



The New Jersey Comprehensive Statewide **FREIGHT PLAN**



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New Jersey Department of Transportation

Governor Jon S. Corzine



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TABLE OF CONTENTS

1. INTRODUCTION	1-1
2. WHY, WHAT, AND WHERE GOODS MOVE	2-1
3. HOW GOODS MOVE	3-1
4. GOODS MOVEMENT TODAY AND TOMORROW	4-1
5. STAKEHOLDER ENGAGEMENT	5-1
6. HIGHWAY FREIGHT	6-1
Highway Freight Context.....	6-1
Highway Freight Issues.....	6-29
7. RAIL FREIGHT	7-1
Rail Freight Context.....	7-1
Rail Freight Issues.....	7-11
8. MARITIME FREIGHT	8-1
Maritime Freight Context	8-1
Maritime Freight Issues	8-10
9. AIR FREIGHT	9-1
Air Freight Context.....	9-1
Aviation Issues.....	9-5
10. WAREHOUSING FREIGHT AND DISTRIBUTION CENTERS	10-1
Warehousing Context.....	10-1
Warehousing Issues	10-5
11. SYSTEMWIDE FACTORS	11-1
12. SUMMARY OF RECOMMENDATIONS AND ACTIONS	12-1
Statewide Coordination and Advocacy.....	12-2
Priority Freight Nodes.....	12-5
Priority Freight Corridors	12-6
System Optimization Strategies.....	12-10
Policy and Planning Strategies.....	12-11
Data Collection and Multimodal Analysis Tools.....	12-15
Safety and Security	12-16
LIST OF TABLES	ii
LIST OF FIGURES	iii

LIST OF TABLES

Table 2-1 - New Jersey Employment and Industries over Time	2-4
Table 2-2 - Top Manufacturing Sectors in New Jersey – 1900 and 2000	2-5
Table 2-3 - International Waterborne Tonnage (Short Tons) by Port Districts, 2003	2-12
Table 2-4 - Top Imported General Cargo Commodities through the New York.....	2-13
Table 2-5 - Destination Counties for Inbound Truck Moves.....	2-14
Table 2-6 - Origin Counties for Outbound Truck Moves	2-16
Table 2-7 - Origin Counties for Outbound Rail Moves.....	2-18
Table 2-8 - Origin Counties for Outbound Rail Tonnage (Short Tons), 2003	2-20
Table 2-9 - Top Trading Partners by Weight (Short Tons, Truck and Rail Only), 2003	2-22
Table 2-10 - Top Trading Partners by Value (Truck and Rail Only), 2003	2-22
Table 3-1 - Components of the Freight Transportation System	3-1
Table 4-1- Trends and Implications for the Freight Industry in New Jersey.....	4-1
Table 4-2 - Roles and Responsibilities of Private-Sector Businesses.....	4-4
Table 4-3 - Roles and Responsibilities of Public-Sector Entities	4-5
Table 4-4 - Legend for Tables 4-2 and 4-3	4-6
Table 6-1 - Vehicle Miles of Travel by County.....	6-10
Table 6-2 - Vehicle Hours of Travel by County	6-11
Table 7-1- Rail Freight Flows by Direction, Type, and Region of the State, 2003 (Tons)	7-2
Table 7-2 - Summary of New Jersey Railroad Miles and Class (2003)	7-4
Table 7-3 - Active Shortline Railroads in New Jersey	7-7
Table 7-4 - Estimated Capacity and Demand in Train Moves per Day - 2003	7-12
Table 9-1 - Domestic Air Cargo Commodities by Weight (Short Tons).....	9-2
Table 9-2 - Top 10 Freight Carriers at EWR for 12 Months Ending September 2004.....	9-3
Table 10-1 – Current Industrial Property in New Jersey.....	10-2

LIST OF FIGURES

Figure 2-1	Population Density Trends in New Jersey, 1930-2000.....	2-1
Figure 2-2	Forecast Population Density Projections for New Jersey, 2015 and 2025	2-2
Figure 2-3	Concentration of Population Density and Retail Establishments in New Jersey (2004)	2-3
Figure 2-4	Manufacturing, Mining, and Agricultural Facilities in New Jersey	2-6
Figure 2-5	Summary of Estimated 2003 Statewide Freight Flows by Weight (Short Tons)	2-7
Figure 2-6	Tons of Freight Moving Into, Out of, and Within New Jersey in 2003.....	2-8
Figure 2-7	Estimated Statewide 2003 Freight Flows by Mode in Short Tons	2-9
Figure 2-8	Truck Commodities by Weight (Short Tons), 2003	2-10
Figure 2-9	Rail Commodities by Weight (Short Tons), 2003	2-11
Figure 2-10	New Jersey Port Districts.....	2-12
Figure 2-11	Inbound Truck Destinations by Weight (Short Tons), 2003.....	2-15
Figure 2-12	Origin Counties for Outbound Truck Tonnage (Short Tons), 2003	2-17
Figure 2-13	Destination Counties for Inbound Rail Tonnage (Short Tons), 2003	2-19
Figure 2-14	Origin Counties for Outbound Rail Tonnage (Short Tons), 2003	2-21
Figure 3-1	NJ Freight System.....	3-3
Figure 3-2	Foreign Auto Distribution Supply Chain.....	3-4
Figure 3-3	Orange Juice Supply Chain.....	3-5
Figure 3-4	Domestic Air Cargo Modes	3-7
Figure 3-5	International Maritime Movement Modes	3-7
Figure 4-1	Portway Phase 1 Projects.....	4-7
Figure 4-2	Portway Extensions Study Area.....	4-8
Figure 6-1	Estimated 2003 Statewide Freight Flows by Direction in Short Tons.....	6-1
Figure 6-2	Estimated Inbound and Outbound Truck Tonnage (Short Tons) by County, 2003..	6-2
Figure 6-3	Truck Commodities by Weight (Short Tons), 2003	6-3
Figure 6-4	New Jersey Truck Flows (1998).....	6-4
Figure 6-5	National Highway System	6-4
Figure 6-6	National Highway System in New Jersey.....	6-6
Figure 6-7	National Highway System, Inset A – Northern Port Area.....	6-7
Figure 6-8	National Highway System, Inset B – Southern Port Area.....	6-7
Figure 6-9	National 102” Truck Network*	6-8
Figure 6-10	All Vehicle VHT by Capacity Category	6-12
Figure 6-11	Truck VHT by Capacity Category.....	6-12
Figure 6-12	Major Truck Corridors.....	6-14
Figure 6-13	Corridor Modeled Truck Volume Comparison, 2000-2025	6-15

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

Figure 6-14	NJTPK Corridor.....	6-16
Figure 6-15	Base 2030 PM Peak Period Truck Traffic on NJTPK Between Exit 12 and 13 (MP 52.0)	6-17
Figure 6-16	Base 2030 PM Peak Period Truck Traffic on NJTPK South of I-195 (MP 14.0)	6-17
Figure 6-17	Interstate 78 Corridor.....	6-18
Figure 6-18	Base 2030 PM Peak Period Truck Traffic on Interstate 78 West of I-287 (MP 29.0)	6-19
Figure 6-19	Interstate 80 Corridor.....	6-20
Figure 6-20	Base 2030 PM Peak Period Truck Traffic on I-80 near the Essex/Passaic County line at MP 52	6-21
Figure 6-21	Interstate 287 Corridor.....	6-22
Figure 6-22	Base 2030 PM Peak Period Truck Traffic on Interstate 287 North of I-78 (MP 24.0)	6-23
Figure 6-23	Interstate 295 Corridor.....	6-24
Figure 6-24	Base 2030 PM Peak Period Truck Traffic on Interstate 295 South of Commodore Barry Bridge (MP 11.0)	6-25
Figure 6-25	Route 17 Corridor	6-26
Figure 6-26	Base 2030 PM Peak Period Truck Traffic on Route 17 North of GSP (MP 14.0)	6-27
Figure 6-27	Increasing Demands for All Modes	6-31
Figure 6-28	Typical Daily Traffic Profile for NJ Interstates/Highways.....	6-33
Figure 6-29	Daily Traffic Profile: Newark/Elizabeth Port Area (2000).....	6-34
Figure 6-30	Service and Rest Facilities	6-39
Figure 7-1	Estimated Freight Flows with Breakout of Rail Tonnage by Type	7-2
Figure 7-2	Rail Commodities by Weight (Inbound, Outbound, and Intrastate) - 2003.....	7-3
Figure 7-3	Rail Operating Map.....	7-5
Figure 7-4	New Jersey Freight Rail Network.....	7-9
Figure 7-5	Freight Rail System Traffic Density (Estimates).....	7-10
Figure 7-6	Rail Ownership Map	7-17
Figure 7-7	New Jersey Carload Weight Capacity Limits	7-19
Figure 8-1	NY-NJ Region Inland Movement of Maritime Cargo.....	8-2
Figure 8-2	Delaware River Inland Movement of Maritime Cargo.....	8-2
Figure 8-3	Port Newark/Elizabeth	8-3
Figure 8-4	Global Marine Terminal and NEAT	8-3
Figure 8-5	Beckett Street Terminal	8-4
Figure 8-6	Broadway Produce Terminal	8-4
Figure 8-7	Port of Salem Terminal.....	8-4
Figure 8-8	PANYNJ Facilities.....	8-5

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

Figure 8-9	Major Rail Freight Facilities at the Port of New York and New Jersey	8-6
Figure 8-10	Total Rail Containers as a Percent of all Port Volumes.....	8-6
Figure 8-11	Port Inland Distribution Network	8-7
Figure 8-12	Key Waterway Channels in Northern New Jersey	8-8
Figure 8-13	Key Waterway Channels in Southern New Jersey	8-8
Figure 8-14	Backhoe Dredge in Operation.....	8-9
Figure 9-1	On-Airport Cargo Facilities at EWR	9-1
Figure 9-2	Inbound/Outbound Cargo at Newark Airport	9-2
Figure 9-3	Air Cargo Areas at Newark Liberty International Airport.....	9-4
Figure 10-1	Value-Added Warehouse	10-1
Figure 10-2	Industrial Density in New Jersey, by County	10-3
Figure 10-3	New Jersey's Warehouse Rings	10-4
Figure 11-1	Multiple Organizations in the Public and Private Sector are.....	11-2
Figure 11-2	Freight and Land Use in New Jersey	11-11

1. INTRODUCTION

In simple terms, “freight” means goods in motion, and, more fundamentally, the economy in motion. Each year, hundreds of millions of tons of freight move into, out of and across New Jersey by truck, van, ship, plane, train, and barge. The goods within these shipments are valued at more than \$850 billion. Our quality of life and our economic vitality are dependant on the ability of New Jersey’s freight system to move goods efficiently and cost effectively.

Where and how goods move is defined by the freight system. This system includes producers, consumers, and the multi-modal transportation facilities that connect them. Many people, companies, agencies, and authorities are involved in the movement of freight. New Jersey’s freight system is a key generator of jobs within the state, with some 500,000 people working to move goods to local, regional, national, and international destinations. In many respects, the jobs generated by New Jersey’s warehouses and distribution centers represent the “new manufacturing” workers in the state – workers who are undertaking the final stages of the production process to ensure goods are ready for consumption by the end users.

Until recently, the delivery of practically everything we own – when we want it and where we want it – was virtually invisible and taken for granted. However, that condition has changed. Significant and rapid growth in the number of people and markets to be served, coupled with ever-rising expectations about reliable and precise delivery times and an increasingly global economy, have created the heaviest demands on our freight delivery system ever. These demands continue to grow at a remarkable rate. Freight movement has the nation’s attention like never before as the public begins to realize the many impacts that freight transportation has on their lives and their livelihoods.

New Jersey is part of an enormous market of millions of people who now consume more than they produce. The States’ transportation network delivers goods to the doorstep of its residents from west coast marine ports, local airports and marine ports, and suppliers and distribution centers from around the country. The state’s ports, rail lines, and highways must meet regional needs and also serve as a gateway connecting North America to the world.

In return for providing the infrastructure to support freight movement to the rest of the nation, New Jersey is uniquely situated to benefit from the industries that add value to that freight as it moves through the transportation system. When planned for appropriately, freight activity can drive economic activity, create jobs, and support broader community quality of life goals.

While the movement of freight presents New Jersey with opportunities, it also comes with challenges. More freight needs to be handled by the existing infrastructure and new investments are needed. The high cost of land and labor and competing land uses threaten the state’s ability to remain competitive with its neighbors. At the same time, the freight system’s ultimate customers – the general public – are less tolerant of the constantly growing number of trucks and trains. Communities are fighting to stop expansions of the rail freight system, both in and out of court. The state’s Large Truck network and associated regulatory system is being challenged. Funding for freight infrastructure must compete with other public priorities in a highly constrained and shrinking fiscal environment. Meanwhile, segments of the freight industry are in financial distress. The emerging picture is complex, with no easy solutions.

This *Comprehensive Statewide Freight Plan* is intended to identify and elevate the opportunities and challenges associated with the movement of goods in New Jersey to the level of importance attached to the movement of people. Many of the same pressures that complicate personal travel also apply to freight: highways are heavily congested; rail infrastructure is incomplete and in some cases outdated; demand for travel is increasing; land is becoming scarce; and, all viable solutions require trade-offs.

As the first Comprehensive Statewide Freight Plan, this work has been undertaken by the NJDOT to accomplish the following objectives:

- Describe the state’s goods movement transportation network from a physical, operational, economic, and citizen's perspective.
- Highlight the issues, trends, challenges, and opportunities for goods movement in New Jersey.
- Identify, evaluate, and propose recommendation that address system and modal constraints from a systems perspective.
- Increase private and public understanding of system level goods movement and logistics issues.
- Develop (or recommend for development) specific data and analysis tools necessary to evaluate freight issues, weight options, and quantify performance.
- Strengthen partnerships and coordination with sister transportation agencies, other government organizations, private industry, and the public.

To address these objectives, the following chapters present a “back to basics” approach to logically formulate an action plan based upon a comprehensive definition of the context and issues of freight in New Jersey today and in the future. This organization mirrors the planning methodology utilized by the study team throughout the two-year effort to compile this document.

CHAPTER TWO: WHY, WHAT, AND WHERE GOODS MOVE

This chapter serves as a primer on why we have freight in New Jersey, why it is so vitally important in our State, and why the issues presented later in the Plan must be addressed. In order to set the context for discussing the goods movement supply and logistics chain, this chapter first discusses the demand for freight in New Jersey, focusing on the two fundamental origin and destination markets: consumers and producers. It then describes the character of freight, including what kinds of goods are moving, how much is moving, by what modes, and where the goods are coming from and going to.

CHAPTER THREE: HOW GOODS MOVE

With the understanding of why goods are moving (and must be moving) and what goods are moving and where, the supply-side of the freight system – the transportation and logistics infrastructure – is presented in this chapter. By overlaying the consumers and producers with the overall infrastructure system, this economic backbone of our state is examined from a global perspective to consider why goods movement occurs where it does and how it does, and the factors that drive infrastructure development.

CHAPTER FOUR: GOODS MOVEMENT TODAY AND TOMORROW

In defining the supply and demand elements of freight in New Jersey, trends that will effect goods movement need to be understood. Chapter Four presents a discussion of the major trends that are changing the future outlook for goods movement and logistics and defines the responsible parties that can respond to the implications of those trends.

CHAPTER FIVE: GOODS MOVEMENT STAKEHOLDERS

One of the primary conclusions of this planning effort is the significant lack of data and data analysis tools to enable a systemic quantitative assessment of freight needs and opportunities. Although these tools will be vital for future freight planning, their absence was beneficial for this first statewide Plan, as it resulted in the launch of a comprehensive stakeholder outreach effort which served as the basis for the issues and action plan set forth in this document.

With a detailed framework for system analysis established in Chapters Two through Four, Chapter Five outlines the stakeholder outreach effort to diagnosis system needs and prioritize potential recommendations.

CHAPTERS SIX THROUGH TEN: SYSTEM COMPONENTS

Based on the outcomes of the stakeholder outreach, as well as quantitative analysis using available tools and a literature review, these chapters discuss key components of the freight system. Chapter Six focuses on Highway, Chapter Seven on Rail, Chapter Eight on Maritime, Chapter Nine on Air, and Chapter Ten on Warehousing. The following is discussed for each component:

- context and description
- primary issues
- what is already being done to address the primary issues

The chapters also present recommendations and action steps to address the primary issues, including:

- what more needs to be done
- what group or groups should do it

The primary issues and recommendations included in these chapters reflect the priorities determined by multiple rounds of outreach, including final review by the Freight Plan Advisory Board and the Freight Plan Management Committee.

CHAPTER ELEVEN: SYSTEMWIDE FACTORS

The planning process and stakeholder outreach identified many influencing factors or system-wide issues for freight in New Jersey, which were also prioritized through an extensive review process. This chapter summarizes the context and details of these issues, and, as with Chapter Six through Ten, outlines current initiatives, recommendations for future initiatives, and implementation responsibilities. These system-wide issues include:

- institutional fragmentation
- funding for capital investment
- safety and security
- public perceptions of freight
- land use

CHAPTER TWELVE: SUMMARY OF RECOMMENDATIONS AND ACTION PLAN

Chapter Twelve presents a summary of Recommendations and an action plan for enhancing goods movement in New Jersey based on this planning effort. These recommendations were selected in consideration of their ability to support economic development, improve and sustain safety and security, preserve communities and the environment, improve access and efficiency, provide lasting returns on public investment, and foster cooperation and coordination.

APPENDICES

In support of the Statewide Freight Planning study, a series of stand alone documents (included here as appendices) were created to explore certain aspects of freight movement in more detail. The appendices include details of the commodity flow analysis, trends affecting freight today and in the future, information on the major freight initiatives in New Jersey, and the stakeholder outreach effort.

2. WHY, WHAT, AND WHERE GOODS MOVE

New Jersey is part of an enormous economic market driven by the demands of consumers and producers around the world. First and foremost, the nearly nine million people who live in the state alone consume a huge amount of goods. When another 114 million people are included as part of the consumer market within one day’s drive for a total of 123 million people, the dimensions of the demand for freight grow exponentially. Goods are also needed at every workplace and retail center, and raw materials and unfinished products are essential to the manufacturing sector of the state’s economy.

Changing needs at the local, national, and international levels have shaped the current freight system. The US is now part of a vibrant global economy, with goods sourced, produced, and marketed throughout the world. Elements of the freight system in New Jersey are key gateways to the global economy. The freight system has been shaped nationally by changes in regulation and funding and by the evolving needs of the people and businesses served throughout the country. Locally, the freight system has been shaped by these same forces, as well as by the characteristics of New Jersey’s transportation infrastructure, land use, and environmental and quality of life considerations.

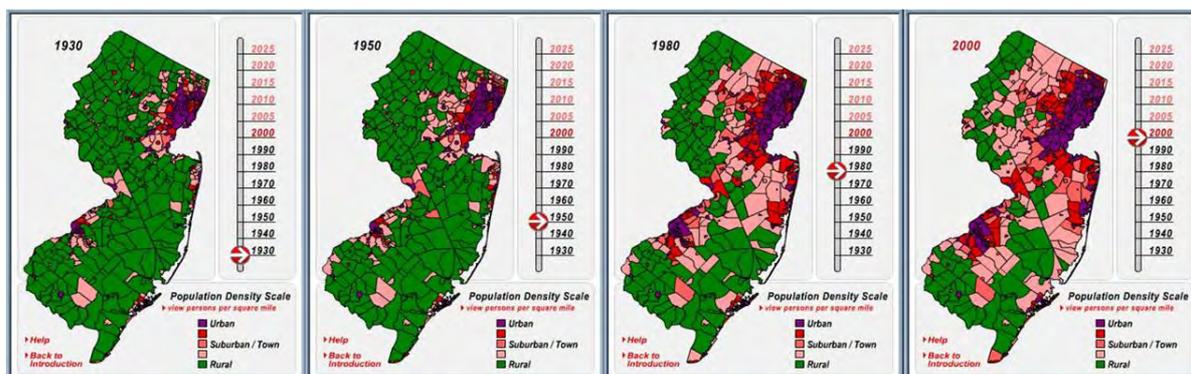
The following sections discuss the sources of demand for freight in New Jersey, including consumers, both residential and commercial, and producers, such as farmers and manufacturers. They also describe the character of freight, including what kinds of goods are moving, how much is moving, by what modes, and where the goods are coming from and going to.

NEW JERSEY’S CONSUMERS

People need products to support their daily lives. They need food, clothing, appliances for their homes, and cars to drive. As consumers, New Jersey’s residents play a vital role in determining the character and volume of goods moving within the state.

New Jersey’s population characteristics have changed over time, influencing the patterns and demand for freight. New Jersey’s early population growth was originally focused in its urban centers, especially in Newark in the north and Camden and Trenton in the south. The urban centers were the industrial cores of the state and its major employment centers. When the interstate highway system began opening up new locations for businesses and residences, New Jersey’s population also began to move outward, as shown in Figure 2-1 as the increasing areas of purple, red, and pink. In addition, northern New Jersey became a major economic component of the vibrant New York-New Jersey metropolitan area, and southern parts of the state became part of the Philadelphia metropolitan area. New Jersey’s prosperity attracted more residents, increasing the state’s population density.

Figure 2-1 - Population Density Trends in New Jersey, 1930-2000

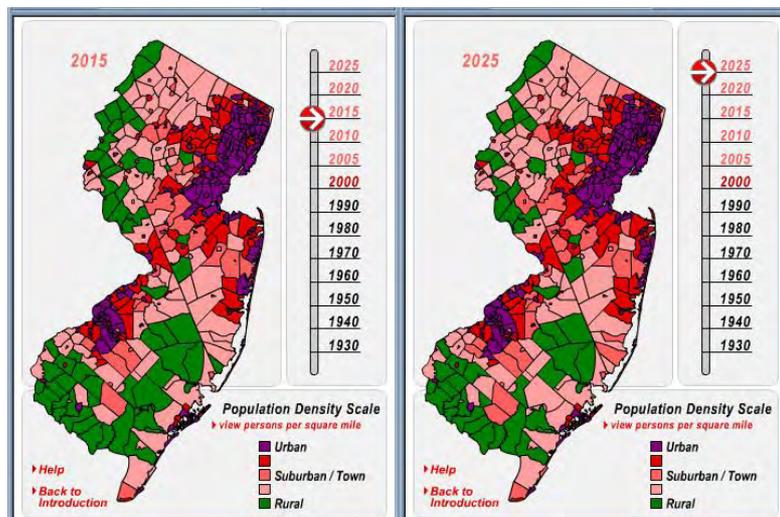


Sources: US Census, MPO projections, NJChoices.com

Trends suggest that New Jersey’s population will continue to grow. The New Jersey Department of Labor projects that the state’s population will grow to 9.5 million by 2015 and 10.3 million by 2025, with population density spreading from the urban to suburban and rural areas, as depicted in Figure 2-2.

This growing population density is significant. New Jersey’s residents make up only three percent of the US population, but while the US has an average of 80 people per square mile, New Jersey has 1,134 people per square mile. In addition, the median household income in 1999 for New Jersey’s households was more than \$55,000, the highest in the US. In contrast, the US average was about \$42,000, and the median household income in our neighboring states of Connecticut, New York, and Pennsylvania was \$54,000, \$43,000, and \$40,000, respectively.

Figure 2-2 - Forecast Population Density Projections for New Jersey, 2015 and 2025



Sources: US Census, MPO projections, NJChoices.com

In terms of freight demand, New Jersey, the most densely populated state in the nation, provides an affluent, highly concentrated market for goods produced in this state and elsewhere, including an increasing amount of products and raw materials imported from throughout the world.

Given the density and affluence of its population, New Jersey has an equally strong and concentrated development of retail businesses. The relationship between population density and retail establishments is illustrated in Figure 2-3. New Jersey has the distinction of having the most shopping malls in one area in the world, with seven major shopping malls in a 25-square-mile radius.

Each of these retail locations must be kept supplied with products, and the goods must be present when people demand them. Furthermore, as the population grows, retail stores will continue to follow the consumers, also spreading out and growing in number. The Department of Labor projects that employment in retail trade businesses will grow by more than 56,000 jobs, or 12 percent, between 2002 and 2012.

“Bricks and mortar” retail stores are only one of the means by which consumers now purchase products. People may also place mail and telephone orders and make purchases using the Internet. In 2004, American online shoppers spent \$23.2 billion, up 25 percent from 2003. Deliveries of these products to New Jersey consumers place an additional burden on the freight system.

People generate the overall level of demand for retail products, as well as the characteristics of that demand (such as the types of products, whether they will be picked up at stores or delivered to their homes, the characteristics of the services needed from the freight industry. Consequently, the ocean vessels, cargo aircraft, trucks, freight railroads, and courier delivery trucks are all moving in response to the demands of the population.

In addition to retail purchases, the freight industry also supports the population by removing “post-consumer” products – waste materials and recyclables, as well as items being returned to retail stores.

NEW JERSEY’S PRODUCERS

In the supply and demand market, New Jersey plays an important role as a producer of goods consumed around the globe. New Jersey has a rich heritage of production, starting with farms and mines and quickly becoming an industrial center for the US. In colonial times, New Jersey formed the bridge between Philadelphia and New York. Today, it is at the heart of one of the greatest concentrations of consumers in North America, as discussed in the previous section.

Business sectors and locations in New Jersey have also changed over time. In 1900, manufacturing was a key component of the economy, employing 35 percent of New Jersey’s workforce. By 1950, manufacturing employed nearly half the state’s workforce, or 756,000 workers, and the 1950s and 1960s turned out to be the heyday of manufacturing. Beginning in the 1970s, manufacturing declined as businesses relocated production facilities to less expensive locations in the southern US and overseas.

The state has now migrated from being a manufacturing center to an economy largely focused on service industries. New Jersey still retains a diversified and extensive manufacturing base, although the products generated have shifted over the years. The level and composition of the associated freight demand has also shifted.

By 2000, manufacturing employed just 10 percent of the New Jersey workforce, or 457,000 workers. In contrast, the service sector of the economy employed about 74 percent of the workforce, or 1.2 million workers. The NJ Department of Labor projects manufacturing employment to continue to decline in the state, while employment in the service sector will increase, particularly in business and professional services, educational services, health care/social services, and arts/recreational/ entertainment services. Table 2-1 on the following page illustrates these trends.

Table 2-1 - New Jersey Employment and Industries over Time

Employment Type/ Year	1900	2000
NJ Manufacturing Employment	326,000	457,000
Manufacturing as a % of NJ Labor Force	35%	10%
	Largest Industry: Manufacturing – 326,000	Largest Industry: Services – 1,200,000

Sources: New Jersey Review and Economic Outlook for 2000-2001, New Jersey Council of Economic Advisors

The composition of manufacturing activity has also shifted over time. Table 2-2 illustrates the changes over the last century. This changing nature of New Jersey’s industries has had an impact on the character of freight. In the past, New Jersey was much more self-reliant, with many New Jersey producers meeting the needs of New Jersey consumers. Exports in New Jersey were also much higher when the state was a manufacturing hub with prominent steel mills and other manufacturing centers in the early 20th Century. Now, with primary industries including services and pharmaceuticals/chemicals, production in New Jersey is less focused on the needs of New Jersey’s consumers, and more focused on high-value, but lower volume exports. More and more, the basic needs of New Jersey residents are being met with imports, often from Asian countries.

Table 2-2 - Top Manufacturing Sectors in New Jersey – 1900 and 2000

1900	2000
Copper Smelting/Refining	Chemicals
Silk & Silk Goods	Food
Foundry/Machine Shop Products	Petroleum/Coal
Slaughtering & Meat Packaging	Printing and Publishing
Woolen, Worsted & Felt Goods	Industrial Machinery
Wire	Electronic Equipment
Leather	Instruments
Tobacco Manufacture	Transportation Equipment
Electrical Machinery	Fabricated Metals
Chemicals	Paper

Sources: New Jersey Review and Economic Outlook for 2000-2001, New Jersey Council of Economic Advisors

As shown in Figure 2-4, production facilities today (including manufacturing and agricultural) are primarily located in the urban areas, as well as along major highways and rail lines throughout New Jersey. The close orientation of the facilities to major links in the transportation network demonstrates both the reliance on the system to move goods and the efficiency of locating close to it.

Each business, whether manufacturing or service, has different freight requirements. For example, manufacturers bring in raw materials and inputs to the production lines and generate outbound finished goods for clients. Some manufacturers, such as plastics companies, need bulk deliveries, while other production plants require smaller shipments of more diverse items. Restaurants and hotels must have supplies on weekly and daily bases. Offices may need the delivery and pick-up of time-sensitive documents, as well as supplies.

As the characteristics of New Jersey’s economy shift, the overall level of demand, as well as the composition of demand (e.g., what is shipped, the size of shipment, frequency of shipment, time sensitivity, whether the origins and destinations are local or international, etc.), also shift.

The following sections describe the character of freight, including what kind of goods are moving, how much is moving, by what modes, and where the goods are coming from and going to.

A more detailed review of information on freight movements is provided in the Appendix A- Commodity Flows.

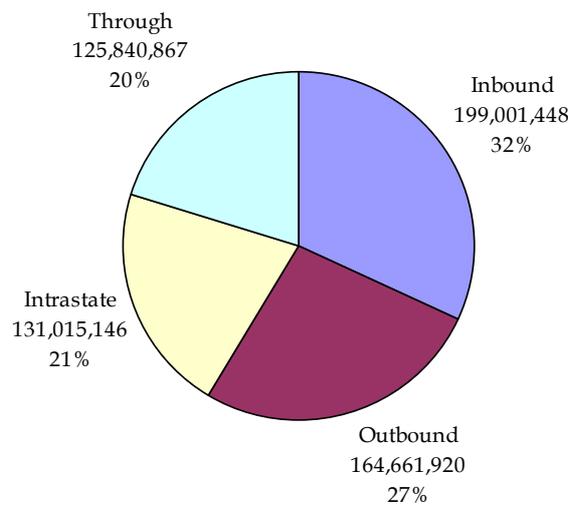
HOW MUCH FREIGHT IS MOVING?

The nearly nine million people, 270,000 business establishments, and major international gateways in New Jersey generate a tremendous amount of goods movement in a relatively small geographical area. In addition, New Jersey’s physical location within the nation has traditionally resulted in “through traffic” – goods movement that both originates and terminates outside of the State but uses New Jersey’s transportation infrastructure.

In 2003, nearly 621 million tons of freight moved into, out of, within, and through New Jersey (Figure 2-5). To put that number into perspective, this equates to roughly 130,000 lbs of freight for each person living in New Jersey, or about 379 pounds of freight per person per day. The value of the goods moving into, out of and within New Jersey alone is estimated at \$860 billion. Note that one of the data sources used--the Reebie Associates Transearch database--does not include the movement of waste products, which may represent a significant amount of additional tonnage and movements on New Jersey’s freight system.

As a major consuming region and a major gateway for imported maritime cargo, it is not surprising that nearly a third of the freight tonnage is moving into New Jersey. The data also reflects the State’s role as a distribution origin for the rest of the U.S., with 27 percent of the tonnage moving outbound from the State. Over 20 percent of the tonnage moves within the State – moving, for example, from local warehouses to local retail stores and from port terminals in New Jersey to local warehouses. Through traffic, or traffic that originates and terminates outside of the State, is estimated to account for 20 percent of the tonnage (based on truck and rail data, as data for water and air through movements is not available).

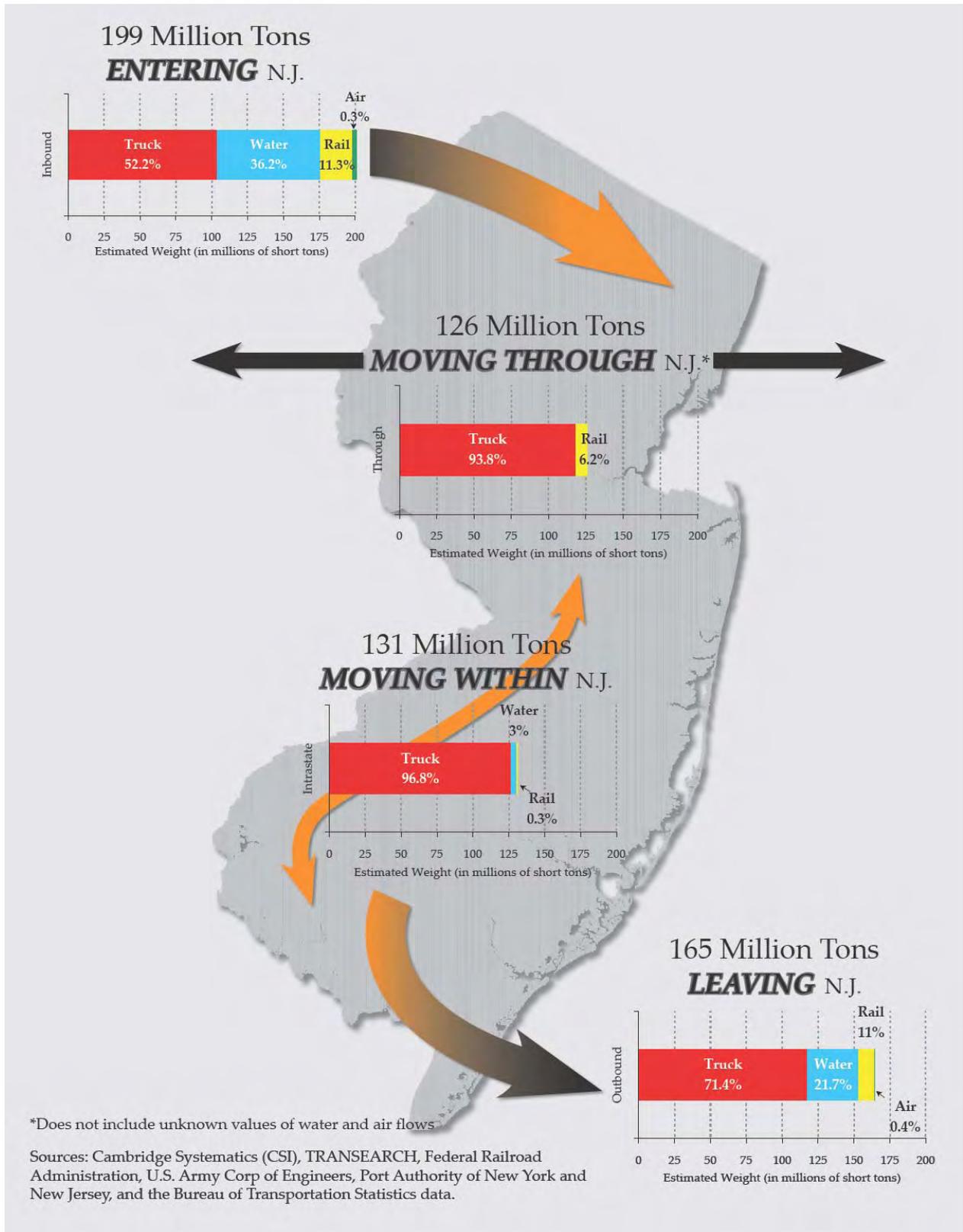
Figure 2-5 - Summary of Estimated 2003 Statewide Freight Flows by Weight (Short Tons)



Flow Type	Total	Estimated Weight (Short Tons)			
		Truck	Rail	Water	Air
Inbound	199,001,448	103,873,482	22,518,945	72,069,000	540,021
Outbound	164,661,920	117,584,251	10,974,367	35,679,000	424,302
Intrastate	131,015,146	126,807,290	294,856	3,913,000	0
Through	125,840,867	118,059,233	7,781,634	Unknown	Unknown
TOTAL	620,519,381	466,324,256	41,569,802	111,661,000	964,323

Sources: Cambridge Systematics (CSI), US Army Corps of Engineers, Federal Railway Administration 2003 Rail Waybill, Reebie Associates TRANSEARCH Database, and Port Authority of New York and New Jersey. See Appendix A page 3 for more clarifiers.

Figure 2-6 – Tons of Freight Moving Into, Out of, and Within New Jersey in 2003



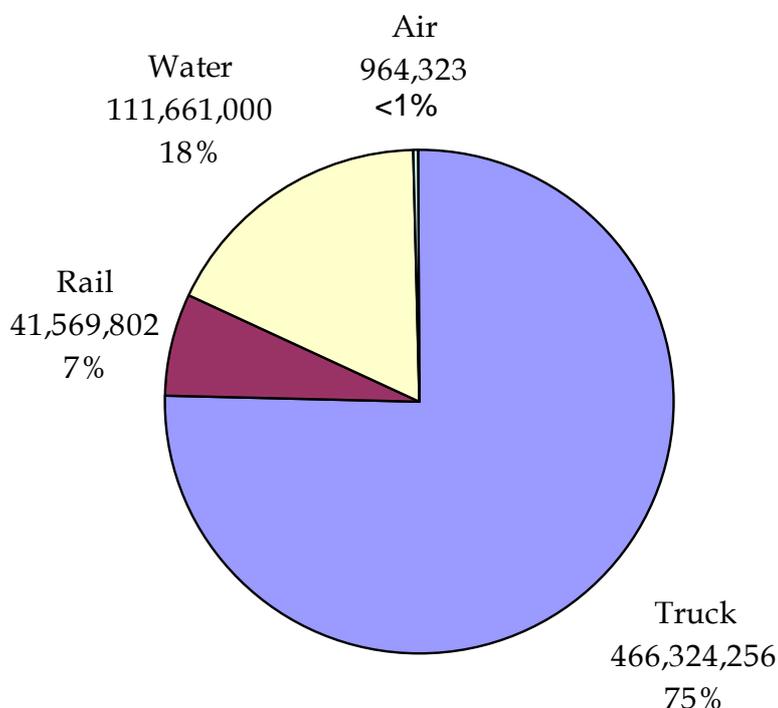
Examining the data by mode indicates the importance of trucks in moving freight in New Jersey. As depicted in Figure 2-6, trucks carry the majority of freight, and carry almost all of the intrastate freight – accounting for 97 percent of the volume of intrastate goods by weight. Water is a significant carrier of inbound and outbound goods, accounting for 36 percent of the inbound and 22 percent of the outbound goods.

A summary of the modal breakdown is shown in Figure 2-7.

Trucks accounted for about 75 percent of all goods moved in New Jersey. Truck movements include local and long distance pick up and delivery, moves to and from rail, air cargo, and maritime terminals, long distance movements of cargo, and local movements to homes and businesses.

Waterborne movements accounted for 18 percent of the movements, indicating the importance of the ports to New Jersey. Rail freight accounted for seven percent of the tonnage. While air cargo does not move a large amount of freight relative to the other modes, it does move very time sensitive and high value shipments.

Figure 2-7 - Estimated Statewide 2003 Freight Flows by Mode in Short Tons



Source: Cambridge Systematics analysis of TRANSEARCH, Federal Railroad Administration, U.S. Army Corps of Engineers, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics data.

Note: Through tonnage for water and air modes could not be estimated due to limitations of data sources.

WHAT TYPES OF GOODS ARE MOVING?

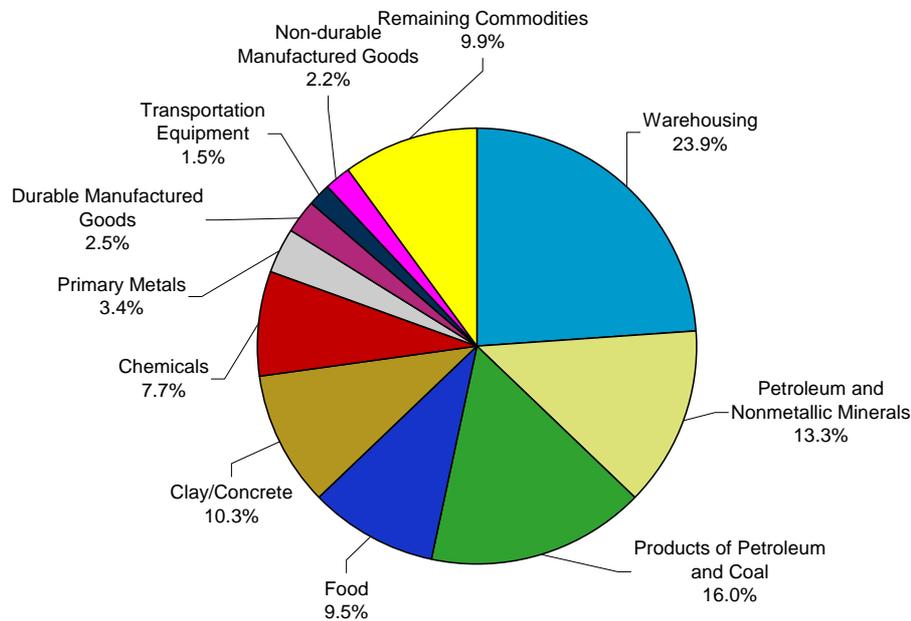
New Jersey's transportation system handles a wide range of commodities. Retail products, supplies for businesses, goods produced by New Jersey's manufacturing and agricultural base, and items that we typically use in our daily lives (for example, food and automobiles) are among the shipments into, out of and within New Jersey. A discussion of the type of goods moved by mode follows.

GOODS MOVED BY TRUCKS

Trucks move the largest amount of freight in New Jersey. In terms of tonnage, the leading commodities moved by truck, as shown in Figure 2-8, are:

- Diverse products moving to and from warehouses, ports, the airport and rail freight yards (defined as “Warehousing” in this document). These “freight all kinds” movements include low and high value goods and represent 29 percent of the truck movements (truckload equivalents) and 24 percent of the tonnage.
- Petroleum, coal and related products (including fuels, plastic pellets, natural gas and ores) is the second largest commodity category, representing about 26 percent of truck movements and 29 percent of the tonnage.
- Food products are the third largest, representing nine percent of the truck movements and ten percent of the tonnage.

**Figure 2-8 - Truck Commodities by Weight (Short Tons), 2003
(Inbound, Outbound, and Intrastate)**



Number	Commodity Group	Truckload Equivalents	Share	Short Tons
18	Warehousing	8,059,534	29%	83,238,369
4	Petroleum and Nonmetallic Minerals	3,843,956	14%	46,187,787
10	Products of Petroleum and Coal	3,427,855	12%	55,840,726
5	Food	2,520,266	9%	32,912,374
13	Clay/Concrete/Glass/Stone	2,444,844	9%	35,708,400
9	Chemicals	1,771,557	6%	26,791,677
14	Primary Metals	894,239	3%	11,854,722
12	Durable Manufactured Goods	728,393	3%	8,579,904
16	Transportation Equipment	717,688	3%	5,097,787
6	Nondurable Manufactured Goods	643,921	2%	7,496,916
	Remaining Commodities	2,454,915	9%	34,556,360
TOTAL		27,507,166	100%	348,265,023

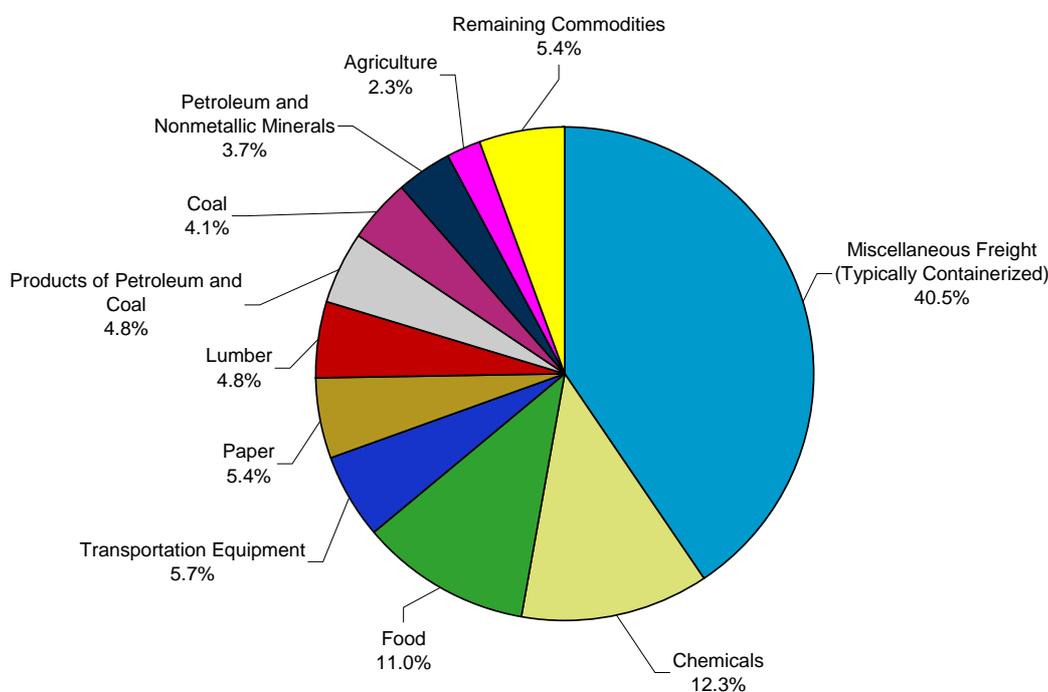
Source: Cambridge Systematics analysis of TRANSEARCH data and FreightTools_{CS}.
 Note: Columns may not sum precisely to totals due to rounding.

GOODS MOVED BY RAIL FREIGHT CARRIERS

Leading commodity movements by the rail freight carriers, as shown in Figure 2-9, include:

- Miscellaneous freight. At 13.6 million tons, this category includes goods in domestic and international containers and trailers moved by rail. Included in this category are International container movements that arrive at West Coast ports that are then moved across the country (or “landbridged”) for delivery in New Jersey, international container movements that arrive at New Jersey’s port facilities and continue their journey inland through rail yards located on and near the ports, and goods that are shipped in domestic containers and trailers loaded onto railcars.
- Over 4 million tons of chemical shipments.
- Nearly 4 million tons of food products.
- Nearly 2 million tons of “transportation equipment,” which can include automobiles and trucks shipped to and from the region. Note that Port Newark is one of the leading import locations for automobiles.

**Figure 2-9 - Rail Commodities by Weight (Short Tons), 2003
(Inbound, Outbound, and Intrastate)**



Number	Commodity Group	Short Tons	Share
17	Miscellaneous Freight	13,685,508	41%
9	Chemicals	4,143,872	12%
5	Food	3,720,728	11%
16	Transportation Equipment	1,916,488	6%
8	Paper	1,813,620	5%
7	Lumber	1,621,420	5%
10	Products of Coal and Petroleum	1,616,092	5%
3	Coal	1,400,487	4%
4	Petroleum and Nonmetallic Minerals	1,261,706	4%
1	Agriculture	773,415	2%
	Remaining Commodities	1,834,832	5%
TOTAL		33,788,168	100%

Source: Cambridge Systematics analysis of Federal Railroad Administration data.

GOODS MOVED BY OCEAN CARRIER

New Jersey’s port facilities (the New York / New Jersey Port District & the New Jersey / Pennsylvania Delaware River Port District), as shown in Figure 2-10, are among the largest in North America. In addition to the facilities managed by public port agencies, the State also has major refineries that receive products via the waterways. One example is the Bayway Refinery in Linden.

Reviewed on a tonnage basis, the heavier bulk commodities, such as petroleum and chemicals, lead the goods moved by ocean carriers (Table 2-3). Approximately 27 million tons of containers and auto/vehicles shipments moved in 2003

Figure 2-10 - New Jersey Port Districts

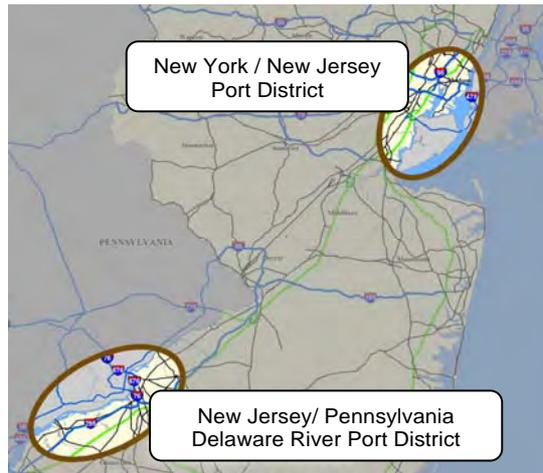


Table 2-3 - International Waterborne Tonnage (Short Tons) by Port Districts, 2003

Port District	Commodity	Total Tons (000)	Inbound Tons (000)	Outbound Tons (000)
Philadelphia				
	Coal	522	521	1
	Petroleum and Petroleum Products	65,801	65,600	201
	Chemicals	1,659	1,358	301
	Crude Materials	2,781	2,301	471
	Primary Manufactured Goods	4,335	3,601	734
	Food and Farm Products	2,760	2,732	28
	Manufactured Products	431	313	118
	Unknown/Other	179	159	20
	Total	78,468	76,594	1,874
New York/New Jersey				
	Coal	743	741	2
	Petroleum and Petroleum Products	43,955	43,226	729
	Chemicals	4,362	3,042	1,320
	Crude Materials	8,456	5,222	3,234
	Primary Manufactured Goods	5,656	4,424	1,232
	Food and Farm Products	7,193	6,210	983
	Manufactured Products	7,872	6,381	1,491
	Unknown/Other	1,447	1,005	442
	Total	79,684	70,251	9,433

Source: Cambridge Systematics analysis of U.S. Army Corps of Engineers data. Note: NY District data includes NY, NJ, VT, and MA. Philadelphia District includes the Delaware River port complex including PA, NJ, and DE

The diversity of consumer needs met by maritime movements is also demonstrated when general cargo is analyzed separately from bulk commodity movements. As shown in Table 2-4 the top imported general cargo commodities through the New York / New Jersey Port District in 2003 included vehicles, apparel, beverages, furniture, footwear, fish, and toys.

**Table 2-4 - Top Imported General Cargo Commodities through
the New York / New Jersey Port District in 2003
(does not include bulk commodities)**

Rank	Commodity	Millions of Dollars
1	VEHICLES, NOT RAILWAY	\$14,209.37
2	MACHINERY	\$ 6,381.92
3	WOVEN APPAREL	\$ 3,846.98
4	KNIT APPAREL	\$ 3,280.83
5	BEVERAGES	\$ 2,591.19
6	ELECTRICAL MACHINERY	\$ 2,499.34
7	FURNITURE AND BEDDING	\$ 2,476.75
8	PLASTIC	\$ 2,175.79
9	ORGANIC CHEMICALS	\$ 1,877.74
10	FOOTWEAR	\$ 1,691.44
11	PERFUMERY,COSMETIC,ETC	\$ 1,443.14
12	FISH AND SEAFOOD	\$ 1,352.85
13	TOYS AND SPORTS EQUIPMT	\$ 1,336.68
14	PHARMACEUTICAL PRODUCTS	\$ 1,301.08
15	OPTIC,NT 8544;MED INSTR	\$ 1,035.36
16	IRON/STEEL PRODUCTS	\$ 958.48
17	MISC TEXTILE ARTICLES	\$ 945.69
18	COCOA	\$ 903.93
19	PAPER,PAPERBOARD	\$ 849.19
20	DAIRY,EGGS,HONEY,ETC	\$ 696.51

Source: A. Strauss-Wieder, Inc. review of Port Authority of New York and New Jersey data.

GOODS MOVED BY AIR CARRIER

Newark Liberty International Airport is one of the largest cargo hubs in the US with nearly one million tons of freight handled in 2003. However, little information is available on the mix of commodities moving through the airport. The vast majority of the goods moves via “integrated carriers,” such as FedEx and UPS, and represent “freight all kinds” shipments. The key characteristic shared by these shipments is that they are time sensitive and/or high value shipments where a premium is placed on their quick arrival at a distant location.

WHERE ARE GOODS COMING FROM AND GOING TO?

This section summarizes the key origins and destinations of goods movement within the State. The information is presented at the county level, and as such, it focuses on truck and rail movements based on data availability.

TRUCK DESTINATIONS IN NEW JERSEY

All of the counties in New Jersey receive significant amounts of freight by truck. Figure 2-11 depicts the inbound truck destination by weight for each county in New Jersey, with the darker shading indicating higher values. Cape May County, with the lowest amount of truck freight tonnage was the destination for over 2.4 million tons of goods valued at \$8.4 billion in 2003. The County receiving the greatest amount of truck freight tonnage, Bergen County, was the destination for nearly 11 million tons of goods valued at \$20.4 billion in 2003. Bergen County is both a leading node of warehousing and retail facilities.

The other leading destinations (shown in Table 2-5) were Middlesex, Hudson, and Union Counties. Middlesex County is the leading hub of warehousing activity in the State and also has a substantial amount of retail activity. Hudson County includes the warehouses in the Meadowlands area, which support many New York City businesses, as well as considerable retail and office developments. Union County includes Port Elizabeth, along with the on-airport facilities for UPS and FedEx at Newark Liberty International Airport. The County also has a large amount of warehousing and major retail centers.

Inbound truck destinations by weight were lower for South Jersey and distributed between Burlington, Camden, Gloucester, and Cumberland Counties. Outbound Truck tonnage, however, was more concentrated in Camden and Gloucester Counties. While the tonnage moved is lower in South Jersey, the truck network is more limited, resulting in significant truck concentration.

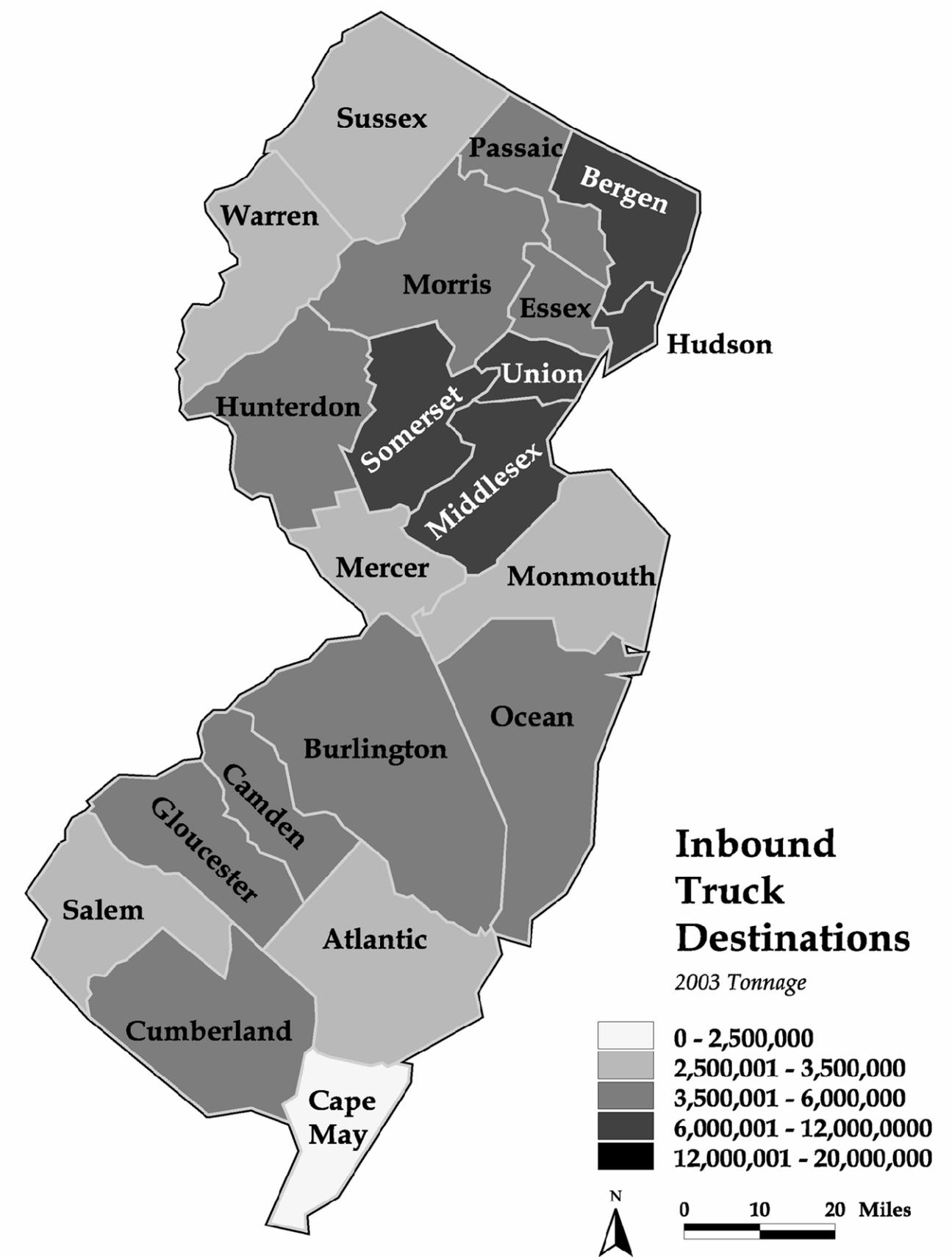
Table 2-5 - Destination Counties for Inbound Truck Moves in 2003
(by Truckload Equivalents, Weight, and Value)

Destination County	Inbound Truckloads	Share of Truckloads	Inbound Weight (Short Tons)	Inbound Value (\$ Billions)
Bergen	698,184	10%	10,678,894	\$20.4
Middlesex	694,720	10%	9,669,831	\$17.7
Hudson	579,470	8%	7,546,188	\$14.4
Union	458,328	7%	6,533,518	\$15.0
Somerset	451,684	7%	6,272,522	\$12.4
Camden	378,214	5%	5,933,075	\$14.9
Essex	371,955	5%	5,564,377	\$13.7
Morris	361,391	5%	5,372,489	\$13.1
Burlington	339,267	5%	5,303,128	\$14.0
Passaic	295,930	4%	4,568,497	\$12.6
Gloucester	250,717	4%	4,008,683	\$11.3
Cumberland	243,622	4%	3,889,997	\$11.9
Mercer	234,341	3%	3,422,171	\$10.5
Ocean	223,201	3%	3,605,508	\$10.2
Monmouth	223,019	3%	3,431,964	\$11.1
Hunterdon	220,935	3%	3,532,994	\$10.6
Warren	196,206	3%	3,182,569	\$10.1
Atlantic	192,327	3%	3,033,542	\$10.0
Sussex	179,835	3%	3,019,044	\$9.8
Salem	176,831	3%	2,859,632	\$9.7
Cape May	153,036	2%	2,444,858	\$8.4
TOTAL	6,923,212	100%	103,873,482	\$262

Source: Cambridge Systematics analysis of TRANSEARCH data and FreightTools_{cs}.

Note: Columns may not sum precisely to totals due to rounding.

Figure 2-11 - Inbound Truck Destinations by Weight (Short Tons), 2003



Source: Cambridge Systematics analysis of TRANSEARCH data.

