode splits. Trucks are expected to carry 79 percent of all freight tons, while pipelines are expected to move 15 percent of freight tons. Rail and other modes are expected to move 3 percent of Middlesex County's freight tons in 2050. Pipelines are expected to move 34 percent of outbound tonnage, rail is expected to move 10 percent of inbound tonnage, and truck will carry about 99 percent of intracounty and intraregional freight moves.



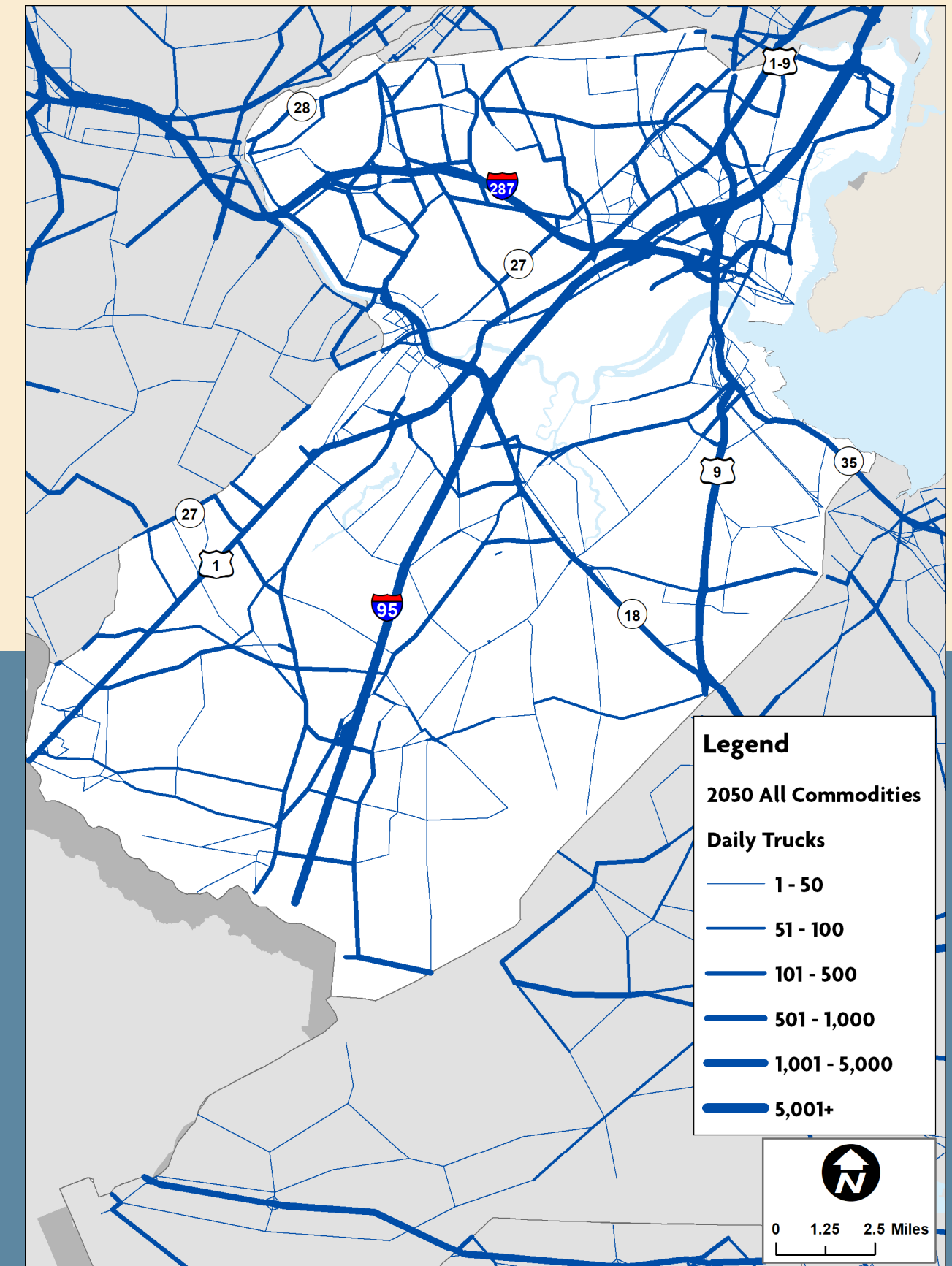
Source: NJTPA Freight Forecasting Tool, 2020

Future Highway Network Utilization

In 2050, Middlesex County's highway network is expected to remain the primary conveyor of freight into, out of, within and through the County. The number of commodity trucks traveling on the New Jersey Turnpike/Interstate 95 is expected to increase by about 500 trucks per day in each direction between 2020 and 2050. Commodity truck volumes on Interstate 287 are expected to increase by about 300 trucks per day in each direction. Routes 1, 9, and 18 are expected to carry about 200 more trucks per day in each direction by 2050.

The map on Page 11 illustrates the projected commodity truck volumes in 2050 on highways in Middlesex County.

Highway Network Utilization, 2050



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

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.

Middlesex County Freeholder Charles Kenny is Third Vice Chair of the NJTPA Board of Trustees.

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, covering the 13 counties of the NJTPA region, the City of Newark, Jersey City, and the region as a whole.

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.