TRUCK ORIGINATIONS IN NEW JERSEY

Outbound truck movements match the location of key maritime, air cargo, warehousing, and rail freight terminal locations within the State. As shown in Figure 2-12 and Table 2-6, the leading origination counties for truck traffic in New Jersey are:

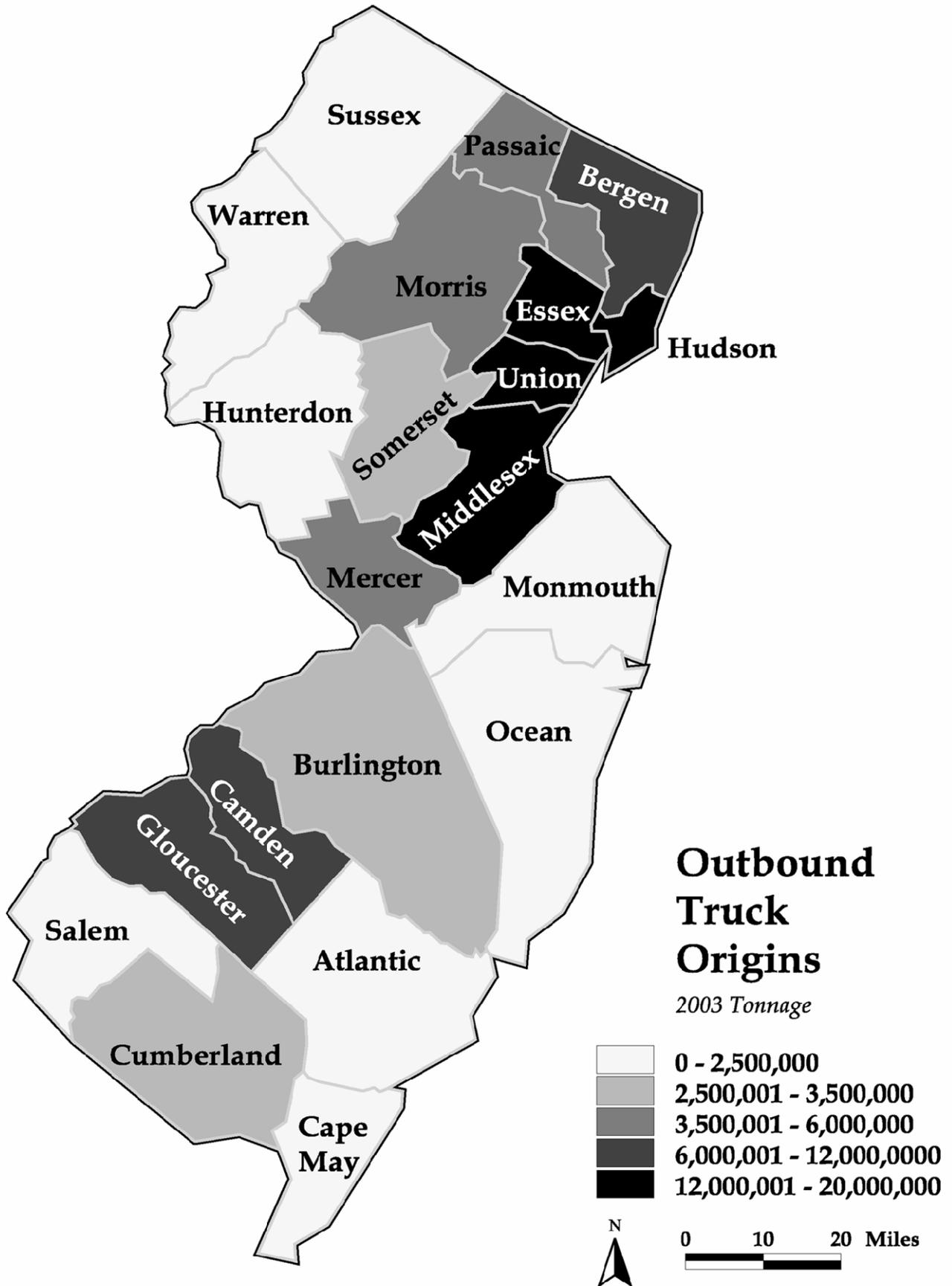
- Union, Middlesex, Hudson, and Essex Counties – Union and Essex Counties host Port Newark/Elizabeth, the major rail yards, and Newark Liberty International Airports, all of which are major generators of truck activity. The four counties also have high concentrations of warehousing activity.
- Camden and Gloucester Counties in southern New Jersey are also major truck originating points. Similar to the northern top ranked counties, Camden and Gloucester host port facilities and have warehousing activity.

Table 2-6 - Origin Counties for Outbound Truck Moves in 2003
(by Truckload Equivalents, Weight, and Value)

Origin County	Outbound Truckloads	Share of Truckloads	Outbound Weight (Short Tons)	Outbound Value (\$ Billions)
Union	1,393,010	17%	19,899,284	\$29.1
Middlesex	1,100,080	14%	16,680,062	\$24.0
Essex	1,004,083	12%	14,322,963	\$26.3
Hudson	1,001,122	12%	13,347,142	\$16.1
Bergen	667,454	8%	9,294,181	\$21.7
Gloucester	519,377	6%	8,946,929	\$13.5
Camden	419,157	5%	6,125,735	\$13.5
Passaic	341,779	4%	4,970,471	\$13.4
Morris	291,402	4%	4,174,419	\$12.6
Mercer	252,884	3%	3,659,129	\$10.2
Burlington	219,167	3%	3,226,866	\$10.7
Somerset	208,533	3%	2,990,873	\$8.6
Cumberland	197,668	2%	3,077,216	\$6.6
Monmouth	141,383	2%	2,192,103	\$6.4
Atlantic	75,984	1%	1,330,979	\$3.2
Hunterdon	59,529	1%	900,213	\$4.3
Warren	45,542	1%	643,984	\$3.2
Ocean	43,058	1%	655,263	\$3.3
Salem	42,161	1%	666,920	\$2.4
Sussex	20,652	0%	295,530	\$2.2
Cape May	11,723	0%	183,984	\$0.8
TOTAL	8,055,747	100%	117,584,251	\$232

Source: Cambridge Systematics analysis of TRANSEARCH data and FreightTools^{cs}.
 Note: Columns may not sum precisely to totals due to rounding.

Figure 2-12 - Origin Counties for Outbound Truck Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of TRANSEARCH data

RAIL FREIGHT DESTINATIONS IN NEW JERSEY

Rail tonnage is usually divided into two types:

- Intermodal movements, which are defined as containers and/or trailers moving on rail cars. Intermodal movements originate and terminate at rail yards, with trucks making the local pick-ups and deliveries.
- Carload movements, which are defined as boxcars, tank cars, lumber cars, hopper cars, and other more traditionally known types of rail freight movements. Carload movements may originate or terminate directly at end user facilities or have all or part of their cargo “transloaded” at a rail yard onto trucks.

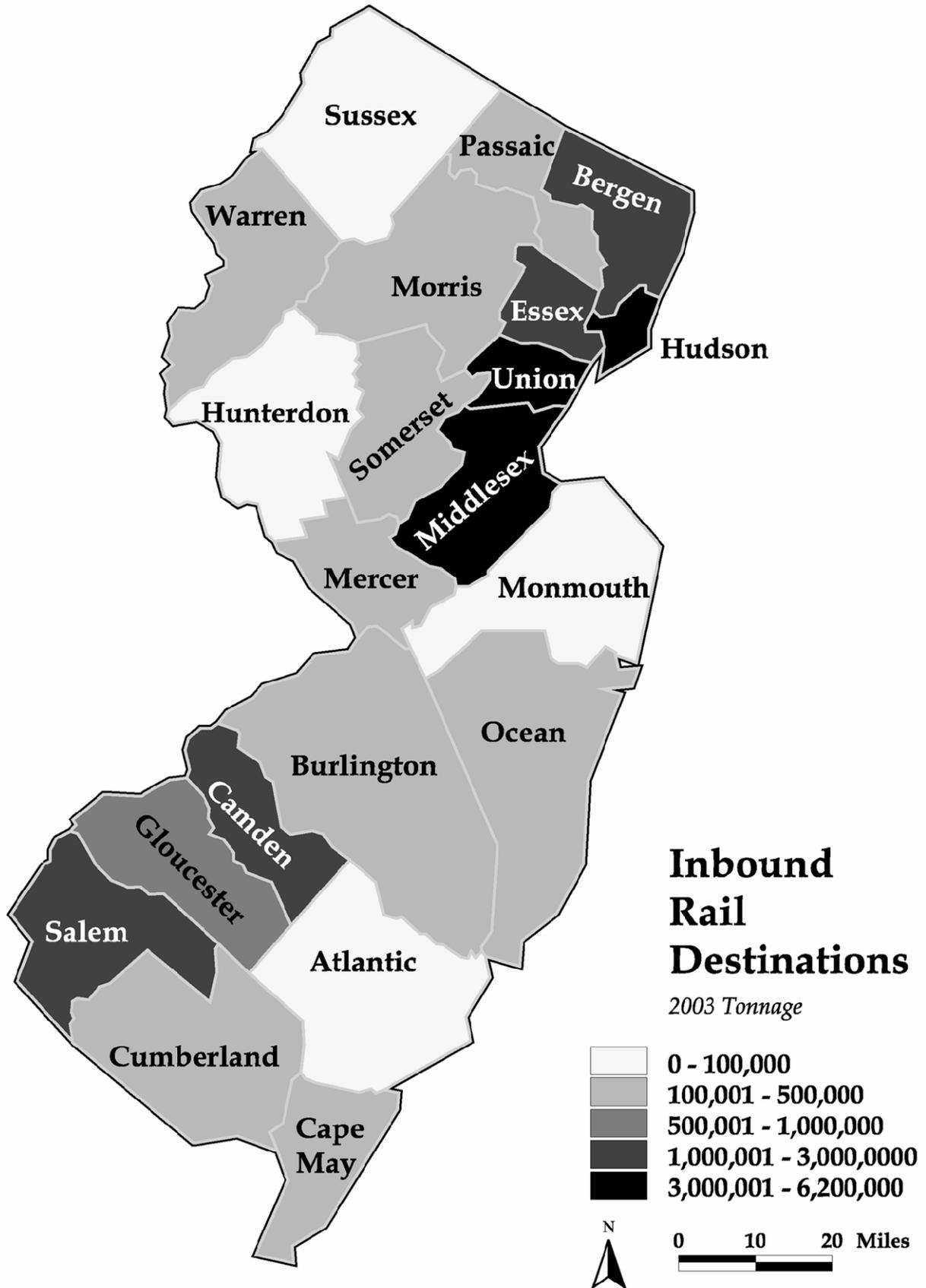
As shown in Figure 2-13 and Table 2-7 the counties receiving the most rail freight shipments are Hudson, Union, Middlesex, Essex, Bergen and Camden counties. Hudson, Union, Essex, and Bergen Counties are the lead destinations for intermodal movements, consistent with the location of rail yards handling these movements in the region. Major carload destination counties, which also include Salem County, are generally the location of large manufacturing operations. Examples include petroleum and chemical production. As a specific example, the New York Times printing plant is located in Middlesex County and regularly receives boxcars of newsprint and other paper products.

Table 2-7 - Origin Counties for Outbound Rail Moves in 2003
(by Truckload Equivalents, Weight, and Value)

Destination County	Carload (Short Tons)	Carload Share	Intermodal (Short Tons)	Intermodal Share	Total Weight (Short Tons)	Total Share	Value (\$ Billions)
Hudson	1,829,036	12%	4,278,600	56%	6,107,636	27%	\$4.4
Union	811,920	5%	2,783,320	36%	3,595,240	16%	\$5.2
Middlesex	3,047,460	20%	0	0%	3,047,460	14%	\$6.5
Essex	2,070,408	14%	232,360	3%	2,302,768	10%	\$4.1
Bergen	1,252,084	8%	333,040	4%	1,585,124	7%	\$3.6
Camden	1,270,480	9%	800	0%	1,271,280	6%	\$1.9
Salem	1,159,157	8%	0	0%	1,159,157	5%	\$1.0
Gloucester	889,296	6%	0	0%	889,296	4%	\$2.5
Burlington	494,348	3%	0	0%	494,348	2%	\$2.0
Cape May	479,928	3%	0	0%	479,928	2%	\$0.0
Passaic	294,020	2%	0	0%	294,020	1%	\$0.4
Somerset	258,920	2%	0	0%	258,920	1%	\$0.8
Cumberland	211,976	1%	0	0%	211,976	1%	\$0.5
Warren	190,880	1%	0	0%	190,880	1%	\$0.7
Morris	188,480	1%	0	0%	188,480	1%	\$0.8
Mercer	177,120	1%	0	0%	177,120	1%	\$0.8
Ocean	101,760	1%	0	0%	101,760	0%	\$0.4
Hunterdon	63,920	0%	0	0%	63,920	0%	\$0.3
Monmouth	58,492	0%	0	0%	58,492	0%	\$0.3
Sussex	33,700	0%	0	0%	33,700	0%	\$0.1
Atlantic	7,440	0%	0	0%	7,440	0%	\$0.0
TOTAL	14,890,825	100%	7,628,120	100%	22,518,946	100%	\$36.2

Source: Cambridge Systematics analysis of Federal Railroad Administration data and FreightToolscs.
Note: Columns may not sum precisely to totals due to rounding.

Figure 2-13 - Destination Counties for Inbound Rail Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

RAIL FREIGHT ORIGINATIONS IN NEW JERSEY

Similar to the pattern for destination counties, the pattern of originating rail freight tonnage reflects the facilities located in the respective counties. While the amount of tonnage originating in New Jersey is far less than the rail freight tonnage flowing into the State, the outbound amount was still nearly 11 million tons in 2003.

As shown in Figure 2-14, the leading originating counties were Hudson, Union, Essex, and Gloucester. As shown in Table 2-8 the leading origination counties for intermodal rail freight were Hudson and Union, reflecting the rail yards located in their boundaries.

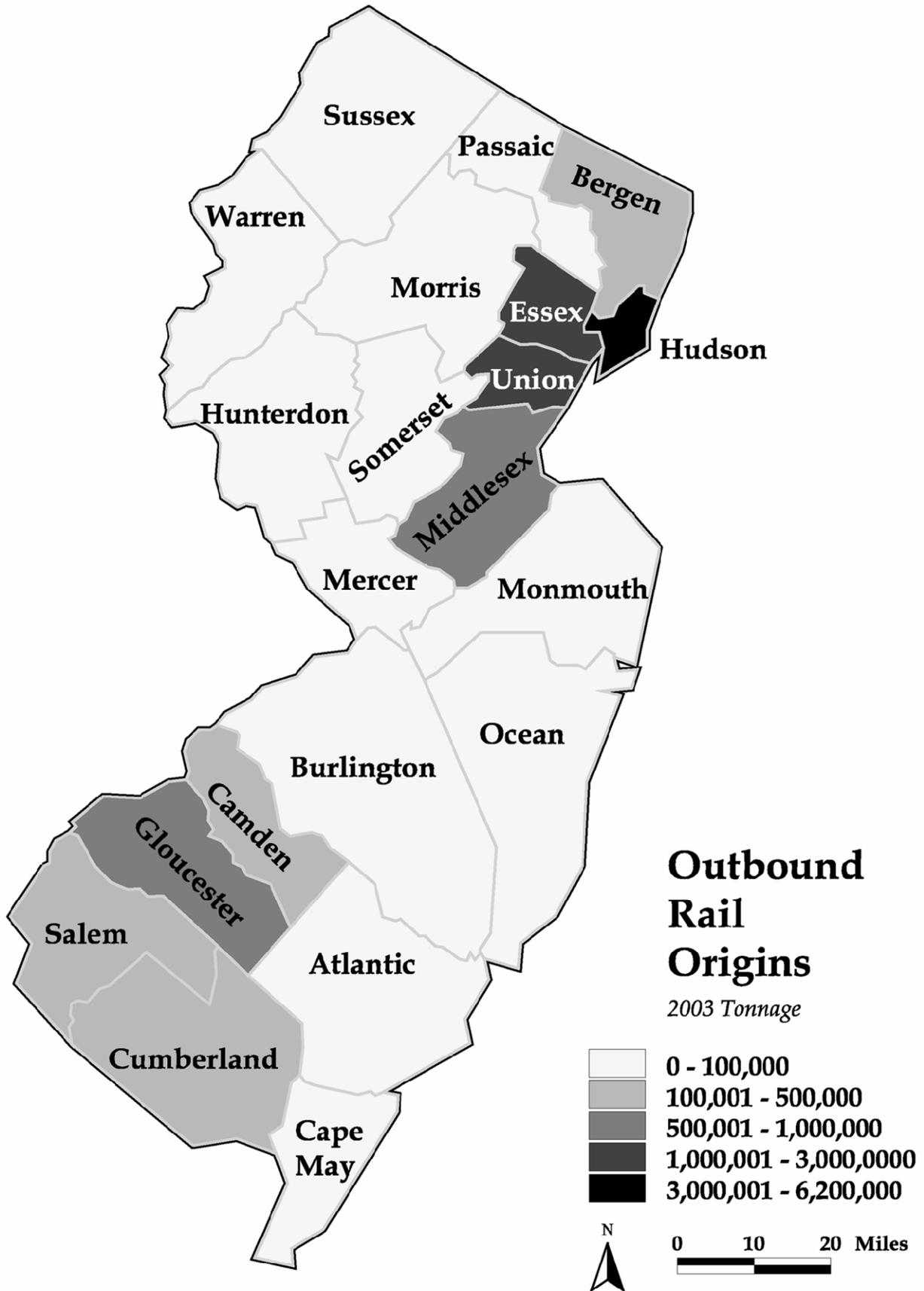
Leading originating counties for carload movements included Essex, Gloucester, Union, and Middlesex. Each of these counties had manufacturing bases in 2003. Union County was the site of the General Motors Plant (since closed) and the Bayway Refinery. Essex County's manufacturing base includes the Anheuser-Busch Brewery.

Table 2-8 - Origin Counties for Outbound Rail Tonnage (Short Tons), 2003

Origin County	Carload (Short Tons)	Carload Share	Intermodal (Short Tons)	Intermodal Share	Total Weight (Short Tons)	Total Share	Value (\$ Billions)
Hudson	646,887	13%	3,360,440	57%	4,007,327	37%	\$2.9
Union	642,626	13%	1,906,600	32%	2,549,226	23%	\$3.3
Essex	1,138,571	23%	305,000	5%	1,443,571	13%	\$3.1
Gloucester	867,764	17%	800	0%	868,564	8%	\$1.7
Middlesex	744,076	15%	0	0%	744,076	7%	\$2.7
Bergen	51,920	1%	332,720	6%	384,640	4%	\$0.6
Cumberland	343,471	7%	0	0%	343,471	3%	\$0.2
Salem	255,312	5%	200	0%	255,512	2%	\$0.8
Camden	158,928	3%	0	0%	158,928	1%	\$0.5
Burlington	57,992	1%	0	0%	57,992	1%	\$0.2
Mercer	51,440	1%	0	0%	51,440	0%	\$0.2
Passaic	31,800	1%	0	0%	31,800	0%	\$0.0
Warren	29,920	1%	0	0%	29,920	0%	\$0.2
Ocean	11,760	0%	12,760	0%	24,520	0%	\$0.2
Morris	9,040	0%	0	0%	9,040	0%	\$0.1
Somerset	7,520	0%	0	0%	7,520	0%	\$0.0
Hunterdon	6,820	0%	0	0%	6,820	0%	\$0.0
TOTAL	5,055,847	100%	5,918,520	100%	10,974,368	100%	\$16.7

Source: Cambridge Systematics analysis of Federal Railroad Administration data and FreightTools_{CS}.
 Note: Columns may not sum precisely to totals due to rounding.

Figure 2-14 - Origin Counties for Outbound Rail Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

NEW JERSEY'S TRADING PARTNERS

Table 2-9 and Table 2-10 depict the states that are New Jersey's primary trading partner. Many of the trading partner states in these figures represent locations where New Jersey rail and truck traffic interchanges with either the Western railroads or transfers from rail to truck outside of New Jersey. For example, the leading partner states by tonnage include Illinois and Pennsylvania. The Chicago area is the leading interchange point between the Western and Eastern rail freight carriers. Pennsylvania has several yards, particularly in Harrisburg and Bethlehem where traffic is shifted rail to truck. Pennsylvania also has a major concentration of warehouses and distribution centers. New Jersey both serves and is served by facilities in these states.

The outbound destinations include many areas of New York. This data reflects the fact that New Jersey warehouses and distribution centers support consumers and businesses east of the Hudson River.

Louisiana is a major origination point for petroleum products moving to New Jersey. California is the leading West Coast gateway for maritime cargo from Asia. Ohio is a one of the leading locations of distribution centers in the US.

Table 2-9 - Top Trading Partners by Weight (Short Tons, Truck and Rail Only), 2003

Trading Partner	Total Tonnage	Inbound Tonnage/Percent of Total	Outbound Tonnage/Percent of Total
Illinois	19,382,361	12,974,283 67%	6,408,079 33%
New York West	14,548,320	2,853,873 20%	11,694,447 80%
New York East	13,779,590	1,331,459 10%	12,448,131 90%
Pennsylvania South	13,235,487	8,679,637 66%	4,555,851 34%
Louisiana	11,647,012	10,461,119 90%	1,185,893 10%
California	9,528,822	5,628,046 59%	3,900,776 41%
Pennsylvania North	8,875,991	3,565,761 40%	5,310,230 60%
Virginia	8,864,126	4,450,953 50%	4,413,174 50%
Kings County, New York	8,603,155	2,944,770 34%	5,658,385 66%
Ohio	8,551,710	4,487,532 52%	4,064,178 48%

Source: Cambridge Systematics analysis of TRANSEARCH and Federal Railroad Administration data.

Table 2-10 - Top Trading Partners by Value (Truck and Rail Only), 2003

Trading Partner	Total Value (in Billions)	Inbound Value/Percent of Total	Outbound Value/Percent of Total, 2003
Illinois	\$24.2	\$16.0 66%	\$8.3 34%
Ohio	19.5	10.8 55%	8.7 45%
Virginia	19.1	11.7 61%	7.4 39%
Texas	18.3	11.5 63%	6.8 37%
Louisiana	18.2	13.5 74%	4.7 26%
California	17.9	11.3 63%	6.6 37%
Pennsylvania South	17.5	10.5 60%	7.1 40%
New York West	17.3	7.0 40%	10.3 60%
Pennsylvania North	16.0	7.6 47%	8.4 53%
Maryland	15.2	8.9 59%	6.2 41%

Source: Cambridge Systematics analysis of TRANSEARCH and Federal Railroad Administration data and FreightTools_{cs}

3. HOW GOODS MOVE

Goods move through a *freight transportation system* that encompasses all modes of transport, key origins and destinations, connecting corridors, and support facilities (see Table 3-1). Often, parts of the system are shared with other users, such as passenger cars on the highway, public transit on the rails, and passenger planes at airports. New Jersey’s freight transportation system provides the critical infrastructure and linkages necessary to accommodate the demand for the movement of goods from international, national, and local producers and consumers.

Table 3-1 - Components of the Freight Transportation System	
Freight Transport Equipment	<ul style="list-style-type: none"> • Trucks • Trains • Aircraft • Maritime vessels
Freight Terminals	<ul style="list-style-type: none"> • Air cargo facilities • Maritime terminals • Rail yards • Truck terminals • Transload/ intermodal yards
Freight Infrastructure	<ul style="list-style-type: none"> • Roadways • Rail lines • Waterways • Pipelines
Warehousing/ Distribution Centers	<ul style="list-style-type: none"> • Storage • Value-added activities • Cross docking
Support Facilities:	<ul style="list-style-type: none"> • Truck rest stops • Equipment storage • Maintenance facilities • Interchange yards • Terminals • Rest areas/passing sidings • Staging areas

Chapter Three examines New Jersey’s freight transportation system, and how goods move into, out of, and within the state. The freight transportation system includes key modal elements, destinations (nodes), routes (corridors), and support facilities between nodes and corridors. More details on the context of the system elements are presented in Chapters Six through Nine.

The *freight transportation system*, as discussed in this plan, encompasses the entire logistics supply chain, including all modes of transportation, all kinds of commodities, and all kinds of businesses. Pipelines, while part of the freight transportation system, are subject to different regulations and agencies from the elements included in this Plan.

THE FREIGHT TRANSPORTATION SYSTEM IN NEW JERSEY

New Jersey has had an active role in freight transportation since the earliest days of the nation because of its key location in one of the world's most significant markets. The state connected two major port cities in colonial times – New York City and Philadelphia – and, in so doing, created a foundation for New Jersey's farms, mines, and factories. Today, New Jersey is a microcosm of the nation's freight system, with extensive roadways, rail lines, major port complexes, and a leading airport, as depicted in Figure 3-1. It is also a state with older infrastructure that developed over time and has had to adapt to changing freight transportation equipment and demands.

While the freight system is composed of a series of individual components, each one generally relies on the others to ensure the movement of freight from an origin to destination. Given the relationships between components, it is beneficial to think of the individual components according to their function as a Node or Corridor.

NODES are locations of major freight activity such as Gateways, Hubs, and Freight Generators.

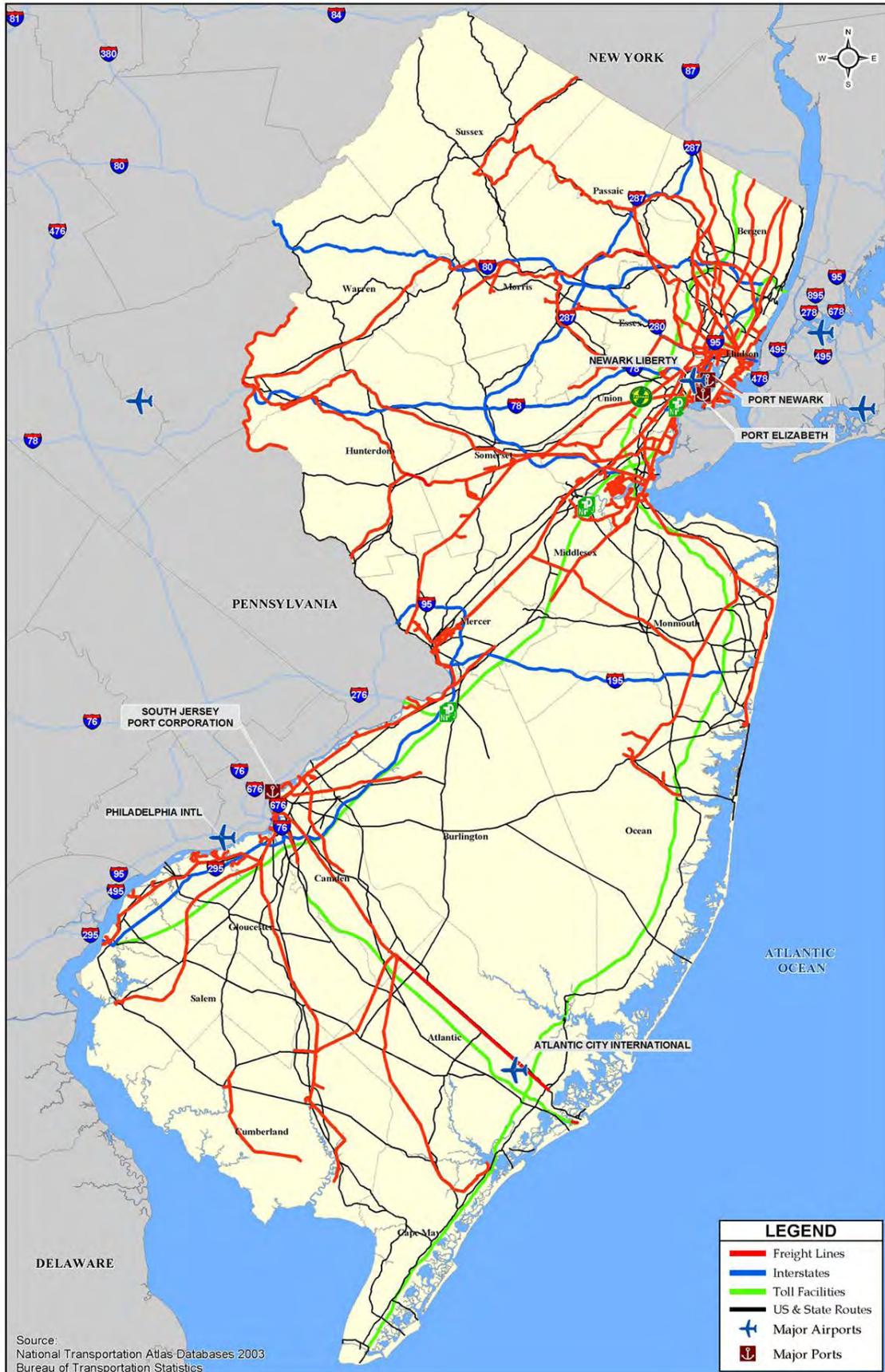
- **Gateways** are links from NJ to a national or international market
- **Hubs** are concentrations of freight activity, including transfer points between modes
- **Freight Generators** are concentrated initiators or attractors of goods movement, such as: distribution centers/warehouses; value-added facilities; manufacturing/assembly facilities; and agricultural/mining transfer facilities

CORRIDORS are links among nodes (single or multi-modal). These include:

- Single mode corridors such as:
 - Primary interstates or alternative routes
 - Intercity routes,
 - Rail routes
 - Military-critical highways and railways (STRAHNET and STRACNET)
 - Major waterway channels
- Multi-modal corridors:
 - Corridors where highway and rail could serve to link the nodes (such as the emerging Liberty Corridor)

Nodes and Corridors also have different roles depending on their scale. For example, nodes can be international/national in scale, such as the node of Newark Liberty Airport, or they can be on a statewide scale, such as the activity that occurs at the warehouse/distribution center located at NJ Turnpike Exit 8A in Monroe Township, which serves consumers and producers from most of the state, or localized, such as can be found at an individual site, such as a major big box retail center located in Cherry Hill or a manufacturing site located in Vineland.

Figure 3-1 - NJ Freight System



GOODS MOVEMENT LOGISTICS

Logistics addresses the questions of how, where, and when components of the freight transportation system will come together to move specific goods. The answers both affect and are affected by issues such as land use, modal alternatives, cost/efficiency, public perceptions, and capital investment. Understanding Logistics and supply chain economics is critical to understanding what drives business decisions and in informing the public about what is actually necessary to meet the demand for goods. The multiple freight modes, warehouses, intermediate processing facilities, and, in some cases, the international nature of the processes needed to ensure that products are available when customers want them, is largely invisible to the end users. Figure 3-2 illustrates an example of a supply chain responsible for the delivery of foreign vehicles to auto dealerships where vehicles produced at an overseas plant are imported into the US via ship.

After arrival through the port (in this example, a New Jersey port), the vehicles are readied for the showrooms and customers. During this process, radios and instruction manuals may be added to the cars, protective coverings removed, and repairs made for minor damages that occurred while the vehicle was in transit. These activities are generally considered “value added” – workers add value to the products that are on their way to the end users or customers. These value added activities represent one of the ways New Jersey can capitalize on its unique location and transportation assets to gain economically from the goods with flow through the state. Finished vehicles are trucked to showrooms from the preparation centers.

Figure 3-2 - Foreign Auto Distribution Supply Chain

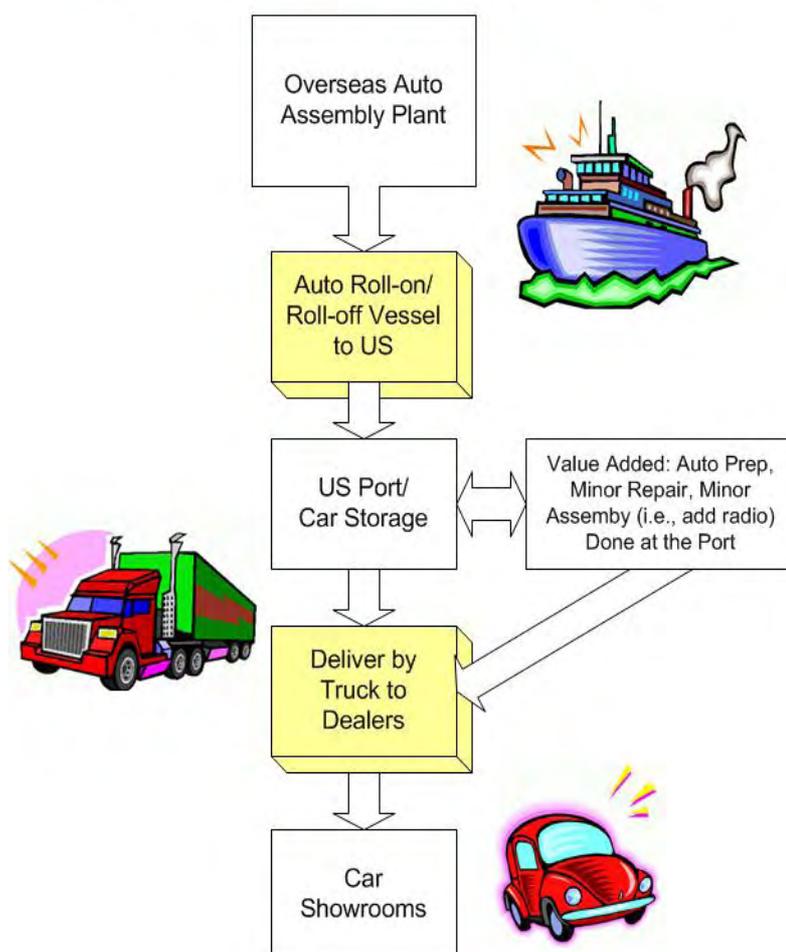
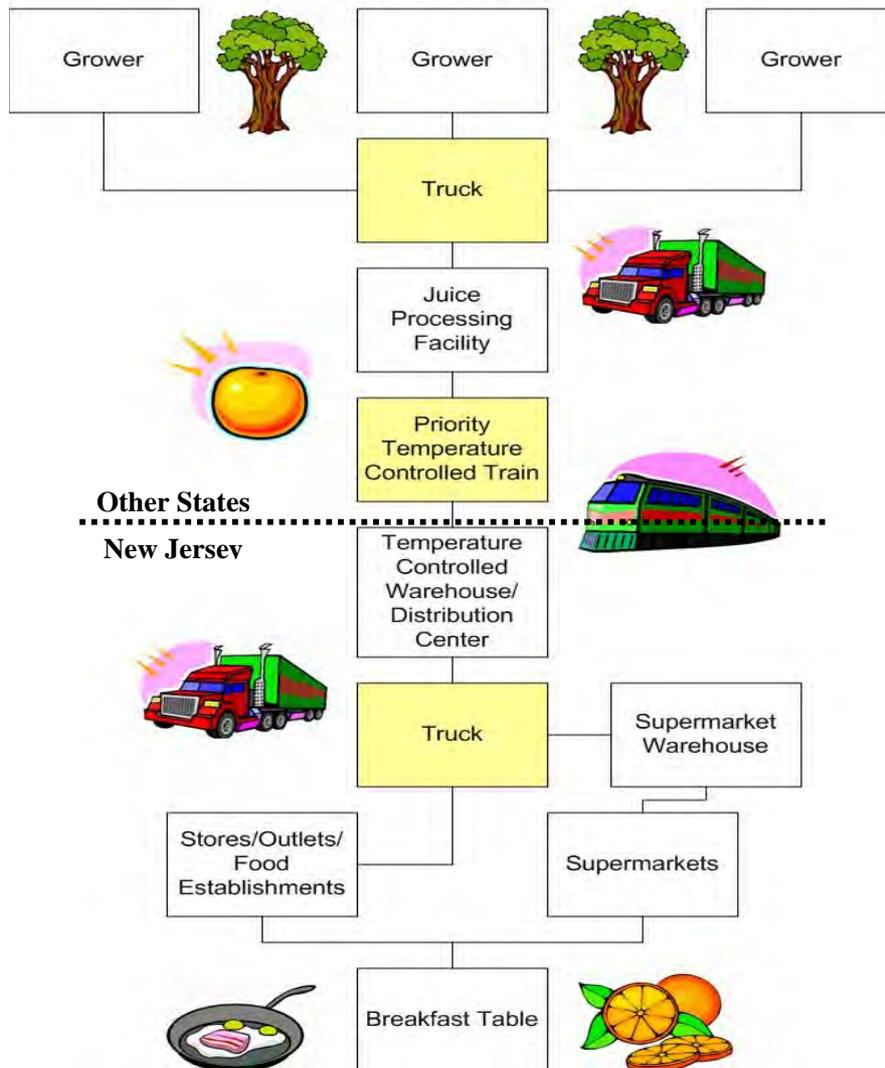


Figure 3-3 illustrates another supply chain example. In this case, orange juice that makes its way to the breakfast table.

Orange juice may begin at a domestic or overseas location with the harvesting of the fruit. The fruit is then usually shipped by truck to a facility where the juice is processed. The juice then travels to a regional distribution center where it is packaged for sale. One such supplier of orange juice has a major regional distribution center in Jersey City, where it processes and packages the juice that arrives by train in temperature controlled boxcars from Florida.

Once processing and packaging are completed, trucks fan out from this distribution center to deliver the finished products to supermarket warehouses and individual stores and food establishments.

Figure 3-3 – Orange Juice Supply Chain



A CHANGING “HOW”

The demands placed upon the freight transportation system change over time. Sometimes, these changes are brought about by increased demands or shifting needs of non-freight users who share the system. Infrastructure, however, is not as easy to change as use patterns. In recent times, the freight transportation system has been asked to meet vastly different needs than those envisioned when it was created. These include:

- Reliable, cost-effective “door-to-door” movement of the shipment from origin to destination
- Time-definite delivery – the shipment will arrive on the date and time specified
- Longer distance movements – with global sourcing, production, and marketing, supply chains are now longer than ever before
- More frequent delivery of smaller shipments, which reflects both the need to have cargo arrive “just in time” for its use in the production process or stores, as well as the multiple-stop home delivery patterns of mail order and Web-based purchases.

Beginning in the 1980s, the US essentially deregulated the freight transportation industry. In so doing, the federal government reduced the barriers to entry in some sectors of the transportation business (allowing more companies to operate), facilitated more flexible pricing of services, and enabled various modes and companies to work together more easily.

The result is a freight transportation system that is multimodal. Customer service is geared towards the required characteristics of the movement – pick-up and delivery locations and times, transit time requirements, shipment size, and price of service. The freight transportation infrastructure and service elements are then molded to the customer service requirements.

For example, as shown in Figure 3-4, air cargo service may no longer consist of dropping a package at an airport consolidator and arranging pick-up at the destination airport. Instead, the air cargo service is multimodal – cargo is picked up by truck at various shippers (which can include offices, production lines, warehouses, and other establishments) and taken to a consolidation point, which may be the facility of an integrated carrier or an air cargo consolidator. Shipments are consolidated according to destinations and loaded onto aircraft, or sometimes placed on trucks (if a truck can make the trip within the time requirement, it is much less expensive). At the destination, cargo is separated by receivers at a similar consolidation or sort facility and trucked to their destinations.

Figure 3 5 shows a similar example for international maritime cargo. Cargo is picked up at various shippers and delivered to the departure port by truck, rail, barge, or a combination of modes. Ocean vessels transport the goods to the port of entry, where the cargo is offloaded. In some cases, the cargo must be reconfigured to meet the weight limitation of US roads or may require additional processes before being delivered to the final customers. It may go by truck to a nearby intermediate point, such as a warehouse or distribution center. At the warehouse, goods may be transloaded into domestic trailers and work may be undertaken to ready the products for use or sale. These “value-added” activities are a growing source of employment within the US and are discussed elsewhere. From the warehouse, the cargo is moved to the receivers. Depending on the distance and time requirements, goods may be moved by trucks or by a combination of long-haul rail and local delivery trucks. Cargo may also move from the port via rail and barge. For example, rather than directly serving the Port of Boston, some ocean carriers ship cargo to the Port of New York and New Jersey and then move it by barge or rail to the Boston area.

The freight transportation system and goods movement patterns have also largely been affected by the growing Internet retail business. For internet orders, instead of products moving to large retail locations, individual orders are processed and directly delivered to people’s homes by such carriers as UPS, FedEx, and the US Postal Service. It is clear that the future will continue to bring changes that influence how goods are moved in New Jersey.

Figure 3-4 - Domestic Air Cargo Modes

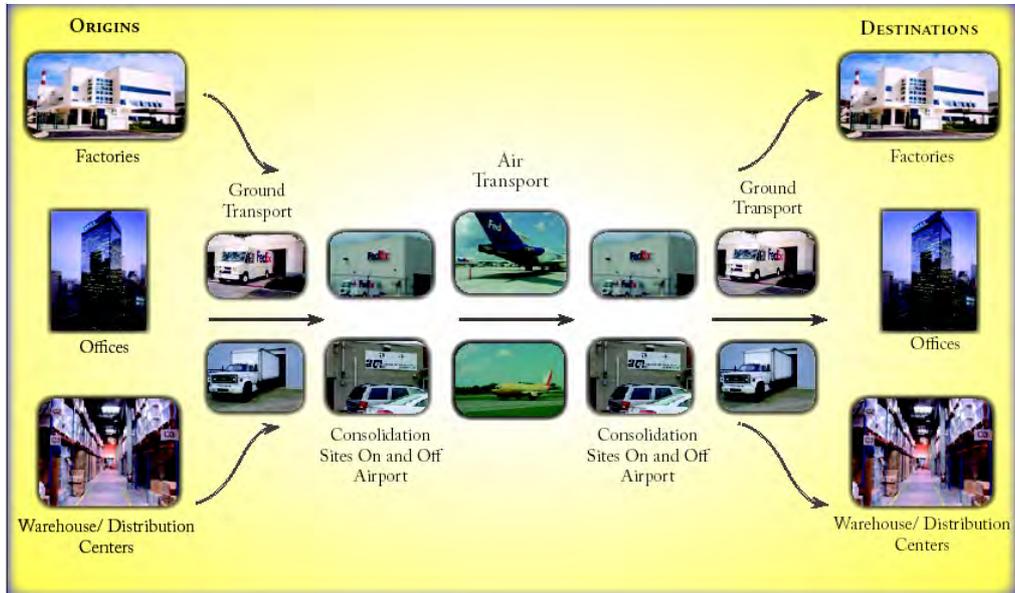
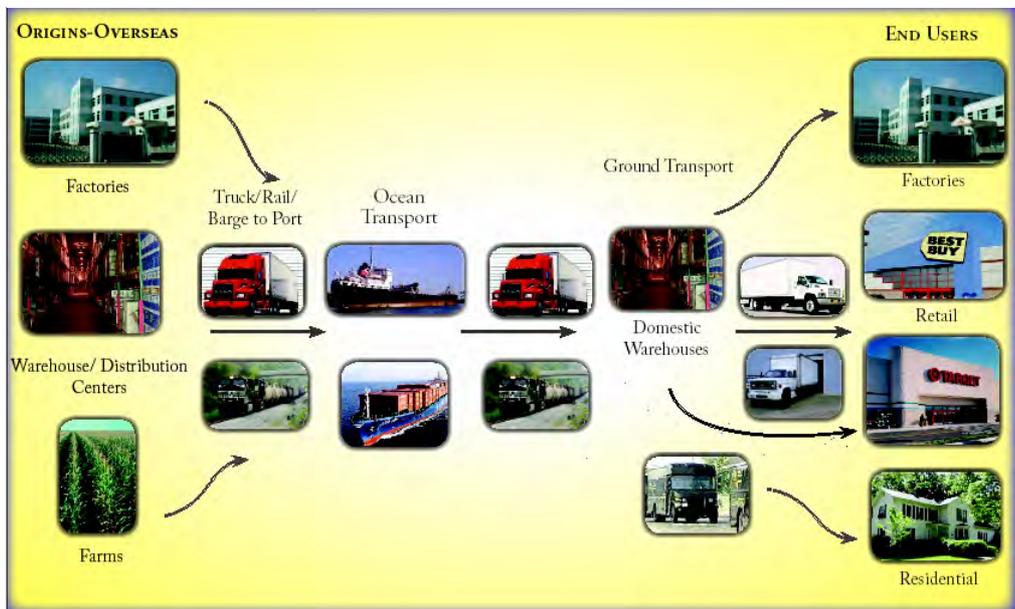


Figure 3 5 - International Maritime Movement Modes



4. GOODS MOVEMENT TODAY AND TOMORROW

The previous chapters of this plan have described the freight transportation system and the goods that move on it. This chapter begins to look forward, examining current trends and emerging conditions that will influence the demand and supply of goods in the future. It also examines who can respond to the implications of those trends.

TRENDS

Looking forward, freight volumes in New Jersey are predicted to grow by more than 65 percent over the next 25 years, which will put increasing pressure on all freight-carrying modes. Planning for freight transportation needs and challenges requires an understanding of current conditions and issues, the factors that have created them, the major trends that are likely to influence the evolving needs, and the challenges facing users and providers of freight transportation. Given the increasingly global nature of trade and the interrelated nature of freight transportation systems and services, these trends must be understood at the global, national, state, regional, and local levels, since each affects the other.

The most significant trends in the freight transportation industry over the past two decades are described briefly in Table 4-1, each followed by the primary implications for New Jersey:

Table 4-1- Trends and Implications for the Freight Industry in New Jersey

TREND	IMPLICATION
Freight traffic continues to grow locally, nationally, and internationally.	Need for greater efficiencies and/or capacities of facilities – ports, airports, truck, rail, and barge.
	Asian trade arriving on the west coast will increase need for rail land bridge terminals or greater truck capacities.
	Pacific fleet going to large ships first, Atlantic fleet to follow – channel and berth deepening needs completion.
	Heavier international containers cause greater roadway wear, therefore they are restricted on US/NJ routes – NJ may need infrastructure reconstruction to allow heavier loads on designated roadways; transloading to smaller containers or rail at ports could be an option.
Tighter supply chains, just in time deliveries	Increased stress on the transportation and warehouse distribution systems
More substitution is occurring – trucks are being used for air cargo, and rail is being used for freight that was previously moved by truck.	Efficient intermodal connectivity a requisite for competitiveness: type, design, location.
Freight movement is now more integrated in the production and retail sales processes – goods are tracked from origin to destination, with the ability to shift deliveries midcourse; product delivery is timed to specific appointments; and automated restocking can include computer-generated directions to freight providers.	A growth opportunity in warehousing, distribution and value-add processing employment, building on current New Jersey strengths.

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

TREND	IMPLICATION
<p>Technology is more tightly integrated with physical freight movement than ever before – Large retailers and other large vendors are requiring radio frequency identification (RFID) tags for pallets and containers, which allow GPS real-time tracking of shipments. Warehouses are run by computerized management systems.</p>	<p>Shipper/provider application of technologies and integration into operations, including adoption of emerging standards.</p>
<p>Security and safety are ever-growing considerations, necessitating new technologies to screen, secure, and improve the safety of freight transportation equipment and facilities. New regulations may have significant impacts.</p>	<p>Security upgrades compete with system expansions for capital and operating resources, including deployment costs (technology, training, mode shifts, etc.); cost passed on to users.</p>
<p>Freight providers are becoming more multimodal or developing strategic alliances. Integrated carriers, such as FedEx and UPS, are growing their truck networks faster than their air operations. Railroads and trucking firms are moving into partnerships.</p>	<p>Increased demand for efficient intermodal connections.</p>
<p>Community scrutiny of, and often opposition to, the development and operation of freight facilities is increasing</p>	<p>Incorporation of “good neighbor” and “green port” practices in project planning and design.</p>
<p>Ports are pursuing major warehouses to secure the international trade associated with these facilities. For example, a major retailer is developing a 2 million square foot warehouse near the Port of Houston, which is anticipated to increase container movements through that port.</p>	<p>Warehouse/distribution center competition from neighboring states or other eastern seaboard ports; challenge to add lands to market in port proximity.</p>
<p>There is renewed interest in rail and water transport. Companies are seeking to use rail freight more. Both short-haul rail shuttles and short-sea shipping via barges are getting increased attention by public agencies.</p>	<p>Challenges to improve Maritime terminal efficiencies (terminal operators have made efficiency/productivity investments)</p> <p>Development of short-haul rail and short-sea operations</p>

Significant changes in the freight transportation industry have had profound impacts on goods movement logistics and facility requirements. These changes affect every aspect of the nation's economy. Decisions regarding surface transportation infrastructure investments are increasingly being considered in the broader context of global and local perspectives and public and private stakeholder interests. Appendix B includes further detail on the implications of these trends for New Jersey.

RESPONSIBLE PARTIES – WHO CAN RESPOND TO THESE TRENDS?

Given the combination of modes and the diversity of goods being carried in New Jersey, a large and diverse number of people, companies, agencies, and authorities are involved in the movement of freight, requiring many interactions among these actors. As the above trends have their impact on goods movement in the state, these entities will be the ones that will confront and/or embrace the changes necessary to sustain effective and efficient freight flows.

Examining the roles and responsibilities of the many public and private stakeholders that are part of the system is important, therefore, to any freight planning effort. This provides a backdrop for understanding the current initiatives, as presented below, and for the implementation of strategies and actions that will result from this Freight Plan.

The layers of actors and multiple agencies involved in freight transportation can also create difficulty – no one agency is responsible for the entire freight system or even the group of elements involved in a multimodal movement. Fragmentation, competing priorities, potentially duplicative efforts, and inefficiencies in the freight system can result if efforts are not made to ensure communication, cooperation, and common messages regarding the value and role of freight transportation.

PRIVATE ROLES AND RESPONSIBILITIES

Private-sector businesses provide nearly all the freight service locally, nationally, and internationally. These businesses execute the transportation arrangements with shippers and receivers, transport the goods, store and finish the goods when required, and receive payment for these services.

The private-sector freight industry provides the vehicles, rail equipment, aircraft, warehouses/distribution centers, vessels, and labor necessary to move goods. While they use infrastructure constructed by the public sector (notably highways and roadways, airports, and some rail lines developed by rail passenger agencies), private-sector businesses also provide their own infrastructure. Examples include freight rail lines, warehouse facilities, cargo facilities on- and off-airport, terminals, and yards. Private-sector freight providers are subject to the rules and regulations promulgated by local, state, and federal agencies.

The private sector generally finances its own infrastructure, although the public sector may also invest and provide some financing. One example is the recent commitment by the Port Authority of New York and New Jersey (PANYNJ) to fund half of a \$50 million rail freight infrastructure improvement program in New Jersey. The remaining half is being funded by Norfolk Southern and CSX railroads.

PUBLIC ROLES AND RESPONSIBILITIES

The public sector includes metropolitan planning organizations (MPOs), regional port organizations, and various municipal, county, state, and federal entities. Each of these stakeholders plays a unique role, or mix of roles, in keeping the freight system operating efficiently in New Jersey. Some agencies provide short- and long-range planning, design, construction, operation, and maintenance of the freight system. Some finance or lobby for funding of the state's freight infrastructure. Public agencies provide the regulatory framework and the oversight to ensure that the framework is followed and that the public's safety is maintained.

Table 4-2 depicts the roles and responsibilities of the private sector in providing freight transportation, while Table 4-3 on the following page describes the roles and responsibilities of various public agencies. In the tables, R,T,A,O, and W stand for rail, truck, air, ocean, and warehousing, respectively. The full legend for both tables appears in Table 4-4.

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

Table 4-2 - Roles and Responsibilities of Private-Sector Businesses

Entity		Infrastructure Development, Operation, or Maintenance					Service Provider					System Planning					Funding				
		R	T	A	O	W	R	T	A	O	W	R	T	A	O	W	R	T	A	O	W
Integrated Carriers	e.g., FedEx, UPS, DHL		x	x			x	x	x				x	x					x	x	
All Cargo Carriers	BAX, Kitty Hawk, Atlas			x					x					x					x		
Airlines	All Cargo & Passenger Belly			x					x					x					x		
Freight Forwarders/ Consolidators Brokers		x	x	x	x	x	x	x	x	x		x	x	x	x	x					x
Trucking Firms			x					x					x					x			
Class I Railroads	NS, CSX, CP, and Conrail	x					x	x				x					x				
Shortline Railroads	14 in NJ	x					x					x					x				
Intermodal Carriers	Trucking and Maritime/ Port	x	x	x	x	x	x	x		x	x	x	x	x	x	x					
Shippers and Receivers	(Manufacturers, Wholesalers and Retailers)	Use the system, all modes, to best meet their needs – generate the demand and the competition																			
Warehouse Operators						x										x					
Ocean Carriers					x					x										x	x
Terminal Operators		x	x		x	x	x	x		x	x	x	x		x	x					

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

Table 4-3 - Roles and Responsibilities of Public-Sector Entities

Public Agency		Infrastructure Development, Operation, or Maintenance					Regulatory and Oversight					System Planning					Funding				
		R	T	A	O	W	R	T	A	O	W	R	T	A	O	W	R	T	A	O	W
Local	Counties/ Municipalities		x	x				x			x	x	x	x	x	x	x	x	x	x	x
State	NJ DOT	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x		
	NJ EDA					x					x					x					x
	NJ DEP	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Office of Smart Growth											x	x	x	x	x					
	NJ TRANSIT	x					x					x					x				
Toll Agencies	NJ Turnpike Authority		x					x					x					x			
	SJTA		x	x				x	x				x	x				x	x		
	BCBC		x					x					x					x			
	DRBA		x					x					x					x			x
	DRJTBC		x					x					x					x			
MPOs	NJTPA											x	x	x	x	x	x				
	DVRPC											x	x	x	x	x	x				
	SJTPO											x	x	x	x	x	x				
Port Authorities (ports and toll facilities)	PANYNJ	x	x	x	x	x		x	x	x		x	x	x	x	x	x	x	x	x	x
	DRPA		x					x					x					x			x
	SJPC	x	x		x	x	x	x		x	x	x	x		x	x	x	x		x	x
Federal	US Treasury/ US Customs						x	x	x	x	x										
	FAA			x					x					x					x		
	MARAD											x	x		x						
	FRA	x					x					x					x				
	FMCSA							x					x								
	FHWA		x					x				x	x	x	x			x			
	TSA/DHS						x	x	x	x											
	US EDA																				x
	US EPA	x	x	x	x	x	x	x	x	x	x										x
	Army Corps of Engineers				x					x					x					x	
STB						x															

Table 4-4 - Legend for Tables 4-2 and 4-3

<p>R – Railroads</p> <p>T – Trucking</p> <p>A – Air Cargo</p> <p>O – Ocean Cargo (Ports)</p> <p>W – Warehousing</p> <p>NJDOT – NJ Department of Transportation</p> <p>NJ EDA – NJ Economic Development Authority</p> <p>NJ DEP – NJ Department of Environmental Protection</p> <p>SJTA – South Jersey Transportation Authority</p>	<p>DRJTBC – Delaware River Joint Toll Bridge Commission</p> <p>BCBC – Burlington County Bridge Commission</p> <p>NJTPA – North Jersey Transportation Planning Authority</p> <p>DVRPC – Delaware Valley Regional Planning Commission</p> <p>SJTPO – South Jersey Transportation Planning Organization</p> <p>PANYNJ – Port Authority of New York and New Jersey</p>	<p>DRPA – Delaware River Port Authority</p> <p>SJPC – South Jersey Port Corporation</p> <p>FAA – Federal Aviation Administration</p> <p>MARAD – Maritime Administration</p> <p>FRA – Federal Railroad Administration</p> <p>FMCSA – Federal Motor Carrier Safety Administration</p>	<p>FHWA – Federal Highway Administration</p> <p>TSA/DHS – Transportation Safety Administration/ Department of Homeland Security</p> <p>STB – Surface Transportation Board</p> <p>US EDA – US Economic Development Administration</p> <p>US EPA – US Environmental Protection Agency</p>
<p>Cells with “x” in table represent agency direct action or authority to develop/operate/maintain infrastructure, regulate infrastructure development or operation, plan infrastructure systems, fund or set priorities for investments, provide customer freight services.</p>			

5. STAKEHOLDER ENGAGEMENT

New Jersey's freight industry includes a diverse group of commercial and transportation entities. The interaction of this diverse group plays an important role in the smooth, uninterrupted flow of goods within and outside of New Jersey. A significant amount of outreach to these groups was a vital part of developing the statewide freight plan. The feedback and input received from key stakeholders provided a framework for specific modal issues discussed in Chapters Six through Ten.

Chapter Five investigates the key players in the movement of freight within New Jersey. It also examines how the stakeholders address the many issues which freight-related businesses and organizations face in New Jersey. Further details on the outreach process and a summary of the input received can be found in Appendix D.

STAKEHOLDER ISSUE IDENTIFICATION

In its broadest sense, every person who lives, works, visits, and even passes through New Jersey is a stakeholder in goods movement. As this Plan demonstrates, freight movement is essential to our personal and economic well-being, connecting us to the nation and to the world. It contributes to our quality of life, provides us with our daily essentials, and supports the state's economic engine. Some 500,000 people work in the freight industry in New Jersey; all of us depend on it.

A myriad of public agencies and private businesses play significant roles in planning, developing, operating, maintaining, and funding the state's transportation infrastructure, and still others regulate it. In developing New Jersey's first comprehensive freight plan, the Study Team turned to key representatives of the freight industry for their perspectives, expertise, and local knowledge.

Stakeholder participation in the development of this plan proved especially important in the identification of goods movement issues, concerns, and opportunities for enhancements. One of the primary conclusions of this planning effort is the significant lack of data and data analysis tools to enable a systemic quantitative assessment of freight needs and opportunities. Although these tools will be vital for future freight planning, their absence necessitated the development and implementation of a comprehensive stakeholder outreach effort, which served as the basis for the issues and the action plan set forth in this document.

Outreach to key stakeholders included several mechanisms intended to reach both the public and private sectors:

- Freight Plan Management Committee
- Freight Plan Advisory Board
- Interviews
- Issue groups
- Standing Metropolitan Planning Organizations (MPOs) freight committees
- Logistics Council
- NJDOT inreach

FREIGHT PLAN MANAGEMENT COMMITTEE

The Freight Plan Management Committee (FPMC) consisted of top-level policy representatives from the major public agencies affected by this study. It served as the central policy sounding board for this work. In addition to directors and managers from key NJDOT departments, the FPMC included NJ TRANSIT; New Jersey's three metropolitan planning organizations: the North Jersey Transportation Planning Authority (NJTPA), the Delaware Valley Regional Planning Commission (DVRPC), and the South Jersey Transportation Planning Organization (SJTPO); the New Jersey Office of Smart Growth; the Port Authority of New York and New Jersey (PANYNJ); the South Jersey Port Corporation (SJPC), and the Federal Highway Administration (FHWA).

FREIGHT PLAN ADVISORY BOARD

The Freight Plan Advisory Board (FPAB), a working group on freight issues and operations, served as the Steering Committee for the Freight Plan. Members participated in project coordination and management functions and acted as the primary advisors for the technical and outreach issues relating to the plan's development. The FPAB was composed of representatives from NJDOT, NJTPA, DVRPC, SJTPO, PANYNJ, SJPC, and the FHWA.

INTERVIEWS

Although the study began with an extensive literature review, it was believed that personal interviews were essential to establish a well-informed context for developing the Freight Plan. Interviews with representatives of the key public-sector agencies were viewed as crucial to developing a greater understanding of New Jersey's current freight system and its challenges and opportunities. They were also essential to identify those policies now used to manage the system and to highlight any inconsistencies among or even within public agencies.

Early in the work, the Study Team interviewed representatives of key agencies to reach agreement about existing issues and challenges and identify emerging trends the Plan should address. The following public agencies helped to refine these issues:

- North Jersey Transportation Planning Authority
- Delaware Valley Regional Planning Commission
- South Jersey Transportation Planning Organization
- Office of Smart Growth
- NJ TRANSIT
- Port Authority of New York and New Jersey
- South Jersey Port Corporation
- NJ Department of Environmental Protection
- Delaware River Port Authority
- NJ Economic Development Authority
- NJ Turnpike Authority

ISSUE GROUPS

As the study proceeded, team members also reached out to both public and private-sector stakeholders through issue groups that focused on more detailed analyses of various sectors of the freight system. Separate issue groups focused on rail freight, highway freight, and nodes (warehouses, distribution centers, marine and air ports). Tier I groups involved government agencies, and Tier II groups reached out to representatives of the freight industry.

STANDING MPO FREIGHT COMMITTEES

Existing freight committees provided ideal forums for the discussion of goods movement issues, opportunities, and constraints. Several presentations and discussions were conducted with NJTPA's Freight Initiatives Committee, DVRPC's Goods Movement Task Force, and SJTPO's Public Advisory Committee.

LOGISTICS COUNCIL

The NJDOT Logistics Council was comprised of representatives from many logistics industry organizations and public agencies. The group was charged with developing a prioritized set of recommended actions that will deliver tangible benefits to New Jersey citizens and businesses while addressing the major challenges facing goods movement in the state. In 2003, three council subcommittees were formed: the Land Use Subcommittee; the Regulatory, Statutory, and Finance Subcommittee; and, the Infrastructure and Operations

Subcommittee. The findings and recommendations of these subcommittees was incorporated into the statewide freight plan. In 2005, a new sub-committee was formed to promote an increase in the movement of goods off-peak.

NJDOT INREACH

The inreach process involved meetings with various NJDOT units to foster internal coordination and gather relevant information, including other Department freight initiatives, management systems data, and information in GIS format, traffic data, and travel demand models.

INTEGRATION OF STAKEHOLDER INPUT

At the initial inreach/outreach sessions and interviews, each of the stakeholders was asked to identify and discuss issues concerning the freight system in New Jersey, including: logistics, operations and interagency coordination; New Jersey's role as a regional, national and global market; and more specific issues regarding congestion, reliability, safety, and security. Generally, these issues fell into four areas, although some issues cross two or more areas:

- congestion related
- costs associated with inefficiencies in the freight delivery system
- operations and coordination of the system
- regulatory Issues at the local and state levels

The Study Team distilled the wide range of information gathered from these activities and organized it in terms of the following major themes:

- planning/coordination
- public perception/education
- highway system congestion/operations
- highway system infrastructure
- port/maritime capacities/operations
- rail capacities/operation
- intermodal infrastructure/operations
- air cargo infrastructure/operations
- multi-modal System
- institutions/regulations/processing/security
- data/analysis
- finance
- economy
- land use
- research

HIGHWAY FREIGHT ISSUE GROUPS

Discussions about highway-specific issues were conducted with public agencies (Tier I) and the private sector (Tier II). The Tier II group was hosted by the New Jersey Motor Truck Association (NJMTA) and included representatives from Linden Bulk Transportation, Dameo Trucking, Inc., Con-Way Central Express, Port Jersey Transportation, Halls Fast Motor Freight, and McCarthy Freight, as well as the NJMTA.

RAIL FREIGHT ISSUE GROUPS

Similarly, two issues groups focused on rail freight. The Tier I meeting included NJDOT, NJ TRANSIT, and the Port Authority of New York and New Jersey. The Tier II meeting, hosted by NJDOT, included Amtrak, CSX, Norfolk Southern, New Jersey shortline railroads (Morristown & Erie Railway, New York Cross Harbor Railroad, Cape May Seashore Lines, New York & Greenwood Lake Railway, SMS Rail Lines, Southern Railroad of New Jersey, Winchester & Western Railway), New Jersey Shortline Railroad Association, Office of Transportation Technology, Planning, Strategy and Development, and The Bucks HUB Conference.

FREIGHT NODES ISSUE GROUPS

In a parallel fashion, two issue groups identified issues regarding the development and operation of freight nodes (warehouses, distribution centers and value-added light industry). The Tier I group included NJDOT, the New Jersey Turnpike Authority, The Port Authority of New York and New Jersey, the Delaware River Port Authority, the South Jersey Port Corporation, NJ TRANSIT, and The New Jersey Commerce, Economic Growth and Tourism Commission. The Tier II group, hosted by the NJ Chapter of the National Association of Industrial and Office Parks, also included NJDOT, NY Shipping Association, Maher Terminals, CB Richard Ellis, Issues Management, and warehouse/distribution property developers and owners: Morris Companies, Gross and Associates, Forsgate Industrial Partners, Matrix Development Group, and Newmark.

Issues resulting from these work sessions, along with similar concerns identified for air and water cargo, provided the basis for information provided to a special meeting of the Logistics Council for its comments.

Feedback from the Logistics Council and from other sessions with the MPO standing freight committees, the FPAB, and the FPMC, resulted in the refinement of issues and actions presented in Chapters Six through Twelve of this plan.

6. HIGHWAY FREIGHT

In New Jersey’s freight system, trucks on highways are the dominant mode, far exceeding all others, providing direct modal services and intermodal links. In essence, goods movement effectiveness in New Jersey hinges on the effectiveness of trucks. The magnitude, location, performance and challenges in goods movement by truck reflect both the roadway networks upon which they travel and the operating practices of the trucks themselves.

This chapter of the Comprehensive Statewide Freight Plan presents the context and issues of highway freight in New Jersey, with a discussion of current initiatives and additional recommended strategies to address these issues. It will be followed by chapters that discuss rail, maritime, aviation, and warehousing. It is designed as both a stand-alone document and a component of a systemwide action plan.

HIGHWAY FREIGHT CONTEXT

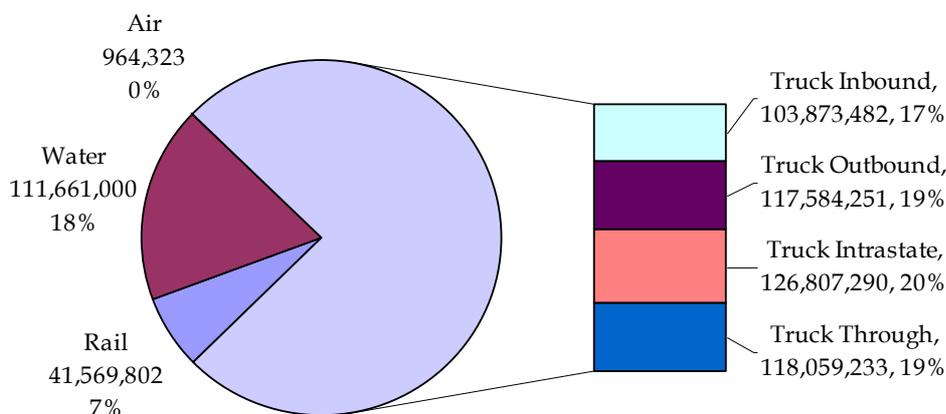
In New Jersey, trucks carry the vast majority of goods. Highway freight offers flexibility in delivering or picking up freight at diverse locations, relative speed of delivery (compared to railroads and maritime carriers), and the ability to alter schedules and routes quickly to accommodate customer needs, qualities unsurpassed by competing modes. Trucking is also seen as highly reliable, with on-time performance standards approaching 100 percent becoming commonplace among carriers.

GOODS MOVED BY TRUCK

As the predominant mode for transporting freight to, from, within, and through New Jersey, trucks moved 446 million tons of freight with a value of \$625 billion in 2003 (according to Reebie Associates data). Figure 6-1 compares the overall share of goods moved by truck to the other modes, along with the type of movement within the truck mode.

As shown in Figure 6-1, trucks dwarf all other modes combined, accounting for 75 percent of all goods moved by weight (tons). Trucks moving goods with one end or both ends of the trip starting or stopping in the state account for 56 percent of all goods moved by weight. The dominance of truck mode share varies, with the highest share being for movements occurring within the state, at 97 percent of the mode share, and through the state, at 91 percent. Trucks also carry a majority share of inbound freight, at 52 percent, and outbound freight, at 71 percent.

**Figure 6-1 - Estimated 2003 Statewide Freight Flows by Direction in Short Tons
(With Breakout of Truck Tons)**



Source: Cambridge Systematics analysis of TRANSEARCH, Federal Railroad Administration, U.S. Army Corps of Engineers, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics data.

Note: Through tonnage for water and air modes could not be estimated due to limitations of data sources.

Trucks move goods into and out of every county in the state, as depicted in Figure 6-2. The leading four counties for inbound truck flows are Bergen, Middlesex, Hudson and Union, while the leading counties for outbound flows are Union, Middlesex, Essex and Hudson. These counties represent 31 percent and 55 percent of the inbound and outbound flows respectively, suggesting that these areas of the state are under the greatest pressures to accommodate truck travel demand on their highways. Much of the outbound truck movement in these counties is associated with demands generated by Port Newark/Elizabeth, major rail intermodal terminals, and strong warehousing/distribution activities, especially in Middlesex county.

Figure 6-2 - Estimated Inbound and Outbound Truck Tonnage (Short Tons) by County, 2003

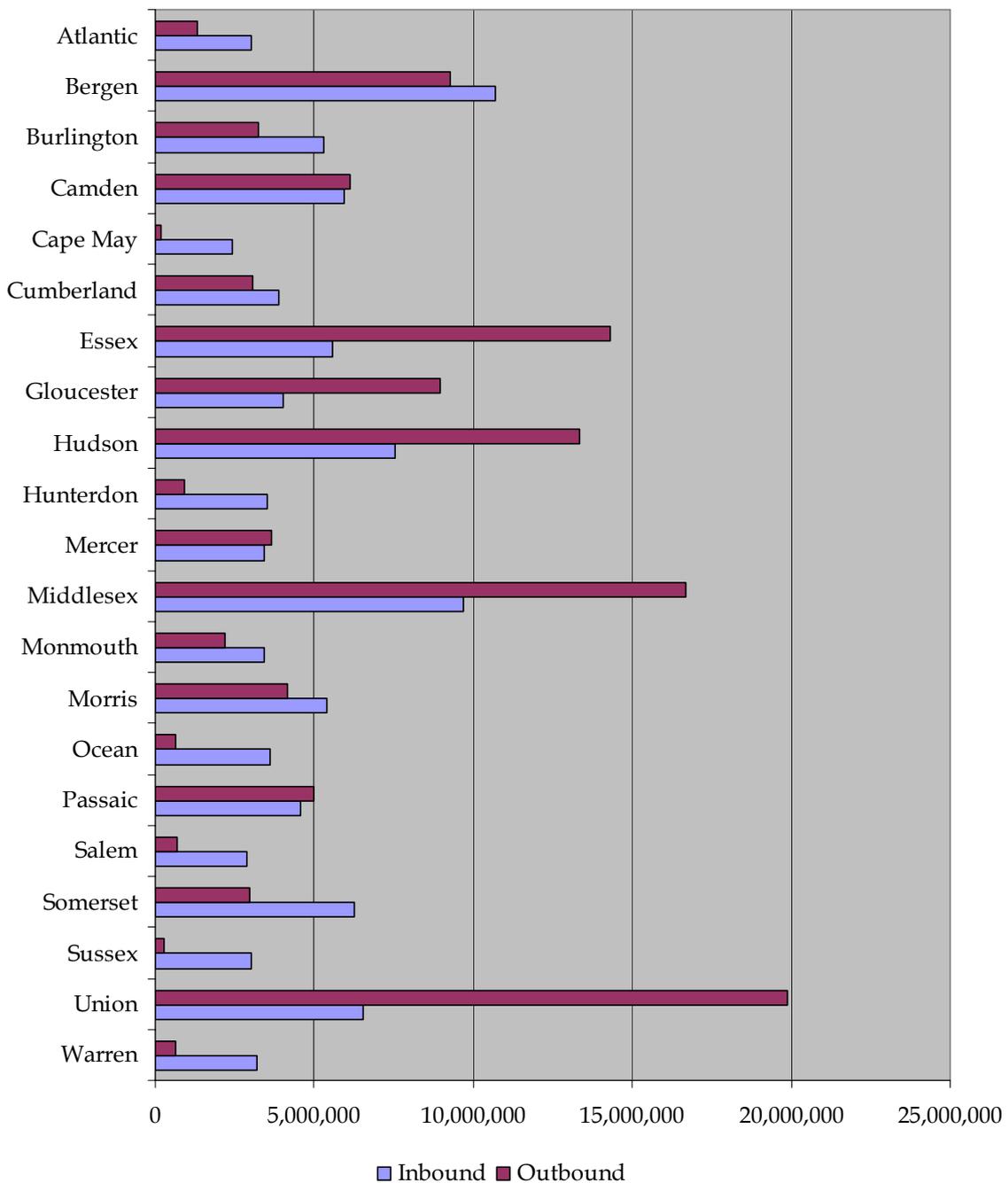
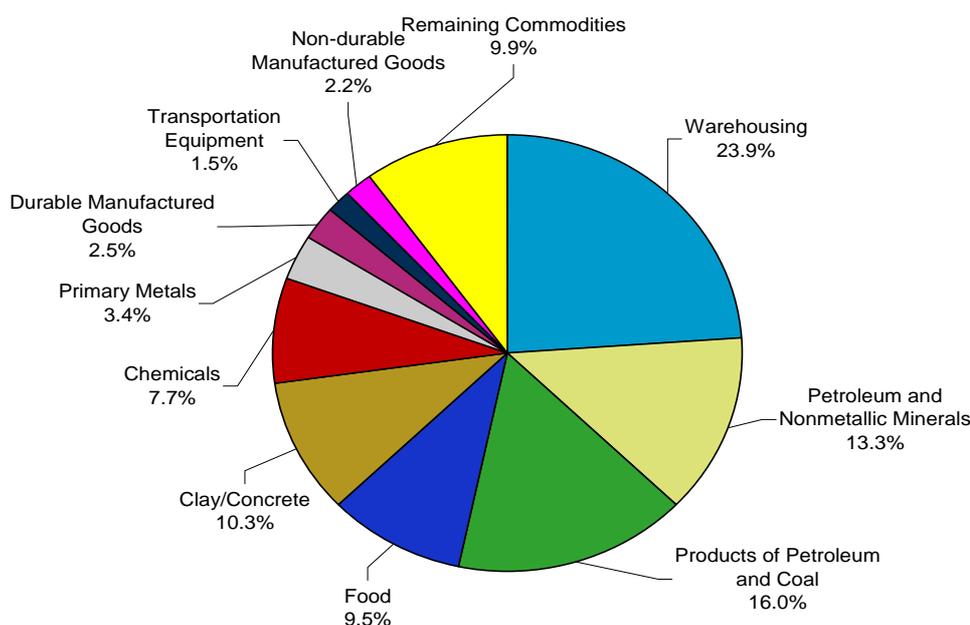


Figure 6-3 shows the commodity mix that is carried by trucks in New Jersey. Moving products to and from warehouses, ports, the airport, and rail freight yards, shown as “warehousing” on the chart, represents the largest movement of freight by trucks at nearly 24 percent of the total tonnage. Trucks play a central role in the economy of the state, picking up and delivering raw materials, goods in various phases of production, and finished products, enabling the various economic sectors to function. Petroleum, coal, and related products together account for nearly 30 percent of the commodities by weight moved by trucks, with food accounting for nearly 10 percent of the total moved by trucks.

Figure 6-3 - Truck Commodities by Weight (Short Tons), 2003
(Inbound, Outbound, and Intrastate)



Source: Cambridge Systematics analysis of TRANSEARCH data.

HIGHWAY FREIGHT SYSTEM

With dominance by value and weight of goods carried, trucks are the most significant component of all goods moving in the state. Thus, the performance of the highway system to efficiently accommodate trucks is a significant challenge to the sustainability and any continued growth of goods movement in the state, and, hand-in-hand, the state’s economy.

On a national level, Figure 6-4 shows the reach of inbound and outbound New Jersey truck freight throughout the United States (the information is based on modeled truck flows and is approximate). This includes significant connections to all 48 continental states, with very strong ties as far west as southern California and as far south as the Texas coast in the Gulf of Mexico.

NATIONAL HIGHWAY SYSTEM (NHS)

Trucks primarily utilize the interstate and arterial roadways in New Jersey, but can be found on almost all roads as they complete local deliveries to stores and homes. Figure 6-5 depicts the National Highway System (NHS), the backbone of the roadway distribution network for goods movement throughout North America. It includes the Interstate Highway System as well as other roads important to the nation’s economy, defense, and mobility. The NHS was developed by the Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations (MPOs) and includes approximately 160,000 miles (256,000 kilometers) of roadways.

Figure 6-4 - New Jersey Truck Flows (1998)

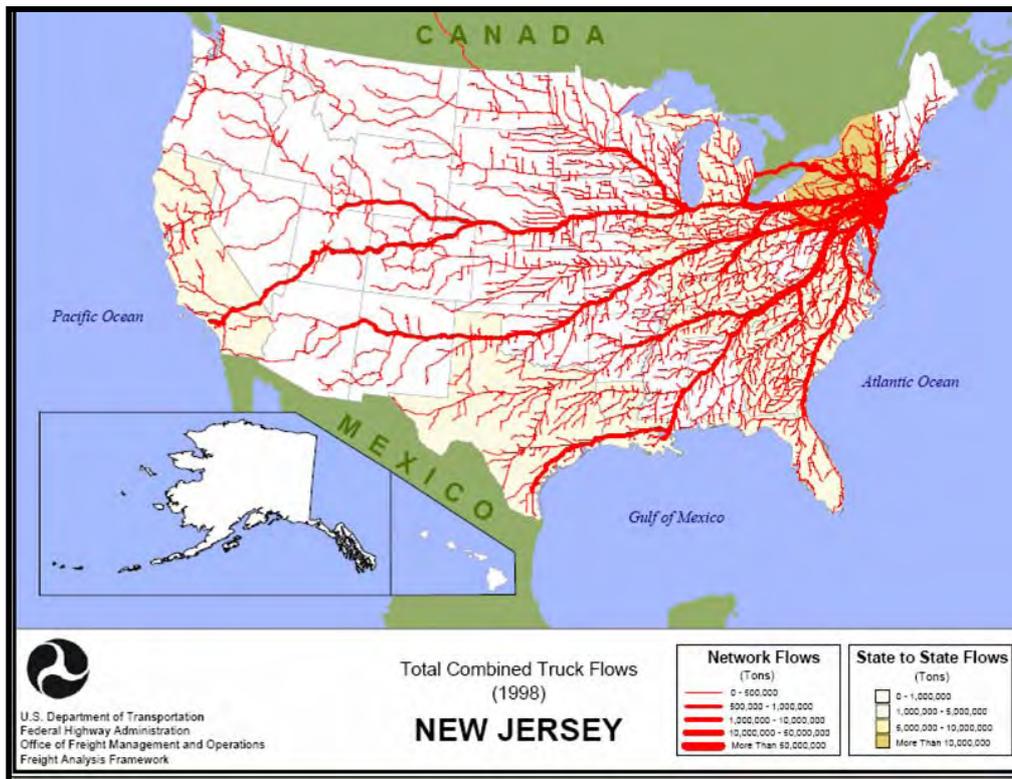
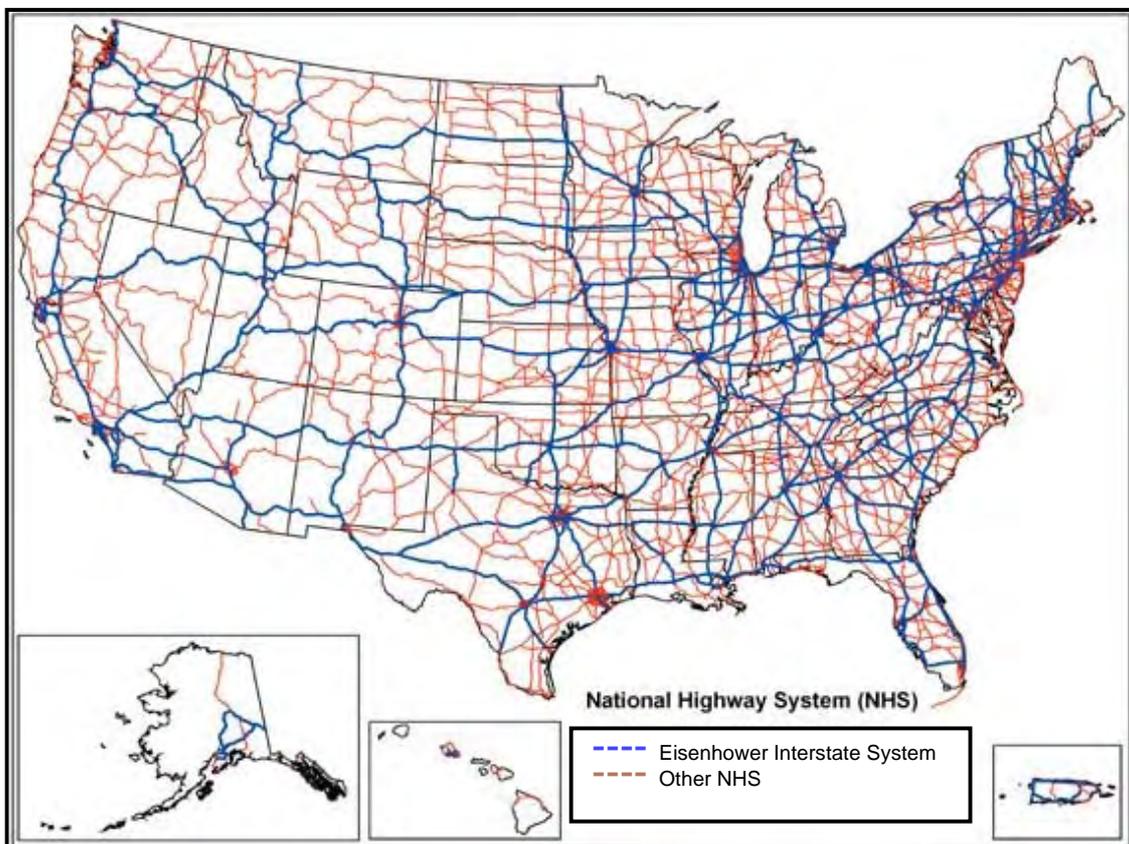


Figure 6-5 - National Highway System



The NHS includes a number of subsystems of roadways (note that a specific highway route may be on more than one subsystem):

- **Interstate:**
The Eisenhower Interstate System of highways retains its separate identity within the NHS.
- **Other Principal Arterials:**
These are highways in rural and urban areas that provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- **Strategic Highway Network (STRAHNET):**
This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.
- **Major Strategic Highway Network Connectors:**
These are highways that provide access between major military installations and highways that are part of the Strategic Highway Network.
- **Intermodal Connectors:**
These highways provide access between major intermodal facilities (mainly port and rail terminals) and the other four subsystems making up the National Highway System.

The state of New Jersey contains over 84,000 lane-miles of state and authority-owned roadways (excludes roadways owned by State toll, State park, and other State agencies). New Jersey has 11.4 lane miles of highway per square mile, more than any other state except Rhode Island, and far exceeds the national average of 2.4 lane miles per square mile (as reported in the May 3, 2000 issue of *New Jersey Future*). An average of 2.6 million vehicles of travel occurs in each lane-mile of roadway in New Jersey each year, compared to a national average of 1.5 million vehicles per lane mile.

The annual vehicle miles traveled (VMT) on the state's highway system is nearly 70 trillion. Trucks account for almost 10 percent of this travel, at 6.7 trillion vehicle miles.

A major portion of New Jersey's highway system is also part of the NHS. Figures 6-6, 6-7, and 6-8 depict the National Highway system in New Jersey. This includes almost all of New Jersey's major roadways: all interstates and authority-owned roadways (i.e., New Jersey Turnpike, Garden State Parkway, Atlantic City Expressway), sections of most US Routes (i.e., 1, 9, 30, 40, 46, 202, and 206) and sections of NJ state routes (i.e., 3, 15, 17, 23, 31, 42, 55, and 72).

In addition to the physical system, there is also a regulatory system. Standards and procedures for truck operations in New Jersey are defined by administrative code (N.J.A.C. 16:32). The code spells out permitted routes, width restrictions, length requirements, access to terminals and other facilities. These large truck routing regulations were established in compliance with Federal Highway Administration regulation for truck size and weight and the reasonable access provisions for commercial motor vehicles authorized by the amended federal Surface Transportation Assistance Act of 1982.

The *National Network* in New Jersey includes the interstates, the Atlantic City Expressway, the New Jersey Turnpike and parts of other roads, such as Routes 42, 81, 130, 322 and 440. In 1999 New Jersey began to restrict 102-inch wide standard trucks and double-trailer truck combinations that do not have an origin or destination within New Jersey from using state highways that have physical characteristics that detract from suitability to be included in the truck network. These vehicles were restricted to the national network. However, 102-inch wide standard and double-trailer truck combinations were permitted to travel up to two miles from the national network to facilities providing food, fuel, rest and repairs. But they could not do so on those roads, highways, streets, public alleys or other public thoroughfares that cannot safely accommodate a truck wider than 96 inches and are so designated by the New Jersey Department of Transportation (NJDOT).

In 2000 the American Trucking Association and U.S. Xpress, a Tennessee-based trucking company, filed suit in U.S. District Court for New Jersey, challenging the statute and regulations that restrict interstate through trucks wider than 96 inches to the national highway network. In March 2004, a judge found that the

regulations were unconstitutional and unenforceable under the Interstate Commerce Clause. The judge granted a “stay” allowing the State’s 102” routing restrictions to remain in effect and enforceable pending appeal.

On February 21, 2006 the U.S. Third Circuit Court of Appeals found New Jersey's large truck routing regulations unconstitutional and NJDOT has repealed these rules and replaced them with regulations that re-established the truck routing restrictions that were in place before 1999. These regulations were adopted on June 22, 2006.

In December of 2006, New Jersey Department of Transportation (NJDOT) proposed to repeal and replace its Truck Access Regulations with new regulations which set forth new standards and procedures for 102 inch wide standard trucks and double-tractor trailers (Large Trucks) in regards to permitted routes, width restrictions, and access to terminals and other facilities.

The proposed rules establish a “Hierarchy of Roads” for all Large Trucks in the following manner:

- 1st Tier - National Network
- 2nd Tier - NJ Access Network
- 3rd Tier - Local Unrestricted Roads
- 4th Tier - Roadways designated by regulation with limited accessibility

The proposed rules require all Large Trucks, regardless of origin or destination, to get to or remain on the National Network - unless making a trip to a terminal. The regulations require 102 inch wide large trucks that are leaving the National Network to utilize the shortest and most direct New Jersey Access Network route to arrive at their terminals in New Jersey. When the trip is completed, the large truck must return to the National Network in a manner consistent with its next destination. Continued use of the NJ Access Network is only allowed if it provides the direct route to the next terminal.

The proposed rules also require all large truck trips to utilize the most direct route when travel along a 3rd Tier (Local Unrestricted) or 4th Tier road is necessary to access a terminal. When the trip is completed, the large truck must return by the most direct route. Continued use of 3rd Tier local unrestricted roads is only allowed if it provides the direct route to the next terminal. Continued use of 4th Tier roads is not allowed.

Figure 6-7 - National Highway System, Inset A – Northern Port Area

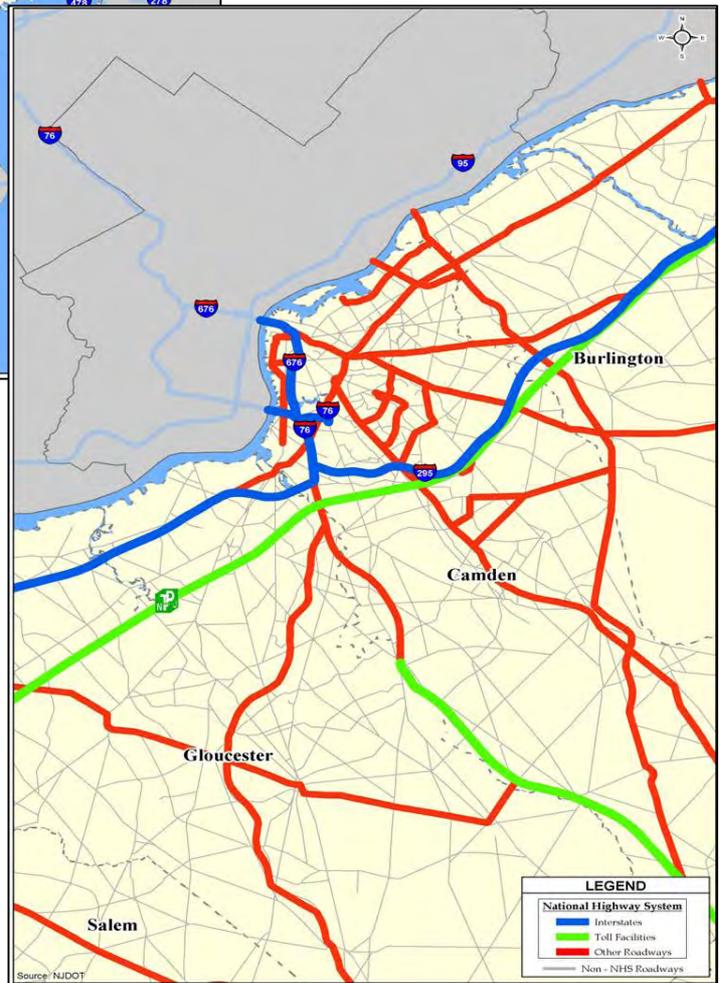
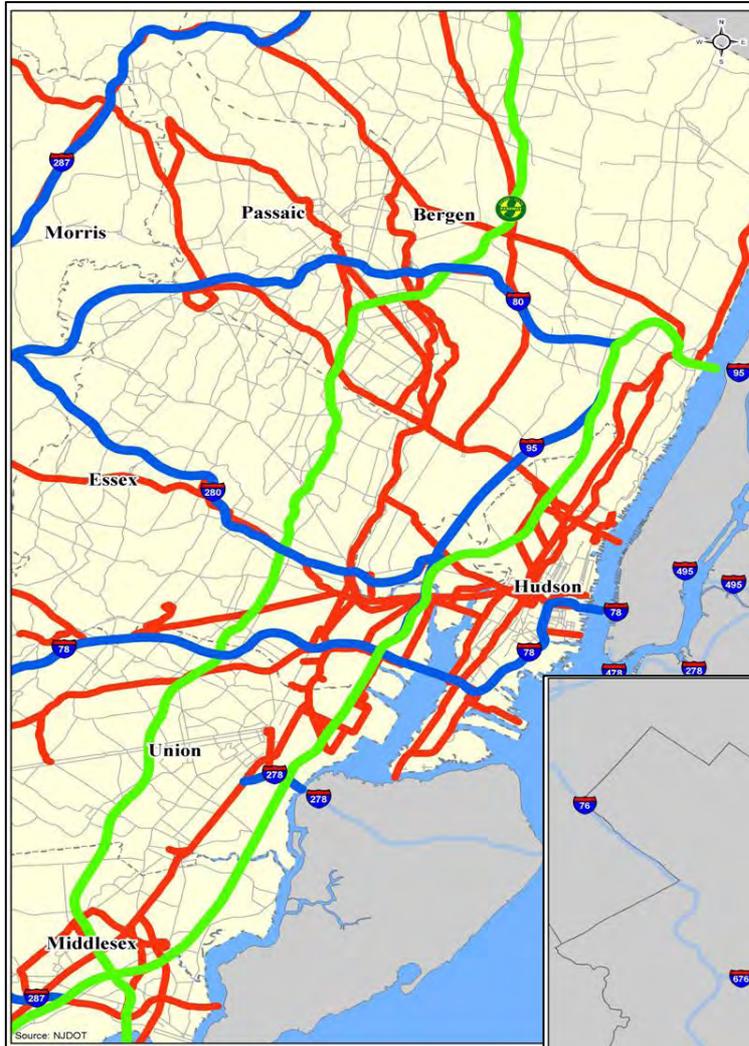
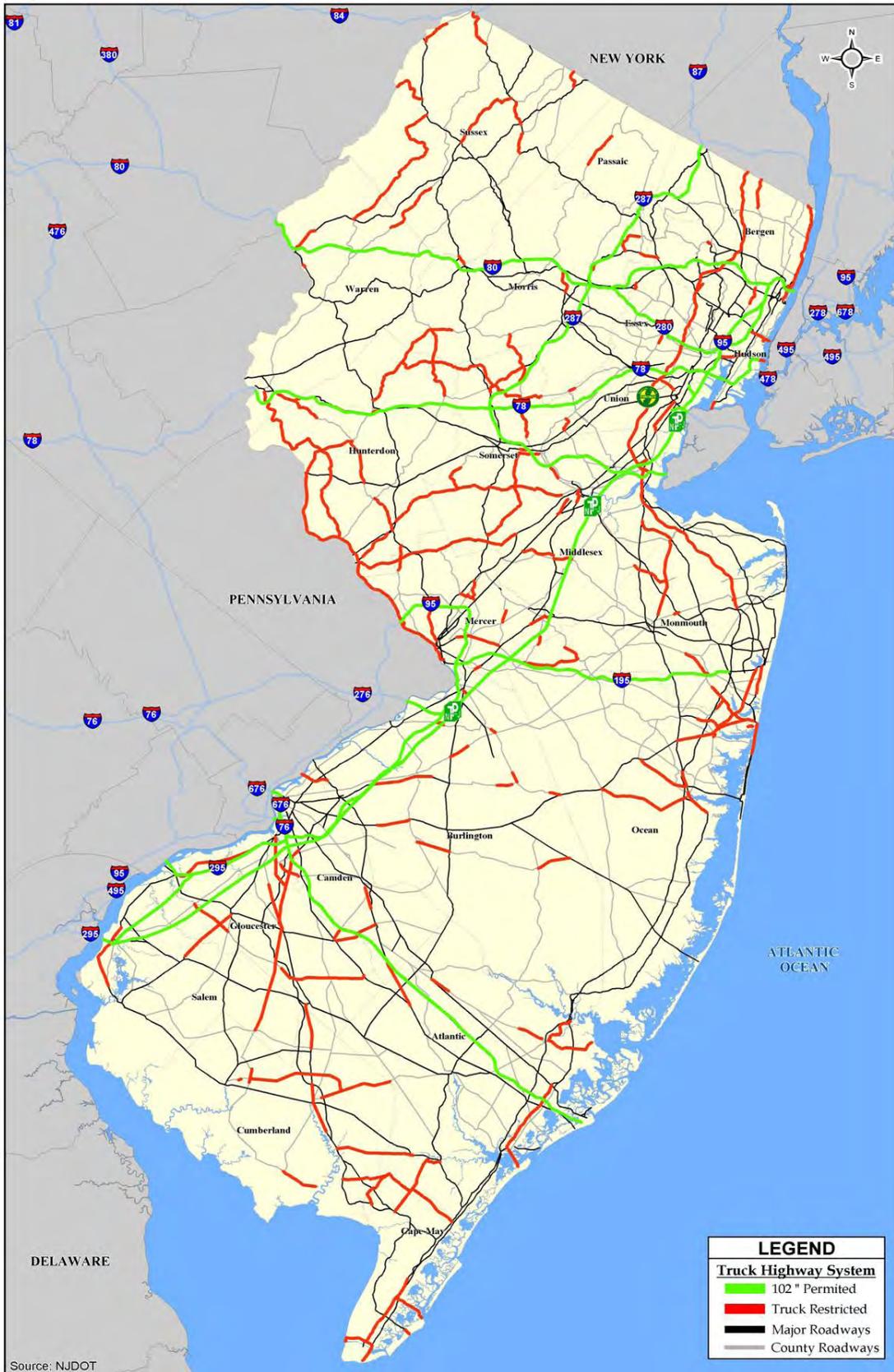


Figure 6-8 - National Highway System, Inset B – Southern Port Area

Figure 6-9 - National 102" Truck Network*



*This map is not the official regulatory map. It is intended to depict the 102" system for illustrative purposes only

SYSTEM ASSESSMENT

STATEWIDE TRUCK MODEL

A travel demand model is a tool used to simulate traffic on the highway system, and is usually capable of assessing existing conditions and forecasting future conditions. NJDOT has invested in the preparation of a travel demand model that focuses on truck traffic. The Statewide Truck Model simulates trucks and all other vehicles moving on the highway system. The Statewide Truck Model covers all twenty-one counties in New Jersey plus parts of Delaware, eastern Pennsylvania, the five Boroughs of New York City, and sections of Orange and Rockland counties in New York State. This extensive coverage outside of New Jersey is necessary to capture the long haul nature of freight flows.

The model produces morning and evening peak-hour and daily truck and automobile trip assignments taking into account a detailed forecast of land use, including land use within and around the port areas. The model contains data for three years, the base year of 2000 and the future horizon years of 2025 and 2030.

Travel demand models produce simulations of traffic flows. The models are calibrated to reflect, as accurately as possible, the actual flows, but in some cases there are significant differences. For the purposes of this plan, the model data is used as a frame of reference and to depict the impact of forecast growth on the truck demands.

TRIP MAKING STATISTICS

Highway performance statistics were summarized for the base year 2000 and the future year 2030 peak hour Statewide Truck Model runs. The evening peak hour statistics were selected as they depict slightly more congested conditions than the morning peak hour (as more trips overall typically occur in the evening peak period). Two performance indicators were selected, vehicle miles of travel and vehicle hours of travel.

Vehicle miles of travel (VMT) refer to the total amount of travel that occurs on the State's highway system; it is the sum of the length of all trips occurring in the system. Vehicle hours of travel (VHT) refers to the total time required to make all the trips in the system, it is the sum of the travel time of each individual trip.

Table 6-1 depicts the VMT summarized for each county and for the state as a whole for both the base year 2000 and the future year 2030. It depicts the totals for trucks and for all vehicles, including trucks. This table illustrates the amount of growth that is expected to occur in the peak hour of travel as forecast by the model.

Table 6-1 - Vehicle Miles of Travel by County

	Year 2000			Year 2030			Truck Change		Total Vehicle Change	
	Truck Totals	All Vehicles	Truck Percentage	Truck Totals	All Vehicles	Truck Percentage	Growth	% Growth	Growth	% Growth
Atlantic	1,300	593,200	0.22%	6,900	1,242,300	0.56%	5,600	430.77%	649,100	109.42%
Bergen	41,100	1,366,800	3.01%	79,700	2,056,900	3.87%	38,600	93.92%	690,100	50.49%
Burlington	19,400	682,600	2.84%	38,900	1,217,600	3.19%	19,500	100.52%	535,000	78.38%
Camden	8,100	668,400	1.21%	20,000	1,111,000	1.80%	11,900	146.91%	442,600	66.22%
Cape May	1,600	197,200	0.81%	3,900	476,600	0.82%	2,300	143.75%	279,400	141.68%
Cumberland	4,300	190,500	2.26%	7,400	399,400	1.85%	3,100	72.09%	208,900	109.66%
Essex	18,300	873,000	2.10%	34,400	1,204,200	2.86%	16,100	87.98%	331,200	37.94%
Gloucester	15,200	430,600	3.53%	32,200	838,500	3.84%	17,000	111.84%	407,900	94.73%
Hudson	34,800	425,600	8.18%	57,000	705,900	8.07%	22,200	63.79%	280,300	65.86%
Hunterdon	19,200	322,500	5.95%	39,000	556,800	7.00%	19,800	103.13%	234,300	72.65%
Mercer	17,500	534,600	3.27%	32,500	964,000	3.37%	15,000	85.71%	429,400	80.32%
Middlesex	40,200	1,458,600	2.76%	88,700	2,340,200	3.79%	48,500	120.65%	881,600	60.44%
Monmouth	5,000	866,400	0.58%	16,300	1,422,800	1.15%	11,300	226.00%	556,400	64.22%
Morris	25,200	1,071,700	2.35%	62,200	1,702,500	3.65%	37,000	146.83%	630,800	58.86%
Ocean	4,200	621,900	0.68%	14,200	1,120,600	1.27%	10,000	238.10%	498,700	80.19%
Passaic	8,200	631,000	1.30%	22,700	869,400	2.61%	14,500	176.83%	238,400	37.78%
Salem	6,500	158,800	4.09%	12,500	289,000	4.33%	6,000	92.31%	130,200	81.99%
Somerset	19,000	630,600	3.01%	44,200	1,067,000	4.14%	25,200	132.63%	436,400	69.20%
Sussex	2,300	206,400	1.11%	8,200	432,200	1.90%	5,900	256.52%	225,800	109.40%
Union	26,500	774,100	3.42%	55,500	1,122,500	4.94%	29,000	109.43%	348,400	45.01%
Warren	15,200	238,900	6.36%	34,500	452,200	7.63%	19,300	126.97%	213,300	89.28%
TOTALS	333,100	12,943,400	2.57%	710,900	21,591,600	3.29%	377,800	113.42%	8,648,200	66.82%
Growth %				113.42%	66.82%					

Source: Statewide Truck Model

VMT Discussion

Overall, total VMT in the peak hour will rise from around 13 million VMT to over 25 million, an increase of about 67 percent. Truck VMT is forecast to rise at a much higher percentage overall, going from about 330,000 VMT to over 710,000, an increase of over 110 percent. The counties with the highest percentage of growth in truck VMT include Atlantic County, Ocean County, and Sussex County; all with growth over 200 percent. These counties, however, have a modest base of existing truck traffic, so the net increase in truck trips is moderate. The counties with the highest net rise in vehicle miles of travel for trucks include Middlesex, Morris, Bergen, and Union. These counties have among the highest existing amount of truck traffic, indicating the presence of major industrial locations, ports, and warehouses. The amount of growth forecast in these counties will further tax the highway system.

Table 6-2 on the following page depicts the vehicles hours of travel (VHT) summarized for each county and for the state as a whole for both the base year 2000 and the future year 2030.

Table 6-2 - Vehicle Hours of Travel by County

	Year 2000			Year 2030			Truck Change		Total Vehicle Change	
	Truck Totals	All Vehicles	Truck Percentage	Truck Totals	All Vehicles	Truck Percentage	Growth	% Growth	Growth	% Growth
Atlantic	100	18,500	0.54%	500	63,300	0.79%	400	400.00%	44,800	242.16%
Bergen	1,300	57,800	2.25%	3,800	113,800	3.34%	2,500	192.31%	56,000	96.89%
Burlington	300	17,600	1.70%	900	37,900	2.37%	600	200.00%	20,300	115.34%
Camden	200	20,000	1.00%	600	42,300	1.42%	400	200.00%	22,300	111.50%
Cape May	40	4,700	0.00%	100	15,700	0.64%	100	150.00%	11,000	234.04%
Cumberland	100	6,000	1.67%	300	18,900	1.59%	200	200.00%	12,900	215.00%
Essex	700	40,000	1.75%	1,900	70,200	2.71%	1,200	171.43%	30,200	75.50%
Gloucester	300	10,400	2.88%	700	24,100	2.90%	400	133.33%	13,700	131.73%
Hudson	2,600	24,200	10.74%	3,800	49,300	7.71%	1,200	46.15%	25,100	103.72%
Hunterdon	400	8,500	4.71%	1,000	19,100	5.24%	600	150.00%	10,600	124.71%
Mercer	400	16,900	2.37%	1,100	43,200	2.55%	700	175.00%	26,300	155.62%
Middlesex	1,100	61,900	1.78%	3,700	136,200	2.72%	2,600	236.36%	74,300	120.03%
Monmouth	200	29,600	0.68%	800	61,300	1.31%	600	300.00%	31,700	107.09%
Morris	600	35,900	1.67%	2,600	88,900	2.92%	2,000	333.33%	53,000	147.63%
Ocean	100	21,400	0.47%	600	48,600	1.23%	500	500.00%	27,200	127.10%
Passaic	300	31,500	0.95%	1,200	54,100	2.22%	900	300.00%	22,600	71.75%
Salem	100	3,800	2.63%	300	8,900	3.37%	200	200.00%	5,100	134.21%
Somerset	500	22,200	2.25%	1,800	55,600	3.24%	1,300	260.00%	33,400	150.45%
Sussex	100	6,200	1.61%	300	21,000	1.43%	200	200.00%	14,800	238.71%
Union	800	29,200	2.74%	2,100	49,700	4.23%	1,300	162.50%	20,500	70.21%
Warren	300	7,100	4.23%	800	16,200	4.94%	500	166.67%	9,100	128.17%
TOTALS	10,500	473,400	2.22%	28,900	1,038,300	2.78%	18,400	175.24%	564,900	119.33%
Growth %				175.24%	119.33%					

Source: Statewide Truck Model

VHT Discussion

Overall, total VHT in the peak hour is predicted to rise from around 473,000 hours to over 1 million hours, an increase of about 120 percent. Truck VHT is forecast to rise at a much higher percentage overall, going from about 10,500 VHT to nearly 29,000, an increase of over 175 percent. This equates to an average reduction in the speed of trips by about 7 mph for trucks and vehicles overall. The model forecasts that several counties will have VHT increases of over 300 percent. The counties with the highest net rise in vehicle hours of travel for trucks are Middlesex, Bergen, and Morris. In these counties, the average speed of truck travel will decrease by 12.5, 10.6, and 18.1 mph, respectively. All of these speed decreases are cause for significant concern, as reductions of greater than 10 mph will likely result in a large increase in delay.

VMT and VHT Conclusions

These two key indicators point to a highway system that will see a significant rise in both truck and auto traffic, and this traffic rise will result in a significant increase in delay. The delay will be experienced by both people and goods, but more significantly by goods, as the percent of increase is higher for trucks than total vehicles overall. The ability of shippers to provide reliable, on-time service will be hampered by the forecast increase in delay.

TRIP PERFORMANCE STATISTICS

The overall performance of the highway system was assessed based on aggregated state level statistics of the volume to capacity (v/c) ratio calculated for each highway link. The higher the v/c, the more congested the roadway, and the more vehicles that experience delay. Roadways operating at acceptable conditions are defined as those with a volume to capacity ratio generally in or below the range of seventy to eighty percent,

indicating some unused capacity remains, roadways operating near unacceptable conditions are those that are approaching or at capacity, meaning all of the available capacity is being used, and those operating in unacceptable conditions, experiencing extensive congestion and delays, are those where the demand on the roadway exceeds capacity.

Figure 6-10 displays the results of the assessment for both the base year and the future year peak PM hour. In 2000, 44 percent of the vehicle hours traveled in the peak hour by all vehicles occurred within acceptable conditions, 30 percent with conditions approaching congestion, and 26 percent in highly congested conditions. Over a thirty year forecast period, that condition is forecast to change considerably for the worst. Only 18 percent of the vehicle hours traveled by all vehicles are predicted to occur in acceptable conditions, while 32 percent will occur in conditions approaching capacity and congestion, and 50 percent predicted to occur in highly congested conditions. The amount of vehicles hours traveled spent in highly congested conditions essentially doubles.

Figure 6-10 - All Vehicle VHT by Capacity Category

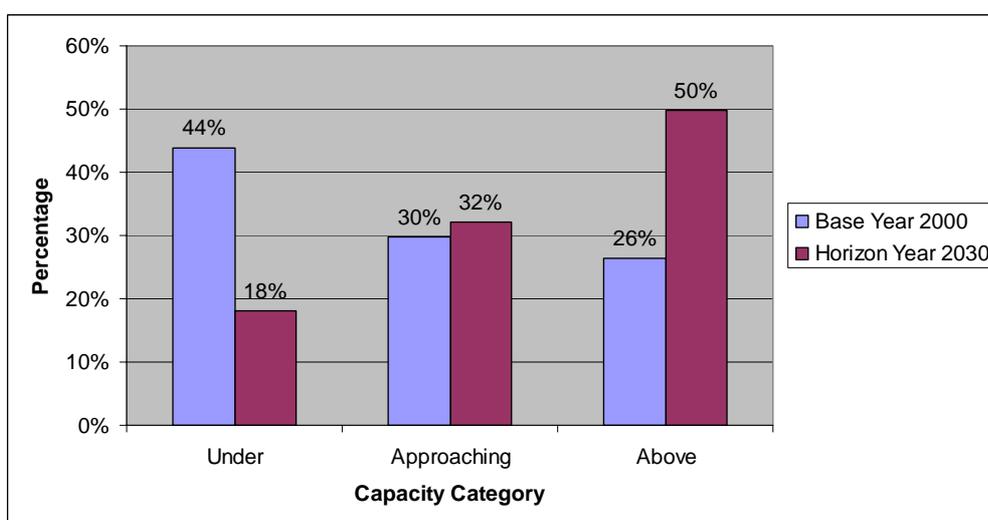
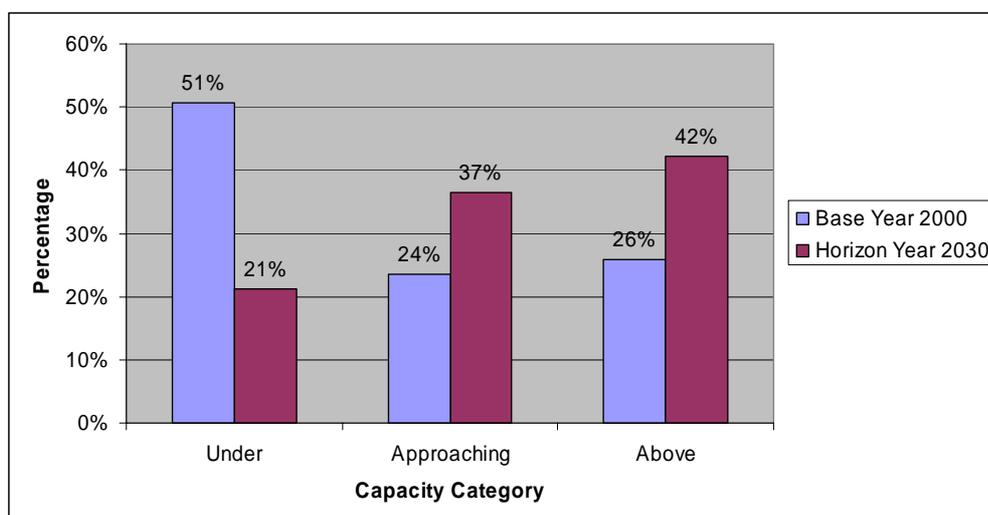


Figure 6-11 displays the results of the assessment for truck trips only. Only 21 percent of the vehicle hours traveled by trucks are predicted to occur in acceptable conditions, with 37 percent in conditions approaching capacity and congestion, and 42 percent predicted to occur in highly congested conditions. The amount of vehicles hours traveled by trucks in congested conditions rises by almost 30 percent overall.

Figure 6-11 - Truck VHT by Capacity Category



CORRIDOR ASSESSMENT

Truck traffic occurs on most roadways in the State; however, the highest concentration of truck traffic occurs on a limited number of roadways. These select roadways form the major truck corridors, defined as arterial roadways that carry a significant amount of truck traffic, either by volume or as a high percentage of overall traffic. In some cases the entire length of a roadway within the state serves as a major truck corridor, such as the New Jersey Turnpike and I-287 as north-south corridors, and I-78 and I-80 as east-west corridors. This reinforces the notion that New Jersey's highways are a critical connection to both intrastate and interstate truck traffic.

Truck traffic extends from New York over the land bridge to points as far west as the Pacific coast. Trucks are and will continue to be a key linkage in the northeast corridor providing connections for goods moving along the east coast from the southeast through to New England.

The major truck corridors defined in this plan are as follows:

- **I-78**
- **The New Jersey Turnpike**
- **I-80**
- **I-287**
- **I-295**
- **Route 17**

The primary truck corridors are shown in Figure 6-12. The corridors, while centered on the defined roadways, extend several miles from the roadways, and encompass adjacent roadways, other modal facilities, and nodes of freight activities.

In addition to these corridors, there are two areas of concentration centered on the ports where several roadways carry significant amounts of truck traffic. These areas are defined as the:

- **Northern New Jersey Port Area**
The northern port area, centered on Port Newark/Elizabeth, has been the subject of several studies and an extensive multi-modal improvement program has been proposed, as defined in several chapters of this plan
- **Southern New Jersey Port Area**
The southern port area, centered on the facilities of the South Jersey Port Corporation, is also experiencing increased investigation, with recent studies completed or underway from Paulsboro up to Camden. As these studies advance, more projects will emerge.

Figure 6-12 - Major Truck Corridors

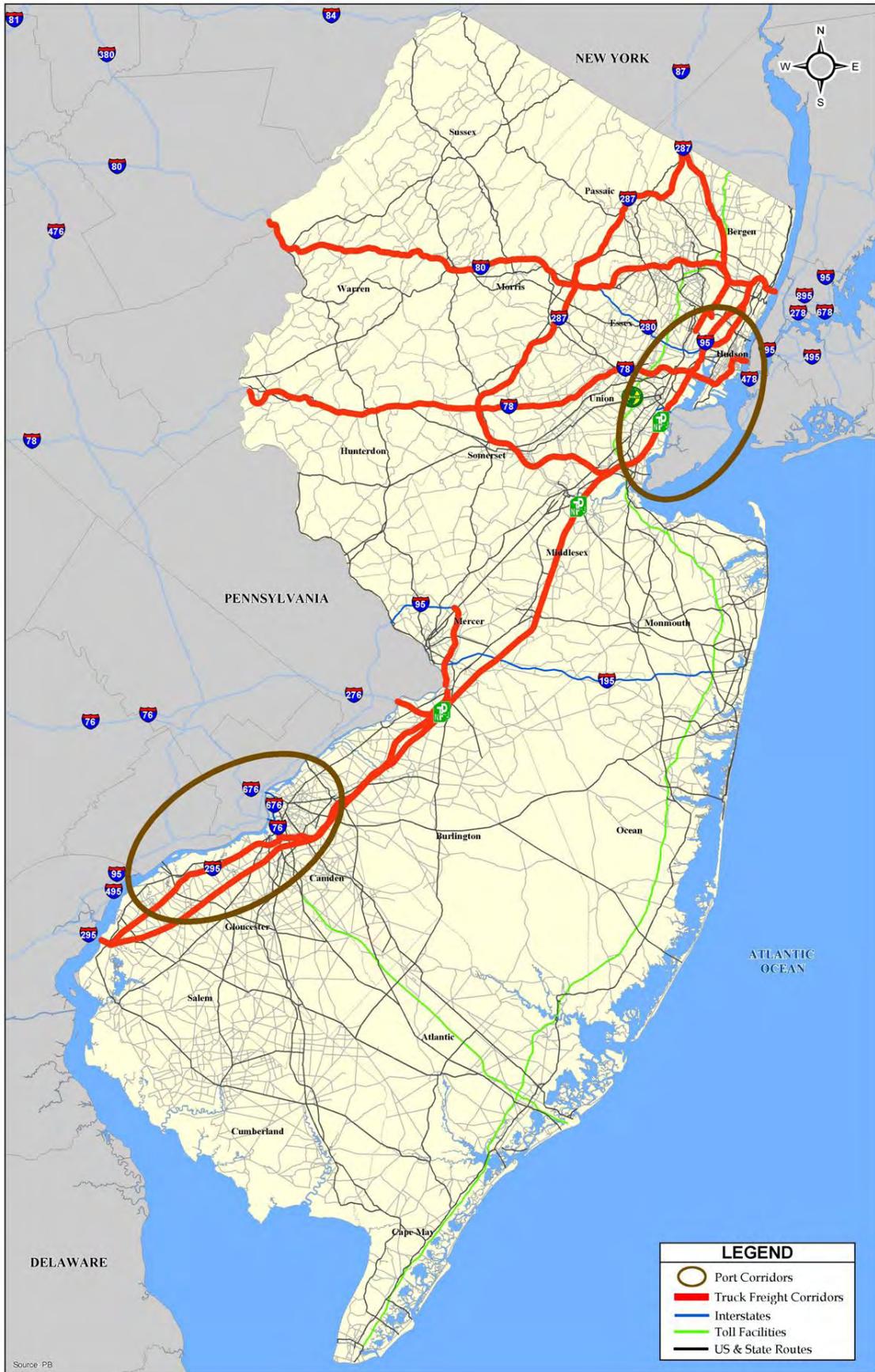
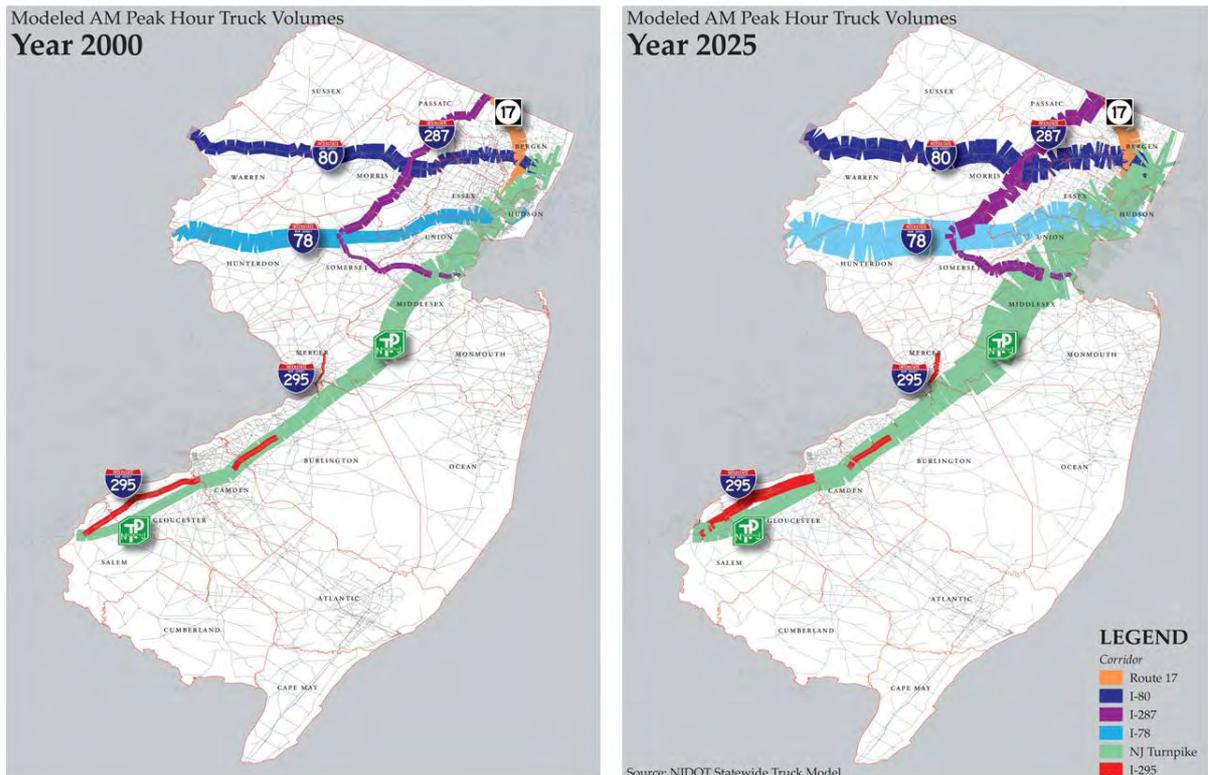


Figure 6-13 represents the output of the Statewide Truck Model depicting total AM peak hour truck volumes for the years 2000 and 2025. The width of the line for each corridor is in proportion to the volume it carries. The model predicts significant increases in truck volume on all of the major truck corridors. Most notable is the large growth forecast on I-78 and on the northern segment of the Turnpike, outpacing the growth of the others. Examining I-78 and I-80 together indicates the magnitude of goods forecast to move across the state will increase substantially. North-south flows will also increase, particularly from the New York region, as depicted by the increased bandwidth of I-287, Route 17, and the Turnpike.

Figure 6-13 - Corridor Modeled Truck Volume Comparison, 2000-2025



Each corridor is discussed in greater detail in the following sections. Each section includes an overview of the location of the corridor, the characteristics of traffic on the corridor and how traffic is forecast to change over time. The Statewide Truck Model was used to generate a number of statistics for the roadways, including the amount of truck traffic on the roadway, the proportion of truck traffic to that of all vehicles, the vehicle miles of travel (VMT) occurring daily and during the peak hours, and the daily truck VMT occurring at a LOS E or F, indicating a poor level of service. Highlights are presented for each corridor.

The maps depicting the corridors also indicate the location of the link selected for tracing trip patterns through the select link process. The Statewide Truck Model was used to track trucks on a given link of the model network, referred to as select link analysis. This process provides the ability to examine truck trip patterns along a particular segment of roadway. In the figures that follow for the corridors, the width of the red line indicates the relative volume of truck trips that pass through that segment of the roadway and where they are coming from and going to. The width of the line is scaled based on the total trips that pass through that point to depict the relative number of trips from the origins to the destinations. The scale is not absolute or tied to any given volume threshold, and therefore is not held constant for the different corridors.

THE NEW JERSEY TURNPIKE CORRIDOR

Corridor Definition

Figure 6-14 depicts the NJTPK Corridor, and the links highlighted for assessment, which include a link just south of Newark Airport and a link south of I-195. This corridor encompasses the Liberty Corridor.

2000 Conditions

According to the Statewide Truck Model, the daily truck volumes carried on the Turnpike range from about 40,000 trucks in the northern section, to about 20,000 in the mid section, and to about 8,000 near the southern end. These are very high truck volumes as compared to most other roadways in the state.

In 2000, the model estimated the northbound New Jersey Turnpike carried approximately 9.4 million VMT daily, with approximately 1.8 million VMT during the AM peak hour, and approximately 2.5 million VMT during the PM peak hour. The percentage of VMT that is truck travel daily is about 11 percent, with trucks carrying 2 percent of VMT during the AM peak hour and 10 percent of VMT during the PM peak hour.

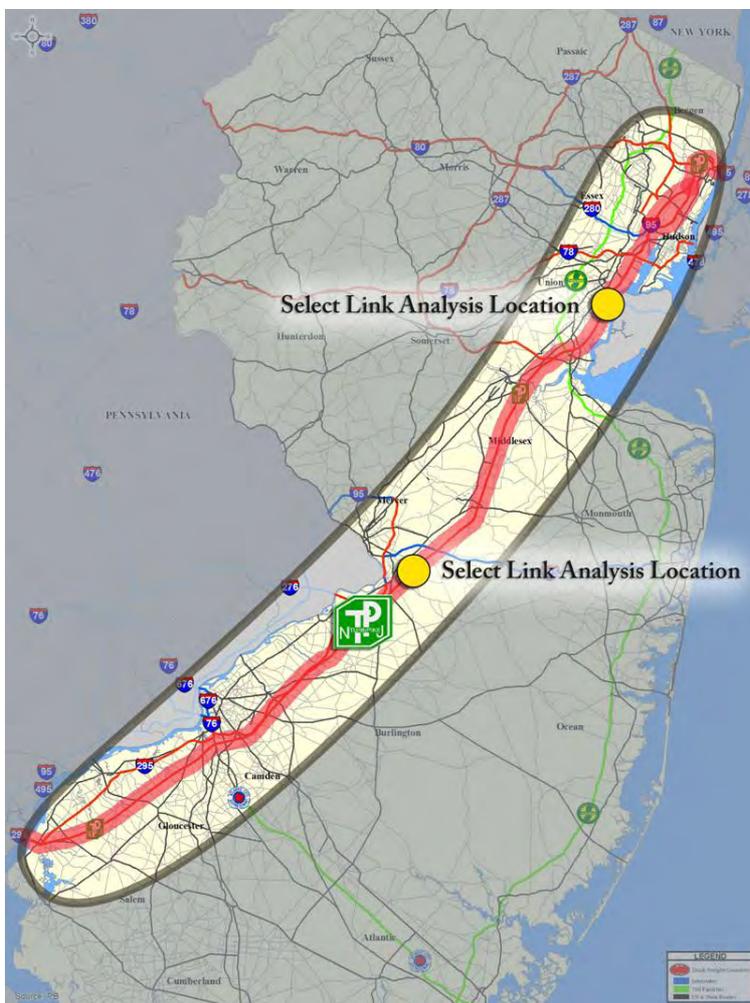
In 2000, the model estimated the southbound New Jersey Turnpike carries approximately 4.7 million VMT daily, with approximately 1.2 million VMT during both the AM and PM peak hours. The percentage of VMT of trucks daily is 11 percent with trucks carrying 4 percent of VMT during the AM peak hour, and 11 percent of VMT during the PM peak hour.

2025 Conditions

Overall, the model forecasts that truck travel will grow significantly, and more will occur in highly congested conditions. In the northbound direction, the model forecasts the percentage of northbound daily truck VMT to increase to 13 percent from 2000 to 2025, with a significant increase during the AM and the PM peak hours (both at 11 percent). Overall, total vehicle (including trucks) daily VMT is forecast to increase 86 percent from 2000 to 2025, while daily truck VMT is forecast to increase 108 percent from 2000 to 2025. On a proportional basis, truck traffic is growing faster than all vehicles overall.

Daily truck VMT occurring at a LOS E or F is forecast to increase from 3 percent to 20 percent in 2025. The percentage of daily truck VMT increases to 15 percent from 2000 to 2025, with a large increase during the AM and PM peak hours (both at 14 percent). The model forecasts that southbound daily VMT will increase 21 percent from 2000 to 2025, with daily truck VMT increasing 63 percent from 2000 to 2025. Truck VMT is forecast to increase significantly in the peak hours also, again outpacing the increase in total vehicles.

Figure 6-14 – NJTPK Corridor

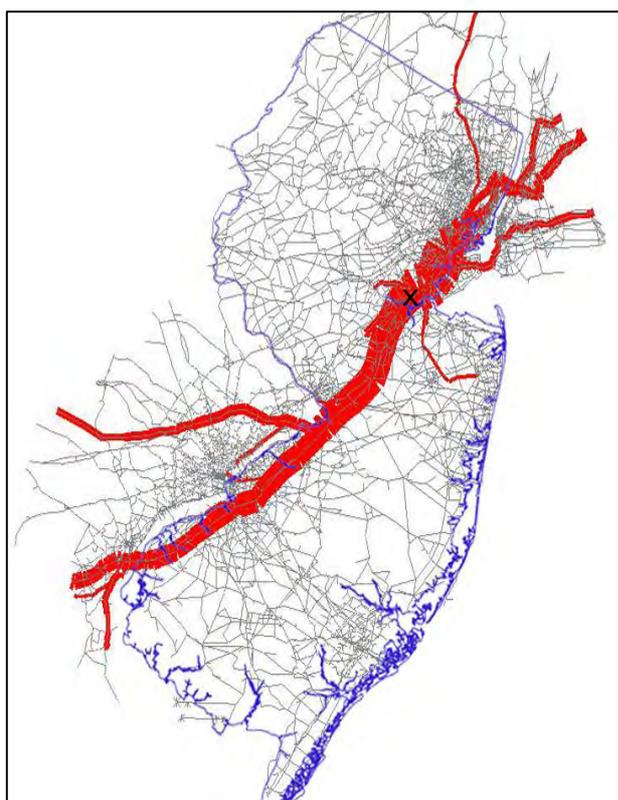


Select Link Analysis

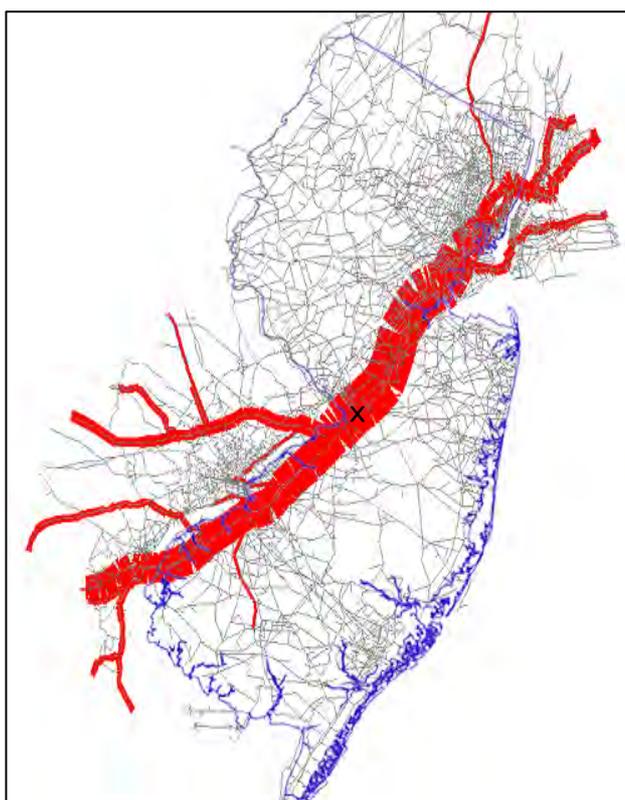
Figure 6-15 depicts the result of the select link analysis for truck trips forecast for the year 2030. The location of the select link is just south of Newark Airport, indicated by the “X”. It is clear from the figure that the Turnpike carries a significant volume of truck traffic across New Jersey’s borders, as well as a significant amount of intrastate trips. Over half of the truck trips in the northern section of the Turnpike are intrastate trips, as evidenced by the thickness of the line within the New Jersey border. About 14 percent of the trips in the northern section are trips to/from Delaware and beyond, and about 18 percent are going to/from New York.

Figure 6-16 depicts the result of the select link analysis for a link further south on the Turnpike, located just south of I-195. Overall, the roadway carries a high volume of truck traffic, with a higher percentage of trucks passing this location being through trips, at about 1/3 of all the trips, which is significantly higher than the northern section. On this link, 43 percent of the trips in the southern section are trips to/from Delaware and beyond and about 26 percent are going to/from New York. A large number of trips access New Jersey from Pennsylvania in the southern section of the Turnpike.

**Figure 6-15 - Base 2030 PM Peak Period
Truck Traffic on NJTPK between Exit 12
and 13 (MP 52.0)**



**Figure 6-16 - Base 2030 PM Peak Period
Truck Traffic on NJTPK South of I-195
(MP 14.0)**

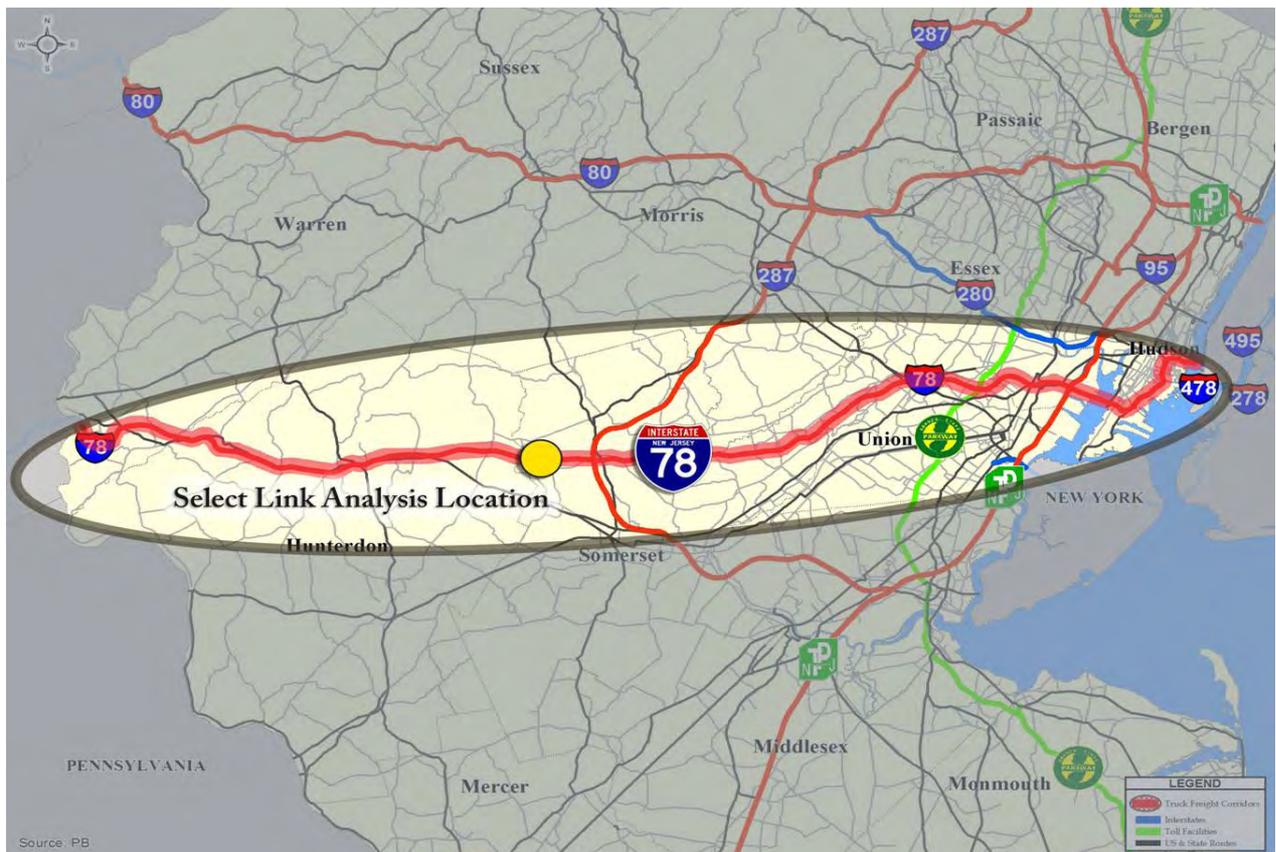


INTERSTATE 78 CORRIDOR

Corridor Definition

Figure 6-17 depicts the Interstate 78 Corridor, and the link highlighted for select link assessment, west of Interstate 287, near milepost 29.0.

Figure 6-17 – Interstate 78 Corridor



2000 Conditions

According to the model, the daily truck volumes carried on I-78 range from about 11,000 trucks on the western end, to about 15,000 trucks in the vicinity of I-287, and holding steady at this level to west of the New York State line. Some links carry over 35,000 truck trips, nearly the volume found on the most heavily traveled truck links on the Turnpike.

In 2000, the model estimated I-78 westbound carried approximately 3.2 million VMT daily, with approximately 730,000 VMT during the AM peak hour, and approximately 750,000 VMT during the PM peak hour. The percentage of VMT of trucks daily is 11 percent, with trucks carrying 11 percent of VMT during the AM and PM peak hours.

In 2000, the model estimated I-78 eastbound carried approximately 3.7 million VMT daily, with approximately 700,000 VMT during the AM peak hour, and slightly more than 1 million VMT during the PM peak hour. The percentage of VMT of trucks daily is 7 percent with trucks carrying 6 percent of VMT during the AM peak hour, and 6 percent of VMT during the peak hour.

2025 Conditions

The percentage of daily truck VMT in the westbound direction is forecast to increase to 14 percent from 2000 to 2025, with a slightly larger increase during the AM peak hour (15 percent) than the PM peak hour (14 percent). Overall, daily VMT is forecast to increase 45 percent from 2000 to 2025, while daily truck VMT increasing 89 percent during that period. During the AM peak hour, overall VMT increases 47 percent, while overall truck VMT increases 93 percent. During PM peak hour, overall VMT increases 43 percent, while overall truck VMT increases 89 percent.

Daily truck VMT at a LOS E or F is forecast to increase from 13 percent of all trucks in 2000 to 21 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F is forecast to increase to 57 percent in 2025, and during the PM peak hour to increase to 21 percent.

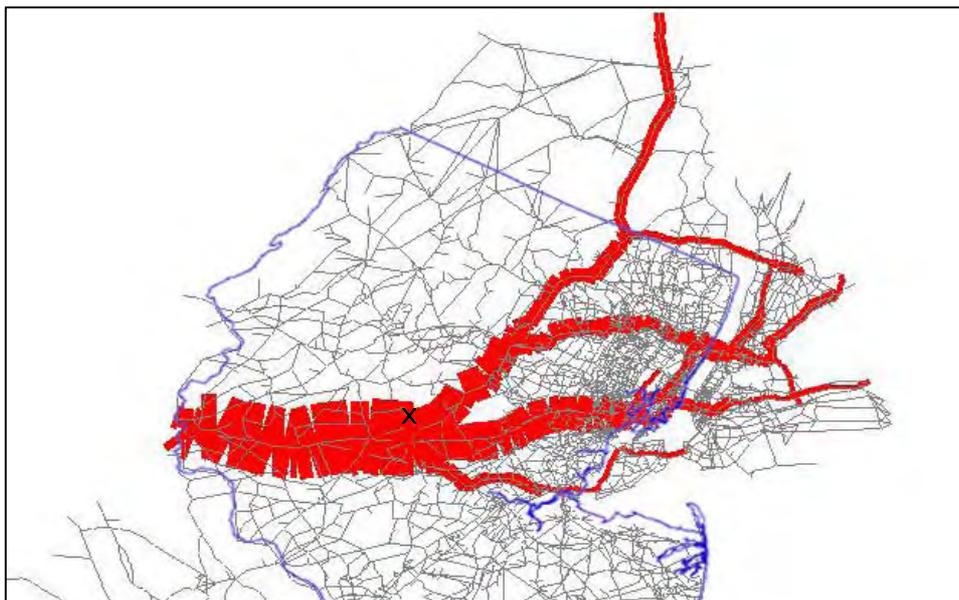
The percentage of daily truck VMT in the eastbound direction is forecast to increase to 10 percent from 2000 to 2025, with an increase during the AM peak hour (8 percent) and during the PM peak hour (9 percent). Overall, daily VMT increases 56 percent from 2000 to 2025, while daily truck VMT increases 124 percent from 2000 to 2025. During the AM peak hour, overall VMT is forecast to increase 42 percent, while overall truck VMT increases 112 percent. During the PM peak hour, overall VMT increases 48 percent, while overall truck VMT increases 102 percent. Daily truck VMT at a LOS E or F is forecast in the eastbound direction to increase from 4 percent of all trucks in 2000 to 29 percent in 2025.

Overall, the model forecasts that truck travel will grow significantly on I-78, and more will occur in highly congested conditions.

Select Link Analysis

Figure 6-18 depicts the result of the select link analysis for truck trips forecast for the year 2030. The location of the select link is just west of the crossing of I-287. The figure indicates that I-78 carries a significant amount of truck traffic into and across the State. It is forecast that about 45 percent of the trips passing this link are trips to/from Pennsylvania. A significant portion of these trips travel through to New York, at about 23 percent. More of these trips use the trans-Hudson crossings than I-287 to access New York State. About a third of all trips are generated within and destined to NJ on this link.

Figure 6-18 - Base 2030 PM Peak Period Truck Traffic on Interstate 78 West of I- 287 (MP 29.0)

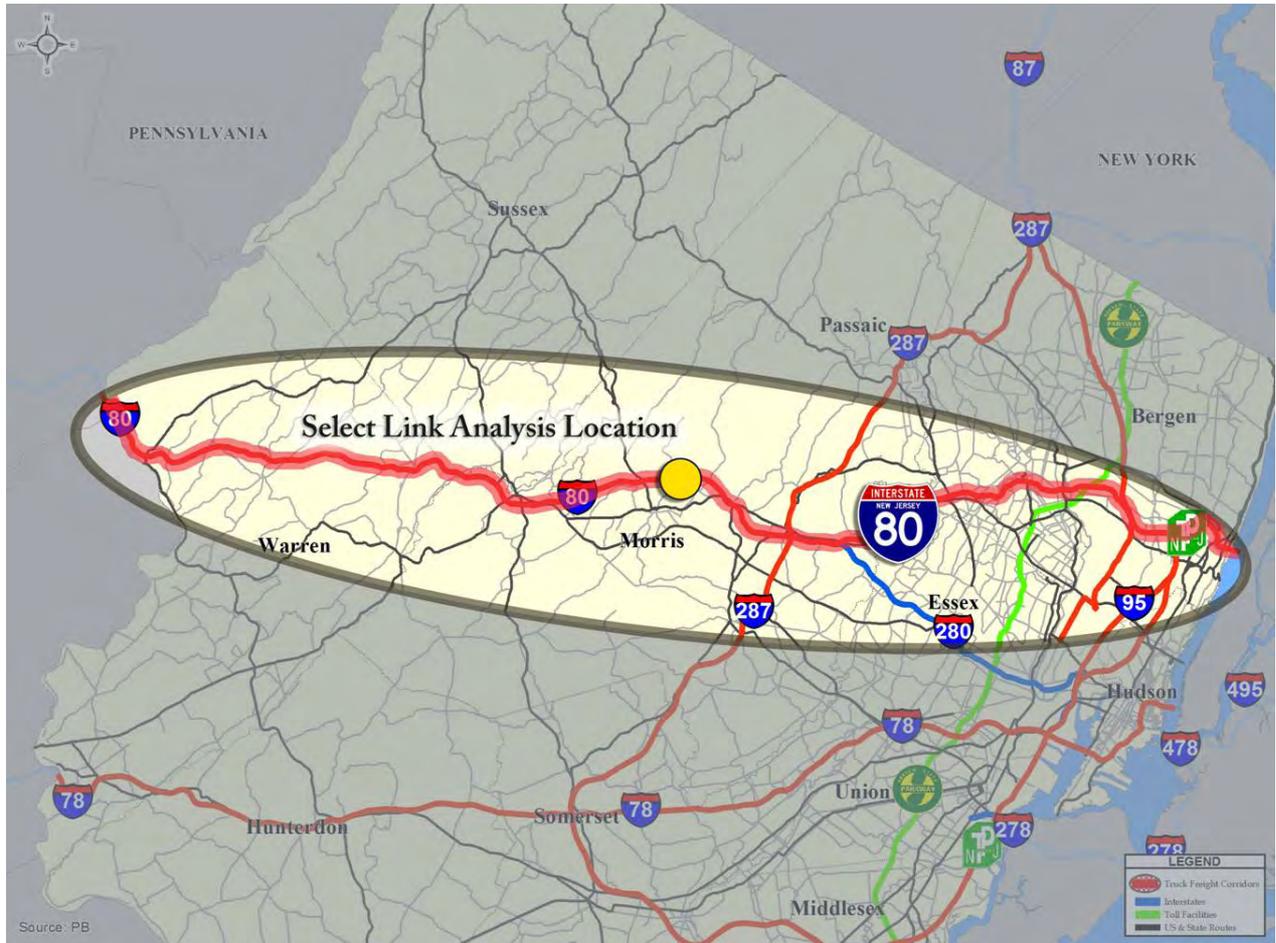


INTERSTATE 80 CORRIDOR

Corridor Definition

Figure 6-19 depicts the Interstate 80 Corridor, and the link highlighted for assessment, west of I-287.

Figure 6-19 – Interstate 80 Corridor



2000 Conditions

According to the model, the daily truck volumes carried on I-80 range from about 6,000 trucks on the western end, to about 15,000 trucks west of I-287, and then dropping to about 10,000 trucks east of I-287.

In 2000, the model estimated I-80 westbound carries approximately 3.7 million VMT daily, with approximately 770,000 VMT during the AM peak hour, and 930,000 VMT during the PM peak hour. The percentage of VMT of trucks daily is 9 percent, with trucks carrying 9 percent of VMT during the AM peak hour, and 7 percent of VMT during the peak hour.

In 2000, I-80 eastbound carries approximately 4.1 million VMT daily, with approximately 870,000 VMT during the AM peak hour, and slightly more than 1 million VMT during the PM peak hour. The percentage of VMT of trucks daily is 5 percent, with trucks carrying 4 percent of VMT during the AM peak hour, and 5 percent of VMT during the peak hour.

2025 Conditions

The percentage of daily truck VMT in the westbound direction is forecast to increase slightly to 10 percent from 2000 to 2025, with a larger increase seen during the AM peak hour (11 percent) than the PM peak hour (7 percent).

Overall, daily westbound VMT is forecast to increase 63 percent from 2000 to 2025, while daily truck VMT increases 86 percent from 2000 to 2025. During the AM peak hour, overall VMT increases 65 percent, while overall truck VMT increases 98 percent. During the PM peak hour, overall VMT increases 62 percent, while overall truck VMT increases 82 percent.

Daily westbound truck VMT at a LOS E or F is forecast to increase from 5 percent of all trucks in 2000 to 18 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F increases from 17 percent of all trucks in 2000 to 38 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases from 5 percent of all trucks in 2000 to 30 percent in 2025.

The percentage of daily truck VMT in the eastbound direction is forecast to increase to 7 percent from 2000 to 2025. Overall, daily VMT is forecast to increase 38 percent from 2000 to 2025, while daily truck VMT increases 89 percent from 2000 to 2025. During the AM peak hour, overall VMT increases 33 percent, while overall truck VMT increases 89 percent. During the PM peak hour, overall VMT increases 39 percent, while overall truck VMT increases 89 percent.

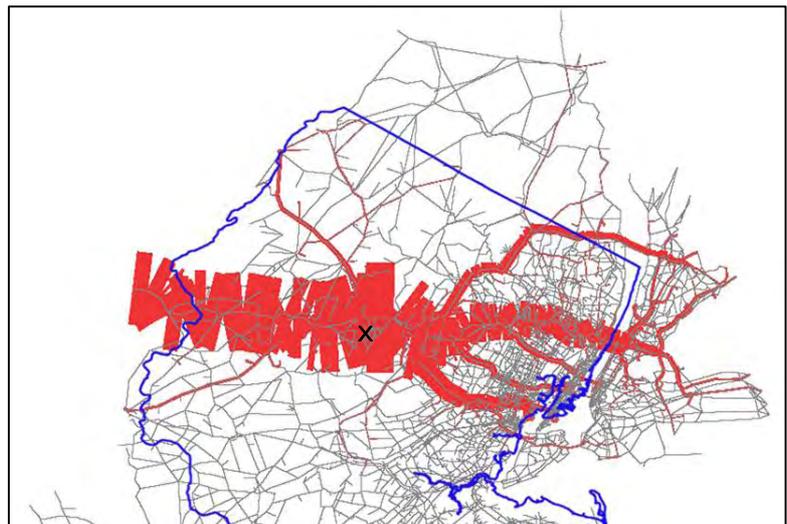
Daily truck VMT in the eastbound direction at a LOS E or F is forecast to increase from 7 percent of all trucks in 2000 to 24 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F increases from 36 percent of all trucks in 2000 to 65 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases to 47 percent in 2025.

Overall, the model forecasts that truck travel will grow significantly on I-80, as on I-78, and more will occur in highly congested conditions. These two critical east-west roadways are the links to goods flowing into New Jersey from the West coast and serve to move goods through New Jersey to New York and the New England Region. Significant impact to the travel time and reliability of truck flows on these roadways will occur unless provisions are made to address the deficiencies found on these corridors.

Select Link Analysis

Examining the select link analysis indicates the importance of I-80 in moving goods into and through New Jersey. As can be seen by the red line in Figure 6-20, I-80 carries a high number of truck trips. A substantial number of truck trips on I-80 originate or are destined to Pennsylvania and points west, at about 35 percent of the total. Trips coming from or heading to the New York region account for about 18 percent of the total. A significant number of trips using this link either terminate in New Jersey or are intrastate trips.

Figure 6-20 - Base 2030 PM Peak Period Truck Traffic on I-80 near the Essex/Passaic County line at MP 52

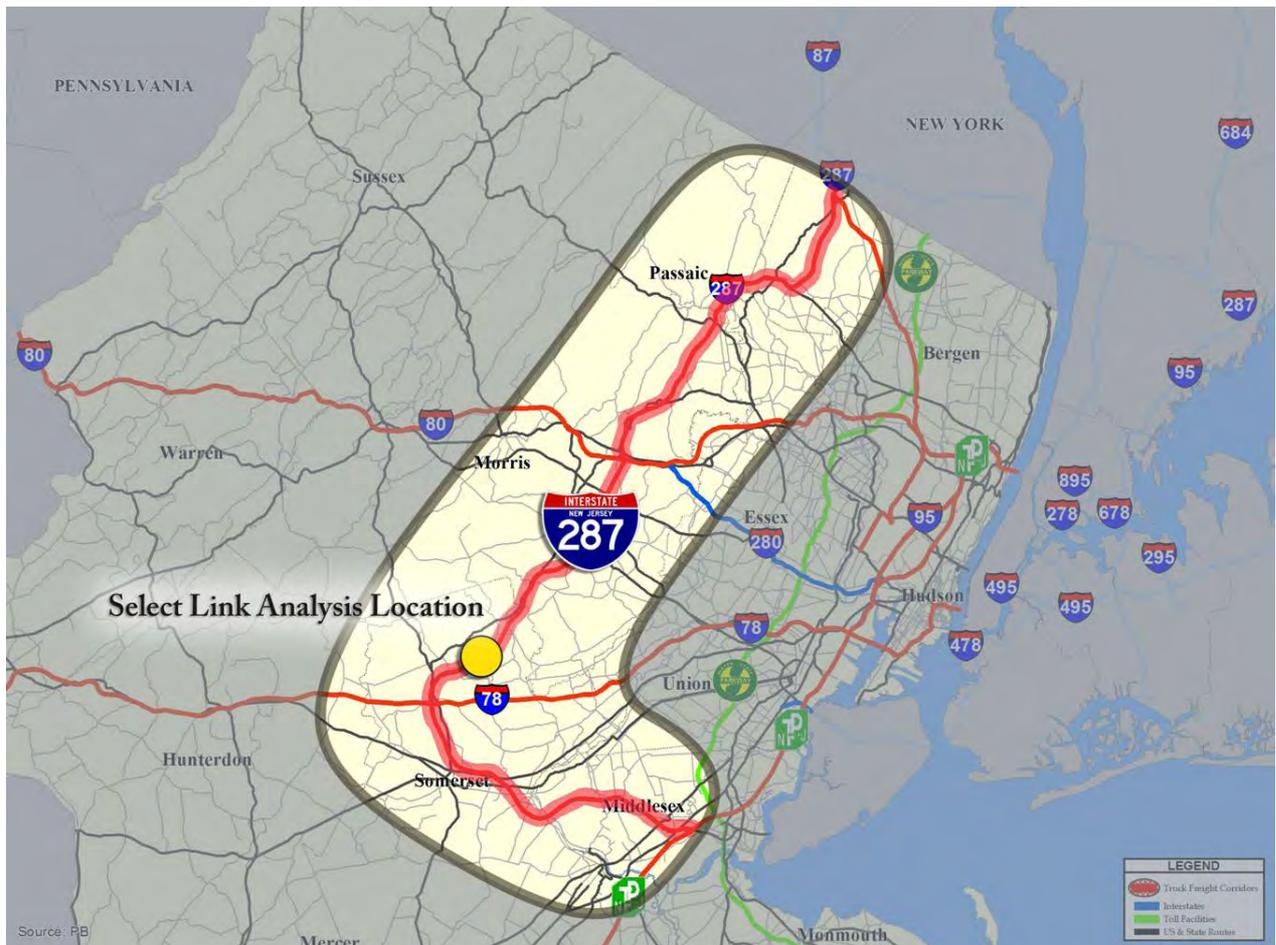


INTERSTATE 287 CORRIDOR

Corridor Definition

Figure 6-21 depicts the Interstate 287 Corridor, and the link highlighted for assessment, north of Interstate 78, near milepost 24.0.

Figure 6-21 – Interstate 287 Corridor



2000 Conditions

According to the model, the daily volumes carried on I-287 range from about 8,000 to 10,000 trucks south of I-80. The model indicates that a substantial number of trips divert from I-287 onto I-80 to access the New York region, and truck volumes on the northern section of I-287 are substantially lower than those on the southern end.

In 2000, the model estimated I-287 northbound carries approximately 2.3 million VMT daily, with approximately 450,000 VMT during the AM peak hour, and approximately 560,000 VMT during the PM peak hour. The percentage of VMT of trucks daily is 7 percent, with trucks carrying 5 percent of VMT during the AM peak hour, and 6 percent of VMT during the peak hour.

In 2000, the model estimated I-287 southbound carries approximately 5.5 million VMT daily, with approximately 1.2 million VMT during the AM peak hour, and approximately 1.4 million VMT during the PM peak hour. The percentage of VMT of trucks daily is 4 percent, with trucks carrying 4 percent of VMT during the AM peak hour, and 3 percent of VMT during the peak hour.

2025 Conditions

The percentage of daily truck VMT in the northbound direction is forecast to increase to 9 percent from 2000 to 2025, with a slightly smaller increase seen during the AM peak hour (6 percent) than the PM peak hour (8 percent). Overall, daily VMT is forecast to increase by 64 percent from 2000 to 2025, while daily truck VMT more than doubles. During the AM peak hour, overall VMT increases 66 percent, while overall truck VMT increases 96 percent. During the PM peak hour, overall VMT increases 65 percent, while overall truck VMT increases 111 percent.

The model predicts that northbound daily truck VMT occurring at a LOS E or F will increase from 8 percent of all trucks in 2000 to 32 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F increases from 16 percent of all trucks in 2000 to 65 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases from 4 percent of all trucks in 2000 to 41 percent in 2025.

In the southbound direction, the model forecasts that the percentage of daily truck VMT increases to 6 percent from 2000 to 2025, with a slightly smaller increase seen during the AM and PM peak hours (both at 5 percent). Overall, daily VMT increases 50 percent from 2000 to 2025, while daily truck VMT increases 106 percent from 2000 to 2025. During the AM peak hour, overall VMT is forecast to increase 47 percent, while overall truck VMT increases 101 percent. During the PM peak hour, overall VMT increases 51 percent, while overall truck VMT increases 108 percent.

Daily truck VMT at a LOS E or F is forecast to increase from 13 percent of all trucks in 2000 to 25 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F increases from 44 percent of all trucks in 2000 to 51 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases from 12 percent of all trucks in 2000 to 39 percent in 2025.

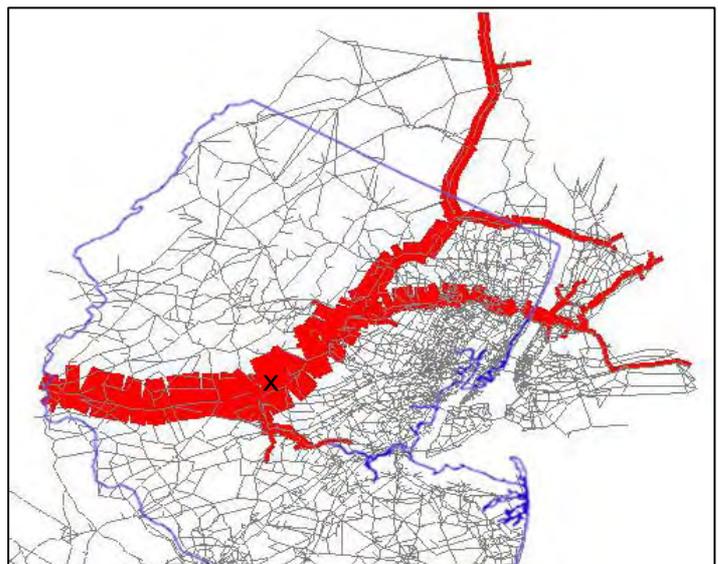
Select Link Analysis

Figure 6-22 depicts the result of the select link analysis for truck trips forecast for the year 2030. The location of the select link is near the Passaic River, just north of I-78.

The figure indicates that I-287 carries a significant amount of truck traffic, although it is less in magnitude than some of the primary east-west corridors. The model indicates that it is forecast to carry a large number of trucks into and out of New Jersey from Pennsylvania.

About 45 percent of the trips passing this link are trips to/from Pennsylvania. A significant portion of these trips travel through to New York, with about 15 percent traveling to southern New York State via I-287 and about 12 percent crossing the Hudson. About 20 percent of all trips are generated within and destined to NJ on this link. It is interesting to note that the model indicates that very little truck traffic traveling on I-287 at this location comes from locations south of I-78. Most of the truck traffic generated south of this location utilizes the Turnpike as opposed to I-287.

Figure 6-22 - Base 2030 PM Peak Period Truck Traffic on Interstate 287 North of I-78 (MP 24.0)

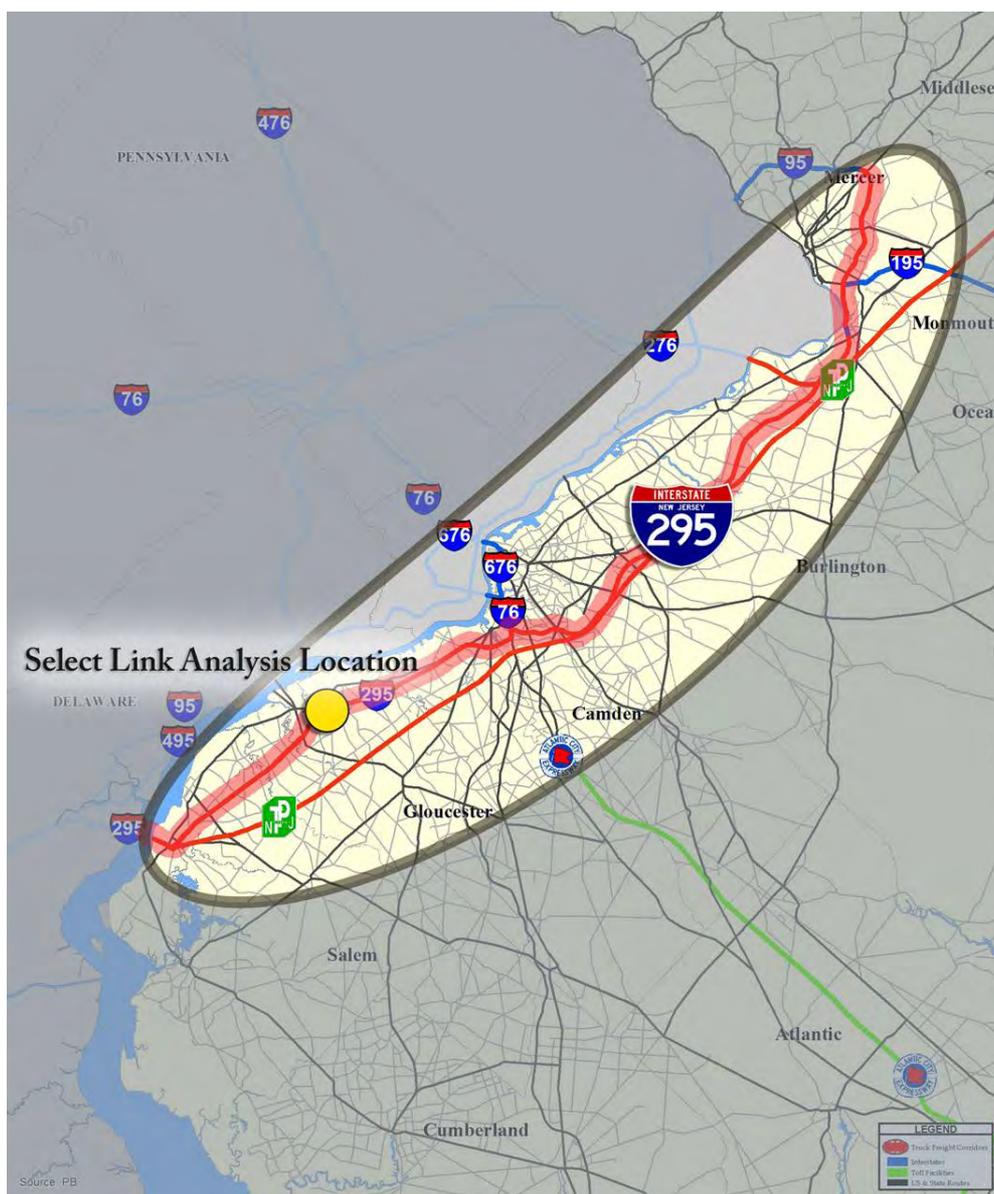


INTERSTATE 295 CORRIDOR

Corridor Definition

Figure 6-23 depicts the Interstate 295 Corridor, and the link highlighted for assessment, south of the Commodore Barry Bridge, near milepost 111.0.

Figure 6-23 – Interstate 295 Corridor



2000 Conditions

According to the model, the daily volumes carried on I-295 range from about 4,000 to 6,000 trucks. I-295 and the Turnpike compete for truck traffic in this region, and both serve as gateways to Delaware and points south. In examining the model output, it appears that the model assignment favors the Turnpike, while observations indicate that a substantial number of truck do use I-295. This should be kept in mind when reviewing the model statistics.

In 2000, the model estimated I-295 carries approximately 2.6 million VMT daily in both directions, with approximately 380,000 VMT during the AM peak hour, and approximately 830,000 VMT during the PM peak hour.

2025 Conditions

The percentage of daily truck VMT increases to 4 percent from 2000 to 2025, with similar increases during the AM peak hour (4 percent) and PM peak hour (3 percent). Overall, daily VMT increases over 100 percent from 2000 to 2025, while daily truck VMT more than doubles from 2000 to 2025. Similar statistics are forecast for the AM and PM peak periods.

Daily truck VMT at a LOS E or F increases from 1 percent of all trucks in 2000 to 2 percent of all trucks in 2025. During the AM peak hour, truck VMT at a LOS E or F increases from almost zero percent in 2000 to 4 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases from 1 percent of all truck VMT in 2000 to 4 percent in 2025.

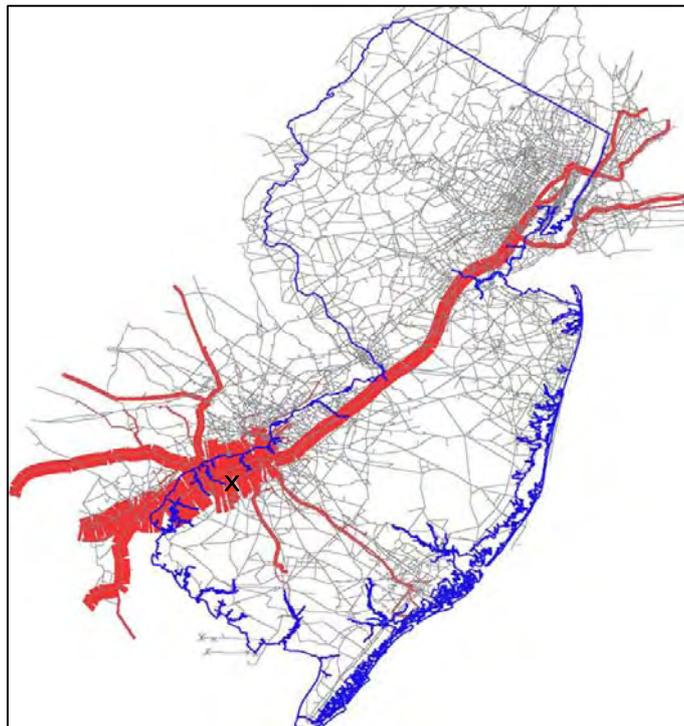
As discussed above, the Statewide Truck Model needs to be updated to better reflect the competitive nature of travel in this corridor between I-295 and the New Jersey Turnpike.

Select Link Analysis

The link selected for assessment is a link just south of the Commodore Barry Bridge. I-295 is primarily an alternative route to the New Jersey Turnpike in this location. It serves to move truck traffic from Delaware and southeastern Pennsylvania to the southern New Jersey region with some trips jumping back on the Turnpike to head north after passing the Camden area.

As shown in Figure 6-24, the pattern of trips indicates that this section of I-295 primarily serves southern New Jersey.

Figure 6-24 - Base 2030 PM Peak Period Truck Traffic on Interstate 295 South of Commodore Barry Bridge (MP 11.0)

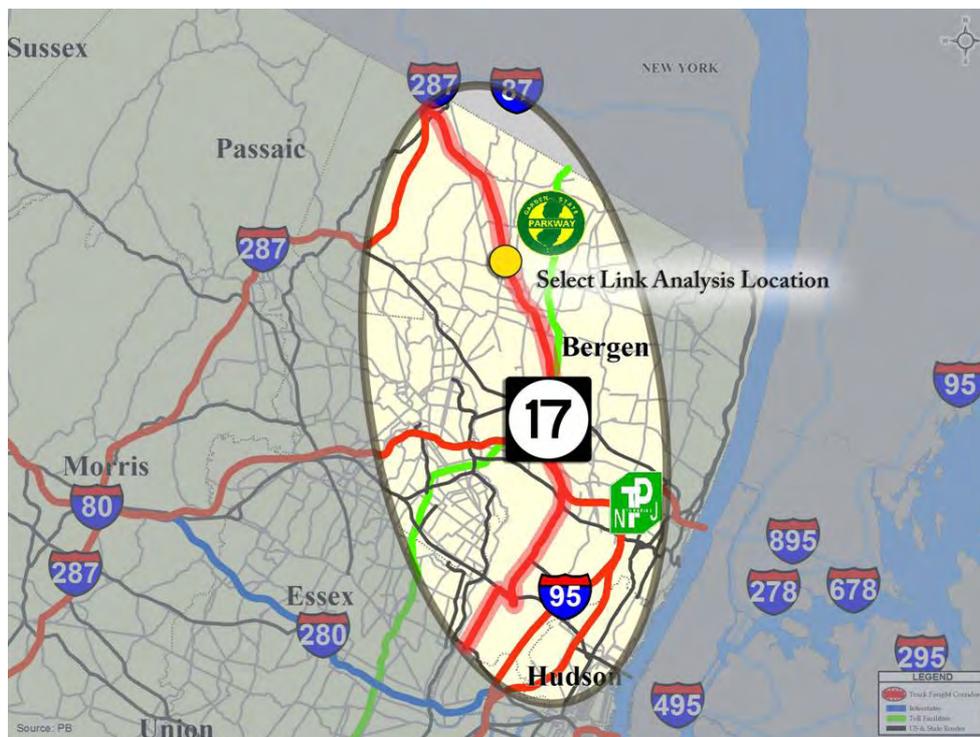


ROUTE 17 CORRIDOR

Corridor Definition

Figure 6-25 depicts the Route 17 Corridor, and the link highlighted for assessment, north of the Garden State Parkway, near milepost 14.0.

Figure 6-25 – Route 17 Corridor



2000 Conditions

According to the model, the daily volumes carried on Route 17 range from about 8,000 to 11,000 trucks.

In 2000, the model estimated Route 17 carries approximately 2.5 million VMT daily in both directions, with approximately 530,000 VMT during the AM peak hour, and approximately 600,000 VMT during the PM peak hour. The percentage of VMT of trucks daily is 9 percent, with trucks carrying 6 percent of VMT during the AM peak hour, and 8 percent of VMT during the peak hour.

2025 Conditions

The percentage of daily truck VMT is forecast to increase slightly to 10 percent from 2000 to 2025, with similarly small increases during the AM peak hour (7 percent) and PM peak hour (9 percent). Overall, daily VMT increases 31 percent from 2000 to 2025, while daily truck VMT increases 52 percent from 2000 to 2025. During the AM peak hour, overall VMT is forecast to increase 23 percent, while overall truck VMT increases 46 percent. During the PM peak hour, overall VMT increases 29 percent, while overall truck VMT increases 42 percent.

Daily truck VMT at a LOS E or F increases from 24 percent of all truck VMT in 2000 to 47 percent of all truck VMT in 2025. During the AM peak hour, truck VMT at a LOS E or F is forecast to increase from 34 percent in 2000 to 83 percent in 2025. During the PM peak hour, truck VMT at a LOS E or F increases from 60 percent of all truck VMT in 2000 to 79 percent in 2025.

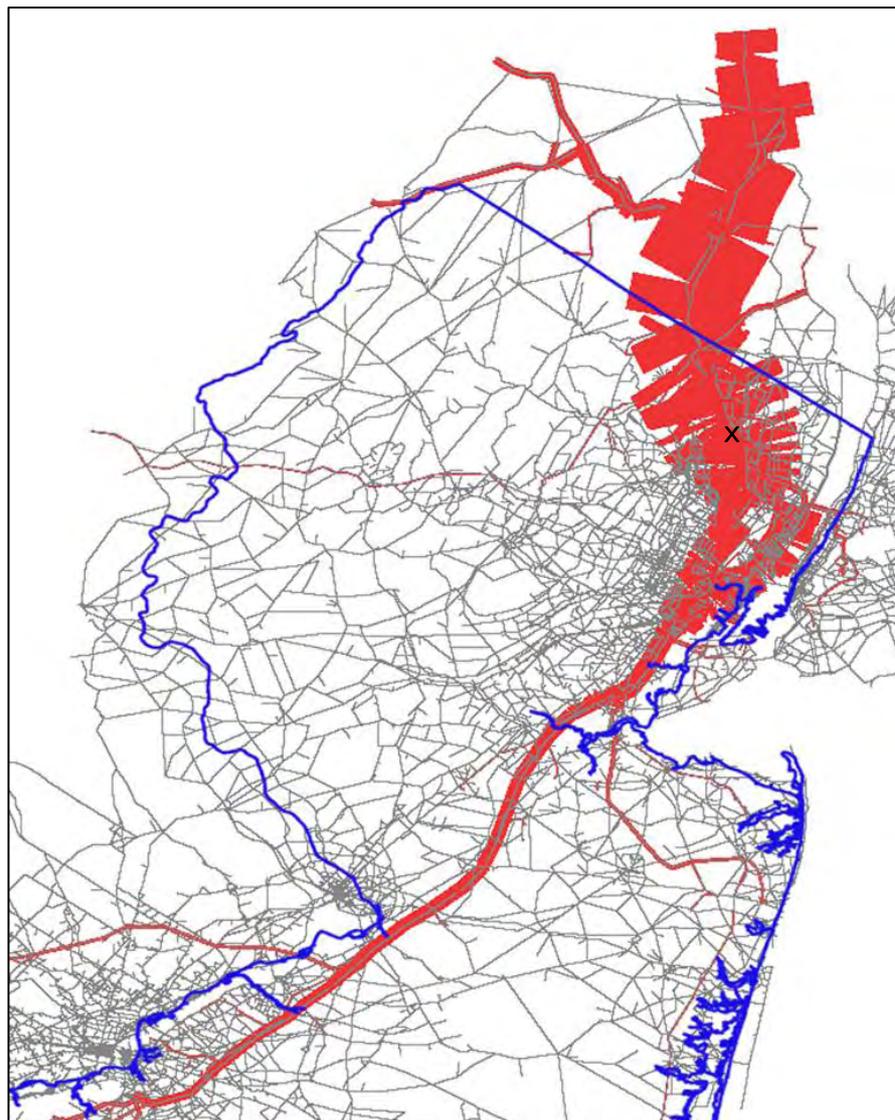
Select Link Analysis

Route 17 carries a large amount of truck traffic into New York State. Most of the traffic is generated in the north Jersey metro area. The roadway serves a significant portion of local and intrastate truck trips, as indicated by the thickness of the band in the metro region as compared to the other areas as shown in Figure 6-26.

Route 17 carries many non-commercial vehicle trips. It functions as a major urban arterial, proving both mobility and accessibility throughout the region. That fact that the roadway also carries a large amount of truck traffic places further strain on an already congested corridor. With the forecast growth, this roadway will need attention in order for it to maintain its important mobility and accessibility functions.

As in all of the primary truck corridors, Route 17 serves a dual purpose, moving both people and goods. These corridors are very important to the economic well being of the State and the regional as a whole. They serve as conduits for both intrastate and interstate travel. Most are already highly congested in the peak periods, and measures must be taken to improve traffic operating conditions.

Figure 6-26 - Base 2030 PM Peak Period Truck Traffic on Route 17 North of GSP (MP 14.0)



CORRIDOR ASSESSMENT NEEDS

The State's primary truck corridors face many challenges:

- The major truck corridors will continue to carry large amount of truck trips, both internal trips to New Jersey, and interstate traffic.
- The forecasting tool indicates that all the major truck corridors will have substantial growth in both total vehicles and truck traffic.
- Truck traffic in general is expected to grow at a higher rate than the others vehicles.
- More and more truck trips are forecast to occur under congested conditions.

As these vital roadways are so important to the movement of both people and goods, it is necessary to develop a program of improvements aimed at reducing congestion and maximizing traffic flow.

A corridor assessment program and project development process focused on these key corridors is required. For each corridor, and in the areas near the ports and warehouses, a study and development work program should commence that will thoroughly investigate the traffic flow conditions and needs on these facilities. A data collection program targeting vehicle classification and an operational assessment program, relying on highway capacity assessment techniques and the advanced tools of the Statewide Truck Model, can be used to define a traffic profile of each key corridor, assessing existing and future conditions including area and spot problems. Management system information and field reviews will provide the opportunity to identify and quantify operational deficiencies, both related to auto and commercial vehicles. Unique characteristics of the corridors should be identified, as they relate to the composition of traffic and the demand for the movements of people and good in the corridor.

Improvement programs / projects can be formulated based the results of the assessments, and should consider the assessment of multi-modal alternatives to best meet existing and future demands. The impact of actions proposed throughout this plan must also be accounted for in order to develop a coordinated program of investments that can build synergies. For examples, actions to reduce the growth in peak period demand for truck travel, such as shifting a portion of truck traffic to rail, or utilizing off peak period capacity, as well as localized capacity improvements, can be assembled into an action plan for each priority corridor or areas of significant freight activity.

The impact of non-commercial vehicle growth in these key corridors must also be quantified. The growth in overall traffic is forecast to have a more pronounced impact on truck traffic, resulting in a higher increase in overall delay for commercial vehicles. Planning improvement projects to address this need, and exploring methods to ensure freight oriented improvement projects do indeed benefit freight traffic, must be included in the planning effort.

HIGHWAY FREIGHT ISSUES

It is predicted that New Jersey's demand for goods will continue to grow strongly. Between 2000 and 2020, Port Newark/Elizabeth-related truck traffic is expected to grow by 86 percent and highway vehicle miles of travel are predicted to more than double in thirty years. Based on current trends, the highway transportation system capacity will not keep pace, and overall delay and congestion is expected to rise.

This section discusses the key issues confronting the highway freight system within this context, current initiatives in place to address these issues, and suggested improvement strategies, including, where applicable, criteria for measuring performance. For the highway freight chapter, the strategies are referenced as Strategy H-X, where the "H" represent the series of highway strategies and the "X" a consecutive number for the series.

ISSUE ONE: INCREASING DELAYS CAUSED BY CONGESTION

Over a thirty year period, it is forecast that total vehicle hours traveled in the peak hour will increase about 120 percent, and vehicle hours of truck travel will rise over 175 percent. This travel will be in increasingly congested conditions, indicated by the average travel speeds of trucks dropping by about 10 mph. Increasing truck delays caused by congestion will raise the cost of moving freight in New Jersey. Most of the major highway freight corridors in New Jersey already experienced delays due to excessive congestion in the year 2000, and forecasts for future freight growth anticipates a sizeable increase in vehicle miles of travel for all vehicles including trucks.

A lack of roadway redundancy, specifically along the most traveled truck corridors, can also contribute to congestion. Freight delivery logistics depend on predictable travel times, reliable major routes, and the ability to bypass congested roadway sections using alternate routes. As the system becomes less reliable, motor carriers have to adjust by making more frequent deliveries, keeping more inventories on hand, or building more freight support and storage facilities near their customer bases. All these options add costs to the price of the shipped goods.

CURRENT INITIATIVES

Each year, NJDOT and its transportation partners invest millions of dollars improving the highway infrastructure. Projects are designed to address maintenance, safety, capacity, and operations along the State's highways and its border crossings. While this program is significant it cannot, given the current level of transportation funding, address all the issues facing the transportation system. As growth continues, capacity problems will also continue throughout the state.

While not all problems can be addressed, targeting specific highway infrastructure improvement to facilitate the movement of freight is very important. NJDOT, the Authorities, and the MPOs are placing an increased emphasis on developing projects targeted to improve highway freight operations. The Portway and Portway Extensions programs initiated by NJDOT and discussed in detail in Chapter Four and in Appendix C, are a major first step in recognizing the demands for improved access and safer and strategic travel associated with the highway freight system serving New Jersey. These programs are advancing a series of targeted highway freight improvement projects.

The development of improved data and analysis tools help determine where it is best to target infrastructure improvement to mitigate current and forecast congestion. The ability to simulate and forecast travel, and estimate how both vehicle and truck trips will react to changing conditions, is a major benefit of travel demand models like the Statewide Truck Model. NJDOT regularly updates and upgrades its analysis tools to maintain the best "state of the practice" toolbox.

During the development of this plan, it was recognized that even though it was a very useful tool, the Statewide Truck Model would benefit from an enhanced reporting mechanisms of the simulation process. In reaction to this need, NJDOT has commissioned a project to develop and report enhanced model network performance statistics specifically applicable for trucks. NJDOT already utilizes an advanced reporting

system that delivers enhanced network performance measures for vehicles and person trips. However, it is currently oriented toward auto trips. The enhancements underway are adopting PPSUITE (a post processing package that links to the output of the model) to analyze truck trips separately from the remainder of the traffic stream. This would allow for enhanced assessment and analysis of truck related issues, such as mode and temporal shifts of freight in the system and along targeted “freight” corridors. New performance measures under development at this time include:

- travel time index – a relative ranking of corridor congestion throughout the state
- lane-miles of congestion
- average corridor volume to capacity ratio development
- truck vehicle hours of delay
- average travel speed for trucks
- ability to report separately port-related and all other truck traffic
- report of available roadway capacity by time periods – a temporal look at peak and off-peak capacity

Some of these enhancements were available for use in this plan. After the enhancements are completed, the model will be used to identify and target corridors with the greatest reliability problems and congestion issues. The travel time index and various demand to capacity measures will allow the user to determine a relative ranking of corridors in terms of congestion and reliability issues.

Transportation models and analysis tools require data. NJDOT made a significant investment during the development of this plan to purchase and analyze 2003 TRANSEARCH data, a commodity flow database that captures the flow of freight that originates, terminates, or passes through New Jersey. NJDOT also purchased a significant amount of data from InfoUSA, a commercial database of 14 million businesses in the US. The database includes information on each business' primary and secondary NAICS code, number of employees, square footage, and location in GIS format. The Master Plan team purchased information on all businesses in New Jersey with 50 or greater employees at a location. Considerable effort was also made to secure data from other sources, and the result of this effort is the commodity flow analysis presented in Chapter Two and in Appendix A. This database and assessment provided a wealth of data for this plan.

Not all of the data gathered can be used “off the shelf”. A considerable amount of effort is required to clean and process the data. NJDOT is currently in the process of purchasing a software package that will allow the department to better process and display freight related data.

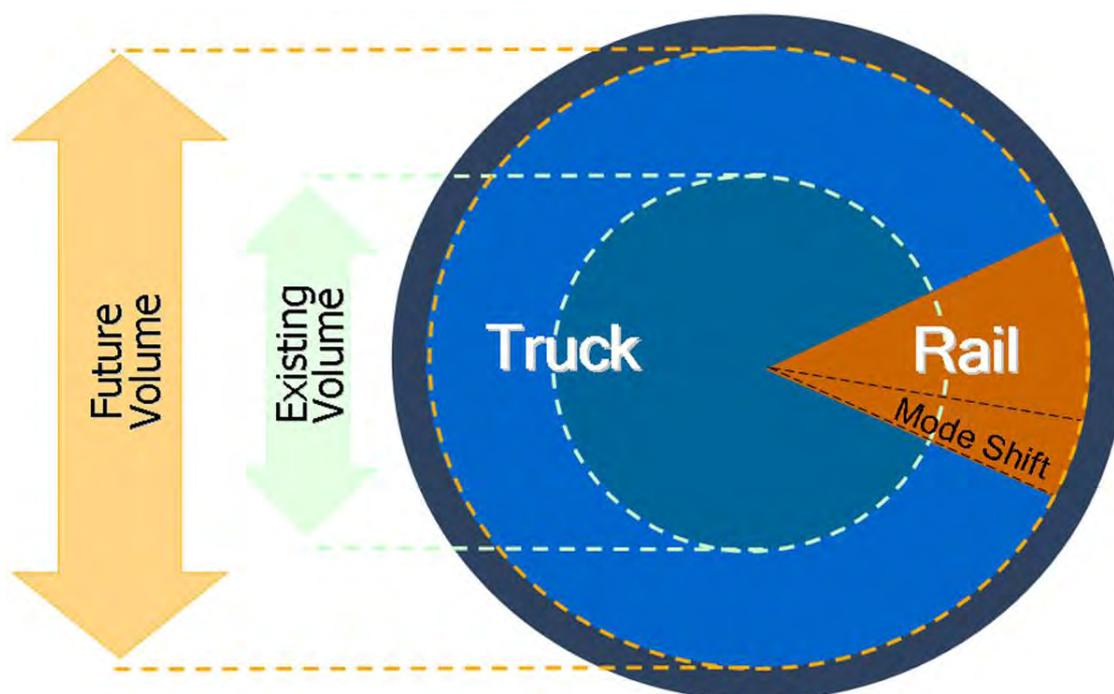
The Department will commence a five year truck counting and monitoring program in 2007. The Program will:

- Monitor the statewide effect of the proposed new 102’ large truck regulations upon truck traffic volumes and patterns over the next 5 years to quantify their effectiveness in assigning more truck traffic to the National Network.
- Collect, analyze, and report on truck volumes, Origin/Destination (O/D) patterns, and crash statistics along key truck corridors throughout the state during that time period.
- Ensure functionality of existing Weigh in Motion (WIM) Stations and add new WIM Stations.
- Provide much needed truck volume data to support the advancement of a variety of freight plans, programs and projects statewide.

STRATEGY H-1: SHIFT A PORTION OF TRUCK TRAFFIC TO RAIL AND OTHER MODES

System-level issues are more important than ever; demand for freight movement is growing for every mode, and each must be able to continue to carry its share. As trucks are the predominate mode in moving freight, and are operating on an increasingly congested highway network, a sound strategy to reduce highway freight congestion is to move a portion of the goods from trucks to rail and other modes. As Figure 6-27 shows, mode-shift strategies (shown in the example as shifting a portion from truck to rail) will not fully address the overall level of demand, as the size of the overall pie is growing. While a shift from truck to rail could help ease the burden on the highway system, with future volumes projected to increase by more than 65 percent for all modes, the mode shift would have to be dramatic to preclude the increase in truck freight. Nonetheless, there are benefits to implementing measures to reduce the amount of truck freight growth.

Figure 6-27 Increasing Demands for All Modes



STRATEGY H-2: DEVELOP IMPROVED HIGHWAY FREIGHT ANALYSIS TOOLS AND DATA SETS

Capacity related improvements to the highway system need to be targeted to the primary highway freight corridors in order for them to effectively address congestion problems impacting the movement of goods. The development of improved data and analysis tools could help determine where it is best to target infrastructure improvement to mitigate current and forecast congestion. NJDOT is working on elements of its planning toolbox, but more work needs to be done.

To be effective and efficient, the elements of the freight system must both be optimized individually and work together seamlessly. Significant planning and analytical capabilities will need to link both the rail and truck freight system to waterborne commerce and intermodal transfer locations. This will be required to gain a better understanding of the relationship among improvements in capacity, travel times, and reliability at nodes and along corridors and their impacts on freight movements as part of the overall logistics supply-chain. Analyzing the impact of reducing truck trip growth could provide very useful information. However, due to the lack of a methodology to estimate the number of truck trips that could be shifted to rail, it would be necessary to settle for an assumption. A method of calculating the range of shift possible, under various scenarios, could feed more accurate information into the system assessment, and thereby produce more accurate results.

System efficiency and balance is a fundamental issue that affects how freight moves. Understanding the trade-offs among the modes, and the desires of the users, sets the stage for exploring what system balance is appropriate in New Jersey. NJDOT does not have the ability to assess the components together as a system to identify trade-offs in benefits and costs.

NJDOT should take the lead in the development of an integrated, multimodal planning package. It will, however, be a challenge. Each of the modes has its own characteristics, issues, and performance measures. Fundamental system-level considerations must also be factored into the planning process. Developing the architecture of an analysis tool would be a good starting point, and working to develop individual components would be a logical next step. Ideally, the process would also have linkages to funding considerations and the investment decision making process.

STRATEGY H-3: INTEGRATE HIGHWAY FREIGHT CONSIDERATION IN THE HIGHWAY IMPROVEMENT PLANNING AND PRIORITIZATION PROCESS.

One of the primary goals of developing this first *Comprehensive Statewide Freight Plan* was to elevate the movement of goods in New Jersey to the level of importance attached to the movement of people. There are several measures that could be implemented to move toward achieving this goal.

First, NJDOT maintains a series of management information systems that include data on pavement condition, bridge condition, congestion, safety, drainage, and maintenance issues. The Department is in the process of upgrading these systems and integrating the systems to provide a more useful database.

Considerations of freight needs and issues must be incorporated into the design of the integrated database. The transportation system must move both people and goods. An increased emphasis on freight needs and issues must be integrated into the Department's planning and design process to provide better data on the locations where freight movement is a significant activity and where efforts should be made to better accommodate it. The designation of the major truck corridors earlier in this chapter is a start in this direction.

Additional efforts include integrating and emphasizing highway freight and other modal freight issues and needs into the Department's Long Range Transportation Plan, the capital programming process, and the capital investment strategy. Freight should also be emphasized in the planning and project development process of the MPOs, and the State Development and Redevelopment Plan.

Integrating freight considerations into local municipal planning is also an important step. Pilot efforts such as the exit 8A Congestion Busters Task Force as well as the development of the Model Circulation Element for New Jersey towns are initiatives in this direction.

STRATEGY H-4: INCORPORATE INTELLIGENT TRANSPORTATION SYSTEMS (ITS) INTO HIGHWAY FREIGHT SYSTEMS.

ITS offers the opportunity to extract more practical capacity from our transportation system by operating the system in a more efficient manner. CVISN, the Commercial Vehicle Information System Networks, is an example of an ITS program specifically designed to improve motor carrier safety, efficiency, and convenience (CVISN is discussed in greater detail in Strategy H-8). EZPass, an electronic toll collection system that is part of the ITS family of components, has been implemented throughout New Jersey's toll roads and at crossings of the State line.

ITS can also be used to gather useful information to better manage the highway system. One possible way of validating existing reliability data on an ongoing basis is to collect real-time data on positions and speeds using vehicle transponder data from EZPass or TRANSCOM. Over time, this rich database of operational data could be used to monitor and identify regions and hot spots with congestion and reliability problems. This data could be cross-referenced with the state's Safety Management System to further determine whether delays are recurring (congestion related) or non-recurring (incident related). This information can be used by the state to further refine its deployment and use of ITS technologies.

STRATEGY H-5: DEVELOP HIGHWAY FREIGHT TARGETED INFRASTRUCTURE IMPROVEMENTS, FOCUSING ON THE MAJOR TRUCK CORRIDORS

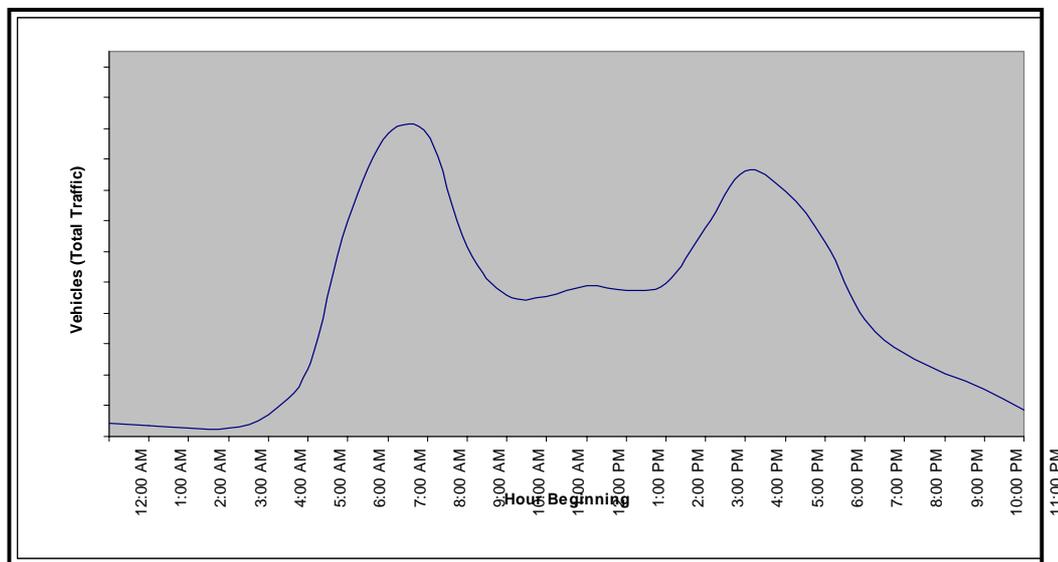
It is unlikely that near-term system redundancy for the highway system in New Jersey can be achieved through major capacity expansions. Notable exceptions include the expected widening of the NJ Turnpike for 21 miles from Exit 6 in Burlington County to Exit 8A in Middlesex County; and, the expected widening of the NJ Turnpike between Exit 1 (Delaware Memorial Bridge) and Exit 4 (NJ 73). Redundancy and reliability options will have to be created through the effective use of existing parallel facilities, the deployment of ITS strategies throughout the state, and by targeted capacity increasing projects.

The Portway and the Portway Extension projects are examples of developing infrastructure improvements targeted to highway freight (and the linkage to the Port). Additional initiatives should be developed for the major truck corridors, defined as the New Jersey Turnpike, I-78, I-80, I-287, I-295, and Route 17. The port regions and the Liberty Corridor should also be examined.

ISSUE TWO: UNDERUTILIZATION OF OFF-PEAK PERIOD ROADWAY CAPACITY

The Statewide Truck Model indicates that peak hour congestion will continue to grow. The growth in system hours of travel is so great that a significant portion of the growth is expected to spread to the shoulders of the peak hours and extend both the morning and evening peak periods. While traffic overall is increasing, the proportion of off-peak period demand to capacity is still significantly lower than those found in the peak periods. Figure 6-28 illustrates a typical daily traffic profile over the course of a normal commute weekday. The volume spikes seen in the morning and evening peak periods are where congestion usually occurs, as many roadways are carrying volume at or near their capacity during the peak periods. During the off-peak periods the volume on these roadways is usually far below carrying capacity. In the late evening and early morning period, traffic is even lower, and vehicles experience near free flow traffic conditions.

Figure 6-28 - Typical Daily Traffic Profile for NJ Interstates/Highways

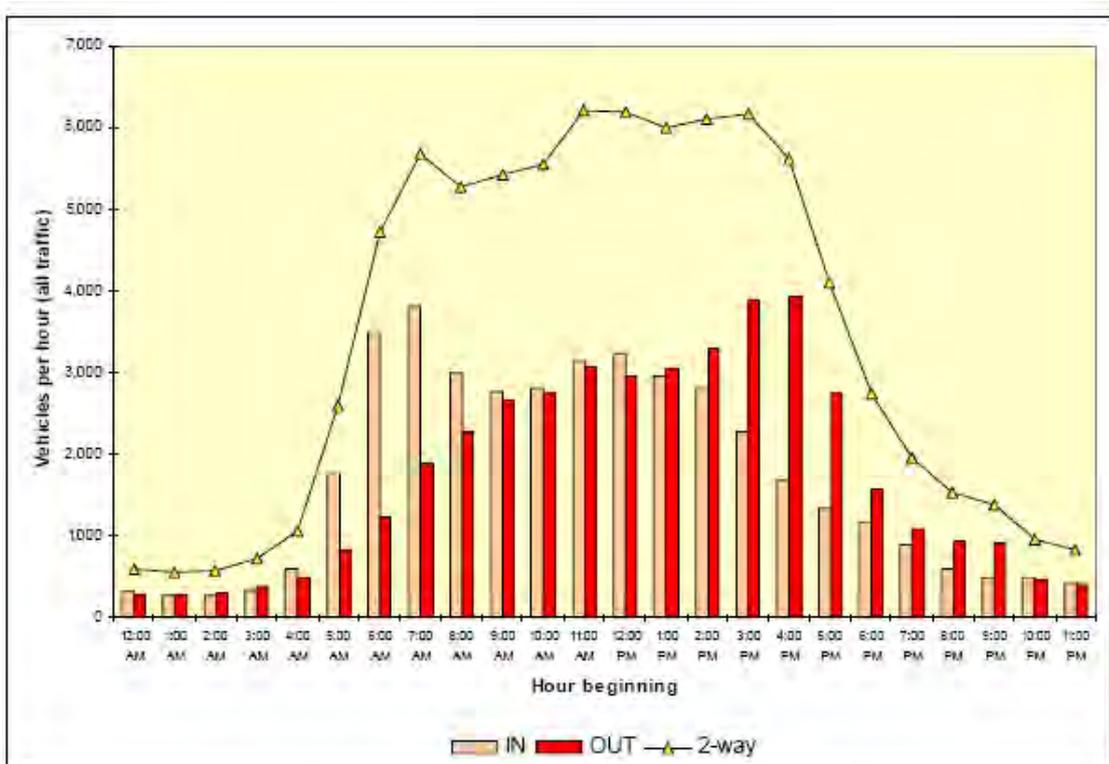


As discussed in the context section, truck trips are forecast to grow considerably and truck travel in congested conditions will also grow. Congestion results in added travel time to the movement of freight by trucks, which in turn leads to increased shipping costs, or even the loss of business to other states as carriers and shippers seek to avoid the congestion.

Currently, trucks travel during the peak periods for a number of reasons, but mainly in response to customer needs and business practices. Many businesses that utilize the trucking industry, such as shippers, warehouses and consignees, operate in and around the traditional peak periods. Package delivery companies (i.e., Federal Express, UPS, US Postal Service) have established their reputation on delivering packages during the morning peak periods and picking up new packages during the evening peak period.

For example, Figure 6-29 shows that most truck travel in the Newark/Elizabeth port area occurs between 5 a.m. and 6 p.m., and that the peak hours of port traffic correspond closely with the traditional morning (6 a.m. to 10 a.m.) and evening (4 p.m. to 7 p.m.) commuter peak hours. This means that most motor carriers are on the road concurrently with the highest number of motor vehicles and are subject to the same roadway congestion that plagues the peak periods.

Figure 6-29 - Daily Traffic Profile: Newark/Elizabeth Port Area (2000)



It is unrealistic to believe that New Jersey can provide enough new roadway capacity to match and mitigate the peak period demands, nor enough new capacity to even maintain the level of service experienced today as time moves forward. For this reason feasible solutions must address ways to utilize available capacity that exists in the off-peak periods. There are, however, barriers that prevent the whole scale shifting of truck trips to off-peak hours, including warehouses and consignees whose operating hours and delivery schedules dictate that motor carriers operate primarily during the peak periods.

Freight movement occurs both within New Jersey and external to New Jersey. Addressing this problem will require cooperation of agencies, operators, and receivers beyond New Jersey’s borders in order for it to be highly successful. As an example, if the South Jersey Port Corporation were to extend its hours, and Philadelphia area businesses did not accept deliveries past normal working hours, then the program would be ineffective for trips heading from the South Jersey Port to Philadelphia, as the drivers would be unable to complete their journeys in a efficient manner.

CURRENT INITIATIVES ADDRESSING THE ISSUE

The New Jersey Logistics Council has formed an Extended Hours Task Force subcommittee which is examining the barriers to off-peak operations and is working to develop feasible solutions for getting stakeholders to expand operations outside of their traditional hours.

STRATEGY H-6: PROMOTE EXTENDED HOURS

Extending the operating hours of ports, warehouses, and consignees would pave the way for truckers to take advantage of operating in less congested conditions. Both costs and demand drive the need for facilities to operate extended hours. Port and warehousing facilities that are generally located in less restrictive operating areas (in terms of local ordinances) can and do respond to the marketplace. If it is cost effective and profitable to extend the operating hours at their facilities, the industry will respond accordingly. At present, however, the market for these extended hours is limited because of the limitations at the consignee end of the trip.

Consignees do not always have the option to operate extended hours. Some municipalities have enacted time-of-day restrictions as conditions of approval for retailers to locate and operate in their communities. This is in response to the public perception that trucks create noise, air pollution, and threaten their security and safety. These restrictions limit the hours of operation primarily to “normal” business hours and keep truckers from altering their delivery schedules to effectively use off-peak capacity. As a result, the demand for extended hours at the ports and warehousing facilities remains below the critical mass that would support remaining open for longer periods.

There are several steps that can be done to promote extended hours, including:

- Facilitate discussions between the Office of Smart Growth (OSG) and local/county officials to create zoning legislation for “freight-friendly” areas that would allow consignees, warehouse/distribution center operators, and freight support facilities to operate during off-peak periods while maintaining the principles of smart growth presented in the SDRP.
- Seek to dedicate additional land near port and industrial locations for freight operations, and limit non compatible uses. This would enhance the ability of the facilities to operate for extended periods with minimum interference or opposition.
- Evaluate the transportation cost savings associated with off-peak period operations and share the results with stakeholders to help them understand the benefits to their operations and costs.
- Evaluate the air quality benefits of moving truck traffic out of the peak periods including the reduced idling time in queues outside of facilities and reduction loading turn-times.
- Work with consignees to encourage extended hours of operations to accept deliveries of freight during off-peak periods.
- Work with toll agencies to develop tolling incentives that encourage motor carrier usage during off-peak periods.
- Create tax incentives and other legislation to encourage freight-related development that keeps New Jersey warehousing and freight support facility prices competitive in the regional market.
- Encourage private sector stakeholders to develop self sustaining solutions that encourage off-peak period use of the roadway system. One such program is called “OFFPeak”, and is discussed below.

In California the ports of Los Angeles and Long Beach have recently launched a program called “OffPeak”. In addition to operating outside of the weekday peak periods, terminals will now also operate on Saturdays. OffPeak is aimed at reducing the residual effects of the increasing volume of container cargo moving through the ports by shifting operations to weekends and nights when trucks are not competing with commuter traffic. Incentives to use the off-peak periods include a Traffic Mitigation Fee that is assessed to each container moving through the ports during peak periods. This fee is used to defray the cost of the additional gate hours on

Saturdays and outside of the weekday peak periods. OffPeak was conceived in part in response to proposed legislative initiatives to tax the movement of cargo during peak periods. It is organized and is being operated by a consortium of private-sector terminal operators called PierPass.

OffPeak is expected to foster more efficient use of terminal gate hours and mitigate congestion by shifting 15 percent to 20 percent of all container movement at the ports to weeknights and Saturday's in the first year and 40 percent to 45 percent within three years. Initially, Turn-times (the amount of time for a truck to enter a facility, pick up its load, and exit the terminal) were just half of what they had been before the program was initiated. To date over 4,500 member groups of the freight industry have registered with PierPass Inc., including importers, exporters, truckers, freight forwarders and customs brokers.

It is recommended that NJDOT encourage the development of a similar program in New Jersey as an effective means to implement better use of off-peak period capacity.

STRATEGY H-7: COORDINATE OFF-PEAK PERIOD INCENTIVE TOLLING

Many of the major truck corridor and border crossings are tolled facilities. Promoting a coordinated effort to lower tolls charged to commercial vehicles for traveling during the off-peak hours provides incentives to alter travel times and discourages trucks from moving in the peak periods. If combined with other economic incentive, as defined in the Offpeak program, synergies could be achieved to enhance the attractiveness of the strategy.

Further synergy could be achieved if the off-peak period incentives were extended to all vehicles. Various programs have been in operation, and changes are proposed for many. Working to strengthen the incentive tolling program is important, and will require coordinated regional decision making, as operators of individual facilities often act based on their individual facility needs and interests. NJDOT should take a leadership role to ensure that the decision making process includes consideration of regional and statewide issues.

ISSUE THREE: INCREASED EMPHASIS ON SAFETY AND SECURITY

The attacks of September 11th, 2001, created an added urgency to securing our ports and highways. This increased awareness and enforcement has added a layer of complexity in the freight delivery system, and in some cases is creating delays for the motor carrier industry. Protecting the nation's infrastructure, and its citizens, is of paramount importance. However, highway security measures have led to a greater chance that cargo traveling by truck will be stopped, inspected, and searched multiple times before reaching its destination. While important measures, the current system delays the delivery process and adds costs.

There is also an expressed need to make motor carrier travel safer and more efficient than ever before. This emphasis on safety is carried from the truck driver, to the cargo being carried, to the vehicle carrying the freight and the routes where it is traveling. There is a need to keep heavier and wider trucks off many of New Jersey's roadways where they are not appropriate. The issue is how to balance the security and safety needs of the state and the nation with the need to maintain and further streamline the efficiency of commercial vehicle operations.

Benefits of the "Off-Peak" Program

Move cargo more efficiently:

- Spreads existing traffic across more hours
- Makes better use of valuable port assets
- Reduces uncertainty of delivery times, enabling better planning by cargo owners
- All terminals will operate the same days and hours
- Reduces turn times (pickup and drop-off) for trucks and drivers
- Reduces truck traffic on California highways during commute hours

Community and environmental benefits of OffPeak:

- Reduced road congestion around the ports
- Reduced truck idling during commute hours
- Reduced fuel consumption
- Improved air quality
- Gives the community crucial time to develop a more comprehensive growth plan

Excerpted from PierPass.ORG

STRATEGY H-8: PROMOTE CVISN PROGRAM AIMED AT VEHICLE INFORMATION SYSTEMS

Security measures that add delay involve stopping or inspecting vehicles or containers because of the unknowns; either the contents of the vehicle or container or who is moving it. A program aimed at reducing the unknowns should result in time savings to the delivery process. It should also increase the ability of responders to emergency situation to quickly and properly react to any concerns that may arise due to the nature of the goods being transported.

New Jersey is part of the multi-state I-95 Corridor Coalition that is working together on the design and deployment of integrated information systems that extend beyond state and agency borders. The Coalition focuses on improving such functional areas as interoperability, mobility, congestion, economic growth, safety, and security. Commercial Vehicle Information System Networks (CVISN) is one initiative that the Coalition is actively advancing.

CVISN is one part of the FHWA's national architecture for Intelligent Transportation Systems (ITS). Specifically, CVISN is designed to improve motor carrier safety, efficiency, and convenience. It also contains elements that can be used to enhance overall security measures. CVISN touches on three major areas:

- Safety information exchange – automating the input of safety inspections and providing instant recall of historical inspection and safety data.
- Electronic credentialing – of the driver and cargo, providing the motor carrier with efficient ways to apply and pay for permits (i.e., overweight permits) while also adding to the overall security of the freight being moved.
- Electronic screening – making inspections and law enforcement activities more efficient through the interoperability of motor carrier data.

The state should continue its support of the I-95 Corridor Coalition programs and seek funding for the development and implementation of ITS-related technologies for commercial vehicles, including promoting CVISN.

ISSUE FOUR: LACK OF SUPPORT FACILITIES

Support Facilities include fuel stations, repair facilities, truck parking, rest areas, container storage, and other ancillary elements of the highway system which are critical to the movement of goods by truck. Considerable concern has been expressed by the trucking industry in regards to the perceived lack of support facilities in New Jersey, particularly the lack of truck accessible rest areas and service areas. It has been observed that the existing facilities do not have a sufficient number of spaces to accommodate the demand generated by today's trucking fleet.

The lack of support facilities makes operating efficiently more difficult for the trucking industry. Truckers depend on these facilities for refueling, down-time and maintenance. Figure 6-30 depicts the locations of the state's official service and rest areas. All of these facilities are located on Authority-owned roadways (New Jersey Turnpike Authority, South Jersey Transportation Authority) some parts of which are not accessible to trucks. The figure indicates that other than authority-owned roadways, there are no other State leased, owned, or operated rest or service facilities in New Jersey. The absence of support facilities on interstates, U.S., and New Jersey routes is a significant concern for the trucking industry, especially in light of the new hours of service regulations, which put pressure on truck drivers to find areas to park and comply with mandatory time-off requirements.

Also significantly, good data about the type and amount of services at truck stops (i.e., the number and availability of parking spaces and whether showers are present) is not readily available.

One of the major hurdles to additional rest facilities (truck or otherwise) is that both federal and state statutes currently prohibit using rest areas on Interstates for commercial purposes. At present even interested

companies cannot build and operate these facilities where they are most needed. The American Association of State Highway Transportation Officials (AASHTO) is currently working to have the law amended to accommodate privatization. Although some federal funds are allocated to build general rest stop facilities, there is no funding for the operation and maintenance of these facilities.

As with trucks in general, truck stops/rest areas are perceived as undesirable and unprofitable in many communities. Safety, security, and air quality issues are the common reasons for communities not agreeing to host these facilities. Further discussion of this issue is presented in Chapter Eleven in the land use sections.

CURRENT INITIATIVES

One of the promising initiatives in New Jersey has been introduction of the IdleAire Corporation. IdleAire is a company that specializes in modern rest stop technology. This technology provides truckers with the amenities of power, air conditioning, television and the Internet from the comfort of their cab through an external power source that does not require the truck engine to be on. Therefore, idling and its negative effects on air quality are greatly diminished. As of now there is one pilot location in New Jersey and there are plans to expand this program in New Jersey in the near future.

A single, standard heavy-duty diesel truck with a 425 horsepower, operated the standard 306 days a year, idling during legally required rest breaks and stopping for other reasons for 30 minutes per day produces 55,833 lbs. of emissions annually-solely from idling. These emissions include:

- 54,240 lbs. of carbon dioxide
- 1,047 lbs. of nitrogen oxides
- 396 lbs. of carbon monoxide
- 110 lbs. of volatile organic compounds
- 40 lbs. of particulate matter.

*Excerpted From IdleAire Website

STRATEGY H-9: INVENTORY TRUCK REST AND SERVICE FACILITIES AND ANALYZE NEEDS

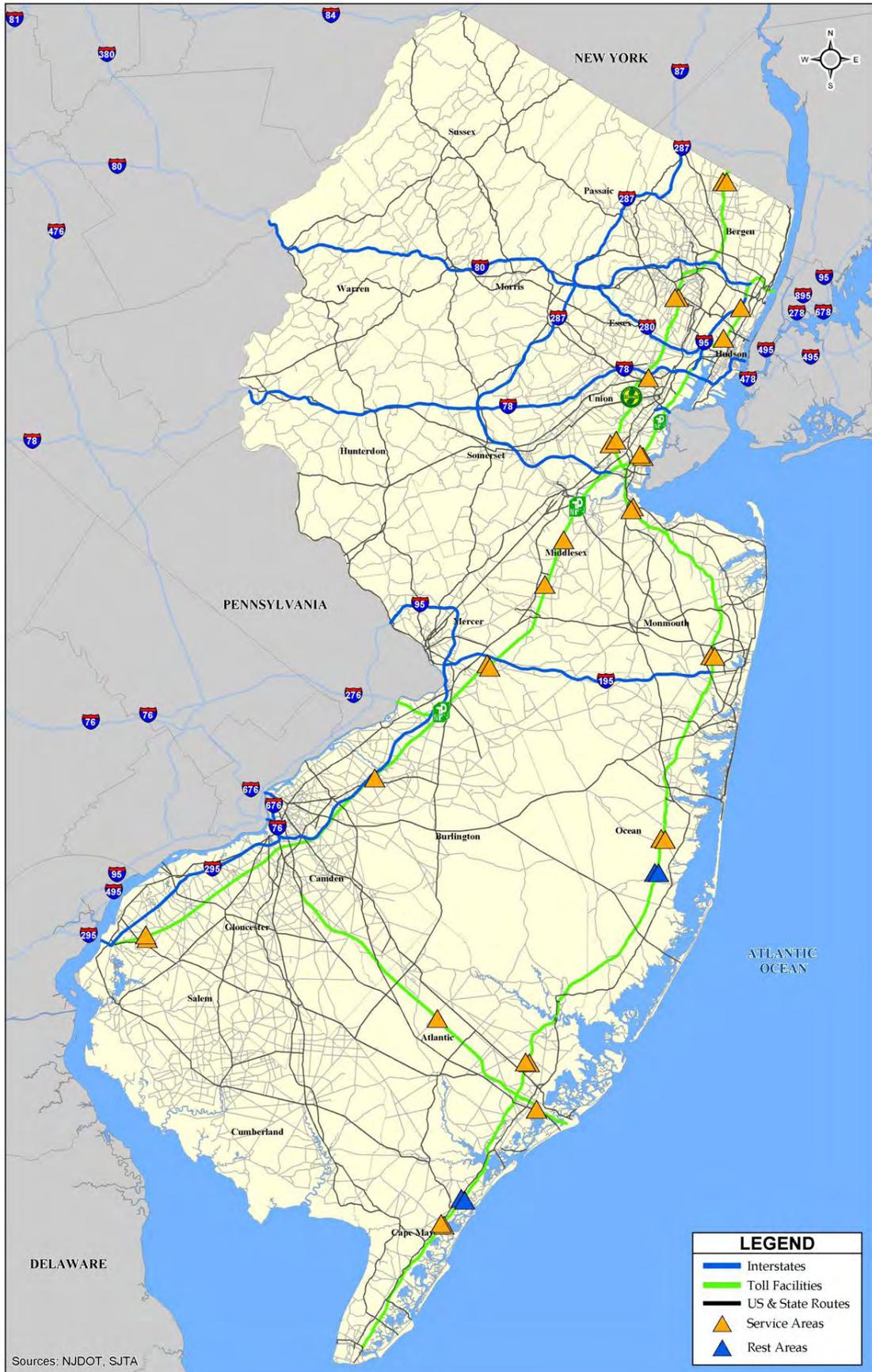
The NJDOT is working with The North Jersey Transportation Planning Authority in their study to analyze the needs of the trucking industry for rest/service stops in the 13-county NJTPA region. In particular, the study will examine the feasibility of the expansion of existing staging/rest area locations to accommodate more trucks and/or will identify potential new locations for such facilities.

The analysis will take into account major truck highway activity and concentrations of trucking activity such as warehousing, marine terminals, and rail intermodal yards in the NJTPA region, which includes the core NJ port terminal area. The study will be part of a metropolitan tri-state analysis which will be coordinated by the New York Metropolitan Transportation Council (NYMTC) with further support from the Connecticut Department of Transportation.

The study will factor in existing and projected truck volumes as well as the influence of truck driver Hours of Service regulations and the need for the placement and/or expansion of new truck staging/rest area services.

At the conclusion of the above work, the NJDOT should consider a similar study for other areas of the State.

Figure 6-30 - Service and Rest Facilities



STRATEGY H-10: DATA COLLECTION AND PERFORMANCE MONITORING

Part of the freight planning toolbox is monitoring system performance on a regular basis. This is done for two reasons. First, it provides NJDOT with vital information on how well the system is performing and how system performance changes over time. Second, it provides a measuring stick to assess the effects of current and future initiatives on system performance to help determine the impact of investment choices and if they yielding the expected results.

There are several sources of information available to monitor the performance of the highway freight system and several data items that should be included as part of a comprehensive data collection program for freight. Some examples are presented below:

- Track Vehicle Hours of Delay by corridor – this measure enables looking at specific roadway segments and quantifying the delay on each portion. Using the Statewide Truck model and the enhanced post processors, highway segments can be aggregated by corridor or area to get a read on where the “hot spots” exist or which truck corridors are the most congested in New Jersey. Separate measures should track both commercial and other vehicles.
- Track Bridge Sufficiency Rating, the Pavement Ride Quality Index (RQI), and other management system data in corridors with high levels of truck traffic. Determine if these corridors behave differently than most corridors.
- NJDOT should also continue to collect (and purchase) commodity flow data and analyze it on a regular basis to contrast the mode shares against existing conditions. Data on goods movement by type, amount, mode, origins, and destinations should be assessed.
- Commodity Flow data does not include the movement of waste products, which may represent a significant amount of additional tonnage and movements on New Jersey’s freight system. A method of collecting or estimating this flow should be explored.
- Track EZPASS penetration for commercial vehicles.
- Track investment guidelines in the capital investment strategy oriented to freight needs.
- Track current and future freight related investments.
- Monitor the amount of truck travel that occurs through out the Newark/Elizabeth port area by hour and day of week. The effectiveness of shifting trips out of the peak period can be directly evaluated based on the change from existing conditions.
- Perform daily as well as hourly monitoring. Performance measures that are currently in place mainly examine the peak periods. But as New Jersey starts to use its off-peak capacity potential, traffic monitoring techniques must be modified to focus on truck freight activity in the off-peak hours. A measure of targeted truck VMT and VHT by time of day and functional class is needed.
- Monitor the amount of all container movement at the ports on weeknights and Saturdays to measure the effectiveness and utilization of shifting to extended hours.
- Measure turn-times (the amount of time for a truck to enter a facility, pick up its load, and exit the terminal) and compare the results against historic conditions.
- If a program such as Off Peak is established, track the number of participants on a quarterly basis.
- Security measures are difficult to track. Safety measures performance can be related to the crash history by tracking the number of truck-related accidents per million truck miles and vehicle miles.
- Conduct a statewide inventory of the number and type of support facilities along with the amenities and services provided.

7. RAIL FREIGHT

New Jersey's rail freight system plays an important role in moving freight in and through the State. The rail system provides critical capacity for the movement of both freight and passengers, serving to lower transportation costs to businesses and travelers in the State, ease the burden placed on our highways, and promoting economic development.

This chapter of the Comprehensive Statewide Freight Plan presents the context and issues of rail freight in New Jersey, with a discussion of current initiatives and additional recommended strategies to address these issues. Along with the other modal chapters of this plan, it is designed as both a stand-alone document and as a component of a systemwide action plan.

RAIL FREIGHT CONTEXT

Rail freight encompasses the movement of a wide range of commodities using railroad infrastructure and equipment typically owned by private sector railroads over rights-of-way owned by either private or public sector organizations. Rail freight serves a wide variety of private industries and impacts an even wider variety of private and public stakeholders. This section describes the freight moved by rail in New Jersey, railroad carriers operating in the State, and the State's rail freight system.

Today's rail system is constrained by the wholesale abandonment of lines and reduction in track capacity from double to single track on much of the network, especially freight-only lines. This is a direct result of the bankruptcies of the private sector railroads in the 70s and their subsequent rationalization under the federal government's Consolidated Rail Corporation, better known as Conrail.

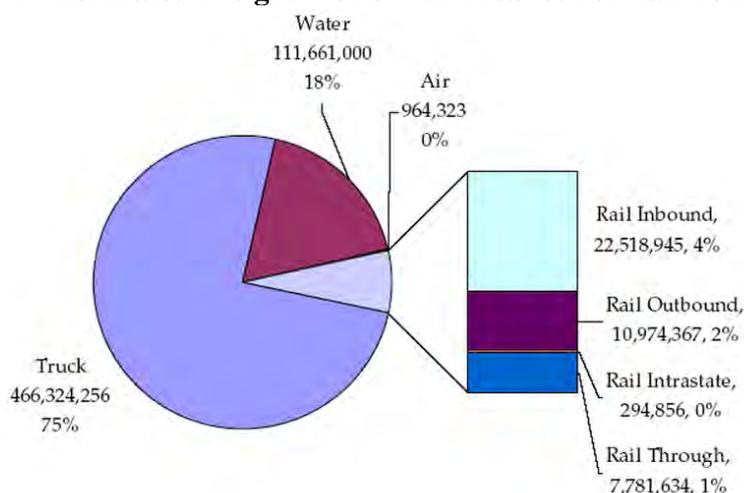
GOODS MOVED BY RAIL

Railroads carry cargo of all types. In general, railroad services are often categorized by what is carried and how it is carried as follows:

- **Carload** Different types of railcars and commodities such as boxcars and hoppers for bulk commodities including minerals, stone and lumber.
- **Intermodal** Movement of shipping containers on flat cars (COFC) or truck trailers on flat cars (TOFC) suitable for transloading (direct movement from one mode to another) by trucks and ships. These are usually time sensitive products for customers arriving at the State's international ports.
- **Unit Trains** Long trains carrying a single bulk commodity such as coal to power plants, grain, waste (garbage moving out of the state), or even orange juice: the Tropicana Juice train from Florida to Newark.

In 2003, New Jersey's railroads handled 41.6 million tons of freight, representing approximately 7 percent of the State's total freight in terms of tonnage. As shown in Figure 7-1, twice as much rail freight comes into the state as leaves. Through traffic (neither the shipment origin nor destination is in New Jersey) represents almost 19 percent of all rail freight movements in the State, reflecting New Jersey's strategic importance as a major crossroads for rail shipments along the northeast corridor. In contrast, intrastate rail shipments (both origin and destination of shipment are in New Jersey) account for less than one percent of all rail traffic in the State, reflecting the predominant use of the railroads as a long-distance conveyor of freight.

Figure 7-1 - Estimated Freight Flows with Breakout of Rail Tonnage by Type



Source: composite of Transearch, Federal Railroad Administration, US Army Corps of Engineers, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics data.
 Note: through tonnage for water and air modes could not be estimated due to limitations of data sources.

Table 7-1 shows the geographic breakdown of rail freight in New Jersey during 2003 by type of equipment (with the limited number of unit trains merged into the carload figures). About 60 percent of rail freight that originates or terminates in New Jersey moves in carloads, while 40 percent is intermodal (containers). More than 80 percent of rail freight that originates or terminates in New Jersey is concentrated in the northern half of the State. Intermodal traffic, in particular, is focused in the north, consistent with the strong presence of mixed freight commodities carried by rail and the major seaport terminals in the Newark/Elizabeth area.

Table 7-1- Rail Freight Flows by Direction, Type, and Region of the State, 2003 (Tons)

	Carload	Intermodal	Total
INBOUND			
North	10277	7627	17904
South	4614	1	4615
Total	14891	7628	22519
OUTBOUND			
North	3360	5905	9265
South	1695	14	1709
Total	5055	5919	10974

Source: FRA data and Cambridge Systematics

The counties with the highest freight flows include Hudson, Union, Middlesex, Essex, and Bergen, all of which are in the north. Rail movements here tend to be intermodal, especially in the outbound direction, and are related to port activities.

New Jersey's top rail commodities for inbound, outbound, and intrastate movements are depicted in Figure 7-2. The top commodity shipped by rail in New Jersey is "miscellaneous freight" that is carried as TOFC/COFC.

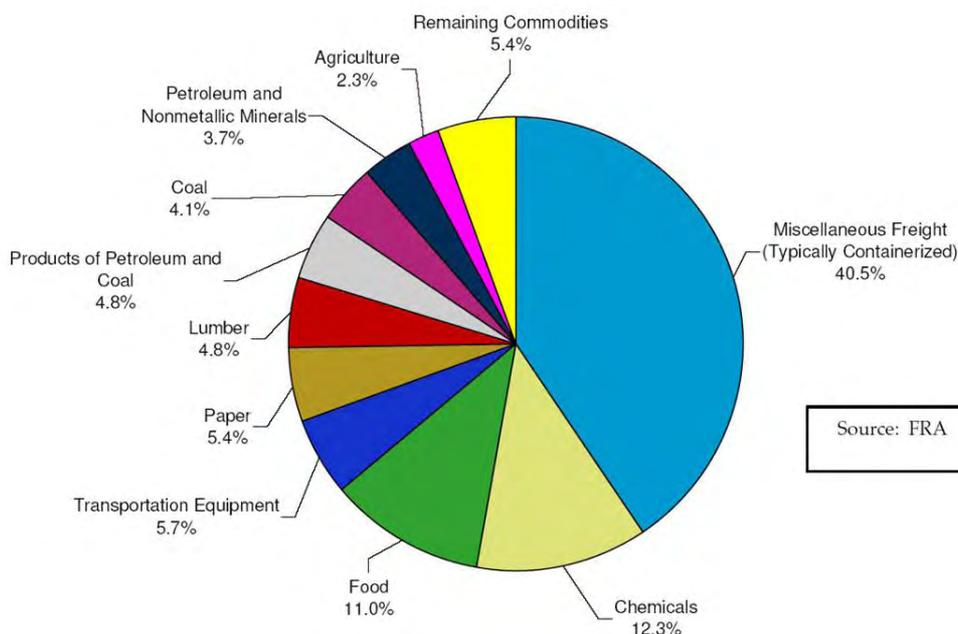
These include containers that arrive at the west coast seaports and then move to New Jersey by rail, container shipments coming from the Port of New York and New Jersey, and other container moves between New Jersey and other North American origins and destinations.

Intermodal accounts for 34% of inbound rail tonnage and 54% of outbound rail tonnage. After miscellaneous

freight, the leading commodities shipped by rail include: chemicals, food, transportation equipment (automobiles and trucks in specialized railcars), paper, lumber, products of coal and petroleum, coal, and petroleum and nonmetallic minerals. For inbound traffic, the dominant commodity is miscellaneous freight, followed by food and chemicals. For outbound traffic, miscellaneous freight is also the dominant commodity followed by chemicals. Rail freight traffic in southern New Jersey (Camden, Salem, Gloucester, Burlington, Cape May, Ocean, and Atlantic Counties) consists almost entirely of carload and bulk traffic. A complete description of commodity flow on rail is found in Appendix A.

Freight traffic has been growing at an average of 3 percent per year, and it is expected that this pace will continue. Growth at this rate will lead to a doubling of freight volume over the next twenty five years. Commuter and inter-city passenger rail ridership is also growing. While these growth trends reflect an expanding economy, they place significant strains on the entire transportation network. Impacts can be amplified when new or expanded passenger and freight services are proposed over the same tracks or are planned along the same right-of-way, leading to potential operational and jurisdictional conflicts.

Figure 7-2 - Rail Commodities by Weight (Inbound, Outbound, and Intrastate) – 2003



The composition of freight is also changing, as the U.S. becomes more dependent on service industries and less on manufacturing industries. The greatest growth in freight will occur in higher-value consumer goods and less on low-value, high-tonnage bulk commodities. This will favor those freight modes capable of providing higher levels of service in terms of delivery times, reliability, and efficiency. These include trucking, intermodal rail, package express, and air freight services. Even as the nature of freight traffic changes, bulk commodities will continue to grow to support our expanding economy. Railroads represent an important component of the nation’s transportation network due to their capacity to handle large volumes of bulk commodities while also providing premium long-distance intermodal services that connect international port gateways on both coasts with the nation’s major population centers.

RAIL OPERATORS

New Jersey has four types of railroad infrastructure owners: Class I, regionals and shortlines (*Class II, III, and terminal and switching railroads*), NJ Transit, and Amtrak. The companies that own the networks maintain the right of way and yards as well as dispatch or control trains that operate over their own territory. Many of the freight railroads have operating rights or agreements that allow them to run their trains over trackage owned by others. Today, two Class I railroads – Norfolk Southern and CSX – and the regional and shortline railroads operate over the rail network in the State. The Canadian Pacific Railway operates in New

Jersey over trackage rights on tracks owned by Norfolk Southern Railroad. Together, these railroads directly employ more than 1,700 of New Jersey’s workers and indirectly support thousands more. A summary of the railroad operating miles and trackage rights, is depicted below. A map of the operating lines is depicted in Figure 7-3.

Table 7-2 - Summary of New Jersey Railroad Miles and Class (2003)

Class	Railroad Name	Abbreviation	Miles Operated in N.J.
Class I	Norfolk Southern	NS	933
	CSX Transportation	CSXT	648
	Canadian Pacific	CPRS	68
Class II & III	New York, Susquehanna & Western	NYSW	78
	Southern Railroad of NJ	SRNJ	71
	Winchester & Western	WW	54
	Morristown & Erie	ME	42
	Belvidere & Delaware River	BDRV	16
	SMS Rail Services	SLRS	11
	New York & Greenwood Lake	NYGL	2
Switching & Terminal	Conrail	CR	831
	Black River and Western	BRW	17
	Raritan Central	RCRY	16
	Port Jersey Railroad	PJRR	5
	New York Cross Harbor	NYCH	4
	East Jersey Railroad & Terminal	EJR	2
	New Jersey Rail Carrier	-	0.5
	Durham Transport	DRHY	Now RCRY
	Ashland Railway	ASRY	Unknown

Summary by Class	# of RRs	Miles w/ trackage rights	Miles w/o trackage rights
Class I	3	1694	190
Class II & III	7	274	265
Switching & Terminal	7	875.5	464
TOTAL	16	2798.5	919 **

Source: Association of American Railroads, 2003

** Excludes 58 miles owned by Amtrak

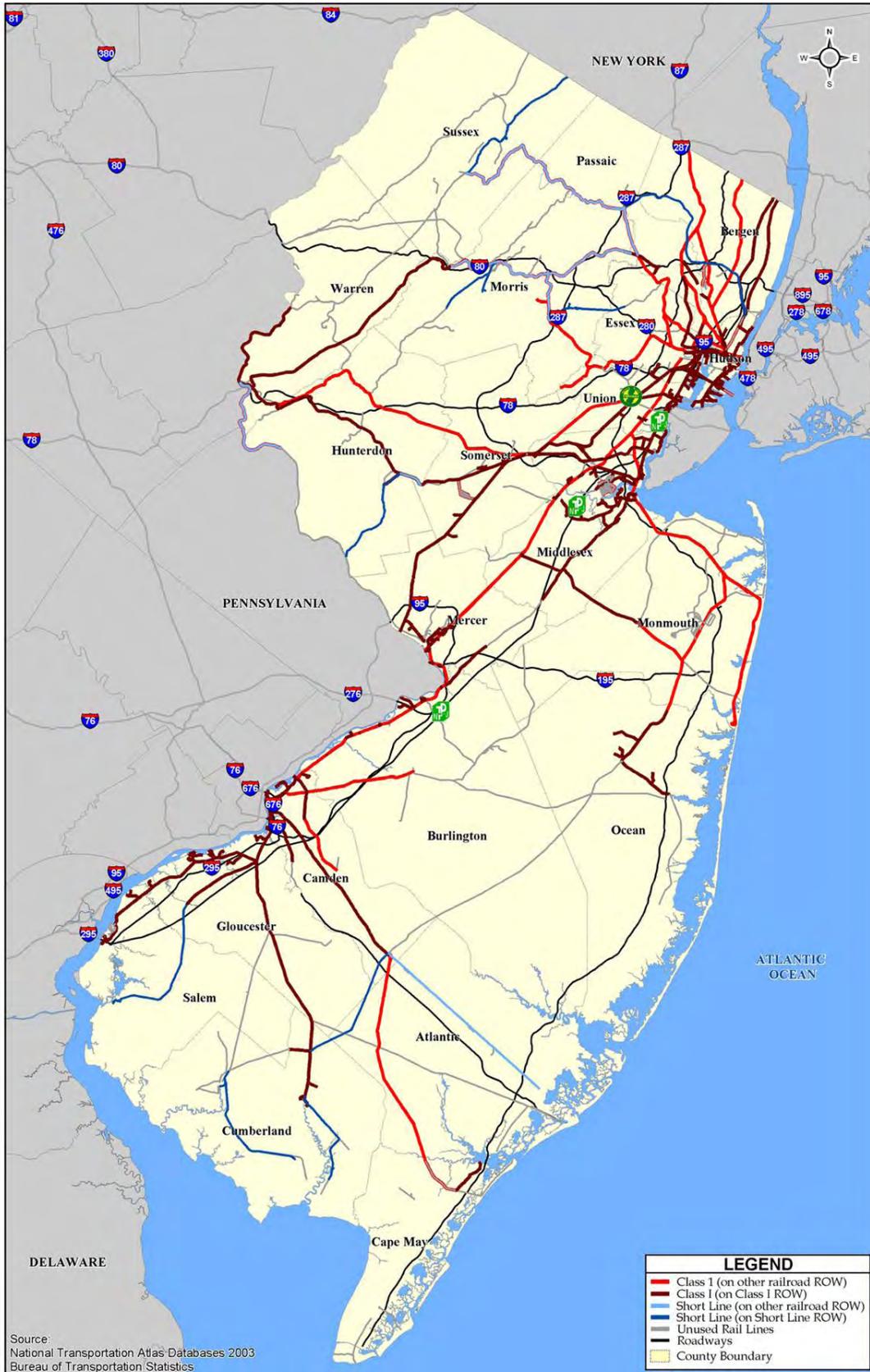
Class I \$277.7 million or more in operating revenues

Class II a non-Class I line-haul railroad operating 350 miles or more with operating revenues of at least \$40 million

Class III a non-Class I or II line-haul railroad

Switching and Terminal Railroad a non-Class I railroad engaged primarily in switching and/or terminal services for other railroads. Class II and Class III railroads generally are referred to as “regional” and “short line” railroads, respectively

Figure 7-3 - Rail Operating Map (2003)*



*Map is based on information obtained from the [Bureau of Transportation Statistics National Transportation Atlas](#). NJDOT is updating this information, but corrected data was not available at the time of this printing

CLASS I RAILROADS & CONRAIL

Norfolk Southern and CSX are the primary railroads serving New Jersey following their acquisition of Conrail in 1999. As part of that acquisition, the Surface Transportation Board (STB) mandated the formation of a “new” Conrail to be jointly owned by both NS and CSX that would manage certain railroad territories in New Jersey. These territories – in the north around Port Newark/Elizabeth and in the south around Philadelphia and Camden – form the Shared Assets Area. Preserving these lines in joint ownership was advocated by the state of New Jersey and supported by the STB as a desirable means to maintain access to shippers by both Norfolk Southern and CSX, thus preserve their competitive positions. The STB recently completed a five-year period of oversight over these territories, referred to as Conrail Shared Asset Areas, and the long-term future of this arrangement is uncertain.

- Norfolk Southern – NS owns and controls the Lehigh Line out of Reading, PA, which passes through Allentown, PA and Phillipsburg, NJ and ends with Conrail Shared Assets control at Manville. This is the main access rail line from the west to northern New Jersey for NS. NS also owns and controls the Southern Tier (between Buffalo and New Jersey through Binghamton) from just west of its Croxton intermodal yard to NJ TRANSIT’s Main Line. NS owns a total of approximately 76 miles of track/route mileage in New Jersey and makes use of trackage rights over NJ TRANSIT’s Main Line and Bergen County Lines.
- CSX – CSX owns and controls the West Trenton Line from Philadelphia through Trenton to Manville, as well as the River Line from North Bergen through the Ridgefield Park area north to the New York State Line. CSX owns and controls approximately 47 route miles in the state.
- Conrail – The Conrail Shared Assets Organization (CSAO) is an operating entity that performs local switching of freight to and from industries and the classification of traffic for both NS and CSX in northern and southern New Jersey. The CSAO, more commonly known as Conrail, controls all the rail trackage for the direct route between Manville through Newark to North Bergen; access by NS to and from Croxton Yard; the Chemical Coast as well as Port Reading secondary lines along the coast in central New Jersey.

Conrail also controls access to all tracks in southern New Jersey that are accessed via the Delair Bridge. Within the two Shared Asset Areas, Conrail controls approximately 305 route miles in the state. North Jersey’s traffic is mainly port, chemical, and automobile related. South Jersey’s traffic is agrarian, chemical, coal, rail and, to some extent, port related.

SHORTLINE RAILROADS

The fourteen shortline railroads serving New Jersey (based on 2003 data) generally operate over tracks that were previously abandoned by the Class I railroads and that are in some cases now owned by NJDOT, NJ TRANSIT, or by individual counties. Combined, the shortline railroads total 288 miles of rail lines in New Jersey, or more than 15 percent of the total rail mileage in the state. They vary considerably in character; some are very short railroads predominately involved in switching operations, while others have longer lines to markets in addition to connecting to Class I railroads.

In general, shortline railroads provide specialized services to end users that would otherwise have to rely solely on trucks. They represent a critical link in connecting smaller end users to the statewide and national rail networks and provide service tailored to the needs of their local customers.

The active shoreline railroads operating in New Jersey are summarized in Table 7-3.

Table 7-3 - Active Shortline Railroads in New Jersey (2003)

Railroad	Miles	Service Area	Interface With Class I Railroads
Belvidere & Delaware River Railway	18.4	Milford and Phillipsburg	NS - Phillipsburg
Black River & Western Railroad	17.3	Three Bridges and Lambertville	NS - Three Bridges
Cape May Seashore Lines	13.0	Cape May County	Conrail at Tuckahoe (currently passenger only)
East Jersey Railroad & Terminal Company	2.4	Bayonne	Conrail at the EJR yard
Morristown & Erie Railway	10.5	Morristown and Roseland	NS - west of Dover on NJT line
New Jersey Rail Carrier LLC	0.5	Columbia Terminal (Kearny)	Conrail Columbia Terminal
New York Cross Harbor Railroad	10.0	Greenville, NJ - Float - Brooklyn, NY (between 43rd and 51st Streets)	Conrail - Greenville, NJ
New York & Greenwood Lake Railway	1.8	Garfield and Passaic	Conrail - Garfield
New York Susquehanna & Western Railway	73.9	North Bergen to Vernon (NY State Line)	NS - Passaic Junction; CSX - North Bergen
Port Jersey Railroad Company	2.4	Port Jersey Distribution Center (Jersey City)	Conrail - Greenville Yard
Raritan Central Railway	16.0	Edison - Woodbridge - Raritan Center	Conrail - off the Amtrak NEC
Shortline Marketing Services Rail Service, Inc.	4.5	Pureland Industrial Complex (Bridgeport)	Conrail - Bridgeport
Southern Railroad of New Jersey	71.1	Winslow Junction to Salem; Winslow Jct. to Pleasantville; Swedesboro to Salem;	Conrail - Winslow Jct. and Swedesboro
Winchester & Western Railroad	46.0	Norma to Bridgeton; Mauricetown to Bridgeton; Millville to Leesburg	Conrail - South Millville Yard

Source: NJDOT

PASSENGER RAIL OPERATORS

The rail system in New Jersey supports extensive passenger services in the form of commuter rail services provided by NJ Transit and intercity passenger services provided by the National Rail Passenger Corporation (otherwise known as Amtrak).

- NJ TRANSIT – operates extensive passenger service over its own right-of-way as well as Amtrak-owned and freight railroad-owned rights-of-way. It also owns rights-of-way over which only shortline railroads operate, as well as other rights-of-way that are being preserved for future rail operations – freight, passenger, or potentially both services. NJ TRANSIT owns approximately 982 route miles of rail right-of-way.
- Amtrak – Amtrak owns and operates the Northeast Corridor, which in New Jersey extends from Trenton northeast through Newark and into New York City. Freight traffic may operate over the NEC at any time, but is restricted on the NJ TRANSIT Riverline to late night hours only. Amtrak owns and controls 58 route miles in New Jersey.

RAIL FREIGHT SYSTEM

New Jersey's freight rail system consists of an extensive array of infrastructure facilities. These include:

- Mainline tracks - which accommodate higher volume, higher-speed traffic.
- Branch lines, secondary tracks, running tracks, and industrial sidings - which accommodate lower-volume, lower-speed traffic and/or last-mile connections to industrial customers.
- Intermodal terminals – which exchange rail containers with trucks and marine terminals. These include: “transload” or “transflow” yards for the exchange of non-containerized commodities between rail and trucks, or between rail and marine terminals; and classification yards for aligning equipment by train, route, and destination.

Figure 7-4 portrays the current freight rail network in the State, including rail lines owned by the Class I and shortline railroads, NJ TRANSIT, and Amtrak. The system consists of 1,756 route-miles of rail lines (counting multiple track lines only once per mile and excluding trackage associated with yards, terminals, passing sidings, and industrial spurs). Forty one percent (716 route-miles) of the State's rail network is owned by freight railroads of which 428 miles are owned by major railroads and 288 miles are owned by Shortlines, Fifty nine percent (1040 route miles) are owned by passenger rail operators. Figure 7-4 also shows the location of intermodal terminals, where rail, truck, and/or maritime services interchange traffic. There are three NS rail yards, three CSX rail yards, and 20 Conrail rail yards in the State.

Among the freight and passenger railroads in New Jersey, there is a significant amount of sharing of rail rights-of-way through the use of trackage rights agreements, which permit specific carriers to operate over rail lines owned by another company or public agency. The priority accorded to the rightee by the owner can create potential limits on the coordination and cooperation among these stakeholders in New Jersey's rail system.

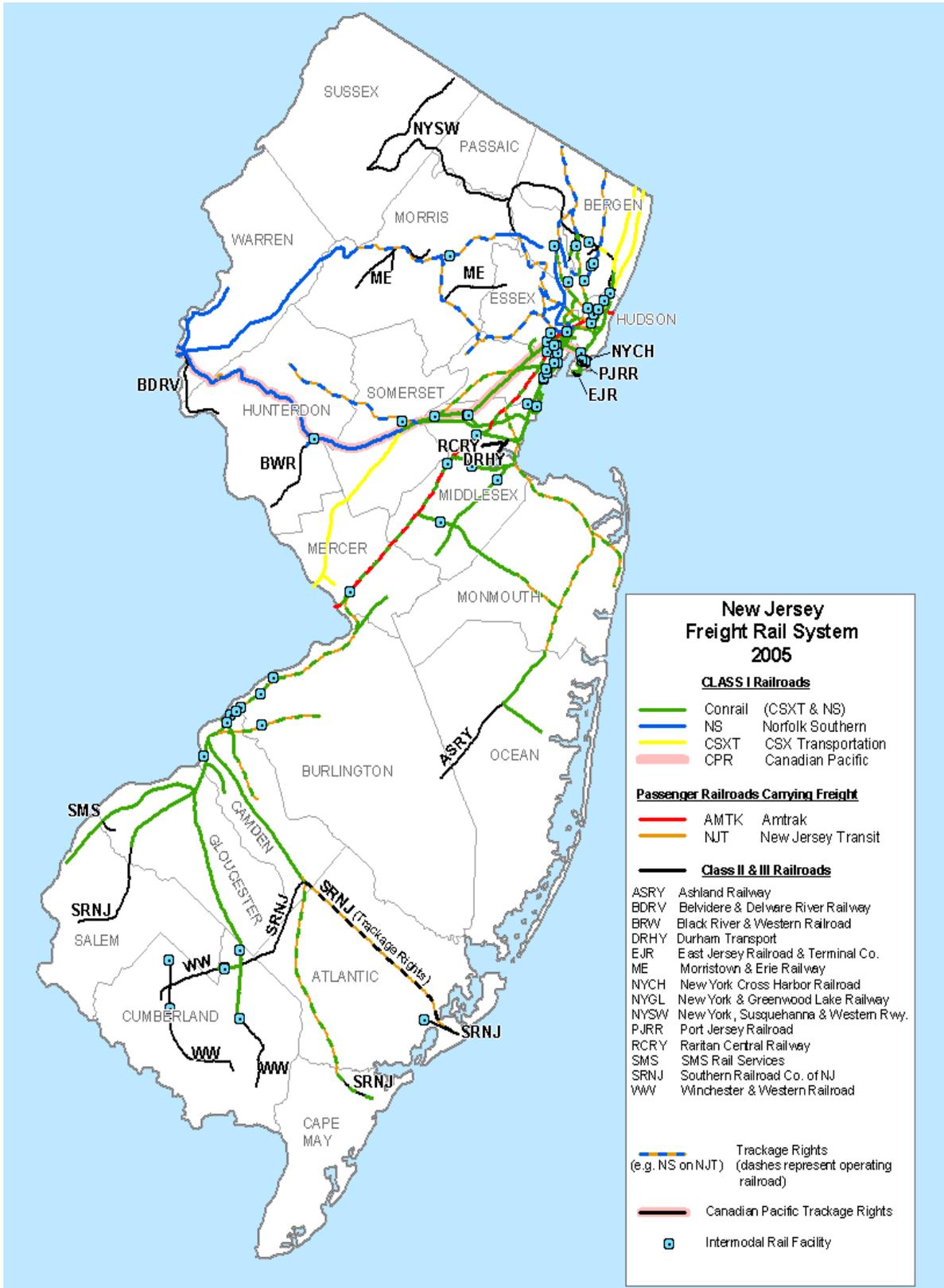
The operating railroad network within New Jersey is essentially divided into two separate parts. The northern and southern parts of the State are connected only by the NJ TRANSIT River Line (the former Bordentown Secondary), which operates light rail passenger service during the day and allows freight shipments only at night over almost all of this line. It also limits access to those lines such as the Robbinsville Industrial Track that can only be reached via the Bordentown Secondary. The lack of connection between major regions of the state limits prospects for providing rail alternatives to in-state truck movements.

The only link from the rail network in southern New Jersey to Class I railroads is across the Delaware River via the Delair Bridge at Philadelphia. This single link to rail freight operations in the southern portion of the state is vitally important. This bridge is currently being upgraded by Conrail to accommodate 286,000-pound carloads. This bridge is also connected to Amtrak's Northeast Corridor passenger line which limits its use for freight operating from the south Jersey port and points north due to its circuitousness, clearance and scheduling conflicts. A potential (but as yet unexplored) alternate routing from south to north could be achieved by reviving a line from Winslow Jct. to Lakehurst across the southeastern part of the state.

Rail System Utilization - As shown in Figure 7-5, the highest-tonnage rail lines in the State are in the northern part of the State. These include the CSX River Line, the Conrail Shared Asset portion of the Lehigh Line, the NS portion of the Lehigh Line, and the CSX Trenton Line (which joins the shared asset portion of the Lehigh Line at Manville).

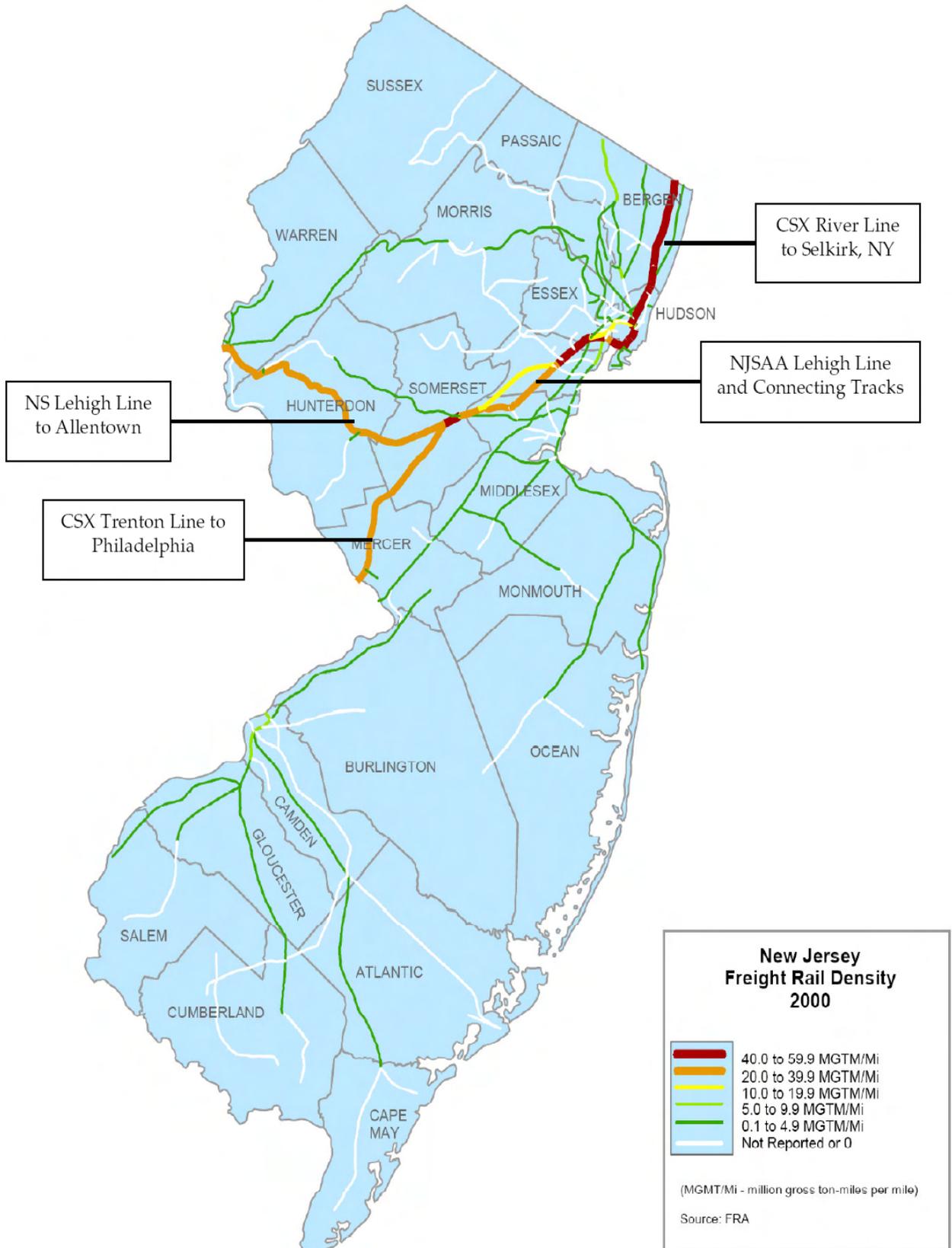
Potential Future Passenger Rail Services - Passenger activity that may affect freight rail lines in New Jersey includes: NJ Transit Commuter Rail over the CSX Trenton Line; Monmouth-Ocean-Middlesex Commuter Rail; NJ Transit Northern Branch Light Rail; and the NJ Transit Union County Light Rail.

Figure 7-4 - New Jersey Freight Rail Network (Abandoned Lines Not Shown)
Showing Intermodal Rail Facilities



Source: FRA and Cambridge Systematics, Inc.
Note: ASRY and DRHY are not currently operating

Figure 7-5 - Freight Rail System Traffic Density (Estimates) – 2000



Source: FRA and Cambridge Systematics, Inc.

RAIL FREIGHT ISSUES

The New Jersey rail freight system faces many challenges – its future will affect not only businesses and residents, but also those industries and consumers who rely on the timely and efficient delivery of goods that travel through New Jersey and its gateways. Without improving throughput and terminal capacity, upgrading track and signal standards, rehabilitating essential rail infrastructure, and improving institutional coordination between large and small freight railroads and their passenger-carrying counterparts, the rail system in New Jersey will not be able to effectively serve the growth in freight projected for the region, thereby placing increasing demands on an already congested highway system.

New Jersey is joined by other states, the Federal government, and private freight carriers in debating whether the public sector should take a more active role in developing a freight rail system that better supports industry, provides jobs, relieves roadway congestion and pollution, improves safety and security, and reduces logistics costs. With a large number of both public and private organizations involved in providing, regulating, and funding rail freight services, meeting anticipated challenges will require increased institutional coordination and planning.

This section discusses the key issues confronting the rail freight system serving New Jersey and presents suggested strategies for addressing these issues, and, where applicable, criteria for measuring performance. For the rail freight modal chapter, the strategies are referenced as Strategy R-X, where the “R” represent the series of rail strategies and the “X” a consecutive number for the series.

ISSUE ONE: CONSTRAINTS ON THROUGHPUT AND TERMINAL CAPACITY

Within New Jersey, especially in the north, several rail lines are already at capacity, and future growth projections suggest that significant improvements will be required to accommodate additional traffic. Additional rail yard and terminal capacity will also be required to handle the increased traffic volumes projected. Rail service and capacity issues extend beyond the borders of the State and pose significant implications for freight transportation in New Jersey and the effectiveness of capacity improvements made within the State’s border. Shipments that cannot get to and from the region by rail because of service and capacity constraints in the national system will find other modes to reach the region.

Without additional investment in rail infrastructure, rail customers will increasingly suffer longer travel times, lower reliability, and higher costs. If the rail network is to play a role in handling the projected growth in freight traffic in New Jersey, baseline throughput capacity must be increased. Otherwise shippers and receivers will increasingly look to other freight modes and rail terminals in neighboring states where such investments are being made. Both will result in more freight coming into and out of New Jersey over the State’s already congested highway network.

The deregulation of the freight railroads in the 1980s enabled railroad companies across the nation to merge and consolidate their facilities to provide for more cost-effective operations and improve financial performance. As a result, the industry became significantly more competitive. Railroads trimmed their networks considerably to eliminate unnecessary costs, and passed many of these economies on to shippers in terms of lower rates. At the same time, one of the major issues facing freight railroads in New Jersey is keeping their rights-of-way in a state of good repair through proper maintenance, repair, and renewal.

Rail infrastructure investment projects generally belong in one of the following three categories:

- State of good repair: Extraordinary investments needed to bring railroads up to the planned/specified level of service (generally defined by track class); these projects include major drainage or track bed replacement projects, bridge replacements, etc., that are beyond normal maintenance and are designed to bring the railroad back up to a level of performance so the infrastructure can be sustained through normal maintenance.

- **Normal maintenance:** Recurring and regularly scheduled maintenance to renew infrastructure to existing standards; this includes renewal programs developed through an inspection and/or preventive maintenance process.
- **Expansion:** Investments to increase capacity or level of performance, such as added sidings, trackage, or signalization; these are intended to add capacity, reliability, clearance capacity, weight-carrying capacity, etc., to support market growth and expansion or to improve the financial performance of the railroad.

While some projects have all three characteristics, the distinction is that the first two categories are designed to provide only a “status quo” level of network service, preserving current market share (in the absence of changes in competitive factors or demand patterns). That is, these types of projects are viewed as being necessary to maintain the level of service without degradation, or restore the system to an acceptable level of service in order to maintain the current competitive position, rather than enhance it beyond what is expected if it was in a state of good repair. “Expansion” programs, on the other hand, are generally pursued only if the state of good repair and normal maintenance investments have been programmed; expansion programs respond to strategic directions that are driven by marketing considerations or other financial imperatives of the railroad. Many of the key rail bridges, tunnels, and track beds in New Jersey are well over 100 years old. Consequently, the capital investment required just to maintain this infrastructure in a safe condition is substantial, which leaves the privately owned railroads with little financial capacity for system expansion – and the ability to enhance their competitive position.

Table 7-4 displays information on estimated capacity and demand on high volume rail lines in New Jersey, based on train moves per day. The results indicate the lack of adequate capacity for such lines as the NJSAA Lehigh Line, NS Lehigh Line, P&H Line, and Chemical Coast Line, with the CSX River Line close to capacity. Forecast growth in total freight traffic will require a significant increase in capacity along key rail lines and terminals in New Jersey if railroads are to maintain market share, let alone add service to increase it. Investment programs such as those proposed by the Mid-Atlantic Rail Operations (MAROps) study, which was discussed in greater detail in Chapter Four and in Appendix E, represent a new collaboration of public agencies and the private freight railroads in planning and funding important rail infrastructure projects to enhance capacity and conditions. The NJDP (North Jersey Development Plan) detailed in the following section is an example of such a public/private partnership.

Table 7-4 - Estimated Capacity and Demand in Train Moves per Day – 2003

	NS Lehigh Line	CSX Trenton Line	NJSAA Lehigh Line	P&H Line	Northern Running Track	National Docks	Chemical Coast	Port Reading Secondary	CSX River Line***
Average daily freight trains	18	13	32	23	23	16	17	3	22
Average daily total trains	18	13	94*	25	25	16	17	3	22
Peak day trains	23	16	100*	29	29	20	21	4	28
Existing capacity	30-40	30	41** 80-100**	26	42	36	20	15	30

Source: R.L. Banks Associates, Inc., NJTPA Freight System Performance Assessment

* Includes approximately **62 passenger trains** operating on the **NJSAA Lehigh Line**

** Capacity of 41 trains on the single track segment; 81-100 on double track segment

*** Excludes moves passing through New Jersey

CURRENT INITIATIVES ADDRESSING THIS ISSUE (2003)

Several specific planning and capital programming efforts are underway to begin to improve the throughput capacity of the rail network in New Jersey. Among the most significant are:

- **Portway Extensions:** The Portway Extensions study initiated by NJDOT recommended a series of targeted roadway and rail freight improvements focused on efficiently moving maritime container

traffic between the northern port facilities, intermodal rail yards in northern New Jersey and distribution centers in New Jersey and Pennsylvania. Further details can be found in Appendix C.

- North Jersey Development Plan (NJDP): A program totaling \$132.5 million in projects has been defined in the North Jersey Shared Assets Area (NJSAA) to improve rail operations in this critical region. The main objectives of the NJDP program is to reinforce and improve operations along the main spine of the NJSAA Lehigh Line and its connecting tracks, to better serve railyards and industries located along this route. Phase I is proceeding, with the PANYNJ contributing \$25 million, and CSX and NS each contribution \$12.5 million. Further details can be found in the Rail Appendix- Appendix E.
- The Mid-Atlantic Rail Operations (MAROps) Program: The MAROps program is a 20-year, \$6.2 billion program designed to remove specific chokepoints in New Jersey and the mid-Atlantic states of Pennsylvania, Delaware, Maryland, and Virginia. This innovative public-private partnership involves a cooperative planning and funding process among the five states listed above, the I-95 Corridor Coalition (representing these five states and seven others along the Northeast Corridor), and three railroads (NS, CSX, and AMTRAK).

The projects included in the MAROPS Program are intended to increase capacity and improve efficiencies, resulting in more competitive rail services from the Northeast to Atlanta (for NS) and Jacksonville (for CSX). The projects will require a funding commitment from public and private sources over many years to be fully realized. Many of the NJ projects are being advanced by the NJDP. This multi-state cooperation will inevitably require some form of federal support and financial assistance.

- Comprehensive Port Improvement Plan (CPIP): CPIP was undertaken by a consortium of relevant state and regional agencies, will indirectly impact rail freight capacity needs even though the primary objective is improvement in maritime shipping and service by improving land-side access to rail service.
- PANYNJ Improvements: expansion and modernization of ExpressRail and other facilities serving Port Newark, Port Elizabeth, and the New York Container Terminal (formerly Howland Hook).
- NJDOT State Rail Plan: The plan is a program of projects that provide direct investments to the State's rail system, particularly shortlines requiring an infusion of funds to upgrade or rehabilitate their lines.

These various initiatives have identified existing system needs, totaling over fifty projects with a funding need of over \$350 million dollars within New Jersey alone. Many of these needs do not have any funding source identified or funding commitments at this time. In addition, this list of existing needs likely does not include all the needs of the rail freight industry, as many private entities chose not to disclose the information due to the competitive nature of their business.

The list of existing needs and a map of these locations are included in Appendix E. These needs fall into the following categories:

- line capacity (adding second main lines, upgrading signals, adding sidings)
- clearance/weight (upgrading to accommodate 286,000 or 315,000 pound standards, double stack clearance)
- access/connectivity (including multimodal connection)
- facility capacity (rail yards and other facilities)
- line rehabilitations

Among the areas suggested for rail infrastructure improvement overall (including locations both in and outside of New Jersey) are:

- Bridge and tunnel chokepoints along the I-95 Corridor - such as improvements in Maryland (double-stack trackage clearance along the Northeast Corridor in the vicinity of Perryville), the Baltimore (Howard Street) Tunnel, and the Washington, DC (Virginia Avenue Tunnel and Potomac River Bridge), area to open up capacity into the Northeast.

- Rail capacity chokepoints along the I-95 Corridor - including added second (or third) mainline tracks to increase throughput capacity in New Jersey (Chemical Coast, Port Reading Secondary, River Line, Lehigh Line).
- Clearance projects in New Jersey and neighboring states - to provide double-stack container clearances that will facilitate long-haul movement of these highly-efficient intermodal trains.
- Terminal area throughput capacity improvements – such as at Croxton Yard, Waverly Yard, and Oak Island Yard.

This extensive number of projects reflects the importance that key stakeholders in the freight logistics industry place on efforts to eliminate the most significant constraints to rail corridor capacity. The private- and public-sector sponsors of these initiatives have combined their resources through public-private partnerships to expedite a number of important projects. These kinds of partnerships demonstrate the ability and willingness of major stakeholders of rail freight services to commit the necessary resources to complete projects of mutual interest in a timely manner.

Routine maintenance and state-of-good-repair projects are typically undertaken by the railroads, although cash-strapped shortlines may require public funds to repair and upgrade their lines. Major rail capacity improvements are costly and impact multiple stakeholders. As a result, they require the involvement of multiple agencies and stakeholders for planning, programming, funding, and delivery. As demonstrated by the various programs and projects listed above, some initiatives and programs reside at the multi-state level, others at the State level, others at the regional level, and others with the railroads themselves.

STRATEGY R-1: CREATE RAIL FREIGHT CAPACITY ORIENTED PROJECT DEVELOPMENT PROCESS

NJDOT's freight planning process can serve as the medium for soliciting input and gaining the participation of all stakeholders of rail freight services in crafting and funding capacity improvement projects. There are significant capacity needs identified throughout the state and beyond its borders that require attention and emphasis. A primary legacy of this Comprehensive Freight Plan is to elevate the status of freight needs in the project development and prioritization process. In order to accomplish this, NJDOT's freight planning process should:

- Identify overlaps and/or conflicts - among previously proposed improvement programs.
- Work to fund improvements proposed. Over \$130 million dollars worth of improvements have been identified in the NJSAA, including efforts to improve operations along the critical main spine of the NJSAA Lehigh Line and its connecting tracks. The program is only partially funded.
- Classify additional critical chokepoints on the New Jersey rail network - with significant impacts on operators or customers to form the rationale for public-private partnerships. This should include an assessment of East West Corridor Capacity. While detailed planning and analysis of this corridor has not been recently explored, an expansion of capacity of the Lehigh Line as the major western rail gateway to New Jersey will be needed to support future levels of rail freight traffic.
- Identify opportunities for joint funding – investments in rail line and terminal capacity improvements.
- Identify critical capacity constraints beyond New Jersey's borders - that affect the accessibility of rail freight to/from the State, recognizing that easing New Jersey's chokepoints alone will only partially respond to the freight railroad industry's needs to improve long-haul rail service and thus impact market growth and share. An example of this might be to perform a capacity/choke point analysis for westward traffic on the Lehigh Line.
- Develop or adopt analytical techniques - to support a basic cost-benefit evaluation of proposed investments in terms of private and public benefits.

NJDOT should develop a systematic distillation and prioritization of proposed throughput capacity improvement projects into practical, workable programs that can be funded and supported by both the public and private sectors. Given the scarcity of available funds, those projects should be selected that offer the greatest potential for improving the existing capacity of New Jersey's rail system and that can leverage scarce public and private resources.

Major rail capacity improvements are costly and impact multiple stakeholders. As a result, they require the involvement of multiple agencies and stakeholders for planning, programming, funding, and delivery. In support of this strategy, NJDOT should assume a leadership role to develop long-term partnerships with railroads, ports, the federal government, local counties and municipalities, and its internal partner NJ Transit. This should include the development of a process for program development and funding that can be publicly supported. With railroad participation, the State should work toward fully funding a program of capacity improvements in primary corridors. Further, NJDOT should take the lead in working with neighboring states to develop network and corridor railroad investment strategies to create regional as well as statewide benefits.

STRATEGY R-2: DEVELOPMENT OF A MULTI-MODAL ANALYSIS TOOL

Significant analytical capabilities will need to be developed to analyze the freight transportation system as a whole. For example, it will be advantageous to develop an analytical tool that is able to assess the impact of a change on the rail freight system, and then also be able to access the impact of that change on the highway and truck freight systems and intermodal transfer locations. Such a tool will be required to gain a better understanding of the relationship between improvements in capacity, travel times, and reliability at points, corridors, and Interstate routes (or freight lanes) and the impacts on freight movements as part of the overall logistics supply-chain. This tool, or process, while presented in this chapter, is applicable to all the modes represented in this plan.

While supply-side constraints are generally easier to define based on railroad operators' inherent understanding of the barriers to their ability to serve markets, the mechanisms for projecting and evaluating proposed improvement projects and programs are more limited. However, an understanding of the demand-side or market impacts of the freight investment challenge is crucial. This includes the collection and analysis of quality cross-modal data for existing systems as well as a capability to project future demands for freight movements. These projections should be based on macroeconomic projections of the trade patterns, economic development, and land use and population patterns influenced by changes in the levels of service provided by various components of the freight system serving the State (some components of this process have already been developed).

Ultimately, a process for linking demand impacts to supply change is needed, possibly through the use of multimodal network analysis with supporting demand and modal share models. The benefits of a freight investment program for rail (or for any mode, corridor, or location, for that matter) will depend on the ability of the freight distribution network to influence freight flows so they support commerce and the regional goals of economic development, transportation mobility, and environmental integrity/quality of life in a cost-effective manner.

PERFORMANCE MEASURES

To assess the results of strategies adopted by the state, railroads, and the shipper community to improve the throughput capacity of major rail corridors that connect with the national rail network, the following performance measures should be established:

- Freight volume (carloads and car-miles, tons and ton-miles) originating and terminating by rail in New Jersey before and after the capacity enhancements.
- Measures of reliability along key rail corridors before and after capacity enhancements – in terms of average delay affecting rail movements.
- Throughput capacity (or volume-to-capacity ratios) of major rail corridors (before and after).

ISSUE TWO: LACK OF RAIL NETWORK INTEROPERABILITY

Rail is a vital gateway for domestic and international trade, and provides critical access to the region's seaports and rail-dependent industries. To be competitive, rail service must be "seamless" across different railroad operators over the various links in the network. Railroads must be able to move their shipments from one rail operator to the next cost effectively and reliably to compete effectively with trucking on an origin-destination basis. Because it is first and foremost a business, rail freight transportation can serve the people of

New Jersey only if it continues to make a profit. This requires close cooperation between long-haul Class I railroads and shortline railroads providing local connection services.

Thus, interoperability – the ability to move freight cars over the rail network as if it were owned and operated by only one railroad – is a fundamental objective for the rail industry if it is to effectively compete in local as well as long-haul markets. Figure 7-6 on the following page depicts New Jersey’s rail ownership map. From a freight railroad operator’s point of view, the map depicts the trackage available for freight usage using both freight railroad-owned right-of-way and passenger railroad-owned right-of-way over which freight railroads have trackage or access rights. The interoperability challenge is to use the full extent of the freight network in a seamless manner, even though the train operations may be controlled by several different rail carriers.

Shared-Use Rail Lines - Nine distinct classifications of shared use right-of-way exist in New Jersey; seven of these are available to freight railroad carriers – four on a shared usage basis with passenger trains and three for exclusive freight railroad use:

- Class 1, Amtrak, and NJ TRANSIT operations (only the North East Corridor – no shortlines)
- Class 1, NJ TRANSIT, and shortlines (e.g., NJ TRANSIT, NS, and M&E)
- Class 1 and shortlines (e.g., NS and M&E)
- Class 1 and NJ TRANSIT (e.g., NJ TRANSIT and CSX on the River Line)
- Class 1 only (e.g., Conrail, NS, or CSX by itself)
- NJ TRANSIT and shortlines (Atlantic City Line)
- NJ TRANSIT only (e.g., Jersey Coast Line)
- Shortline only (e.g., SNJ)
- Unused railroad right-of-way – (e.g. the Lackawanna Cutoff)

The lack of interoperability is most often reflected in the physical constraints associated with track weight carrying capacity and the ability to carry larger loads – particularly double-stack intermodal traffic.

Class I railroads across the nation have adopted a higher car loading standard to support more cost-effective freight delivery. They have decided that the added capital and maintenance-of-way costs resulting from increasing 263,000-pound carload limits to 286,000 pounds will be more than offset by the savings from higher car and train productivity. In addition, increased intermodal traffic has spurred demands for higher track clearances to handle double-stacking of containers in intermodal service, a method long favored by ocean shipping lines.

Carload Weight Limits - Many New Jersey shortline railroads operate over lines that are rated at only 263,000 pounds. This includes rail lines owned by NJ TRANSIT over which freight rail services continue to operate under trackage rights permitted by NJ TRANSIT. Thus, the rail network does not have a consistent car load carrying capacity in terms of weight limits. These weight limitations reduce the efficiency of rail service since shipping costs are higher when rail cars can be only partially loaded. The lowest shipping cost by rail service results when an origin-to-destination trip can be accomplished completely by rail.

Transloading freight shipments from a heavy (286,000-pound) rail car to trucks or to lighter rail car loads for the shortline railroad portion of a trip creates higher shipper costs due to the extra handling and drayage (driving) expense. Figure 7-7 on the following page presents the rail network interoperability challenge by depicting carload weight limitations on rail lines across New Jersey.

Shortline railroads generally lack the financial resources to upgrade their lines to 286,000 pounds, and NJ TRANSIT is not likely to realize any direct benefit from such an investment, given the lighter weight of its equipment. Some shortline railroads are also concerned that the added axle loadings from heavier car

Figure 7-6 - Rail Ownership Map



*Map is based on information obtained from the [Bureau of Transportation Statistics National Transportation Atlas](#). NJDOT is updating this information, but updated data was not available at the time of this printing

loadings would increase their maintenance-of-way costs (track wear-related maintenance and replacement) and that these costs would not be recoverable through increased revenues. The Class I's are also slow to upgrade their lines for similar financial reasons.

Double-Stack Clearances - Double-stack container equipment is highly preferred for moving containers to inland destinations from major ocean ports such as Port Newark/Elizabeth and distant ports via the rail "land bridge". Class one railroads operating in n New Jersey currently have only two main lines with adequate clearances to accommodate double-stack container traffic and tri-level auto rack cars. These include the CSX River Line west of the Hudson River between Albany and New Jersey connecting to Selkirk Yard in New York (CSX is also cleared from Newark to Trenton but is not cleared in Pennsylvania), and the Norfolk Southern Lehigh Line along the Lehigh Valley to Phillipsburg and continuing to Harrisburg. The ability to move double stack cargo is a high priority issue, as it allows the railroad to operate at higher car capacities and thus improves the operating efficiency and lowers the costs, making the railroads more competitive.

The lack of rail network interoperability, both in terms of weight limits and clearance limits, impedes the cost effectiveness and availability of rail services across the State. Both weight and clearance constraints reduce the market attractiveness of some areas of the state for businesses that rely on direct freight rail service. Shortline railroads that operate over low-density rail lines are particularly vulnerable to the market impediments caused by lower weight limits. Ocean ports seeking to expand their capacity to meet the demands of increased international trade find their efforts stymied by bottlenecks on land-side rail routes that have not been brought up to double-stack clearance standards. Both problems further constrain the operating capacity of existing rail lines and lead to greater diversion of freight traffic to trucks for haulage over increasingly congested state highways.

CURRENT INITIATIVES ADDRESSING THIS ISSUE

A fundamental problem that must be addressed is the development of a comprehensive database and analysis tool to help identify where interoperability issues exist. NJDOT has begun the development of such a system. A Statewide Rail GIS Layer is currently being developed with information and data describing the physical/operating characteristics of the rail network serving New Jersey, as maintained by different public and private agencies. The Rail GIS database will serve as the framework for integrating and rectifying available information, identifying gaps in the knowledge base, and providing data field and system attribute placeholders which may be filled and continually updated.

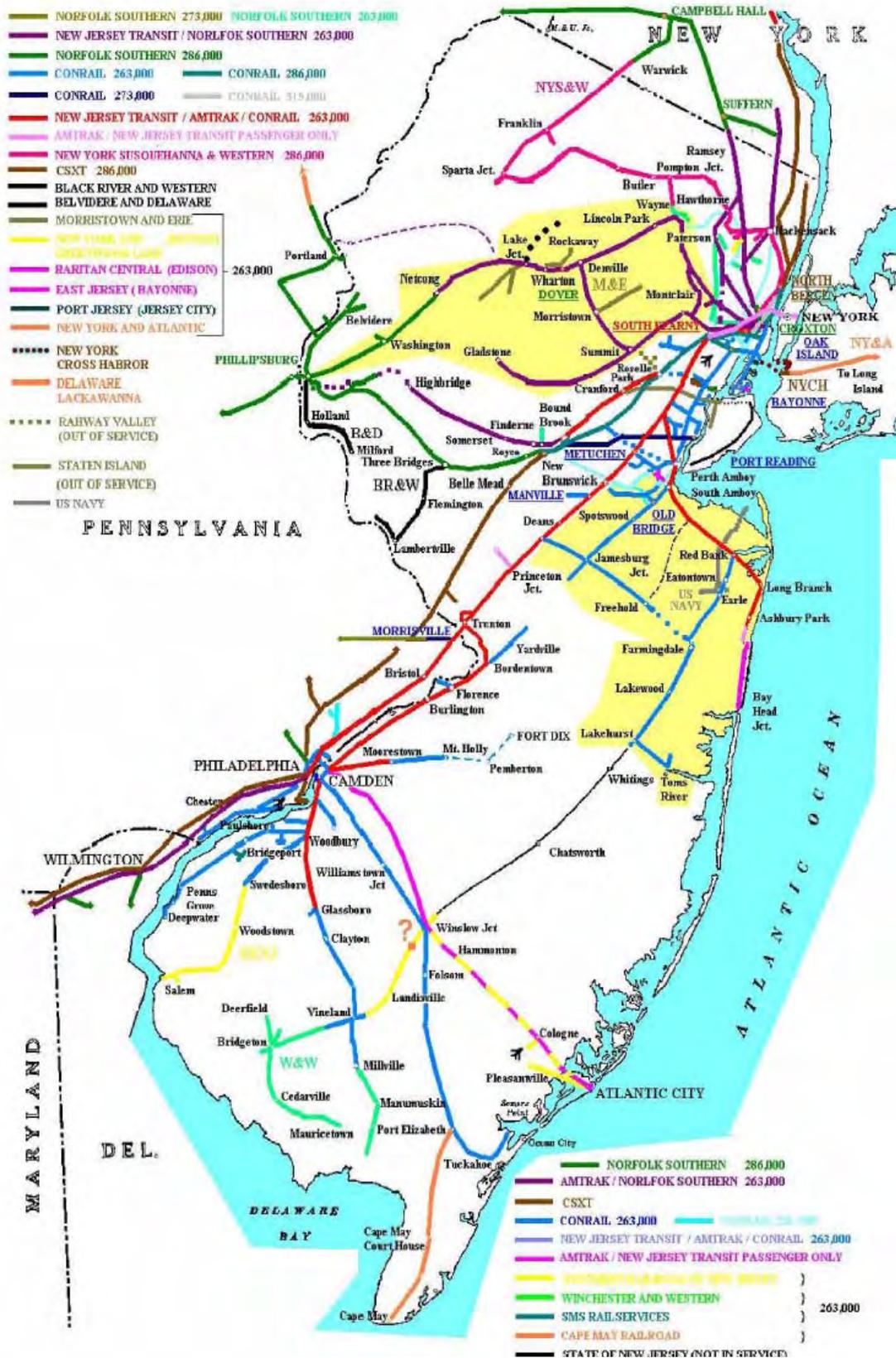
As opposed to creation of the database in a single effort, the process has been isolated into several primary components:

- assembly of available datasets and formulation of database architecture
- rectification of rail system line work with appropriate aerial base maps
- linear referencing and dynamic segmentation of rail network
- definition and integration of segment attributes
- development of a plan for collecting and integrating additional desired information

The desired segment attributes for the layers include items such as the number of tracks, ownership, use, structure information, weight and height restrictions, and current major projects. Not all of the information will be readily available. The initial items that will populate the database will be gathering from existing sources.

The Rail GIS database will serve a vital function of being able to generate a set of consistent base maps for use in future planning efforts. The lack of such a system today accounts for the various map formats displayed in this chapter of the plan.

Figure 7-7 - New Jersey Carload Weight Capacity Limits



Source: Norfolk Southern

STRATEGY R-3: ADOPT STANDARDS FOR RAIL WEIGHT-CARRYING CAPACITY AND HEIGHT/WIDTH DIMENSIONS

Rail service must be “seamless” across different railroad operators and over the various links in the network to operate effectively and efficiently. A systematic assessment of the rail network should be undertaken and goals for basic standards for weight-carrying capacity and height/width dimensions (plate size) should be adopted across the entire New Jersey rail network. A process should be established to achieve these standards cost effectively. Genuine public-private partnerships should be developed to prioritize and fund upgrading the infrastructure at priority locations that do not meet the proposed standards but which meet predefined criteria for upgrade.

Weight restrictions are the most significant issues that impact the short line railroads. Clearance restrictions, in particular those that impact the ability to service double stack containers, negatively impact the cost efficiency of moving goods by rail. Costs for the upgrades are usually high, and are a burden on the private railroads to finance. Addressing these issues is very important to the movement of goods by rail and will not only help the railroads to maintain their market share, but also presents the potential to increase the market share.

Addressing this issue requires several activities that would enhance the ability of the rail system to effectively compete in the marketplace and provide needed overall capacity:

- Characterize the current state of all New Jersey rail lines - as to their weight-carrying capacity and height/width dimensions (plate size). Completion of a basic inventory is a central first step in planning an investment program. It is suggested that a separate effort be focused on populating key fields in the Statewide Rail GIS layer to enable the interoperability issues to be addressed, such as the weight and height restrictions.
- Determine basic standards for weight-carrying capacity and plate size - with the Class I and shortline railroads and NJ TRANSIT, based on the needs of both customers and the railroads.
- Identify key locations not meeting proposed standards - where operational and customer service considerations warrant higher standards.
- Develop a process to evaluate proposals and projects for meeting these standards - incorporating a cost-benefit analysis that would support a public-private funding solution to eliminating these constraints.

PERFORMANCE MEASURES

The development of the following performance measures is recommended to assess the results of strategies adopted by the state, railroads, and the shipper community to improve the interoperability of rail services. Many of these will be greatly assisted by the Rail GIS Layer.

- Plans and estimates of capital and incremental maintenance costs associated with upgrading rail sections to meet basic standards – fundamental metrics for developing an improvement program and budget.
- Percentage of track miles in the state meeting basic weight and plate size standards – a measure of current status and progress towards goal achievement.
- Volume of rail freight or rail modal share before and after rail network weight/height upgrades (projected vs. actual) to measure results from a demand or market point of view.
- Number and value (income) of jobs preserved or increased attributable to the added rail accessibility (or cost effectiveness of service) – a fundamental justification for public-sector participation.

ISSUE THREE: OPERATIONAL AND INSTITUTIONAL INTEGRATION

New Jersey is seeing continued strong ridership on its commuter rail network, and a number of significant capital investments (such as the West Trenton Line and the Monmouth-Ocean-Middlesex Commuter Rail project), which would expand passenger rail service even further, are in development by NJ TRANSIT. While this is a positive development for the movement of passengers by rail, its effects on freight rail services in the State must be examined. Different ownership of rail lines and different operations of rail freight and passenger services tend to constrain rail network development and service improvement. These differences limit joint use of rail rights-of-way and the further development or expansion of rail lines and services.

As noted earlier, shortline railroads provide an important link to the Class I freight rail network for many end users of rail service in New Jersey. However, many of these shortlines operate via trackage rights on NJ TRANSIT-owned rights-of-way. In addition, the Class I railroads occasionally operate directly over NJ TRANSIT lines. There is a fundamental operating disharmony between freight and passenger rail services because of differences in operating speeds and stopping patterns, and the need for greater passenger service reliability—all of which impacts line capacity. Issues of liability and safety are also prevalent (but not irresolvable) in a joint operating environment. Part of the problem stems from the different jurisdictional authority over transit operations and railroad operations at the federal and state levels. Underlying these differences is the focus of freight railroads on carrying goods while transit operators carry people, whose risk tolerance are much lower.

The different operational requirements for freight and passenger rail services have in some cases impeded the optimal performance of the freight railroads. Three areas are of particular concern to the freight railroads:

- **Signal Systems** – NJ TRANSIT employs higher-standard signal systems to achieve the high safety levels required for passenger operations. Implementing these systems on the freight railroads is expensive since it requires installing locomotive-borne equipment that would otherwise not be required.
- **Temporal Separation** – In some case, freight trains are prohibited by FRA rules during any passenger hours (as on the River Line, in this case due to the type of passenger equipment and safety issues). On heavily used NJ TRANSIT or AMTRAK lines freight is allowed at any time, but must be assigned a lower priority so as to not impede scheduled passenger services. Such restrictions can increase travel times and decrease reliability, which in turn reduce the marketability and growth potential of the freight railroads using these lines.
- **Platform Clearance Limitations** – Many current NJ TRANSIT passenger lines (as well as the proposed expansion lines) have high-level passenger platforms at the stations to facilitate the safe and timely boarding and alighting of passengers and to satisfy requirements of the Americans with Disabilities Act. The reduced freight railroad clearances caused by these platforms can inhibit the operation of wider-plate freight trains even when passenger trains are not running.

Thus, while the continued growth in NJ TRANSIT passenger rail service is important for New Jersey, given the state's congested highways and mandate to follow smart growth principles, this growth must be planned in concert with the freight railroads. All freight railroads, but especially shortlines, may feel at a disadvantage when attempting to negotiate with a public entity (NJ TRANSIT) over the weight-carrying capacity of the rail lines over which they operate—primarily because of their limited financial resources and access to public funding. At the same time, the state is hesitant (and in some cases not legally permitted) to put significant public funds into investments that would predominately benefit freight railroads and therefore the private sector – even if the positive impacts of increasing freight capacity are generally understood.

CURRENT INITIATIVES ADDRESSING THIS ISSUE

The envisioned framework of the Statewide Rail GIS Layer will enhance and expedite the coordination, planning and management of rail operations within New Jersey. Additionally, the framework will facilitate analysis at the system level and thereby improve cross agency and operating entity understanding of impacts and trade-offs.

STRATEGY R-4: IMPLEMENT A COORDINATION MECHANISM FOR THE PLANNING AND MANAGEMENT OF THE RAIL SYSTEM

The continuing freight planning process must provide an open forum for discussing and resolving the trade-offs inherent in resolving operational conflicts. A process for issue identification, alternatives development, and evaluation leading to workable and satisfactory solutions for all parties is needed.

NJDOT and NJ TRANSIT should take a joint leadership role in facilitating the resolution of passenger-freight rail operating and program support conflicts, and should recognize and mitigate the difficulties inherent in negotiating these issues between public and private stakeholders. NJDOT and NJ Transit should partner to provide the energy for institutional coordination and cooperation, including leading a forum for increased dialogue between Class I and shortline railroads, passenger rail service operators, and the users of these services regarding all operational issues.

Specific proposals include:

- Identify key institutional issues and constraints to more effective cooperation and coordination among railroad stakeholders, including large and smaller freight railroads and passenger rail operators and rail line owners.
- Identify and prioritize locations of operational conflict between freight and passenger rail service, determine the basis for these conflicts, and develop strategies for resolving these differences in a manner agreeable to the impacted stakeholders.
- Integrate the consideration of freight and passenger rail infrastructure and operational issues and needs in NJ TRANSIT's expansion planning and NJDOT's rail assistance program planning to result in a compatible and mutually reinforcing support program for rail infrastructure by the State.
- Develop a process for considering the economic, fiscal, economic development, and operational tradeoffs among competing interests and programs for supporting freight and passenger rail services and infrastructure and for making hard decisions where institutional conflicts exist.

PERFORMANCE MEASURES

Performance measures need to be embedded in a planning process that addresses the interoperability issue. Once goals have been established, strategies and funding requirements can be identified and an overall program can be developed. The progress towards plan/program completion can then be measured and used to communicate progress to the State, freight railroads, passenger rail service providers, and the shipper community. Next steps include:

- Completion and periodic updating of an official state rail map and database to use as a platform for common understanding of current operational conflicts. Work should include the presentation of key indicators such as freight flows, passenger flows, and measures of freight and passenger train delays.
- Establishment of an NJDOT/NJ TRANSIT jointly sponsored forum for consideration of rail freight and passenger investment needs, the definition of freight and passenger system goals, and the development of prioritized strategies to achieve these goals.
- Creation of a jointly developed process for defining investment options, evaluating impacts, and establishing a funding program.
- Ultimately, the measure of success is associated with the added volume of rail freight (tons and dollars) and rail passengers that result from the program and the measures of quality – generally measured in terms of cost and delay – that can be achieved.

ISSUE FOUR: GRADE CROSSINGS

A comprehensive review of grade crossings for each of the major freight lines in the region is warranted. The main lines feeding the north Jersey terminal include the CSX Trenton Line, CSX River Line, NS Lehigh Line, and the Conrail Lehigh, P&H, Northern, National Docks, Chemical Coast and Port Reading Secondary lines. For each of these major lines, a database should be assembled in junction with the NJDOT

Rail GIS initiative that includes all grade crossings as well as all overhead and undergrade roadways. By utilizing the capability of GIS, the interconnectivity (or lack thereof) of the surrounding road network could be examined.

This information and any road and rail traffic data available (or collected as part of the study), would be used to determine which crossings have realistic alternate routes (e.g. for emergency traffic). Those with reasonable alternates probably don't need expensive grade separation, but perhaps should be considered for better warning devices, quiet zones, etc. Of those that remain on the list without any good grade separated alternative, determine if selecting one crossing to grade separate would create alternate routes for other crossings. Video and ITS (Intelligent Traffic Systems) could also be used as part of the study or implemented in due course to investigate a few select heavily trafficked crossings to determine how long the crossings are actually blocked by the activated warning devices.

Using this approach, the study could develop short and long term plans for addressing crossing related issues along these key rail freight corridors.

CURRENT INITIATIVES ADDRESSING THIS ISSUE

The FHWA disburses monies to the MPOs for grade crossing improvements. They in turn allocate that money to NJDOT for the actual implementation. Fifty percent of these funds must, under the provisions of SAFETEA-LU, be for warning devices. The rest of the monies are used for paving and other improvements.

STRATEGY R-5: DEVELOP A CORRIDOR BASED GRADE CROSSING PLAN FOR:

- Conrail's planned re-doubling tracking of the Lehigh Line between Newark and Bound Brook
- NS's proposed re-double tracking of the West Trenton Line
- the CSX's River Line through Bergen County
- other lines in the port areas – both north and south

PERFORMANCE MEASURES

The reduction of grade crossing accidents and reduced wait times for road traffic are the easiest to monitor. In addition the possible increase in speed and reliability for the railroads may also be measurable, with their cooperation.

8. MARITIME FREIGHT

Historically, ports and maritime facilities were the driving force behind the development and location of cities. Water was the connection to trade, travel, and other life necessities. Today, water serves an important function as a principal highway of the global economy. Ports and maritime facilities serve to connect the State and Nation to expanding global markets, are a conduit for meeting regional needs, and act as an engine for regional prosperity.

New Jersey is fortunate to have two major ports areas: A New Jersey/ New York port region in the north and a New Jersey/ Pennsylvania port region in the south. While the majority of goods which come through these ports are headed for destinations within the region, the ports are also a gateway for goods destined for consumers through the eastern and Midwestern United States. Ports and waterways together are used to move about 36 percent (by tonnage) of all goods into the State, and about 22 percent of all goods out.

While economic opportunities increase along with the predicted growth in global trade, so too do the challenges associated with maintaining the efficient inland movement of goods associated with the ports. Balancing the needs of our maritime global gateways and the needs of other users of the transportation system is important.

This chapter of the Comprehensive Statewide Freight Plan presents an overview of the context and issues facing maritime freight in New Jersey, current initiatives, and additional recommended strategies to address the issues. It focuses primarily on the ports and terminals because of the key and unique role they play in New Jersey's freight transportation infrastructure and economy. It also examines the issues surrounding the waterways in the State. Along with the other modal chapters of this plan, it is designed as both a stand alone document as well as a component of a systemwide action plan.

MARITIME FREIGHT CONTEXT

New Jersey's maritime transportation system consists of three elements:

- Ports and terminals that serve as gateways connecting New Jersey and the US to the global economy
- The inland transportation network of roadways, rail freight operations, and barges that connect the port and terminal facilities to the rest of the State's freight transportation system
- Waterways and channels that provide vessels with access to port and terminal facilities

While the majority of goods brought into the ports are for State and regional consumption, a growing percentage of the traffic is destined for locations throughout the United States. Figures 8-1 and 8-2 on the following page depict the inland movement of cargo by truck for both the NJ/NY region and the Delaware River region respectively. The data for the maps is from 1998 and only includes truck movement. However, they do illustrate the national reach of our State's port facilities.

MAJOR TERMINALS AND OPERATORS

New Jersey has two major ports areas: The New Jersey/New York port complex in the north and the New Jersey/Pennsylvania complex along the Delaware River in the south. Both of these are important regionally and nationally. According to the US Maritime Administration's *Vessel Calls at US Ports 2003* report, facilities accessed via the northern waterways ranked third nationally in the number of vessel calls, and facilities accessed via the southern waterways ranked sixth. The major port terminals within the northern and southern port complexes are discussed below. In addition to these, significant independent petrochemical terminals also operate in both northern and southern New Jersey.

Figure 8-1 - NY-NJ Region Inland Movement of Maritime Cargo

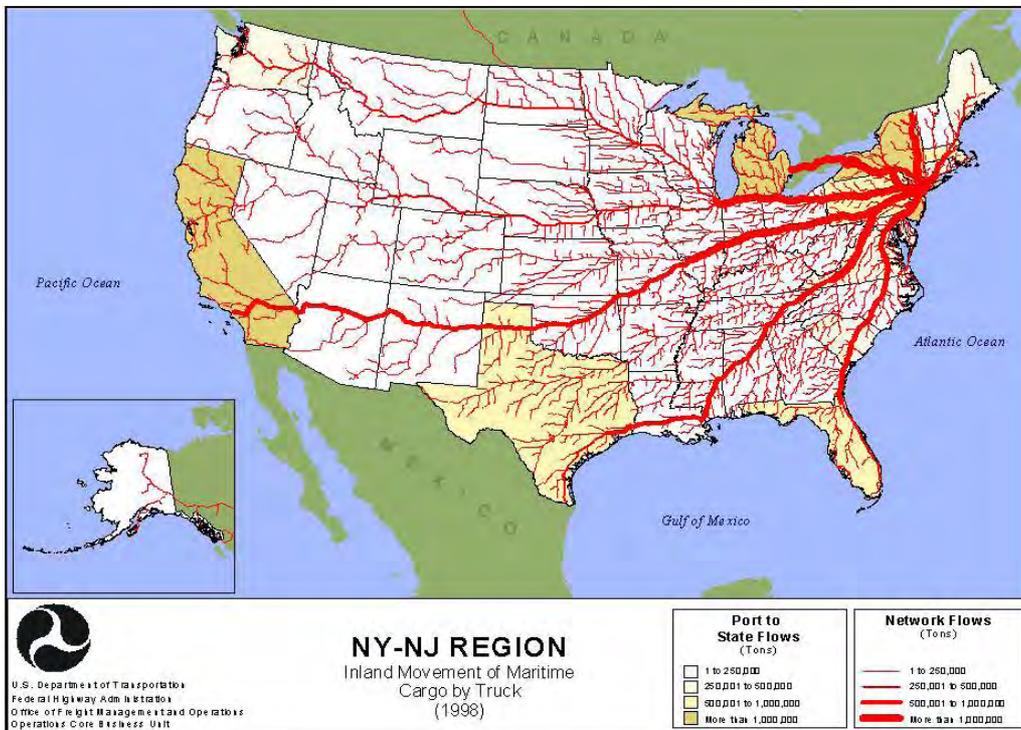


Figure 8-2 - Delaware River Inland Movement of Maritime Cargo

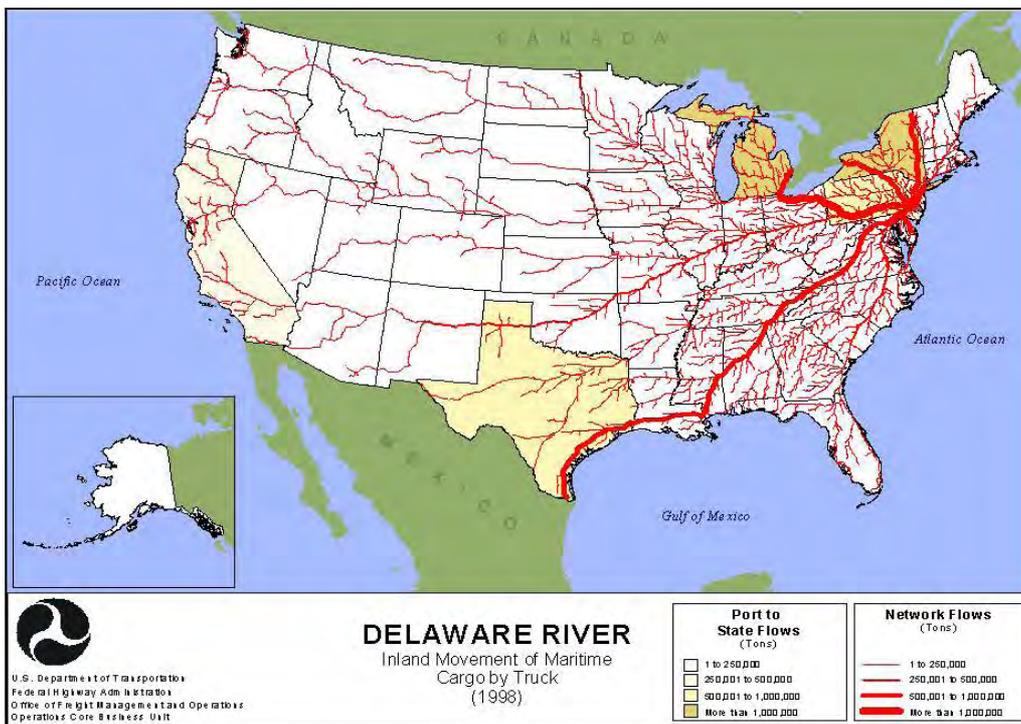


Figure 8-3 - Port Newark/Elizabeth



Source: The Port Authority of NY & NJ Web Site: <http://www.panynj.gov>

PORT NEWARK/ELIZABETH

Figure 8-3 depicts the Port Newark/Elizabeth complex. The portion of the complex located in the municipal boundaries of the City of Elizabeth – Port Elizabeth – covers 1,254 acres and is almost exclusively oriented to the movement of containerized cargo. Two leading container terminals are located here – Maher Terminal, which covers 445 acres, and APM Terminal (operated by Maersk), which covers 350 acres.

Both Maher and Maersk have undertaken extensive reconstructions and expansions of their terminals to handle the new larger vessels and the significant increases in containerized traffic movement. The Maher and APM/Maersk terminals share the newly expanded ExpressRail intermodal rail terminal. This terminal provides “on-dock” movement of containers directly between the terminals and inland points in North America without use of roadways.

Port Elizabeth also includes warehouses and distribution centers. The largest of these is the one million square foot complex operated by East Coast Warehouse. Additional warehouse and distribution center capacity is now under construction immediately south of the APM/Maersk Terminal on the former Allied Signal brownfield property in Elizabeth, NJ.

Port Newark, the portion of the complex located within the boundaries of that city, covers 930 acres and has a more diverse mixture of maritime operations. These include the Port Newark Container Terminal (PNCT), the third container terminal within the complex. Occupying 180 acres, this terminal is operated by P&O Ports North America. The terminal also has access to its own intermodal container rail terminal. The current PNCT on-dock rail facility is an interim operation while the final yard is completed.

Port Newark also contains two auto terminals and preparation centers occupying 300 acres, several bulk handling facilities for such commodities as gypsum, salt, and scrap metal, and two orange juice concentration storage and blending facilities.

Port Newark/Elizabeth is accessed via the Kill Van Kull waterway. This channel was recently deepened to 45 feet and is in the process of being deepened to 50 feet to handle the new large container vessels. As container fleets become dominated by these larger vessels, there will be pressure to increase the height of the Bayonne Bridge to provide clearance (air draft) as well. These vessels are referred to as “post-Panamax” because they are too large to fit in the current Panama Canal locks. These vessels, which can hold more than 5,000 20-foot containers or twenty-foot equivalent units (TEUs), are becoming the standard in the maritime cargo industry. Some new post-Panamax vessels entering service or under construction can hold more than 13,000 TEUs. The new larger vessels require specialized cranes to handle the additional width of the vessel. All the terminals at Port Newark/Elizabeth have these cranes.

GLOBAL MARINE TERMINAL AND NEAT

The Global Marine Terminal and the NEAT auto processing terminals are located in Jersey City and Bayonne, as depicted in Figure 8-4. NEAT and Global are accessed via the Port Jersey Channel. Global is the only freely held container terminal in the Port of New York and New

Figure 8-4 - Global Marine Terminal and NEAT



Source: The Port Authority of NY & NJ Web Site: <http://www.panynj.gov>

Jersey. The terminal, which covers 100 acres, is devoted to container operations. Global currently has 6 “post-Panamax” container cranes.

NEAT and the BMW facility are exclusively for the importing and exporting of automobiles. These facilities, which occupy 130 acres, are directly served by CSX and Norfolk Southern by the adjacent rail yard. The Port Authority of NY and NJ has announced plans to gradually convert these areas to container service over the next decade in order to take advantage of the deeper access channel being constructed with NJDOT support.

These marine terminals are also adjacent to the former Military Ocean Terminal at Bayonne (MOTBY), now known as The Peninsula at Bayonne Harbor. Over 100 acres at the former MOTBY have been designated as the site for a new marine cargo operation. Details of the nature of this cargo operation have not yet been determined by Bayonne, although it is unlikely that the site will host container operations. To date, Bayonne has signed long term lease agreements with Royal Caribbean Cruise Lines.

SOUTH JERSEY PORT CORPORATION AND PORT OF SALEM

The South Jersey Port Corporation is an agency of the State of New Jersey that owns, operates and manages the Ports of Camden and Salem (accessed via the Delaware River), overseeing the import and export of international bulk, break-bulk and container cargos annually into and through South Jersey. The South Jersey Port Corporation (SJPC) operates four terminals:

- **Beckett Street Terminal**, depicted in Figure 8-5, located in Camden, handles project cargo, wood products, cocoa beans, and other bulk cargo considered breakbulk and bulk cargos, which require different operations than containerized cargo. The terminal occupies 125 acres.
- **Broadway Terminal**, also in Camden, occupies 180 acres. The facility handles breakbulk and bulk commodities, including petroleum coke, furnace slag, dolomite, other dry bulks, steel products, wood products, minerals, cocoa beans, and fresh fruit.
- **Broadway Produce Terminal**, depicted in Figure 8-6, occupies 26 acres in Camden. The terminal serves Del Monte and handles its import of bananas, pineapples, and other perishable foods.
- **The Port of Salem**, pictured in 8-7, is the oldest terminal on the East Coast, dating back to the 17th century. The terminal occupies 26 acres and currently handles wearing apparel, fishing apparel, motor vehicles, food products, and consumer goods. SJPC is planning extensive renovations of this terminal.

Figure 8-5 – Beckett Street Terminal



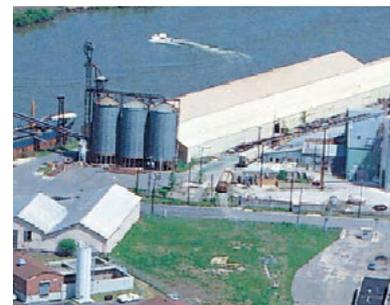
South Jersey Port Corporation Web Site:
<http://www.southjerseyport.com>

Figure 8-6 - Broadway Produce Terminal



South Jersey Port Corporation Web Site:
<http://www.southjerseyport.com>

Figure 8-7 – Port of Salem Terminal



South Jersey Port Corporation Web Site:
<http://www.southjerseyport.com>

SJPC is currently planning to develop Port Paulsboro. The proposed 190 acre facility will accommodate breakbulk, bulk, and containerized cargoes. The upland development is anticipated to consist of warehouse, industrial, distribution and processing facilities, all of which will be port-related. Initial plans call for up to 2 million square feet of warehouse, commercial and processing buildings.

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

The Port Authority of New York and New Jersey (PANYNJ) is an independent bi-state entity responsible for the management bridges, tunnels, bus terminals, airports, passenger rail service, and seaports which support the New Jersey/New York metropolitan area (Figure 8-8).

While no one agency is completely responsible for all the elements necessary to move maritime goods in a given area, the PANYNJ comes close. The Port Authority can invest in terminals, waterway deepening and maintenance dredging (in cooperation with the federal government), and access roads and rail lines.

In addition to initiatives directly related to its facilities, the PANYNJ has been active in addressing maritime-related rail and roadway landside connections. The PANYNJ is completing a 70-acre on-dock rail terminal for containers in Elizabeth and a 50 acre support yard in Newark and Elizabeth that will improve the port's linkage to the North Atlantic rail freight system and provide new rail connections to the Chemical Coast Line in New Jersey.

The PANYNJ also has been actively promoting the Port Inland Distribution Network (PIDN) concept. Through PIDN, a network of inland distribution hubs will be created at key customer locations in the Northeastern U.S. PIDN will improve the efficiency of cargo moving through the Port and facilitate the movement of goods by rail and/or barge instead of trucks. The Port of Albany was the first Northeast port to participate in the PIDN. While the Albany pilot eliminated 20 million vehicle miles of travel, the operation was costly and not self-sustaining and was suspended in 2006. Other locations are being explored, including locations in South Jersey.

Figure 8-8 – PANYNJ Facilities



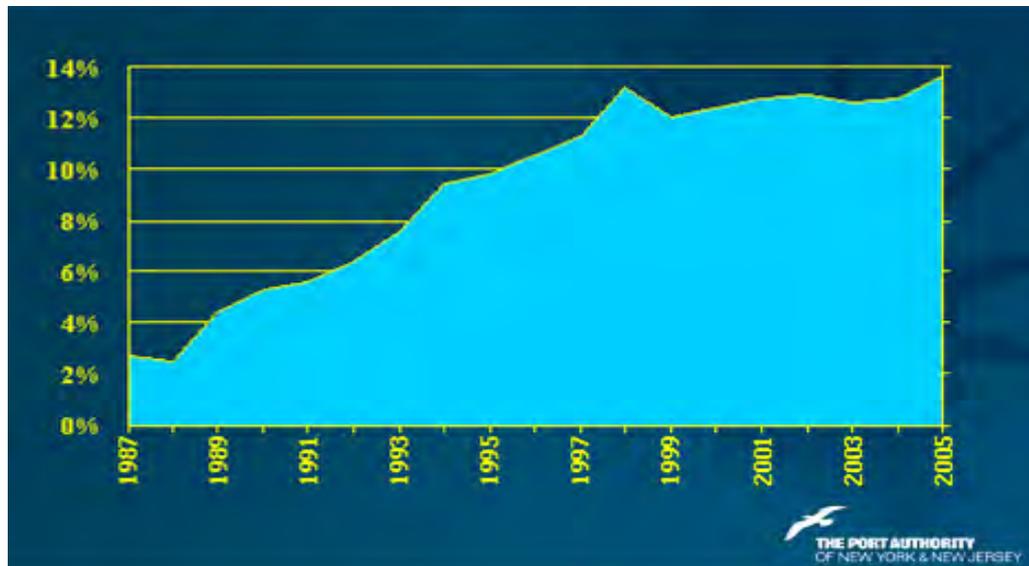
Source: The Port Authority of NY & NJ Web Site: <http://www.panynj.gov>

Additionally, the PANYNJ, in partnership with the NJ Economic Development Administration (NJEDA), have initiated a “Portfields” Initiative. The objective of the Portfields program is to facilitate the redevelopment of designated underutilized and brownfield sites innorthern and central New Jersey into maritime and air cargo-related distribution centers.

NEW YORK CONTAINER TERMINAL

While technically not a New Jersey maritime terminal, New York Container Terminal (NYCT), occupying 187 acres on Staten Island, depends on the New Jersey freight transportation system for its truck and rail freight inland connections and is accessed via the Arthur Kill Channel, which also serves the major petrochemical terminals in northern New Jersey. Goods from this facility can enter New Jersey by train, via the newly refurbished Arthur Kill railroad bridge, or by truck over the nearby Goethals Bridge. The Goethals Bridge is currently planned for replacement by the Port Authority of NY and NJ during the next decade.

Figure 8-10 – Total Rail Containers as a percent of all Port Volumes



In addition to “on dock” rail improvements, the Port of New York and New Jersey is expanding the Corbin St Support Railyard and has been a major contributor (along with the CSX and NS) to the North Jersey Development Plan set of rail projects. These projects, once completed, will increase mainline rail capacity and further enable the Port to increase the volume of goods which leave the dock by rail. The rail chapter of this plan includes more information about these projects. These projects will also assist in flowing non-port related box car traffic into and through the region in a more efficient manner.

Rail freight can also be enhanced to enable the South Jersey ports to attract additional cargo. Conrail controls access to all tracks in southern New Jersey that are accessed via the Delair Bridge. SJPC, for example, is the major import location during the winter months for spools of steel used in Detroit. Currently, the steel travels by truck. A more competitive rail service would allow this traffic to move inland by rail at potentially lower costs. In contrast to the southern New Jersey port terminals, the maritime terminals on the Pennsylvania side of the Delaware River are served by multiple Class I railroads offering a wide range of competitive services.

SHOT SEA SHIPPING

In addition to highway and rail, Short Sea Shipping defined as “commercial waterborne transportation that does not transit an ocean” is being explored by numerous public sector agencies. Short Sea Shipping is an alternative form of commercial transportation utilizing waterways to move commercial freight from major domestic ports to other US destinations.

While short sea shipping has been successful in other world markets, the concept still faces numerous hurdles in the US, including the application of the Harbor Maintenance Tax and the Jones Act. The Harbor Maintenance Tax, which is under review by Congress, essentially applies a tax to all cargo handled by short sea vessels, reducing the competitiveness of this transport option. The Jones Act restricts short sea shipping among US ports to domestic carriers, which can be higher priced.

One example of short sea shipping is barge service. Barge and expanded inland rail movements are being pursued by the PANYNJ through their Port Inland Distribution Network (PIDN) initiative (figure 8-11). The initiative is designed to both expand the northern Port complex’s hinterland, as well as encourage greater use of rail and barge options for inland movement.

Figure 8-11 – Port Inland Distribution Network

The Delaware Valley Regional Planning Commission (DVRPC) and the NJDOT recently completed the “PIDN South Jersey Site Evaluation and Feasibility Development Study”. The effort evaluated the potential to accommodate PIDN developments at five prospective sites in south Jersey: Camden, Gloucester City, Paulsboro, Pennsville and Port Salem.

The study reviewed sites that could be considered as potentially viable inland distribution locations and to explore the potential for value added development around the PIDN or feeder port locations.

Phase two of the NJDOT and DVRPC South Jersey PIDN effort determined key elements of success to enhance southern New Jersey’s economic redevelopment initiatives, while providing a cost-effective alternative to intermodal trucking between north and south Jersey.



Source: The Port Authority of NY & NJ Web Site: <http://www.panynj.gov>

Benefits include job creation, improved quality of life, increased taxes to the state and less impact on stressed roadways. The derived benefits are complimentary and would accrue to both regions.

The proposed South Jersey PIDN system would be based on a routing between the Port of New York and New Jersey and South Jersey Port Corporation’s existing facilities at the Broadway Terminal in Camden. The South Jersey PIDN system has the potential to generate a range of social benefits throughout the state as well as for adjoining states, such as Delaware and Pennsylvania.

The proposed business plan outlines potential and target markets a South Jersey PIDN service could serve, a prospective operational plan, and a commercial strategy designed to ascertain the financial parameters under which a South Jersey PIDN service would operate.

KEY CHANNELS

The waterway channels are also an important component of the State’s marine transportation system. Similar to highways and rail lines, they have signs and navigation systems, serve freight and non-freight users, have operational and environmental constraints, require maintenance and sometimes deepening and expanding. Key waterway channels in northern and southern New Jersey respectively are depicted in Figures 8-12 and 8-13.

CHANNEL DEEPENING

One of the factors that contribute to the competitive position of the State’s ports is ensuring that the channels serving the maritime terminals are of sufficient depth to accommodate the vessels that call on them. The channel depth requirements for these vessels have increased in recent years, with many ports moving to deepen their waterway access channels to 50 feet or greater.

Figure 8-12 - Key Waterway Channels in Northern New Jersey

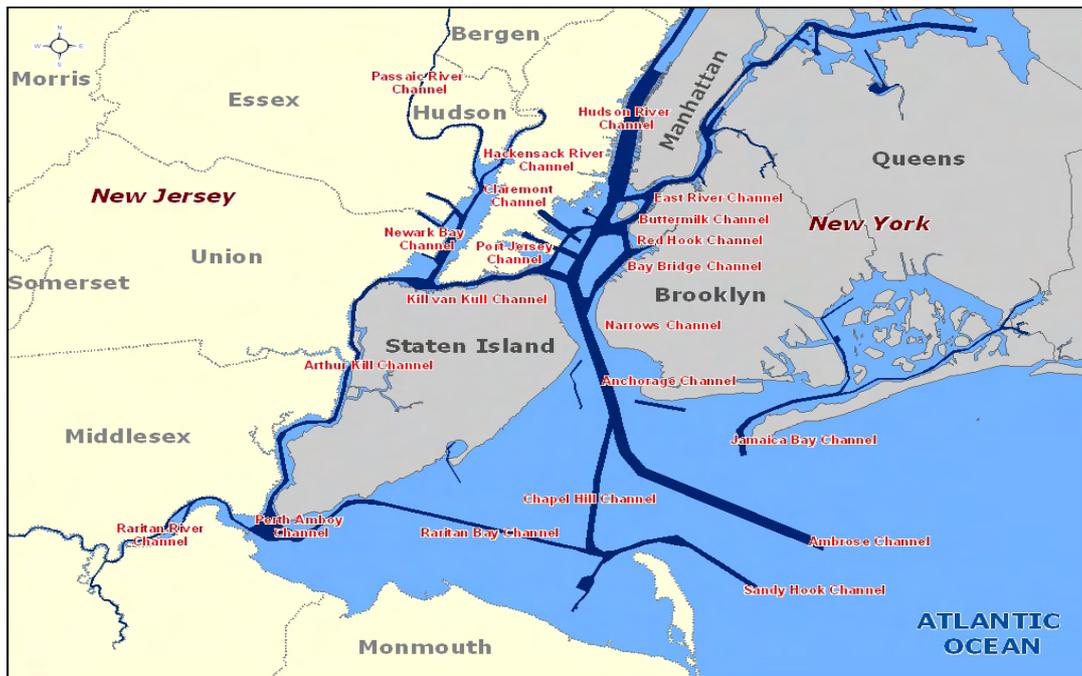


Figure 8-13 Key Waterway Channels in Southern New Jersey



Much has been accomplished to address the deepening of key channels, such as the Kill Van Kull and Arthur Kill in northern New Jersey (as depicted in Figure 8-12), to accommodate the new, larger post-Panamax vessels that have become standard in the shipping industry. Work has been completed on deepening these channels to 45 feet and work is proceeding to further deepen them to 50 feet, with project completion expected by 2014. Many other ports in North America already have or are pursuing 50-foot or deeper channels. Continued support for the deepening of key waterways is critical.

There is a proposal to have the Delaware River and Bay, which serves port terminals in New Jersey, Pennsylvania and Delaware (depicted in Figure 8-13), deepened to 45 feet to accommodate larger vessels and increase the competitiveness of their terminals. Issues surrounding the proposed deepening of the channel in the southern portion of the State are yet to be resolved.

DREDGED MATERIAL MANAGEMENT

Management of dredging activities in New Jersey is divided into three main geographic areas: New Jersey/New York Harbor, Delaware River/Delaware River Ports and State Navigation Channels. State Navigation Channels, for the most part, are not utilized to transport freight, but are critical for commercial fishing and recreation.

Dredging projects have two main parts, dredging and the management of the material removed. Dredged material is mostly sediment that has settled into waterways through natural erosion processes. Sediment can be divided into several geologic types: sand and gravel, silt and clay and glacial till and rock.

Sometimes trash, debris and spilled chemicals can also become entrained in the sediments, making dredged material management challenging. Part of the challenge is simply informing the community of the nature of dredged material. Specifically that contamination is best thought about on a continuum with some dredged material being very clean and some being polluted by various wastes. The more contaminated the sediment is, the more limited the options for management and the more costly management becomes.

Figure 8-14 - Backhoe Dredge in Operation



Dredged material, particularly from state navigation channels, is relatively uncontaminated. This material can often be beneficially used for beach replenishment, as fill, or mixed with leaf mulch or wood chips to create topsoil. Historically, material dredged from Port Districts generally contains higher levels of contamination due to historical point source and ongoing non-point source pollution. However, even in Port Districts, deepening projects contain relatively large amounts of pre-industrial deposits of glacial till, clay or rock that is free of contamination.

New Jersey Department of Transportation's Office of Maritime Resources (NJDOT/OMR) was established partly in response to the dredged material management crisis of 1993 when dredging was halted in the Port of New Jersey and New York due to the closing of the ocean disposal site off Sandy Hook. In addition to port related dredging, the Office coordinates with the NJ Dept. of Environmental Protection for state navigation

channel dredging, a program of great importance to New Jersey's recreational boating and marine trade community.

MARITIME FREIGHT ISSUES

Maritime transportation represents a critical component of New Jersey's overall freight transportation system. The State's ports, terminals, waterways, and the linkages to inland locations are vital assets enabling New Jersey to compete and prosper in an expanding global economy. Like all assets, they cannot be taken for granted.

In the following sections, primary issues facing the State's maritime transportation system are presented. Strategies which address these issues are referenced as Strategy M-X, where the "M" represent the series of maritime strategies and the "X" a consecutive number for the series.

ISSUE ONE - HOW TO BEST MOVE THE INCREASING VOLUMES OF MARITIME CARGO INLAND

This issue primarily relates to the port complex in northern New Jersey, which is the leading gateway on the East Coast for the movement of international maritime cargo. However, the issue of landside connections also affects the maritime terminals in the southern portion of the State. The need to evaluate the movement of freight along the South Jersey corridor is discussed in the Highway section.

Traffic through Port Newark/Elizabeth continues to grow rapidly. Over 1 million *more* twenty-foot container units (TEUs) moved through the Port in 2004 than in 2000. With channel deepening proceeding and significant terminal improvements reaching completion in northern New Jersey, and similar improvements planned in the southern portion of the State, pressure is now on the landside connections to keep pace. Without continual enhancements of the road and rail inland connections, maritime cargo in the State has the potential to become bottlenecked. Delays caused by inland connectivity issues could adversely affect the competitiveness of the State's maritime complexes.

CURRENT INITIATIVES ADDRESSING THIS ISSUE

The port facilities in northern New Jersey have been studied extensively at several levels through the following initiatives:

- The NJDOT Portway Program (discussed in the Highway Chapter)
- The Comprehensive Port Improvement Plan (CPIP): The Port of New York and New Jersey, and other Federal, State and local agencies prepared the CPIP and the CPIP-EIS. The plan determined what was necessary for the Port's facilities to meet significant increases in cargo demand, while balancing environmental, economic, and other quality of life goals. The plan is available on the Port Authority of New York and New Jersey webpage.
- North Jersey Development Plan: – a series of projects to expand capacity in the North Jersey Shared Assets Area (NJSAA), and increase capacity and improve efficiencies of rail serving the Port. (discussed in the Rail Chapter)
- Other initiatives lead by the Port Authority of New York and New Jersey, the North Jersey Transportation Planning Authority MPO (NJTPA), county, and local governments. The Port Inland Distribution Network (PIDN) is one example.
- *Extended Hours of Operations* is being pursued as a strategy to remove trucks from peak commuting periods. A Task Force comprised of public/ private sector representatives is reviewing issues that may inhibit the utilization of off-peak hours; identifying actions necessary to address these issues; determining resources requirements; and developing a coordinated implementation plan. Work is being conducted by NJIT's International Intermodal Transportation Center under the direction of NJDOT's Bureau of Freight Planning & Intermodal Coordination.

- A PANY&NJ lead multi-agency sponsored Virtual container Yard (VCY) demonstration project will test a computer assisted brokerage system that would facilitate the efficient transfer of containers for import and export reuse outside of port terminal. The project, if successful, could help reduce port truck related vehicle miles traveled and terminal congestion.

STRATEGY M-1: ENCOURAGE EXPANDED USE OF RAIL AND BARGE OPTIONS FOR INLAND MOVEMENTS TO AND FROM THE PORTS

The PIDN initiative concept seeks to reduce truck demand by promoting mode shifting at the northern Port facilities to barge and rail. This two-way inland network would likely enhance the attractiveness of the Port to carriers with the larger post-Panamax vessels, and be an economic catalyst to the PIDN facilities and their host communities. While the PANYNJ PIDN efforts extend beyond New Jersey locations, attention needs to be given to the establishment of a PIDN in south Jersey.

In addition to barges, both the NJDOT Portway Extensions Concepts Study and Maher Terminals have recommended the development of rail shuttles to move containers between the northern New Jersey maritime terminals and key warehouse/distribution center clusters both in and out of the State. The rail shuttles are shorter-haul than the existing PIDN program and a new concept for the Class I rail freight companies.

STRATEGY M-2: TIME SHIFT PORT OPERATIONS – ENCOURAGE TRUCKS TO PICK-UP/DROP-OFF CONTAINERS AT MARITIME TERMINALS DURING OFF-PEAK HOURS AND APPOINTMENT SYSTEM

This strategy requires extended gate hours at the maritime ports and terminals. This will allow trucks to access cargo at the terminals during off-peak hours, resulting in a “time shifting” of truck movements over the existing roadway network. The strategy is part of a larger overall effort to time shift the delivery of freight out of the peak hours (as also discussed in Chapter Six – the Highway Chapter). Several elements of the supply chain will have to modify their operation in order for time shifting to successfully occur – this includes chassis and other necessary support facilities.

The Ports of Los Angeles and Long Beach introduced the PierPass program at their terminals in July 2005 to encourage customers to pick up containers during off-peak times. The official PierPass hours at the terminals are from 6 PM to 3 AM Monday through Thursday and 8 AM to 6 PM on Saturday. Container pick-ups during normal business hours are subject to a \$40 fee per TEU. The goal was to shift 20 percent of the movements to off-peak hours at the end of the first year. According to the Journal of Commerce, the first week of operation exceeded that goal – 32 percent of the movements used PierPass and off-peak hours. The goals continue to be exceeded.

Off-peak pick-up at our port facilities also requires that the containers have a destination to accept them at the off-peak hours. Therefore, the time shift strategy also involves working with distribution center operators and other receivers to arrange locations for off-peak drop offs. The needs of small to medium size companies who do not have the resources or immediate business necessity to remain open beyond traditional working hours will have to be addressed.

In addition to the use of extended hour gates, the use of an appointment system in order to smooth peak traffic should also be considered.

STRATEGY M-3: ADVANCE PREVIOUSLY IDENTIFIED PROJECTS DESIGNED TO IMPROVE ACCESS TO/FROM MARITIME FACILITIES. (HIGHWAY, RAIL, AND WATER)

As stated earlier, the Northern New Jersey port region has been the subject of numerous planning exercises. The projects and recommendation contained in these works must continue to be advanced:

- The NJDOT Portway Program
- The Comprehensive Port Improvement Plan

- North Jersey Development Plan
- The PANYNJ PIDN initiative.
- Other initiatives lead by the Port Authority of New York and New Jersey, the North Jersey Transportation Planning Authority MPO (NJTPA), county, and local governments.

PERFORMANCE MEASURES

Potential performance for inland movement effectiveness could include:

- Congestion/road conditions and truck volumes on key access routes connecting New Jersey's port facilities and customers.
- Congestion and port-related volumes on key rail freight routes connecting New Jersey's port facilities and customers.
- The success of time and mode shift strategies in terms of the amount of cargo shifted to off-peak movements and from trucks to alternative rail or barge modes that can be sustained over an extended period.

ISSUE TWO - DEEPEN AND MAINTAIN KEY CHANNELS

Maintaining the depth of the State's waterways and deepening the channels when necessary are critical for the port to maintain a competitive position.

CURRENT INITIATIVES ADDRESSING THIS ISSUE

There is a statewide dredged management program that includes the processing of maintenance dredged material. The program is divided into three main geographic areas: New York/New York Harbor, Delaware River/Delaware River Ports, and State Navigation Channels. As previously noted, work is currently underway to deepen the channels in the Northern waterways. Issues surrounding deepening the waterway channel in the southern portion of the State must be resolved before the project can advance.

STRATEGY M-4: SUPPORT DEEPENING OF KEY CHANNELS

- Continue the deepening of key northern channels in the Port of New Jersey and New York. Included in this is monitoring of potential Bayonne Bridge air draft issue and the deepening of anchorages that support the Port.
- NJDOT must await resolution of issues surrounding the proposed deepening of the Delaware River.

STRATEGY M-5: CONTINUED MAINTENANCE DREDGING OF KEY WATERWAY CHANNELS

- Continue to maintain and improve waterways as necessary.
- Continue to develop, fund, and support the beneficial use of dredged materials in public and private projects.

9. AIR FREIGHT

There is great uncertainty in the Air freight industry. There has been tremendous turbulence in the industry due to significant truck substitution for aircraft use, the rise and domination of the integrated carriers (such as FedEx and UPS), and the poor financial conditions of many passenger airlines. While these trends have reshaped the industry, another potential issue has created concern for the industry and the airport authorities -- the pending release of new security requirements for air cargo from the Department of Homeland Security.

This chapter of the Comprehensive Statewide Freight Plan presents the context and issues of air freight in New Jersey, with a discussion of current initiatives and additional recommended strategies to address these issues. Along with the other modal chapters of this plan, it is designed as both a stand-alone document and as a component of a systemwide action plan.

AIR FREIGHT CONTEXT

Air freight is a multi-modal operation. Trucks bring the cargo to and from the airports, and aircraft transport it between airports. Freight forwarders and consolidators and cargo carriers may maintain facilities both on- and off-airport to support their operations.

As aviation freight is reliant on trucks, airports require efficient access to transportation infrastructure, particularly the highway system. Competition to moving goods arises from the primary role of most airports to move people. Competition for land near the airport to support freight activities is also intensive.

GOODS MOVED BY AIR

The commodities that tend to travel by air are time sensitive, light in weight (in general) and of high value. These types of goods include overnight documents and packages, perishable shipments (such as fresh fish and flowers), pharmaceuticals, electronics, high-end apparel and jewelry. Critical parts, needed to keep assembly lines and offices functioning, may also move by air. Table 9-1 lists the top inbound and outbound commodities moved by air in 2003.

Figure 9-1 On-Airport Cargo Facilities at EWR

FedEx Cargo Operation



UPS Cargo Operation



**Table 9-1 - Domestic Air Cargo Commodities by Weight (Short Tons)
as Reported by TRANSEARCH, 2003**

Name	Commodity Group	Total	Inbound	Outbound	Intrastate
17	Miscellaneous Freight	161,328	90,534	70,793	0
12	Durable Manufactured Goods	66,715	38,899	27,816	0
9	Chemicals	43,835	15,474	28,360	0
6	Nondurable Manufactured Goods	23,356	13,573	9,783	0
16	Transportation Equipment	18,768	8,929	9,840	0
15	Fabricated Metals	6,415	2,862	3,553	0
1	Agriculture	4,749	3,709	1,040	0
8	Paper	4,694	2,456	2,206	31
11	Rubber/Plastic	3,702	2,911	791	0
5	Food	2,377	1,453	924	0
10	Products of Petroleum and Coal	464	195	269	0
13	Clay/Concrete/Glass/Stone	390	390	0	0
14	Primary Metals	147	147	0	0
7	Lumber	39	39	0	0
TOTAL		336,978	181,571	155,375	31

Source: Cambridge Systematics analysis of TRANSEARCH data.

The majority of air freight in New Jersey moves through Newark Liberty International Airport (EWR). Of the inbound freight at the airport, nearly 75 percent of the cargo had domestic origins. Most of this cargo was handled by the integrated carriers, with FedEx handling the most. One-quarter of the air cargo tonnage in 2003 had an international origin.

For outbound freight, domestic destinations dominate, accounting for 84 percent of the cargo at EWR. Sixteen percent of the outbound cargo had international destinations. These values are depicted in Figure 9-2.

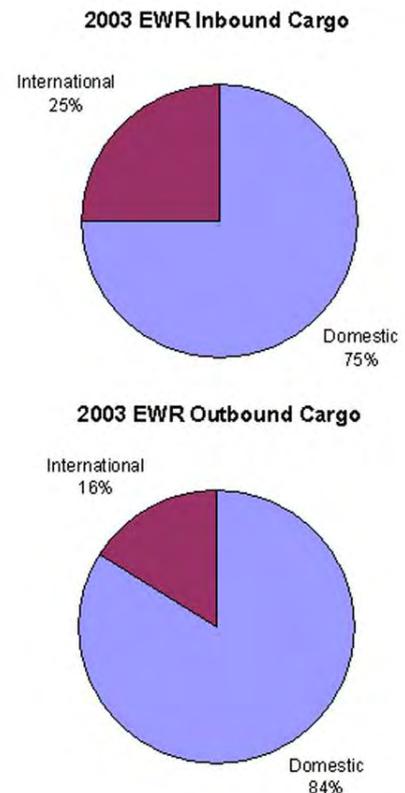
Air cargo activity declined in 2001 concurrent with the recession and the events of September 11. Activity increased in 2002, with a short-term rise resulting from the West Coast port strike and the beginning of an economic recovery. This recovery continued in 2003, resulting in a small increase in cargo tonnage at EWR. Air cargo activity increased in 2004, when congestion and delays at the West Coast ports and on the nation's rail system forced customers to use air cargo options. EWR is primarily a domestic air cargo hub, and its freight activity reflects the national trend towards substituting less expensive time-definite truck service for air cargo movements.

AIR FREIGHT CARRIERS

The air freight carriers consist of three types:

- *Integrated carriers*, which include FedEx, UPS, and DHL. Integrated carriers have extensive multimodal freight structures. Integrated carriers represented nearly 70 percent of the tons that moved through EWR in the 12 months that ended in September 2004.

Figure 9-2 - Inbound/Outbound Cargo at Newark Airport



Source: Cambridge Systematics, Inc.

- *Air passenger carriers that transport cargo in the bellies of their aircraft.* Generally, EWR does not have all-cargo aircraft from divisions of these airlines. By a large margin, Continental Airlines is the leading passenger operation with a freight component. Continental has a large international operation at EWR, as well as an extensive domestic passenger operation. Overseas carriers represent the remainder of the airlines in the top 10 list of service providers – SAS, British Airways, EVA Air, and Virgin Atlantic.
- *All-cargo carriers (freighter),* such as Kalitta and Astar. All-cargo carriers represent only a small portion of the tonnage moved by air at EWR.
- Charter cargo operations also occasionally use the airport.

The key cargo service providers at EWR are listed in Table 9-2.

Table 9-2 - Top 10 Freight Carriers at EWR for 12 Months Ending September 2004

Rank	Service Provider	Tons	Share
1	FedEx Express	505,371	51.6%
2	Continental Airlines	145,083	14.9%
3	UPS	142,998	14.6%
4	DHL (Airborne)	25,662	2.6%
5	SAS	18,986	1.9%
6	British Airways	16,107	1.7%
7	Virgin Atlantic	14,706	1.5%
8	ATI (BAX Global)	13,897	1.4%
9	Astar Air Cargo	7,802	0.8%
10	EVA Air	7,481	0.8%

Source: Port Authority of New York and New Jersey

The air cargo service providers represent one set of the multiple public- and private-sector organizations involved in air cargo planning and operations. True to the pattern in most other areas of the logistics industry, no one agency or organization controls, plans, or funds the full transportation system required for air cargo.

On-airport functions include the operations and development of EWR, which is primarily the responsibility of the Port Authority of New York and New Jersey (PANYNJ). Federal government responsibilities include the Federal Aviation Administration (FAA), which regulates and funds on-airport infrastructure and operations; the Department of Homeland Security/Transportation Security Administration, which manages security-related functions; and US Customs and Immigration, which handles international matters.

Off-airport, different agencies and organizations are responsible for access roads and cargo-related economic development. The FAA, for example, cannot fund projects for access roads that are not controlled by the airport authority. Most access roads are under the jurisdiction of local agencies and connect to highways managed by NJDOT or the New Jersey Turnpike Authority. Off-airport economic development and zoning for cargo/industrial activities is the jurisdiction of the municipality.

MAJOR AIR FACILITIES

Three airports in three states facilitate New Jersey's air cargo activities:

- Newark Liberty International Airport (EWR) in northern New Jersey;
- John F. Kennedy International Airport (JFK) in New York;
- Philadelphia International Airport (PHL) in Pennsylvania.

EWR is the primary hub of air cargo activity within the state of New Jersey. The airport also serves as the overnight/small package center (integrated carriers) for the New York-New Jersey metropolitan area. In 2003, EWR handled more than 964,000 tons of air cargo, and the airport was ranked 9th in the US and 21st in the world in terms of cargo tonnage. EWR focuses primarily on domestic cargo movement through integrated carriers, such as FedEx, UPS, and the US Postal Service. However, the number of international flights and range of overseas connections are growing at the airport, with a corresponding growth in the amount of international air cargo traffic. This traffic moves almost exclusively in the bellies of passenger aircraft.

Because JFK and PHL also provide air cargo services to New Jersey customers, access to these airports is important. JFK currently is the leading international cargo facility in the bi-state region. JFK is the 5th largest air cargo hub in North America and is ranked 11th in the world. The airport functions primarily as an international gateway, covering a broad service area in the US. JFK handled nearly 1.8 million tons in 2003. Air cargo operations at the airport include cargo dedicated aircraft and cargo carried in the bellies of passenger aircraft.

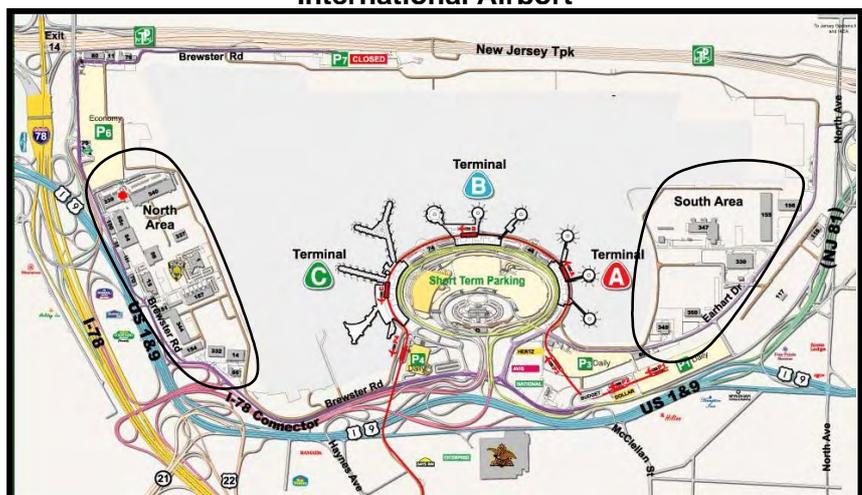
JFK has functioned as a leading international air cargo hub for many years. However, access to JFK is limited and congested. Some experts have noted that the access issues, combined with new aircraft types and a proliferation of routes to alternative airports, may reduce JFK's attractiveness as an air cargo hub in the future.

PHL handled more than 578,000 tons of air cargo in 2003. The airport provides some air cargo services for customers in southern New Jersey. PHL was ranked 14th in North America in terms of tonnage in 2003. The airport has a mix of passenger airline cargo operations, all-cargo carriers (such as Kitty Hawk and BAX), and integrated carriers (such as FedEx and UPS).

NEWARK LIBERTY AIRPORT (EWR)

Operated by the Port Authority of New York and New Jersey, EWR is also one of the largest hubs of air cargo activity in the world. While the airport moves significant volumes of passengers and goods, runway capacity is an issue, and could limit future growth of both passenger and cargo volume. EWR has 290 acres and nearly 1.4 million square feet of space devoted to cargo activity on the north (Essex County) and south (Union County) sides of the airport, as shown in Figure 9-3.

Figure 9 3 - Air Cargo Areas at Newark Liberty International Airport



The cargo facilities in these two areas are relatively new and include:

- The FedEx Cargo Complex (South Area), which was completed in 1995 and includes three buildings. This complex, known as the Newark Regional Hub, is a key national facility for FedEx and services the entire bi-state area.
- The UPS package handling and distribution center (South Area), completed in 1987. The facility occupies 28 acres.
- The USPS Facility (South Area). This \$2.6 million, 36,000-square-foot postal facility opened in 1983.
- The Airis International Air Cargo Center (North Area). Built on the site of the former North Terminal, the center consists of two buildings containing 192,000 square feet, which opened in 1998, and 76,000 square feet, which opened in 1999.
- The United Airlines Cargo Facility (North Area). This facility contains 42,000 square feet of cargo area and 7,300 square feet of office space. The building was completed in 2001.
- The Continental Air Cargo Facility (North Area). This 110,000-square-foot facility was completed in 2001.
- The Port Authority Multi-Tenant Cargo Building, which was completed in the North Area in 2003.

OFF-AIRPORT AIR CARGO FACILITIES

Additional air cargo related operations exist in the area immediately adjacent to the airport on the south side in Elizabeth. This location of off-airport facilities (also known as “through the fence” operations) balances easy access to the airport with far less expensive lease rates. With on-airport space increasingly constrained, the Elizabeth area provides needed capacity to allow the continued growth of cargo activity at the airport. In Union County, off-airport cargo operations can also be found in Hillside and Linden, which are within a 30-minute drive of the airport.

AVIATION ISSUES

The issues involving air cargo inherently involve uncertainty – uncertainty regarding the aviation industry, the impacts of truck substitution, and the impacts associated with emerging security requirements. Air cargo is an important means for moving freight. Yet, the public sector needs to plan within an uncertain context.

For the aviation freight chapter, the strategies are referenced as Strategy A-X, where the “A” represent the series of aviation strategies and the “X” a consecutive number for the series

ISSUE ONE – PLANNING AMIDST UNCERTAINTY

Without question, effective air cargo capacity is crucial to the residents and businesses of New Jersey. However, the industry is in a dynamic situation, making future planning more difficult. National air cargo forecasts are generally made in terms of revenue ton-miles or revenue ton-kilometers. Because of the substantial truck substitution affecting domestic air cargo, it is likely that miles traveled will grow faster than total tons. Projections made in terms of tonnage tend to show smaller anticipated growth. Assuming continued economic growth and consumer activity, it is anticipated that air cargo at EWR may grow between one and three percent annually in terms of tonnage by 2025.

Several issues may affect growth projections and could also cause a decline in the tonnage handled. First and foremost are the evolving security and inspection. New security and inspection requirements could impact the amount of cargo currently moving in the bellies of passenger aircraft, as well as mandate changes in the physical facilities on-airport and/or off-airport. Some proposed requirements may decrease the ability of cargo to travel in the bellies of passenger aircraft. New security requirements could also increase truck substitution. The potential impacts will not be known until the new requirements are promulgated and discussed in late 2005.

Additional issues that may affect the amount of tonnage handled include:

- Congestion and delays on the national transportation system, particularly at West Coast ports. Unanticipated congestion usually results in short-term increases in air cargo.
- Truck substitution intensifies. Truck substitution will decrease the amount of cargo moving on aircraft, although truck-to-truck movements may increase on and near the airport. Truck substitution has grown as a result of the cost differential between truck and air transport costs and the increased ability of users to control goods while they are being moved by truck. This in-transit visibility and flexibility allows companies to use less expensive truck transport, despite its slightly longer transit times.
- The number of international flights to and from EWR continues to increase. International cargo can be moved in the bellies of these aircraft and can result in increased volumes at the airport. International flights may be an important growth market for cargo at the airport. However, pending security regulations may alter the ability of these aircrafts from carrying freight.
- “Right-sizing” of aircraft continues. Many airlines have reduced the size of the aircraft used on their routes. For example, instead of flying a Boeing 737, an airline may now use a smaller regional jet (RJ) for the route. RJs have much smaller belly capacity and that space is required for a greater proportion of passenger cargo (RJs have minimal overhead compartment space). Thus, the downsizing of aircraft also reduces cargo capacities on certain routes. This is an emerging condition, and some airlines are using RJs only in new lower load markets. Additional data and monitoring of the situation is needed.

Given the scarcity of land at EWR, the airport may wish to limit on-airport cargo activity to those operations that only or substantially involve aircraft operations. This decision would then affect the demand for expedited trucking/air cargo-related facility availability in the communities immediately surrounding EWR – some decisions regarding whether truck or aircraft will be used are made at the last moment, requiring quick access to the airport.

Additional questions involve the characteristics of cargo activity at the airport, for example the tonnage and value of domestic and international movements, types of aircraft involved (freighter, belly, integrator), types of commodities moved, and the origins/destinations within New Jersey.

Once the answers to these questions are ascertained, an assessment of EWR’s capacity can be made. Currently, most of the on-airport facilities are relatively new. However, little property remains for the expansion of on-airport cargo operations. Aviation-related uses in Elizabeth and Newark should be encouraged.

In addition, EWR is a growing passenger airport. On-airport space is limited and has to be rationed between cargo and passenger activities. While some leading airports are seeking to shift cargo to alternative airports (e.g., the authority that manages Los Angeles International Airport is actively encouraging cargo carriers to shift to Ontario International Airport), it is highly doubtful if such actions would be required at EWR within the time frame of this freight master plan.

STRATEGY A-1: PROACTIVELY EVALUATE AND RESPOND TO EMERGING FEDERAL SECURITY REQUIREMENTS

Quick assessments of regulations and requirements will be essential to understand the implications for EWR and truck substitution. The security regulations will need to be assessed in terms of required inspection manpower and equipment, impacts involving on-airport facilities and access, and impacts on the use of air cargo. In some cases, the State, along with private sector freight entities, may seek modifications or amendments to ensure the efficient movement of cargo as well as heightened security.

As the operator of EWR, the Port Authority of New York and New Jersey takes the lead on security regulation assessments, with input from the private sector and NJDOT as necessary.

STRATEGY A-2: MONITOR THE TRUCK SUBSTITUTION SITUATION AT THE AIRPORTS AND REACT TO NEEDS

EWR is primarily a domestic air cargo hub, and its freight activity reflects the national trend towards substituting less expensive time-definite truck service for air cargo movements. The increased use of trucking is having a profound impact on air cargo activities and airports, including:

- Reductions in the amount of cargo moving by air domestically.
- An increased demand for on-airport and off-airport facilities that can handle both truck-air and truck-truck operations. (At least 20 percent of all cargo operations on-airport typically can be truck-to-truck moves, with no loading on aircraft.)
- Increased action by the airlines to grow or develop their truck operations faster than their aviation operations, as evidenced by recent trends at BAX and FedEx. BAX is shifting to being an almost entirely ground-oriented operation.

From transportation infrastructure and economic development standpoints, truck substitution requires greater connectivity between the airport and the highway system. Current and planned roadway improvements at EWR are designed to improve truck access.

In addition, as much as 20-to-30 percent of the domestic cargo tendered at the airport by truck may also leave the airport in trucks. This is a pattern found at most US airports and can affect on-airport facility utilizations and requirements. However, the information collected on cargo at the airport is limited and does not currently capture details on non-aircraft cargo movements. Nevertheless, truck-to-truck movements occurring on-airport can affect the level and type of demand for air cargo facilities on airport property – it can affect how much square footage is needed, the number of loading bays, the size of trailer to be accommodated (currently up to 53 foot trailer), and the amount of direct ramp access required.

The amount of truck substitution and its impact will be influenced by a number of factors, including the new security regulations. As it is uncertain at this time what may occur, it is important to gather information and track the situation. Data needs are defined in the following strategy.

STRATEGY A-3: COLLECT AVIATION FREIGHT INFORMATION

Data is needed in order to assess the current and future conditions of aviation freight in New Jersey. It is suggested that the Port Authority of New York and New Jersey obtain more detailed information on the cargo moving through EWR on an ongoing basis. The data should include domestic and international cargo movements in aircraft, parameters needed to track the amount of truck traffic occurring at the airport, the types of commodities moved, and key trading partners. Aircraft cargo information should be segmented into belly, freighter, and integrated carrier types.

Additional surveys of truck drivers at the airport would be useful in identifying key origins and destinations within New Jersey. This information would assist in identifying key roadways for accessing and distributing air freight moving through EWR. Similar information for JFK and PHL would also be helpful in understanding the role and impact of these airports in New Jersey.

For EWR and JFK, the Port Authority of New York and New Jersey should take the lead on data collection, with input from the private sector, NJDOT, and the NJTPA. A more complete and reliable data set is necessary to fully understand and plan for air cargo in the State, as well as to understand the implications of truck substitution.

The resultant data set can be used as performance measures for air cargo in the State. For example:

- track international cargo tonnage and its value
- track the trend in on-airport “truck-to-truck” activity
- track New Jersey domestic and international air cargo traffic moving through EWR as compared with other airports

10. WAREHOUSING FREIGHT AND DISTRIBUTION CENTERS

Warehouses and distribution centers are an often-overlooked element of the freight transportation system because they are not transportation conveyances – the typical elements addressed by public-sector transportation agencies. However, just as the freight transportation modes have altered their functions and business relationships to meet changed customer needs, so have the warehouses.

This chapter of the Comprehensive Statewide Freight Plan presents the context and issues of warehousing freight and distribution centers in New Jersey, with a discussion of current initiatives and additional recommended strategies to address these issues. Along with the other modal chapters of this plan, it is designed as both a stand-alone document and as a component of a systemwide action plan.

WAREHOUSING CONTEXT

Warehouses are no longer dusty storage operations. Today, they are more often referred to as distribution centers (DCs), and workers generally add value to the goods moving through them. Warehouses and DCs are the intersection of the freight transportation system and economic development.

In New Jersey, a significant portion (30 percent) of all originating truck freight is classified as “Warehousing Distribution,” which includes mixed shipments of consumer goods, generally between warehouses and retail locations. As with originating truck freight, the most common type (27 percent) of terminating truck freight is warehousing distribution. Figure 10-1 is a picture of a value added warehouse located at the New Jersey Turnpike near Interchange 8A.

Figure 10-1 - Value-Added Warehouse



Barnes and Noble DC at NJ Turnpike Interchange 8A
(Employs 800 and fulfills Internet and store orders)

FACILITIES AND OPERATIONS

Warehouses and DCs are defined as structures that are primarily used for the receipt, temporary storage, possible modification/customization, and distribution of goods that are en-route from production sites to where they are consumed. Warehouses and DCs are often sites where value is added to the products moving through them. Examples of value-added activities include final assembly and customization of products and preparing products for the sales floor (including packaging and tagging).

The value-added activity has taken on new significance with the increasing number of products manufactured overseas and imported into the US. Under the new paradigm for global production and distribution, goods are mostly manufactured at the least-cost location globally and then undergo final customization and shelf-readiness near the point of consumption. For the US economy, warehouses and distribution centers have emerged as the new manufacturing base.

Warehousing operations vary considerably in size, ranging from just a few thousand square feet to buildings that are over one million square feet. Warehouses may contain temperature-controlled space, which is essential for maintaining perishable food. Generally, larger DCs, especially those in excess of 500,000 square feet, tend to locate in the outlying areas along major Interstate highways where land prices are lower.

Warehousing and DCs are similar to ports and airports in that they are physical locations rather than conveyances of cargo. Warehouses and DCs can also be located at or adjacent to airports and ports to support cargo operations. Warehouses may also have rail sidings for the receipt or shipping of products, although the vast majority of the freight moving to and from warehouses and distribution centers (particularly goods departing DCs) is handled by trucks.

Unlike ports and airports, warehouses and DCs are individually managed. While there are significant concentrations of activity, DC locations are also significantly more diverse than ports and airports. Warehouse users can also more easily choose to vacate a location if another site better suits their needs.

CURRENT WAREHOUSING AND DC SPACE IN NEW JERSEY

New Jersey is one of the leading centers of warehousing and DC space in the US. Over 123 million people live within one day’s drive of New Jersey – yielding a high value, close-in marketplace that can be easily served. These facilities also provide value-added services for products manufactured overseas and delivered to the US via Port of Newark/Elizabeth. A similar relationship exists in California between the Ports of Los Angeles and Long Beach and the concentration of DC space in the vicinity. In both cases, the existence of a leading national port is a major attractor for DC space. Nearly 405,000 people work in New Jersey’s warehouses and distribution centers, making this activity one of the leading job generators in the state.

New Jersey contains nearly 838 million square feet of industrial property, with over 7 million square feet currently under construction. Much of this space consists of warehouses and DCs. As shown in Table 10-1, much of the warehousing activity is located in Middlesex, Union, Hudson, Essex, and Bergen counties. Hudson, Essex, and Bergen warehouses also serve as distribution centers for the New York City marketplace, where high land prices and a scarcity of property limit the availability of comparable facilities. Figure 10-2 illustrates the total square footage of industrial space and also the relationship of total square footage of industrial space to land mass area for counties in New Jersey where information was available.

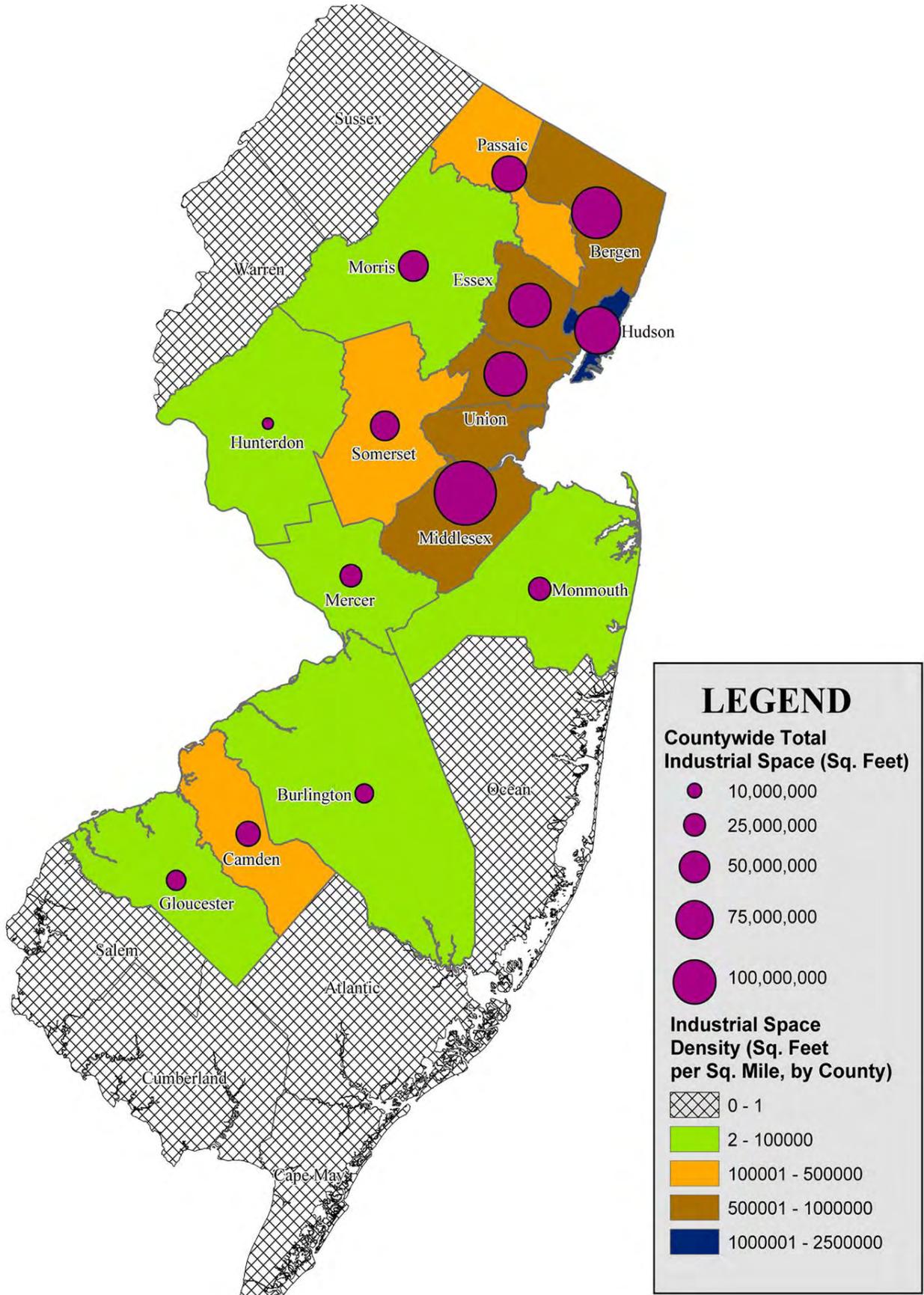
Middlesex is New Jersey’s hub of DC activity. Interchange 8A on the New Jersey Turnpike is the epicenter, with nearly 50 million square feet in this one location and more than 4 million square feet of additional space under construction. Interchange 7A is also now developing as a new center of DC activity in the state. In southern New Jersey, nearly 61 million square feet of industrial space exist in Gloucester, Camden, and Burlington counties, with almost 800,000 square feet of new space being developed.

Table 10-1 Current Industrial Property in New Jersey

<i>County</i>	<i>Existing Industrial Space (square feet)</i>
Bergen	122,253,233
Essex	87,995,086
Hudson	103,425,242
Morris	42,040,709
Passaic	58,062,464
Hunterdon	5,400,503
Mercer	22,394,646
Middlesex	189,674,172
Monmouth	23,498,430
Somerset	39,223,882
Union	89,782,578
Burlington	15,627,505
Camden	27,441,207
Gloucester	17,560,482
TOTAL	844,380,139

(as of 4th quarter of 2004¹, source: CB Richard Ellis)

Figure 10-2 - Industrial Density in New Jersey, by County

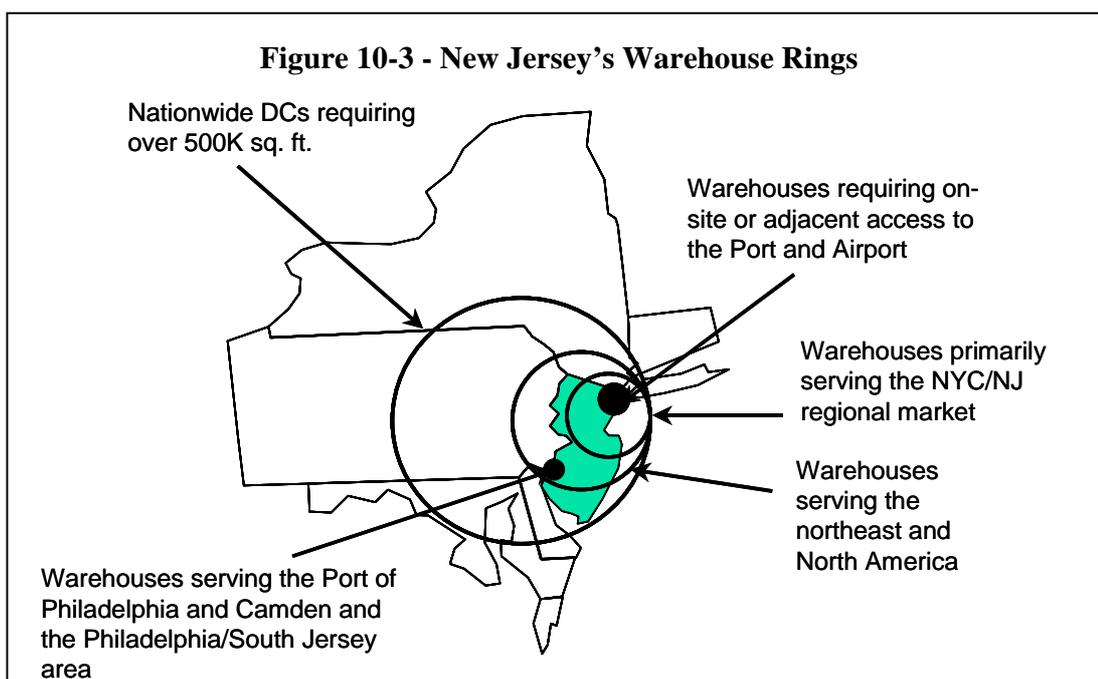


However, New Jersey’s dominance in DC activity is being increasingly challenged by the availability of less expensive property in Pennsylvania along the Interstate 78 and 81 corridors. In the Harrisburg area—encompassing Cumberland, Dauphin, Franklin, Lebanon, Lancaster, and York counties—CB Richard Ellis reported that more than 159 million square feet of industrial space existed in the second quarter of 2004, although no new construction activity was reported. The average asking lease rate of \$3.88 was less than New Jersey’s average rate.

THE THREE RINGS OF WAREHOUSES

Warehouse and distribution centers serve different market areas. As described above, New Jersey is uniquely situated for warehousing. As such, New Jersey is a logical point to do final assembly and customization before products reach their final destinations. Several rings of warehouses have emerged (Figure 10-3).

- *Warehouses requiring on-site or adjacent access to a Port or Airport.* There are warehouses and distribution centers that are on-airport property, on-port property, or immediately adjacent to these facilities to meet the immediate storage and manipulation needs of air and ocean cargo. These needs can include temporary storage, transloading from overweight containers to boxcars or truck trailers, and consolidation of outgoing shipments.
- *Warehouses that serve the regional market.* These warehouses, which can range in size from 100,000 to 500,000 square feet, are designed to distribute products to customers within the New Jersey-New York-Pennsylvania marketplace. For example, distribution centers in the Meadowlands often serve customers in New York, where land and storage facilities are much more limited. Supermarket warehouses receive products and arrange shipments to individual stores in their chain. Proximity to the regional market is critical because of the volume of truck trips to and from the facility. More distant locations increase the cost of transportation associated with serving the regional market.
- *Warehouses that serve larger market areas or all of North America.* These distribution centers are at least 500,000 square feet in size and many are over a million square feet. These facilities require inexpensive property because of their size and unimpeded access to their multi-state or North American markets. Ideally, when a majority of the inbound movements are from overseas, these facilities also desire close proximity to major port terminals. These are among the reasons that the Interchange 8A and 7A locations are important nodes of warehouse and distribution center activities. However, these locational characteristics also favor sites along Interstates 81 and 78 in Pennsylvania.



WAREHOUSING ISSUES

The primary issue for warehouses and distribution centers (DCs) is the need to accommodate the demand for space in New Jersey so that the State can obtain the maximum economic development benefits from these facilities. This issue emerged through reviews of trends in New Jersey and the logistics industry, and during a roundtable discussion among key distribution center owners, developers, and brokers facilitated by the New Jersey chapter of the National Association of Industrial and Office Properties and the Freight Plan team. Serving the existing warehousing and distribution centers places a considerable truck load on our State's highways, accounting for nearly 30 percent of all truck trips being made in New Jersey. As freight growth is expected, addressing both the existing and future truck traffic associated with warehouses and distribution centers is a high priority.

For the warehouse chapter, the strategies are referenced as Strategy W-X, where the "W" represent the series of warehouse strategies and the "X" a consecutive number for the series

ISSUE ONE: TRUCK TRAFFIC ASSOCIATED WITH GOODS MOVEMENTS TO AND FROM WAREHOUSES AND DCs

As previously stated, a significant portion (about 30 percent) of all originating truck freight is classified as "Warehousing Distribution," which includes mixed shipments of consumer goods, generally between warehouses and retail locations. The most common type of terminating truck freight is warehousing distribution, at about 27 percent. These movements account for a large number of truck trips that are taking place on New Jersey highways. In the future, as freight movement grows, additional burden will be placed on the roadway system.

STRATEGY W-1: PROMOTE RAIL SHUTTLES TO SERVE WAREHOUSES AND DISTRIBUTION CENTERS

Rail-based container shuttle service has been proposed in the Portway Extensions Concepts Study and by Maher Terminal, the largest maritime terminal at Port Newark/Elizabeth. The concept involves the development and operation of scheduled, double-stack container service between the maritime terminals in northern New Jersey and key concentrations of warehouses and distribution centers. The service would be an alternative to trucking containers to and from these areas. Interest in the rail container shuttle concept has been growing because of the increased number of containers coming through the port, the increased number of containers that need to be moved inland short distances to warehouses and distribution centers, and the increasing shortage of truck drivers.

From a rail perspective, the service is considered "short-haul" rail because the distances between the proposed origins and destinations are generally less than 100 miles. Short-haul rail service has been offered by shortline and regional railroads in the past; it is a new concept for the Class I railroads and quite different from their standard business model of long-distance movement.

Examples of the type of potential regional rail shuttles which should be evaluated include::

- A rail shuttle paralleling the New Jersey Turnpike with an initial stop at Interchange 8A, the largest concentration of warehouses and distribution centers in New Jersey. As proposed in the Portway project, this shuttle could be extended to Interchange 7A and perhaps also serve closer-in warehouse nodes at Interchanges 12 and 10.
- A rail shuttle to the Norfolk Southern intermodal rail yard in Bethlehem, PA. This location is along the increasingly busy I-78 corridor. The I-78 and I-81 corridors in Pennsylvania have emerged as another major node of warehouses and distribution centers.
- A rail shuttle for the northern port node to the former rail yard in Maybrook, NY. This location is near the growing cluster of warehouses and distribution centers in Orange County, NY.

The rail shuttle concept offers New Jersey a means of managing the increasing number of containers that move between the northern New Jersey maritime terminals and the area's warehouses and "mode shifting" the movements from trucks to rail. However, in considering which route to give priority development to, the state needs to also consider the economic development ramifications of the improvement. This issue is further explored in issue two below.

ISSUE TWO: COMPETITION FOR DC SITES

Large warehouses and distribution centers, such as those that serve the region or continent that are often found in New Jersey, can employ hundreds of workers. Because of the level of employment and the diversity of job opportunities at the new DCs (ranging from entry level non-skilled to highly skilled information and management positions), many regions are beginning to court these facilities as part of their economic development initiatives. New Jersey is one of just a handful of locations where major North American DCs situate, but New Jersey now faces increased competition for these facilities.

New Jersey needs to retain and build on its competitive strength in distribution. The existing base of warehouses and DCs represent a major employment source for New Jersey residents. Other states have already recognized the importance of DCs and have established transportation and economic development initiatives to attract these facilities. Pennsylvania has several programs, most notably its "Keystone Opportunity Zones," which reduce the costs associated with construction. There is no formal economic development program in New Jersey focused on retaining and attracting major DCs to sites in the state.

Sites in Pennsylvania, particularly those along the I-78 and I-81 corridors, have become more popular as alternatives to New Jersey locations. Research and discussions to date indicate that warehouses in Pennsylvania are resulting in increased truck traffic on routes in New Jersey (as trucks move containers from Port Newark/Elizabeth to these locations and trucks deliver goods from the Pennsylvania warehouses to customers in New Jersey). Pennsylvania sites can be less expensive than New Jersey locations, and warehouses appear to be more aggressively pursued by the Keystone State through economic development incentives.

It has been noted by the development community that there are several issues related to accommodating the identified demand for warehouses and DCs in New Jersey, including:

- Inconsistent assistance with environmental reviews of properties, along with changing standards for industrial properties;
- The need to better combine marketing of the port in northern New Jersey with available/developable sites;
- Excessive fees and time lines for the development of sites.

STRATEGY W-2: PROMOTE AN ECONOMIC DEVELOPMENT PROGRAM AT THE STATE LEVEL THAT WOULD FACILITATE DC DEVELOPMENT

The creation of an economic development program would provide a focus on the retention and attraction of warehouse and distribution facilities, particularly value-added operations with larger employment requirements. This program should be designed to streamline the development process, including one-phone-number support with environmental and building questions and permits, as well as facilitating the approval and construction process at the local level. The creation of an ombudsman position could provide this "one stop shopping" service.

Additional elements to consider include:

- Develop and undertake a targeted port/distribution center campaign to attract new major domestic and international companies to New Jersey facilities
- Offer incentives similar to those offered by Pennsylvania and other states to attract warehouse and distribution center development to specified areas, including brownfields.

STRATEGY W-3: IDENTIFY AND GIVE PRIORITY TO ROAD AND RAIL FREIGHT IMPROVEMENTS THAT WOULD SUPPORT WAREHOUSE AND DISTRIBUTION CENTERS, AS WELL AS BETTER CONNECT CLUSTERS WITH PORT FACILITIES

This would include:

- Advancing the Liberty Corridor
- Targeted interchange improvements on the New Jersey Turnpike, as identified in the Portway Extensions Concepts Study
- Investigating and developing rail shuttles, particularly between warehouse clusters at Interchanges 8A and 7A and the northern New Jersey maritime terminals.

From an economic development perspective, it is better to encourage warehouse and distribution center development within New Jersey rather than have the facilities and associated jobs generated outside the state. Accordingly, the rail shuttle along the New Jersey Turnpike to Interchange 8A offers the greatest economic development potential for New Jersey. The proposed rail shuttle along the I-78 route offers the benefit of reducing traffic between the port and destinations within PA, but will not reduce the truck traffic between the Pennsylvania warehouses and New Jersey customers. This is also true of the shuttle proposed by Maher to New York.

PERFORMANCE MEASURES

The performance measures recommended for warehouses focus on maintaining and expanding New Jersey’s DCs. Potential performance measures to track the progress toward this goal include:

- Track warehouse-related employment in the state, including activity and job generation associated with imported cargo through New Jersey’s ports;
- Establish measures of baseline conditions, including the number of jobs associated with developed distribution center space. The baseline of existing conditions should include location, age of building, distribution function (local, regional, national), and employment levels (including contract employees).

ISSUE THREE: LAND AVAILABILITY AND COST

Even if the State were to develop a program to promote the development of warehouses and DCs in New Jersey, there would still be a problem finding available and suitable land, particularly near the ports. Brownfields offer opportunity, and many are located in the industrial areas near the ports. The question becomes how brownfield or underutilized properties in the urban corridors can best be used. Developers have noted that remediation costs and residual liability assessment at some sites may be too cost prohibitive to allow warehouse development. (Warehouses and distribution centers lease at between \$4.50 and \$6.00 per square foot triple net.) In addition, some brownfield sites require transportation access improvements to be effective. For example, while it is adjacent to the New Jersey Turnpike, Tremley Point in Linden does not currently have direct access to the highway. Developers are interested in this location if access can be created.

STRATEGY W-4: DETERMINE WHERE WAREHOUSING AND DISTRIBUTION CENTER FACILITIES CAN BEST BE LOCATED WITHIN THE STATE

Working together, public agencies and the private sector must determine where additional warehousing/distribution space can be accommodated in New Jersey. Several agencies and private developers have emphasized the reuse of brownfield or underutilized properties as at least a partial solution to this problem, and the continued use of “greenfield” sites near existing warehouse clusters is also anticipated. However, following a decade’s long trend, as properties become more expensive and/or less available, warehouse development shifts outwards. In New Jersey, this trend has translated into greater development in

the southern and central portions of the state. The Portfields initiative, described previously, helps address this issue for distribution centers that make use of the port terminals in the northern portion of New Jersey

The objective of this strategy is to maximize the economic development benefits accruing to New Jersey as a result of the concentration of freight activity in the state. This would be done in close cooperation with industry associations, property owners, developers, and localities.

STRATEGY W-5: DEVELOP AN UNDERUTILIZED PROPERTY/BROWNFIELD-REUSE PROGRAM THAT TARGETS WAREHOUSE AND DISTRIBUTION CENTER FUNCTIONS

These improvements may include:

- Facilitate the assembly of parcels of sufficient size to attract development;
- Streamline and facilitate the cost-effective remediation of properties for reuse, including limiting future liability issues.

Several of these strategies are echoed and integrated with other issues in Chapter Eleven: Influencing Factors, particularly in terms of the coordination required to advance them.

11. SYSTEMWIDE FACTORS

To effectively move freight, the modal elements of the freight system must work together and perform as a single system. Many freight movements are multi-modal, and no one modal infrastructure network can begin to satisfy New Jersey’s demand for freight. The modal elements do play key roles in the movement of goods; however, there are additional factors outside the transportation system itself that influence the ability of the elements to perform. These influencing, systemwide factors often dictate how the system components operate and how they are enhanced.

The following sections describe areas of activity or decision-making that have a bearing on the demands on, operation of, and improvements to the modal elements and their combined intermodal performance. Each requires sufficient investigation to frame the critical points and degree of influence on goods movement and what options may be available to manage or alter that influence to develop and exploit opportunities for mutual benefits. The factors of primary influence to the performance of freight operations are:

- Institutional Fragmentation
- Funding for Capital Investment
- Safety and Security
- Public Perceptions and Land Use

The following sections describe the way and degree of influence each factor does or can have on freight, the issues deriving from that relationship and, where appropriate, potential strategies that can address those issues. For presentation purposes, each factor is treated separately below, but there are significant crosscut elements among them, such as land and facility development and construction and public perceptions, funding decision-making among independent agencies, security planning across independent entities, and so on. As in the modal sections, the strategies are referenced as Strategy S-X, where the “S” represent a series of systemwide issues and the “X” a consecutive number for the series.

INSTITUTIONAL FRAGMENTATION

CONTEXT

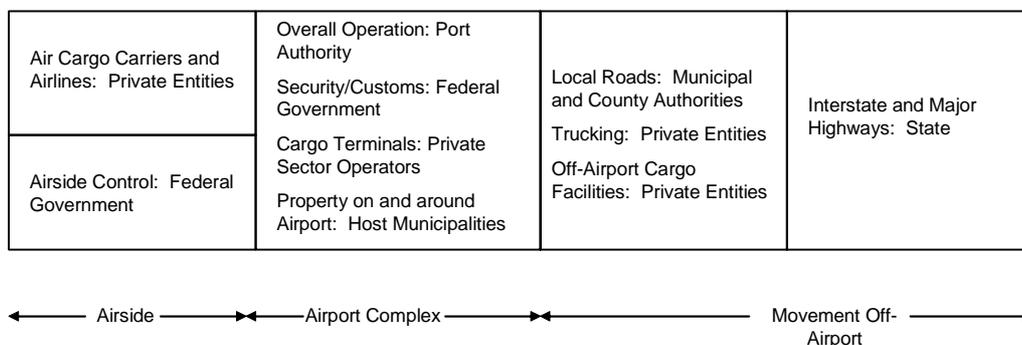
Institutional fragmentation is a condition that results from having multiple state and local public agencies and authorities involved in aspects of the freight system, but not necessarily coordinating their assessments, policies, and investments. No one agency is responsible for the whole system and often competing interests result in different perspectives, priorities, and funding decisions. The diversity of actors and roles in the freight institutional framework makes the movement of freight even more complex. Taking their lead from the federal government, state and regional public agencies have focused on regulatory, funding, and building priorities. The result has been a largely modal focus, – separate organizations or divisions focused individually on trucking, rail freight, maritime/port, and air cargo/aviation issues. In some cases the focus is facility specific, with little regards paid to the connections to the larger system or regional impacts. The diverse ownership and operation of the system components often causes fragmentation. Private businesses, warehousing and distribution centers have not been part of the public-sector consideration of the freight system.

While the individual modal and facility focus worked reasonably well when the freight industry was largely regulated, funded, and geared towards the use of single modes, the modally stratified public-sector structure does not work as well in today’s multimodal freight environment. Freight movement extends across modes, traditional agency responsibilities, and multiple jurisdictions.

For example, Figure 11-1 shows the public- and private-sector roles involved in air cargo movement, which involves multiple modes and agencies. On the airside, private entities – the carriers – move the freight, while the public sector supplies the air traffic controllers and regulations for aircraft operations. Various public and private

entities have roles in the operations that occur on the airport property. Different agencies are responsible for access roads, trucking services, and consolidation activities. Maximum efficiency of the movement of air cargo cannot be achieved unless all the players coordinate their assessments, policies and investments toward common objectives.

Figure 11-1 - Multiple Organizations in the Public and Private Sector are Responsible for the Movement of Air Cargo



While there are numerous examples of agencies working together to achieve common objectives, there have also been situations where agencies have worked separately on similar studies or projects or worked on projects that could be in conflict. The downside of this situation can include duplicative assessments, inefficient use of funds, conflicting regulations, multiple outreaches to private sector stakeholders, and conflicting messages delivered to elected officials and the general public. Such conditions can have a significant negative influence on the ability to maximize the freight system’s efficiency.

While certain funding mechanisms and regulations remain modally focused, there are opportunities to reduce fragmentation and improve coordination among public sector agencies involved in New Jersey’s freight system.

ISSUE ONE - DATA COLLECTION AND ANALYSIS OVERLAPS AND GAPS

Information collection is one of the cornerstones for assessing freight system trends, projections, and performance. Nearly all of the agencies involved in New Jersey’s freight transportation system have their own data collection and evaluation efforts. Data collection includes traffic counts, monitoring of tonnages moving through port and air cargo facilities, accident and incident reports, and surveys of various elements of the freight system (e.g., interviewing truck drivers at Port Newark/Elizabeth).

While this information can serve individual agency needs, there are situations where multiple agencies can make use of a core set of data. Information collection can be expensive and time-consuming.

STRATEGY S-1: CREATE A MECHANISM FOR SUSTAINED DATA AND ANALYSIS COORDINATION AND SHARING

The strategy would involve discussions among transportation agencies to:

- Identify a core set of data or questions that agencies would agree to collect or ask when information collection efforts occur.
- Build and expand upon the new 5 year NJDOT truck data collection program.
- Develop a common format for resulting data files and protocols for the sharing of data among agencies.
- Notify the other agencies when data collection efforts are to occur in order to reduce duplicative efforts.

The result could be a more complete and up to date information set that provides a common foundation for agencies produced at a lower overall cost. The initial agencies that could be involved in developing a core data agreement could include:

- The three metropolitan planning organizations serving New Jersey, the NJTPA, DVRPC, and the SJTPO.
- New Jersey Turnpike Authority
- Delaware River Port Authority
- Port Authority of New York and New Jersey
- South Jersey Port Corporation

ISSUE TWO: DISJOINTED STUDIES AND INDEPENDENT INVESTMENTS

Similar to data collection, the multimodal characteristics of the freight system necessitate coordination among the various agencies involved in its investment and operation. While most major efforts have included outreach to other agencies to at least inform them of studies and projects, more attention to coordination is needed.

STRATEGY S-2: INSTITUTE A FORUM FOR COORDINATING AND INTEGRATING STUDIES AND INVESTMENTS

New Jersey and its various freight partners can all benefit from coordinated studies and findings and investment decisions, including, as appropriate, creation of leveraged funding and implementation agreements for major projects. See the last strategy in this chapter for further detail in this area.

Other regions in the US, for example, the Seattle-Tacoma-Everett region of Washington State, have developed multiple agency investment agreements whereby certain freight projects are mutually prioritized and funded. This approach benefits the overall region and enables a single message to be delivered to elected officials and federal funding agencies.

In New Jersey, projects which fall within the Liberty Corridor or other significant freight nodes, hubs, and corridors are good candidates for such a pooled public/private funding mechanism

ISSUE THREE: INCOMPLETE OR MISSING HIGH-LEVEL COORDINATION

Multiple agencies have multiple mandates, priorities, constituents, and funding mechanisms. Nevertheless, within New Jersey, all of the major agencies ultimately report to the Governor. This reporting structure provides an opportunity to coordinate key visions and decisions regarding the State's freight system at a senior executive level.

STRATEGY S-3: ESTABLISH A SENIOR LEVEL BODY TO ASSURE PROGRAMS, PROJECTS AND INVESTMENTS ARE ALIGNED TO MEET PRIORITIES

A senior level body could:

- Create a mutually agreed upon set of core objectives for New Jersey's freight system.
- Provide an initial conduit for the sharing of key information, issues, ideas, and decisions.
- Provide a method for quick response for both opportunities and safety/security situations.
- An active senior level body can also encourage cooperation among agencies at the staff level. See the statewide coordination section in chapter 12 for more detail.

FUNDING

CONTEXT

Transportation improvement projects need funding to move from concept to reality. Freight needs must compete with other needs for limited available funding. Because the freight system includes multiple modes, spans various geographical areas, and involves both the public and private sectors, there are a wide range of funding mechanisms that can be used to support both initial investment and ongoing operations. One or more mechanisms may be used to secure funding for a particular project or program.

Public sector funding mechanisms exist at the federal, state and local levels. In addition, complete private sector funding occurs for some elements of the freight system, while other investments are made through joint public/private funding agreements.

The federal government provides funding, either in the form of matching funds or grants, through a variety of mechanisms, including:

- SAFETEA-LU – The most recent in a series of legislative acts that authorizes funding for road and rail projects. With this legislation, signed into law in August 2005, there are a variety of mechanisms for funding projects. These include over 5,000 earmarked projects identified by members of the US Congress and various funding programs, each with specific goals. For example, mechanisms focus on improving trade corridors and border crossings, safety improvements, air quality related improvements, and general improvements to the roadway system. Generally, these mechanisms allow for the federal government to provide up to 80 percent of the funding, with the remainder provided by local sources. Nearly all of these funds flow through the metropolitan planning organizations. SAFETEA-LU focuses more attention on freight, and amends and creates funding mechanisms accordingly.
- Congestion Mitigation Air Quality (CMAQ) funds can be used for the installation of emission-reducing electrification equipment at rest stops. A pilot program for truck rest/parking areas has been included. Several funding mechanisms can be used to address rail/highway at-grade crossing safety issues. Projects of National and Regional Significance can include rail freight improvements.
- TIFIA – The Transportation Infrastructure Finance and Innovation Act provides a loan for a major capital project. Loans can be repaid through local mechanisms, such as user fees or special taxes. SAFETEA-LU reduces the eligibility threshold for projects to \$50 million from \$100 million.
- FAA Airport Improvement Program – This program can be used to fund certain projects on airports or involving roads controlled by the airport authority. The projects must be substantially oriented to airport-related improvements.
- US Economic Development Administration (USEDA) – Funds can be used to finance access projects that clearly support economic development. USED A funding was used as part of the Alameda Corridor financing package.

Federal funds are also used for channel deepening and transportation-related security projects.

Within New Jersey, the Transportation Trust Fund is the major source of state-level funding. In addition, authorities with their own bonding capacity can undertake projects. The Port Authority of New York and New Jersey and the New Jersey Turnpike Authority are two examples of state-level agencies with bonding capacity.

Some localities may also use their own funding mechanisms to advance freight-related projects, although this is rare. Transportation or special development districts can be authorized through New Jersey mechanisms. Local budgets can also be selectively used.

Private funding is used far more extensively in the freight transportation system than in the passenger transportation system. Freight railroads invest in and maintain their own rights-of-way, equipment and yards. Trucking firms also supply their own equipment and yards. Similar investments and financing characterize the air cargo and maritime cargo industries.

Increasingly, public/private collaborations for freight projects are occurring. Financial pressures on the private sector freight industry, combined with critical regional needs have resulted in joint funding of rail improvements and maritime terminal investments in New Jersey.

ISSUE ONE – FREIGHT FUNDING NEEDS

Transportation improvement projects need funding to move from concept to reality. Freight needs must compete with other needs to secure funding. With federal, state and local budgets increasingly constrained, the competition for funding has become more pronounced.

Funding of freight projects has always been an issue – freight projects may not be as popular or visible to the general public, multiple jurisdictions are often involved, and dedicated funding mechanisms for freight do not exist in New Jersey (with the exception of a program for shortline railroads).

With the growing importance of freight and goods movement in New Jersey, providing clear funding mechanisms becomes crucial.

STRATEGY S-4: ENCOURAGE COALITIONS OF FUNDING MECHANISMS FOR FREIGHT PROGRAMS

The most successful large-scale freight projects in the US have employed coalitions of funding mechanisms. Examples include the Alameda Corridor in California and the FAST Corridor Program in Washington State. Both involved a variety of federal, state, bonding authority and private funding mechanisms to finance their programs. In the case of the FAST Corridor, the grouping of funding mechanisms allowed for increased flexibility when individual financing sources became constrained.

STRATEGY S-5: CREATE DEDICATED FUNDING FOR FREIGHT

There are two approaches to creating dedicated funding for freight:

- a “set-aside” taken from existing transportation funds
- a new state-level mechanism

The two approaches are not mutually exclusive; they can both be considered and implemented.

A set-aside is defined as a percentage of an existing federal and/or state funding mechanism that is dedicated for specific purposes—in this case, improvements to the State’s freight system. Depending on the existing funding mechanism used as a base, the freight projects may be limited to a particular mode or element of the transportation infrastructure. Ideally, the set-aside freight program would have the flexibility to fund the multimodal and intermodal elements of the goods movement system, particularly those system elements (e.g., intermodal connectors) that have largely “fallen through the cracks” of traditional funding approaches.

The Florida Seaport Transportation and Economic Development (FSTED) Council is a public entity created by statute and charged with implementing the state's economic development mission by facilitating the implementation of seaport capital improvement projects at the local level. In 1990, the State Legislature created the FSTED Program to finance port transportation projects on a 50-50 matching basis. The Legislature established this alternative to the traditional Department of Transportation program, particularly in recognition of the urgency of some port-related projects. State funding can be obtained faster and may expedite projects that would normally seek federal funds. The \$31.6 million Skypass Bridge Project is one example of a project undertaken through FSTED. The project connected the east and west portions of the Port of Palm Beach by replacing at-grade vehicular roadways with a 1,900 foot long bridge. The project was

completed within 36 months and did not use federal funds. A similar mechanism can be explored for key multimodal freight projects in New Jersey that bring economic value to the State.

In addition, Capital Investment Strategies, both at a state and regional (MPO) level, can create guiding principals that establish freight projects as priority projects and/or establish funding target thresholds.

STRATEGY S-6: EARLY PLANNING FOR PROJECT FUNDING

Because freight projects can involve the public and private sectors, as well as multiple agencies and jurisdictions, it is advisable to begin considering funding mechanisms as promising projects and programs emerge. During the initial study and planning stages, the beneficiaries of the system can be identified. These beneficiaries may include public agencies that will see revenues increase through the proposed improvement (e.g., a new toll plaza or facilitation of movements to and from a port) and private sector companies (e.g., a truck driver may be able to make more trips a day because of an improvement or a site can be redeveloped for a freight-related use with new transportation access).

Public sector beneficiaries, particularly those with bonding authority, may be able to use the anticipated new revenue streams as a basis for providing all or part of the upfront capital investments required. Similarly, private sector beneficiaries may be asked to pay a user fee or be part of a special development district to help defray the costs.

Early planning could also identify multiple funding sources for major freight projects and programs. While it may be preferable and simpler to have a single source of funds, the limited budgets of individual agencies, the federal government, and private sector entities makes the multiple-source financing a necessity for large scale freight projects and programs, as previously referenced in strategy S-2.

Three major projects in the US – the Alameda Corridor in California, the FAST Corridor, and the CREATE rail program in Illinois—have or are making use of coalitions of local, state, federal and private funding sources. The success of these projects provides an example for major freight initiatives in New Jersey.

SAFETY AND SECURITY

CONTEXT

Safety and security is defined as a set of public goals related to the freight system that secure the well-being of New Jersey residents and businesses. Many of the responses to and strategies for safety and security have been modally focused. However, there is general agreement that the entire freight transportation system across modes, mode transfers, and facilities needs to be secured and operated in a safe manner. With the enactment of the New Jersey Domestic Preparedness Act, New Jersey through the Department of Law and Public Safety and the Office of Homeland Security and Preparedness has taken an active role in assessing physical security and critical infrastructure protection as they relate to the Transportation Sector within the state. All cabinet level Departments have a supporting role in safety and security and have been tasked by the Governor to develop Best Practices for the sectors within there areas of responsibility.

Safety and security concerns have grown considerably in recent years. There are concerns about the movement and handling of hazardous materials, particularly when these movements are within close proximity to populated areas and businesses or on shared facilities like our state's highways and rail lines. There are also concerns about securing the freight supply chain against terrorist attacks or being used for terrorist actions. Preventing incident, as well as responding to those that happen quickly and effectively, is an issue that has seen significant public exposure, and there is a heightened awareness of the magnitude of the impacts that can result from incidents involving vehicles that move freight.

ISSUE ONE - MOVEMENT AND HANDLING OF HAZARDOUS MATERIALS

Hazardous materials include a wide range of shipments and commodities. They can include flammable liquids and gases, explosives and ordinances, corrosive and toxic products, and radioactive materials. These shipments move by rail, truck, air and water. While each mode has specific, federally mandated requirements for the safe movement of hazardous materials, the regulations and industry practices have a common theme – special handling, packaging, paperwork, and labeling.

Communities are increasingly concerned about the movement of hazardous materials through their areas, both for safety and security reasons. Accidents involving hazardous materials shipments can require evacuations of homes and possible fatalities. Hazardous material spills or leaks may require elements of the transportation system to be closed and must be managed by highly trained, local personnel.

Because of the fear of accidents and security concerns, some communities have recently sought to limit or ban the movement of certain hazardous commodities through their areas. For example, the District of Columbia passed a law in February 2005 that banned all hazardous materials movements by truck and rail within a two-mile radius of the area for a 90-day period. The law was challenged by CSX and overturned by the US Court of Appeals in May 2005. In addition, the City of Boston introduced a bill in May 2005 that would require railroads to obtain a permit from the Fire Department for the movement of “ultra-hazardous” materials within the Copley Square area. Hazardous materials are also largely banned from major roadway tunnels in the New Jersey area.

While the legality of the recent laws is still under contention, the intent of the communities is clear – hazardous materials movement can be dangerous and need to be more carefully managed, packed, handled, and tracked.

STRATEGY S-7: BETTER TRACKING AND CONTROL OF HAZARDOUS MATERIALS MOVEMENT

The New Jersey freight system handles vast quantities of petroleum and chemical products, along with other hazardous materials. While robust systems are in place, it is beneficial to more closely monitor the routes used by trucks and trains carrying these commodities.

Public and private sector coordination and cooperation is needed to set up systems and procedures that would allow the continued efficient movement of goods, while providing better visibility of specific movements to the necessary public sector agencies. This would need to include shifting of such commodities between modes.

The public agencies that would be involved include the New Jersey Departments of Labor and Environmental Protection, the New Jersey Turnpike Authority, the Port Authority of New York and New Jersey, the Delaware River Port Authority, and others.

ISSUE TWO - SECURING THE SUPPLY CHAIN

The post-September 11 world is a different place, with heightened concerns that the freight system can be used in a terrorist attack. In many respects, securing the supply chain is still an evolving area, with new rules being promulgated and new technologies being explored.

Some of the security initiatives have focused on mining shipment information – understanding who the shipper and receiver are, the origination and destination, as well as any interim movements, and the shipment itself. For example, in the air cargo industry, there are different federal regulations for “known” and “unknown” shippers.

Some of the security initiatives focus on the physical inspection of shipments, particularly at ports and airports. Various technologies are in use or are being tested. For example, the Hong Kong Terminal Operators Association and SAIC (Science Application International Corporation) have been testing a set of scanning machines that trucks hauling containers pass through prior to entering the terminal. One of the scanners checks for the presence of radioactive material. The second scanner uses gamma rays to check for suspicious objects within the containers. A third scanner records the container identification number. Several hundred

thousand export containers have been through the test scanners. The US Department of Homeland Security (DHS) and the New Jersey Office of Homeland Security and Preparedness (NJOHSP) are in the process of reviewing technologies and approaches for maritime cargo.

DHS is also anticipated to promulgate new inspection requirements for air cargo in the fall of 2005. While the new requirements will need to be assessed when released, they do have the potential to alter the use of passenger and freighter aircraft for cargo movement, as well as the decision-point for firms considering air versus expedited trucks for shipments.

Random truck inspections are also occurring. Means for further tracking and securing rail shipments are also being explored.

STRATEGY S-8: TRACKING, IMPLEMENTING AND, POTENTIALLY, SUPPLEMENTING FEDERAL SECURITY AND INSPECTION REQUIREMENTS

As home to the largest port complex on the East Coast and being at the center of a densely populated region, New Jersey needs to be at the forefront of security and inspection technologies and meeting federal requirements. Approaches, such as the one being tested in Hong Kong that expedite the movement of goods while allowing broader inspection of containers, may also provide additional security for the area.

In addition, new inspection and security requirements may impact the operation of elements of the State's freight system and lead to some modal shifts. New air cargo inspection requirements may translate into the greater need for on-airport inspection areas or shifts to truck use if inspections reduce the time advantage of air.

Since multiple agencies are affected, a staff-level committee could be formed among transportation and enforcement agencies to quickly assess and respond to new federal regulations.

ISSUE THREE - ACCIDENT PREVENTION, RESPONSE TO INCIDENTS, AND EMERGENCY PLANNING

Accident prevention is of concern to both the public and private sectors. Within New Jersey, the most attention appears to be focused on truck-related accidents, most likely because of the volume of truck movements and the constant interaction between passenger and commercial traffic on many portions of New Jersey's roadway network.

Rail freight accidents are also of concern. The primary accident concern areas are at-grade crossings (where vehicular traffic crosses over rail tracks in the roadbed) and derailments.

Responses to accidents and incidents involve transportation agencies as well as local police, fire, and ambulance organizations. Coordinated response to minimize adverse impacts leads to a more resilient system. For transportation agencies, response times can affect traffic flows and congestion levels – the faster an accident is cleared, the quicker that traffic can return to normal flows. More serious incidents may require the rerouting of traffic for periods of several hours to several months, depending on the damage to the affected transportation segment.

Emergency planning will enable local communities to better cope with accidents and incidents. Local police, fire, and ambulance services respond, meaning that they must have trained personnel and equipment to handle a wide of situations. This is a cost item for local budgets.

STRATEGY S-9: AWARENESS AND SAFETY CAMPAIGNS

Accident prevention can include passenger and commercial driver training, vehicle and equipment inspections, and roadway/rail right of way maintenance and inspections.

Transportation agencies have long focused on quick response to accidents and incidents. The strategy is to ensure that communications arrangements, equipment and trained personnel are available as needed on impacted elements of the New Jersey freight system. A proactive emergency and incident planning program has become even more crucial as the existing infrastructure meets or exceeds its handling capacity making it more susceptible to delays while predictable travel times become even more essential to freight shippers and receivers.

With the higher volumes of freight being moved and the added complexities of a multimodal system, it is recommended that a multi-agency and potentially public/private collaboration be formed to review the whole of the freight transportation infrastructure to ensure that all elements of the system can be accessed and secured in an emergency. In addition, quick identification of alternative routes, as well as creating redundancy in the transportation system, will be needed to ensure continued movement of goods and people when major incidents occur.

PUBLIC PERCEPTIONS AND LAND USE

CONTEXT – PUBLIC PERCEPTION

The view of freight by the public at large is a significant element in understanding the challenges facing investment strategies in the logistics industry. Likewise, a number of factors work against the integration of freight related land development and uses with improvements in accessibility and operational efficiency on the road and rail networks. In addition, the relationships between perceptions and land use change reinforce these challenges. The following section first lays out the back drop for public perceptions and land use, then identifies the interrelated issues and possible strategies and actions that can be taken to overcome these challenges, along with examples of such actions where appropriate.

Reactions of the general public or communities and neighborhoods to freight movement, particularly trucks, rail freight operations, and increased activity at the ports, are becoming increasingly negative as such activity grows. The Transportation Research Board (TRB) report, *Integrating Freight Facilities and Operations with Community Goals*, published in 2003, identifies the following concerns of communities: traffic flow and congestion, safety and security, economic development, land use and value, communication, and environmental considerations. For example, freight transportation can positively or negatively affect a community's economic development goals. Positive impacts can result when freight transportation facilities generate jobs for community residents or cause other, desired economic activities to locate in an area (e.g., an industrial park). Negative impacts on economic development can occur when freight facilities are not located in proximity to other compatible uses, most often the result of a failure of coordination.

As the most densely populated state in the US, New Jersey presents many opportunities for freight activity and the general population and work force to interact, both positively and negatively. The positive aspects are the hundreds of thousands of jobs supported in this state as a result of cargo movement. These include workers at the ports, in warehouses and distribution centers, at air cargo terminals, in trucks, and in the office and information functions associated with cargo movement. The potentially negative interactions include truck and passenger vehicle conflicts, freight moving on rail lines near or in neighborhoods, and the noise associated with night flights of cargo aircraft and nighttime operation of loading docks. In addition, as a coastal state, New Jersey provides more opportunities for conflicts among land uses. For example, the growing popularity of waterfront sites may be at odds with the need for land for port expansions.

Today, most of New Jersey's residents are not directly familiar with goods movement. In the 1950s and 1960s, 50 percent of the workforce was engaged in manufacturing. The visible and frequent personal involvement with day-to-day production activities, with inbound materials and outbound products, provided an inherent understanding of the relationship between goods movement and people's daily lives. Currently, 75 percent of the state's population works in the service industries, mostly in office functions. The intricate series of activities necessary to deliver perfectly ripened bananas to supermarkets to sell for less than \$.50 a pound, for example, is

invisible to the average consumer. With little direct exposure to or involvement in production work and goods movement activities, the public often believes the benefits associated with good movement belong to those others than themselves, and wonder why they endure such inconveniences on behalf of the “other” folks.

As freight movement grows, so do the perceived problems associated with it. All the elements of the freight transportation system are experiencing increases in activities. More trucks are on the road, and port and rail freight activities have grown. As more goods move, the potential impacts increase. As capacity enhancements for freight transportation are sought, more communities are raising concerns about the direct impacts of operations on their areas.

The public sector has not yet sent a coherent message regarding the value of the freight system. With multiple agencies responsible for elements of the freight system, and with each agency having different priorities and different constituencies, the public often gets mixed messages regarding the value of freight. In addition, communities may not understand where or how to seek answers to questions or concerns they may have about certain freight activities. With little access to countervailing information, the premise persists that freight activity is to be avoided in their neighborhoods or communities. The irony is that the freight activity, which must be located in someone’s backyard, is often triggered by the need for additional space or new operations to support the life style of the residents of that community.

CONTEXT - LAND USE

The interrelationship between land use and transportation is a complex issue facing the freight industry and public providers of the infrastructure for goods movement. The more directly, quickly, and reliably goods can move to customers (or to value-added warehouses and distribution centers and then to customers), the less expensive the movement, reducing costs to all along the logistics chain. One means to improve goods movement efficiency is to develop freight-related land uses (warehouses, value-added warehouses, distribution centers, and intermodal facilities) closer to the end user or to other logistics activity locations (e.g., ports, rail yards, airports, retail aggregations). However, a number of factors work against locating or relocating warehouses and distribution centers where they would be most efficient.

As a result, despite concentration in the greater port areas in northern New Jersey, many freight activities are dispersed in patterns incompatible with the State Development and Redevelopment Plan’s (SDRP) objectives and in conflict with surrounding land uses. The following frames the several interrelated factors that challenge the state and municipalities in achieving efficient and mutually desired logistics land development and performance.

OVERALL PATTERN OF WAREHOUSING AND THE SDRP

Figure 11-2 on the following page demonstrates how freight warehouses and distribution centers tend to cluster around ports, rail terminals, and airports and along major transportation routes. Figure 11-2 also shows the policy planning areas of the current SDRP and its designated growth centers. The SDRP encourages growth in those mixed-use, higher-density locations that takes advantage of existing infrastructure or extends already existing, centered urban areas.

The SDRP map, which is now undergoing a third update through the cross-acceptance of map changes among state, county, and local governments, depicts the preferred growth locations. Emphasis is first on existing Urban Centers, followed by the specified geographic areas identified in the map’s legend, which call for defined levels, intensities, and patterns of growth. The Urban Centers of Jersey City, Newark, Elizabeth, and Camden host the primary ports and airport and significant warehousing, and thus meet the objectives of the SDRP.

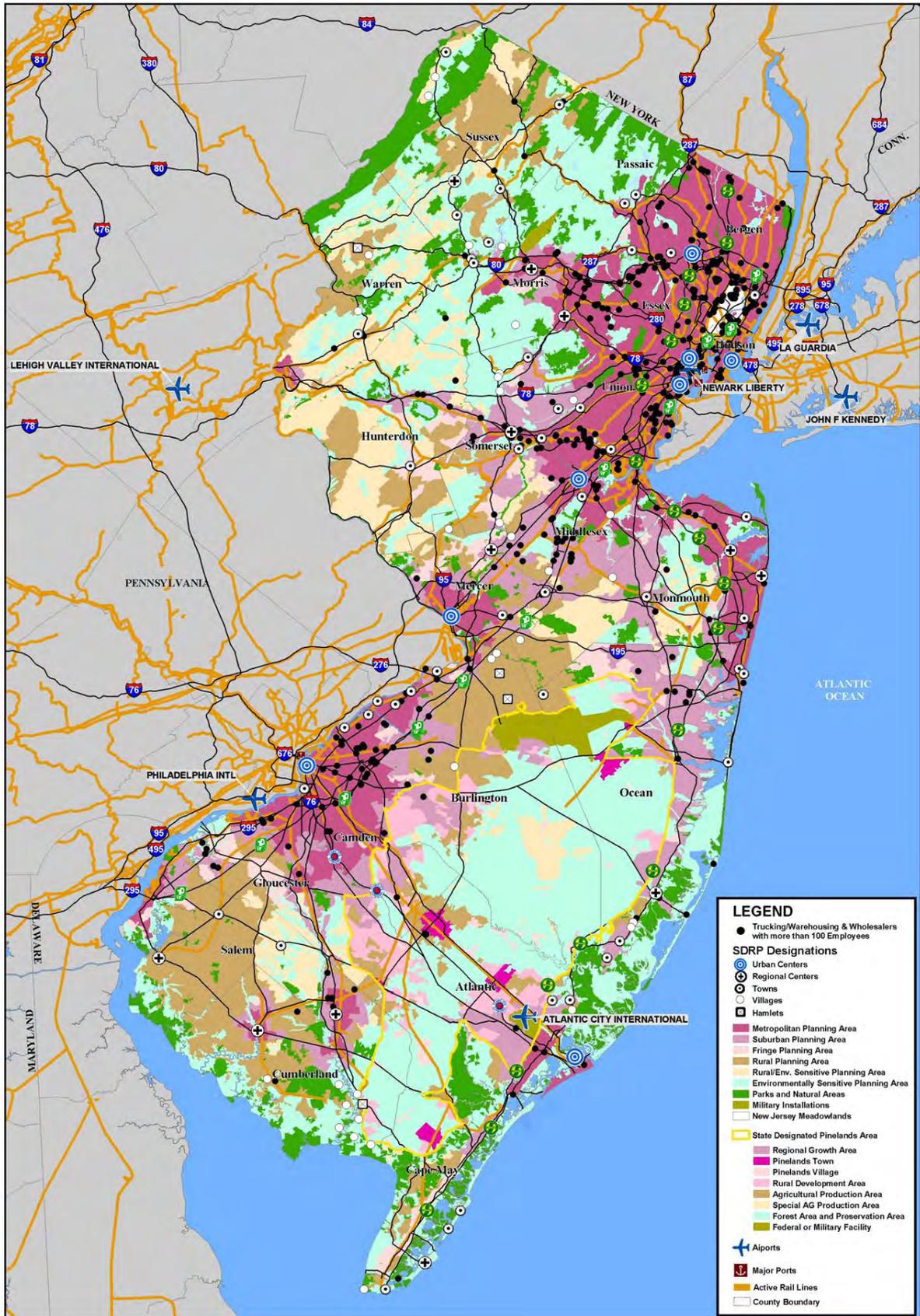
Beyond the Urban Centers, the first area of preferred growth, the Metropolitan Planning Area, surrounds these cities and extends throughout the inner areas of the New Jersey portion of the New York and Philadelphia metropolitan regions. This area contains the greatest number of warehouses and distribution centers (represented by the black dots). All the sites in the Metropolitan Planning Area are also compatible with the objectives of the SDRP.

Some of these facilities are also located in the Suburban Planning Area, where growth is supported by the SDRP but is encouraged in centered patterns. In response to market forces, warehousing aggregates in prime locations (places offering good local roadway or rail access points and superior network connections to regional markets and beyond). However, these single-purpose agglomerations (such as at Turnpike Interchange 8A) do not reflect the mixed-use objectives of the SDRP. There are additional, but far fewer, warehouse/distribution center locations in the third (Fringe Planning Area) and fourth (Rural Planning Area) planning areas. Locations in the Fringe Planning Area are less compatible and locations in the Rural Planning Area are not compatible with SDRP objectives, even though local planning and land use controls may have supported such development around the interchanges of the Interstate highway system.

However, it is recognized that not all warehouse and distribution centers locations are going to be compatible with the SDRP as it is currently defined. The reason that some may seem incompatible is that freight isn't addressed to the degree it needs to be in the SDRP. Increasing freight specific goals in the SDRP may result in some locations in Fringe and Rural Planning areas being compatible if they meet freight specific goals.

NEW JERSEY COMPREHENSIVE STATEWIDE FREIGHT PLAN

Figure 11-2 - Freight and Land Use in New Jersey



SCARCITY OF AVAILABLE LAND AND MARKET REALITIES

Facilities are being developed outside the preferred SDRP locations for several reasons. As this Freight Plan explained in Chapter Ten, the inner ring of warehouses/distribution centers handles most of the freight that is destined for markets in New York City, northern New Jersey, and other portions of the New York metropolitan area. Proximity to the markets accounts for the higher number of black dots in Bergen, Hudson, Essex, and Union counties in Figure 11-2.

Outreach conducted with the private sector stakeholders in warehouse development and operations indicated that sites near the ports and rail terminals continue to be very highly valued in New Jersey, and many businesses are more than willing to pay premium prices to be near the ports and the northern Jersey/New York City consumer market. However, in the highly urbanized region, very little land is currently available that can be readily developed for freight movement activities. Land that could be reused for distribution and value-added processing is often classified as a “brownfield,” requiring some level of remediation to address site contamination associated with previous industrial use. In addition, brownfield and greyfield (uncontaminated industrial or retail sites with redevelopment potential) are also frequently small and land assembly is needed to create sites large enough to accommodate facility design compatible with the current and future generations of value-added and distribution operations. Further, these sites may require roadway improvements to upgrade access to the regional highways.

Although a number of important and very active brownfield redevelopment projects are now underway, somewhat limited progress has been made in bringing abandoned or under-used sites to the market for re-use. Major efforts by the New Jersey Office of Smart Growth, NJTPA, New Jersey Economic Development Authority, and others have documented the potential availability of hundreds of acres of brownfields within the state, including sufficient sites within a 25-mile radius of the Port of Newark/Elizabeth to satisfy the demand for warehouses and distribution centers associated with the projected increases in goods movement there.

To date, these programs have attracted a great deal of attention but very little funding. Merely identifying and mapping all possible brownfield sites is a very large undertaking and is proceeding very slowly because of limited resources and a reluctance on the part of some owners to identify sites that may be contaminated. In addition, empty containers currently occupy much of this land, and few incentives have been offered to relocate these containers and make the land more productive. Most important, the degree of contamination of each of these sites must be determined, possible and practical remediation measures identified, and a prospective redeveloper must step forward to assume the cost and legal liability. Finally, these sites must also possess the necessary transportation facilities to provide direct and easy access. These are major hurdles.

Time is working against New Jersey in terms of brownfield redevelopment. Many industries find themselves unable to wait for this lengthy process and choose instead to locate farther from the center on sites that are much easier to develop. In New Jersey, companies build new value-added warehouses and distribution centers on greenfields—land that might better serve housing, open space, or other needs. The area around Exit 8A on the New Jersey Turnpike is an example of market-driven suburban warehouse/distribution center growth (in this case, of a magnitude that “Exit 8A” is a recognized logistics center in the global marketplace), and other properties near the Turnpike interchanges are being similarly targeted because they have direct access to a major truck transportation route and the eastern continental markets.

In states neighboring New Jersey, such facilities locate (or relocate) along primary Interstate highways that provide access to the larger eastern US and continental markets (I-76, I-78, I-80, I-81, I-83, I-84, I-87, I-95). These competing facilities take jobs that could be located in New Jersey out of state, depriving NJ of an economic benefit, yet in many cases still use New Jersey’s transportation facilities to reach their shippers and customers in the New York/New Jersey market. New Jersey bears the cost of the movements on its infrastructure, but secures little of the benefits. To the degree that development in locations outside New Jersey is driven by desired access to regional/continental markets, with limited return of goods to New York and New Jersey, these locations may offer opportunities for shuttle rail service from the port terminals that could relieve truck demands on New Jersey highways.

To a much lesser extent, the availability of waterfront and nearby property that could be useful for goods movement is also constrained by its attractiveness for recreational, commercial, and residential uses. The more scenic the area, the less likely it is to be used for freight. Few municipalities hesitate when the choice is between freight facilities and high-end housing, open space, or commercial/retail uses with a water view.

LOCAL CONSIDERATIONS

The residents of many communities feel threatened by the movement of freight trains and large trucks. They perceive these vehicles as unsafe and freight facilities as dangerous and noisy; at best, they consider them necessary evils. Many municipalities use zoning and other ordinances to keep freight facilities away from residential areas. From a quality-of-life viewpoint, this strategy is understandable and reflects reasonable local planning objectives.

As a result, however, these facilities are often established outside the urban centers where many potential workers live. Employee access can become a challenge for workers without cars, and those with cars may have to make longer trips to reach their jobs. In some cases, private transport services are carrying workers to these jobs. The provision of public transit, such as the River LINE service to the Haines Distribution Center in Florence, is another solution, albeit less common. Alternatively, those who can afford to move to be near these facilities may do so, potentially contributing to suburban sprawl.

Municipalities must learn to plan for freight. Residents and municipal officials must learn that trucks and freight trains are entirely necessary to maintain the quality of life they have grown to expect. Goods to satisfy every daily need are delivered by truck to local retail outlets, even if they have been partially transported by train, ship, plane, or barge. Further, freight operations can generate jobs and tax revenues.

REGIONAL PLANNING

The need to coordinate freight movement and land use has been more recognized only in the past several years. Planning for freight is difficult because the freight operators are in the private sector, public agencies (even many private freight rail lines share public right-of-way) primarily provide the freight transportation network, and land uses are governed entirely by local municipalities. There are significant opportunities for individual plans to conflict.

ISSUE ONE: COMMUNITY CONCERN OR OPPOSITION TO THE DEVELOPMENT OF FREIGHT FACILITIES OR LAND USE PROXIMATE TO RESIDENCE OF PUBLIC FACILITIES DUE TO REAL OR PERCEIVED NEGATIVE IMPACTS

A number of specific issues—both concerns on the part of the public at large or by residents within localities hosting freight activities and challenges faced in seeking efficient location of such activities relative to travel network accessibility—fall under this issue. Perceived and real operating practices at warehousing, intermodal yards and terminals, rail lines, truck routes, and port terminals, generate impacts in the form of noise, traffic conflicts, lighting, visual intrusions, and vehicle exhausts. In response, many municipalities adopt local land use controls and other ordinances that reflect the public perception that freight facilities/activities (truck and rail) should not be permitted in “quality” communities.

STRATEGY S-10: ADVANCE FACILITY AND INFRASTRUCTURE MEASURES

The TRB report *Integrating Freight Facilities and Operations with Community Goals* identifies dozens of potential techniques for better integrating freight transportation and facilities with community goals. These include:

- Grade separating road and rail freight operations. Congestion and safety issues at at-grade crossings are one of the key concerns voiced in the study. Removing the direct conflict at rail/highway intersections improves safety and eliminates delays in both modes as each reduces speed and awaits passage of the other at the crossings.

- When new or expanded freight facilities are proposed, the sponsoring party and any supporting state or local economic development agency needs to assure that impacts to current operations are fully assessed, options to mitigate such impacts are identified and evaluated and a set of recommended measures included in the development program for the facility, including proactive and extended engagement with local residents and interested parties. Communities hosting freight facilities need to know that local operations will not reduce the local quality of life. In addition to impact assessment during facility development, rail operators and the State should identify at-grade crossings with accident histories and determine priorities for grade separation as capital programming permits.
- Separating passenger and truck activities. Truck-only roadways, in some situations, provide benefits to drivers of passenger vehicles, trucking firms, and developments.
- The Kapkowski Road project in Union County is one example where the physical separation of port and non-port traffic has been the solution to allow all the land uses near Port Newark/Elizabeth to grow.
- Another example is the provision a separate roadway that will be mostly used by trucks to access the Maritime District in the Military Ocean Terminal at Bayonne (MOTBY) Redevelopment Plan, keeping respective freight and passenger traffic streams out of the other's way.
- Use technology to reduce environmental impacts. Application of available technology solutions can also mitigate negative impacts to neighbors from freight operations. Electrical units at truck rest areas allow tractor and refrigerated trailers to continue to operate while the engines are turned off. New technologies can reduce the idling of locomotives. FedEx and UPS are actively pursuing use of alternatively fueled vehicles for their fleets, as well as at PANYNJ maritime facilities.

STRATEGY S-11: PROCESS MEASURES

The above infrastructure and technology solutions, however, are tools in producing “good neighbor” outcomes that are best deployed along with other policy, planning, and design measures that can be best achieved through collaborative facility development approaches. Such measures include:

- Integrating freight and economic development strategies to create enhanced value for communities. Optimizing the economic value of freight development in balance with community objectives is a key concept to enable freight industry growth. This includes brownfield redevelopment for freight-related purposes as well as the creation of integrated logistics centers (ILCs). ILCs combine a critical mass of freight terminals (such as rail freight yards) with surrounding industrial and distribution activities. Joliet, Illinois, for example, was able to replace all the jobs lost in a military base closure through the development of an ILC on the property.
- Collaboration Strategy/Communication. Sustained and proactive leadership to deliver inclusive collaboration that builds on full articulation of issues from all affected parties' perspectives is critical to secure local acceptance of regionally significant or private market driven freight infrastructure and/or warehousing, distribution or value-added facilities. Such collaboration needs to result in follow-through on actions and continued collaboration to resolve emerging issues as implementation unfolds. More on this concept is presented in the last section of the chapter.

ISSUE TWO: INSUFFICIENT LAND FOR FREIGHT USES IN MARKET PREFERRED LOCATIONS

There is a scarcity of readily available urban land that is not contaminated and is large enough for warehouse development, especially near the ports and airports. Competing priorities for land proximate to ports (demand for waterfront residential, commercial, or mixed-use development) adds to this challenge.

CURRENT INITIATIVES

A method to address the scarcity of land is to reuse currently underutilized properties, as is the basic premise behind the reuse of both brownfield and greyfield sites. Some work in this direction is already underway:

- The NJTPA and the New Jersey Institute of Technology (NJIT) have inventories of underutilized sites in northern New Jersey, some of which are brownfield sites. NJIT continues to enhance the data about these sites so that they can be made known to the logistics industry and more easily evaluated for reuse potential. To date, NJIT has entered over 400 sites into the NJ Department of Community Affairs Brownfields SiteMart database.
- In a related effort, a partnership between the PANYNJ and the NJ Economic Development Authority launched the Portfields Initiative that is identifying and evaluating sites in the Bergen, Essex, Hudson, Middlesex and Union Counties for reuse as distribution and industrial space for port logistics tenants. The partners have collaborated with county and local economic development officials and will identify measures needed for the most promising sites in terms of remediation, financing, marketing and development/construction.
- The South Jersey Port Inland Distribution Network (PIDN) Site Evaluation and Feasibility Development Study by the DVRPC identified inland locations for transporting goods from the Port of New York and New Jersey via rail or barge to relieve congestion at the Port, gain distribution functions and value-added logistics opportunities closer to end user markets. An investigation of several locations along the Delaware River can result in reuse of brownfield sites and the creation of new facilities and jobs as the overall Port market and flow of goods grows. Any work in this area needs to consider the recent “Southern New Jersey Waterfront Master Plan” initiative of the Delaware River Port Authority (DRPA). Its goal was to establish a master plan framework for development and redevelopment for the Delaware Waterfront in Camden, Gloucester, and Salem Counties that includes identifying port and logistics activity opportunity locations as well as residential and mixed-use development opportunities.

STRATEGY S-12: ENHANCE AND ACCELERATE BROWNFIELD/GREYFIELD INITIATIVES IN NORTHERN NEW JERSEY

As noted above, the state has established brownfield programs to gather information about potential sites and market them for redevelopment. However, New Jersey needs to increase its leadership and resource commitment to assist owners of brownfield and greyfields sites to document the barriers to redeveloping them specifically for logistics uses – value-added warehousing, distribution centers, and Intermodal transfer activities. State agencies, port authorities, the freight committees of the MPOs, and the logistics members of the New Jersey chapter of the National Association of Industrial and Office Properties could form a partnership to:

- Assess and define the overlap between logistics industry site development needs and brownfield/greyfield site potentials. As stated in the current initiatives section, some work in this direction is already underway.
- Advance a three-step process: 1) Detail (for targeted urban/suburban sites with significant potential) the action agenda necessary to meet these needs: land assembly, liability assignment and limits, and access requirements. 2) For the most significant sites, identify the specific barriers to implementing the agenda and ways to remove these barriers, including partnership roles. 3) Provide resources, advance the barrier removal measures, and achieve the specified action agendas. The Portfields Initiative is advancing these measures in the greater Port Region.
- Additional efforts to work with the public and potential host communities of new or expanded logistics land uses can take the form of more detailed site inventories and interactive data bases, including regarding local planning and zoning regulations and smart growth considerations, direct interaction with communities with potential redevelopment sites in the port environs, convening of public educational forums, and placement of data into GIS formats.
- See the last strategy in this chapter for more about how to advance this concept.
- Monitor progress in constructing re-use logistics facilities in the targeted locations and use early successes to inform subsequent site processes.

STRATEGY S-13: IDENTIFY AND ADVANCE BROWNFIELD AND OTHER UNDERUTILIZED SITES FOR FREIGHT OPPORTUNITIES IN SOUTHERN NEW JERSEY

Additional opportunities to address land shortage through underutilized and brownfield reclamation lie outside the northern New Jersey port region. Underutilized locations along the Delaware River near Camden and south of the city have significant potential to house port and logistics operations.

Collaborative evaluation of how underutilized and brownfield sites could assist in advancing recommendations contained in efforts such as the South Jersey Port Inland Distribution Network (PIDN) Site Evaluation and Feasibility Development Study by DVRPC and the “Southern New Jersey Waterfront Master Plan” initiative of the Delaware River Port Authority (DRPA) would facilitate bringing these lands into the marketplace and satisfying the industries’ needs in New Jersey and through market oriented measures.

ISSUE THREE: DEVELOPMENT OF GREENFIELD LOGISTICS CENTERS IS CONTRARY TO THE SDRP AND GENERATES LOCAL TRUCK TRAVEL .

The emerging dispersal of logistics centers into greenfield areas of the state is contrary to the current principles of the State Development and Redevelopment Plan (SDRP). One result of this is increased truck traffic traversing local roads to access sites requiring freight service, thereby increasing congestion and adding safety concerns. Another is the Concentration of truck traffic where higher demand for auto travel also exists.

Not all greenfield sites display these consequences, but unplanned or poorly planned greenfield sites do. Instituting freight specific goals in the SDRP and proper planning may help address this issue.

STRATEGY S-14: INFORM POLICY MAKERS ABOUT THE MARKET REALITIES OF LOGISTICS NEEDS

Efforts to implement the objectives of the SDRP need to be couched in the reality that not all logistics industry needs can be served within the urban areas of the state. The desire for effective freight access from New Jersey locations outside the inner ring of warehouses/distribution centers to the larger regional and continental markets can generate tension with SDRP policy map objectives, creating the need to identify and evaluate trade-offs. Increasing freight specific goals in the SDRP may result in some locations being compatible if they meet freight specific goals and objectives. A dialogue among the public- and private-sector parties would inform both sides of their needs and would lay the foundation for selecting locations where such market access can be facilitated on the transportation system and where collaborative planning can create a regional and local fit with other community goals.

One response to the needs of such an area is a pilot program focused on the Exit 8A area being conducted under NJDOT's Congestion Buster Task Force Implementation Team. This pilot is collaboration among the municipal and county governments, NJDOT, the NJ Turnpike Authority, the Federal Highway Administration, the NJTPA, and private industry, being orchestrated by the Municipal Lands Use Center (MLUC) of the College of New Jersey. It includes a truck/warehouse survey, an area-wide signal optimization study, and creation of a truck wayfinding/signage system.

An additional effort that is being considered is the encouragement of cross-municipal collaboration in rethinking land use plans, policies and regulations relative to the generation and management of the movement of people and goods. Such collaboration can produce land use and circulation measures to improve functional efficiencies of freight hubs or corridors, including municipal participation in the effort and results.

ISSUE FOUR: ENHANCED PLANNING CAPACITIES AT BOTH THE REGIONAL AND LOCAL LEVELS TO PROVIDE THE TECHNICAL FOUNDATION AND CONTINUING SUPPORT FOR ESTABLISHING AND IMPLEMENTING A STATEWIDE STRATEGY FOR FREIGHT LAND USE

While New Jersey’s MPOs, port authorities, and other parties have undertaken significant efforts to investigate, analyze, and plan for the addition of freight facilities in warehousing, distribution, and value-added activities, more can be done in this area. The work at hand needs further translation into discrete actions for implementation through continuing metropolitan, county and local planning and plan implementation. In some areas, this involves the retention of freight needs in the overall plan framework and agenda. In other areas, it involves adding to the planning toolbox methods and techniques for specifying investment and other actions to meet freight needs.

STRATEGY S-15: CONTINUE AND STRENGTHEN REGIONAL PLANNING

New Jersey’s three MPOs, through their federal transportation planning mandate, include freight needs and issues in the development of their regional plans. The North Jersey Transportation Planning Authority and the Delaware Valley Regional Planning Commission have each established a freight committee that includes private sector as well as public representatives. These committees have undertaken freight-focused analyses that are increasing the understanding of this complex area and providing a foundation for regional decision-making. The MPOs are well positioned and equipped to further distill the broader regional and corridor specific recommendations into action steps and should continue to do so. A further step, however, will be to integrate these recommendations into a statewide New Jersey freight agenda, particularly with regard to land use options. This agenda would support an efficient and competitive logistics industry, balancing economic development, regional access and mobility, and land development for freight purposes. See Issue Five for more on this larger framework.

Planning at the county and state/MPO corridor levels is also addressing freight needs. As these activities advance, they are providing a framework within which municipal decisions to allow for or seek freight-related development can be based. The Logistics Council has also produced valuable recommendations on such crucial issues as extended hours of operation and linking land use and transportation planning.

NJDOT is developing a “Freight Tools” data and analysis program that can prepare critical data about logistics system components that will support it and other planning and implementing agencies with current and focused information.

STRATEGY S-16: PROVIDE GUIDANCE AND TOOLS FOR LOCAL FREIGHT PLANNING AND DEVELOPMENT

The State and the MPOs should develop “best practice” guidance and analytic tools to support freight-related activities at the local level, including land development and operations and truck and train movements. Some areas for tool development/refinement include:

- Integrating land use and circulation plans to address freight needs in the local master plan
- Incorporating freight needs in zoning requirements: parking, setbacks, buffers, etc.
- Requiring the analysis of truck and/or rail movements in site plan or subdivision approval processes for freight-related land uses (big box, retail centers, warehousing, value-added processing, distribution centers, truck or rail terminals and manufacturing), whether in traffic impact studies or other documents, to clarify volumes, routing, and turning movements, intermodal conflict points, site design considerations and to mitigate any adverse consequences

In recognition of this need, NJDOT is formulating a model circulation element for master plans that municipalities can draw on to achieve integrated results. Once complete, periodic updates based on real world application experience will be in order.

Similarly, the freight industry is becoming more sensitive to community concerns and responding by providing sound walls, berms, and buffer zones to reduce their effects on neighborhoods. Freight railroads are installing continuous welded rail for quieter operations. Trucking companies are working to limit emissions when idling. Incorporating these remedies during the site or subdivision approval process will enable communities to balance this type of economic growth with their other goals.

ISSUE FIVE: THE LOSS OF VALUE-ADDED ECONOMIC DEVELOPMENT TO NEIGHBORING STATES

The rising cost of land in New Jersey, the increasing level of congestion on New Jersey roadways, the local tendency to restrain logistics operations (hours of operation, truck access and parking, noise, lighting and related ordinances), and the uneasy and sometimes costly access to labor and other factors discussed above can render competitive locations in eastern Pennsylvania, Delaware, downstate New York and even Maryland more attractive for value-added warehouses and distribution centers

STRATEGY S-17: DEVELOP AN OVERALL NEW JERSEY GAME PLAN AND INSTITUTIONAL FRAMEWORK FOR THE STATE TO ATTRACT, SUPPORT, AND RETAIN LOGISTICS AND VALUED ADDED EMPLOYMENT

The issues and strategies identified under all four areas of the systemwide influencing factors—institutional fragmentation, funding and capital programming, safety and security, and public perceptions and land use—are very interdependent. Success in any one is not attainable independent of the others. Therefore, an institutional construct and strategic and proactive implementation program is needed to achieve the integration and balancing required for such a complex system as logistics in New Jersey.

Building on such experiences as the New Jersey Brownfields Task Force and the New Jersey Brownfields Redevelopment Interagency Team, a standing committee under the new *Office of Economic Growth* could be established. The committee's purpose would be to provide the leadership, policy forum, strategic planning and implementation direction, and monitoring to advance all measures needed to secure a strong logistics future for New Jersey. It would address the diverse and competing issues are barriers to sustaining a strong logistics sector and would be the central clearing house and integrating body by which land development, site preparation (including remediation as needed) and construction, labor force supply (access and development) and supporting transportation plans and actions are launched and tracked to completion.

While many agencies have statutory or regulatory authorities and responsibilities that would not be altered, this forum would provide a comprehensive strategic direction to inform and guide the fulfillment of missions, goals and objectives at the state agency and MPO and other levels of activity. The committee's range of actions could include:

- Drawing from the planning and programs of the State agencies and the MPOs, frame an overall logistics land use and economic development strategy for New Jersey.
- Directing the application of that strategy in state agency plans and implementing programs and assure state coordination with the MPOs.
- Fostering and monitoring strategic planning and implementation measures at successive levels of detail and across agency portfolios (logistics, private and public economic development, location decisions, brownfield remediation and marketing, supporting transportation investment, labor force delivery, etc.).
- Establishing a policy for and means to accomplish (through current state and MPO programs) proactive collaboration with local agencies. This collaboration would involve crafting land development plans and project packages that address warehousing, distribution center and value-added processing facility needs, local community objectives for retaining or improving quality of life, and those that advance the objectives of the SDRP.
- Providing leadership and direction to state agency implementation measures required to achieve logistics oriented economic development such as road, rail, port, or intermodal transportation improvements, environmental approvals, funding and financing, and labor force acquisition. While

the committee may not conduct outreach directly, it could establish a policy that collaboration between state agencies and local governments would be the bedrock for achieving land development for logistics.

- Utilizing a logistics ombudsman housed in an agency such as the New Jersey Commerce, Economic Growth & Tourism Commission, to advance its directives, harness agency resources, secure agency responses and timely processing of regulatory or other matters, and troubleshoot when barriers impede progress.

As a first cut, membership of the committee could include the following:

- New Jersey Office of Economic Growth
- New Jersey Commerce, Economic Growth & Tourism Commission
- New Jersey Department of Transportation
- New Jersey Department of Community Affairs: The Office of Smart Growth
- New Jersey Economic Development Authority
- New Jersey Department of Environmental Protection
- New Jersey Department of Labor
- New Jersey Department of Education
- New Jersey Department of the Treasury
- The Governor's Office
- The New Jersey MPOs (NJTPA, DVRPC and SJTPO)
- The Port Authority of New York and New Jersey
- South Jersey Port Corporation
- The Delaware River Port Authority

The Office of Economic Growth could chair this committee to establish and retain as priority one the economic benefit to the state of each policy, program, action, or investment, whether transportation, labor force development, warehousing siting, development financing, or brownfield reclamation, to list a few.

A primary element for success would be the development of a common approach shared by the state agencies and the MPOs. This approach would build from technical planning, analysis, and documentation to external engagement with communities that would host logistics, land uses, or supporting infrastructure. The approach would attain a collaborative agreement on the project at the concept stage and follow it as it evolves in greater detail to design and finally to construction. The agencies that comprise the committee can produce solid analyses and recommendations for locating, developing, and expanding logistics facilities, but it is only through candid and cooperative engagement with the public in the host communities that an aggressive growth strategy will become a reality.

12. SUMMARY OF RECOMMENDATIONS AND ACTIONS

All indicators point to increased demands being placed on the State's freight transportation system as more and more goods are forecast to move within and through New Jersey. Already, elements of the system are not performing at optimal levels due to a wide variety of problems and constraints. Further, it is clear that today's problems will get worse for all users of the transportation system unless action is taken now.

The system capacity necessary to meet the growing demand for freight movement in New Jersey exceeds what can be provided through the traditional mode specific isolated improvements. A new approach is required- one that recognizes the interaction among freight modes, and acknowledges that freight and people needs jointly contribute to the needs of the overall transportation system.

This chapter presents a consolidated set of actions that were shaped by several factors:

- The actions had to advance the freight movement goals established by the New Jersey Department of Transportation:
 - **Integrated Planning:** To foster increased cooperation and coordination among public agencies and between public agencies and the private sector.
 - **Economic Development:** To retain and generate jobs, maintain and increase revenue, and help maintain and enhance the state's competitive position through strategic freight initiatives.
 - **Mobility:** To improve access to the system and improve the efficiency of freight movement.
 - **Sustainable Investment:** To cultivate and protect freight initiatives which provide lasting returns on public investment.
 - **Community and Environment:** To promote freight as a good neighbor and the movement of freight in a socially and environmentally responsible manner.
 - **Safety and Security:** To protect people, cargo, and infrastructure.
- The actions had to fit coherently together from a systems perspective, and appropriately address the range of strategies and recommendations found within the body of the plan.
- The actions had to recognize the capacity of NJDOT and other public and private sector entities to actually carry forward a common agenda on critical issues.

In the following sections, the plan's recommendations are described and organized into the following eight categories: Statewide Coordination; Priority Freight Nodes; Priority Freight Corridors; System Optimization Strategies; Planning and Policy Strategies; and, Improve Data Collection and Multimodal Analysis Tools

STATEWIDE COORDINATION AND ADVOCACY

□ **Establish a Senior Level Body to promote logistics as a critical element of the state’s economic prosperity**

The most important finding of the Statewide Freight Plan is that New Jersey needs a means to cohesively and cooperatively plan, design, fund, and implement improvements to the freight transportation system in order to sustain the state’s quality of life and economic prosperity. While many of the recommended freight strategies are independently being advanced through existing agencies and programs, this does not ensure that the inefficiencies and mixed messages of today’s fragmented institutional situation will be addressed or that related projects will be advanced together to maximize the ultimate benefit to the State transportation system.

The highest priority must be given to the creation of a senior level body to champion freight issues

A senior level body is proposed as a method of providing a cross-cut, integrating basis for advancing all the freight actions recommended for immediate action and, even more importantly, a comprehensive process for the further development and implementation of actions in the near and long term.

The proposed entity, once created, would spearhead the following general activities:

- Determine the overall logistics / economic development strategy for the state.
- Advance priority strategies bundles: I.e., groupings of programs, projects, and initiatives that must be advance across multiple state agencies, authorities, and the private sector.
- Ensure involvement and close coordination among the state and regional agencies, private sector, and local communities as appropriate at each stage of implementation.
- Identify and advance leveraged funding opportunities utilizing individual agency bonding and funding mechanisms; local, state, and federal programs; and private sector investments and fees.
- Monitor implementation and ensure timely completion of designated projects, programs, and initiatives.
- Develop and deploy educational campaigns to create public and private sector awareness of the roles of goods movement in their daily lives and the contribution of the logistics industry to the New Jersey economy in terms of direct impacts as jobs and income and indirect impacts as supply chain to product completion and retail activity.

In addition to the overall charge, the following initiatives are recommended as needing immediate attention:

- The Liberty Corridor
- Effort to take advantage of available road network capacity during off-peak periods
- Portway Program projects
- The North Jersey Development Plan rail projects
- Efforts to reclamation select brownfield / underutilized properties for logistics operations
- The “Port Smart Growth” initiative within the Liberty Corridor

The plan recommends the following action:

- **Establish a senior level body to promote logistics as a critical element of the state’s economic prosperity.**

□ **Implement Education, Outreach, and Local Technical Assistance programs**

There is a disconnect between what the general public knows about freight and what they need to know in order to have informed public discussion of policies, programs and projects. The private sector also needs to have a fuller understanding of public sector limitations and actively seek ways to make freight a good neighbor. There are three areas where this gap can be best addressed: Education, Outreach, and Local Technical Assistance.

Education: A multi-agency public/private educational program needs to be created and implemented. The program would use multiple channels to explain the critical role goods movement plays in driving the state's economy, enabling daily activities, and supporting quality of life. Roll-out of the freight plan is a first step towards achieving this goal. University research centers, the NJDOT Logistics Council, and the proposed Cabinet Committee could be leveraged to refine the messages and broaden the audience.

In addition to more generalized education, targeted education on themes which the public has an immediate connection with are necessary. Safety, for example, can be a strong element of such a targeted campaign. Improving safety requires informed actions by the infrastructure owners, the freight operators, and the general public, especially as users of shared freight / passenger elements of the system. A targeted freight safety campaign can build on efforts already taken by groups such as the New York Shipping Association, AAA and the NJDOT's own forthcoming safety management plan.

Outreach: Virtually all freight studies and projects undertaken by all public agencies have an outreach component. Private sector entities as well are increasingly utilizing outreach to minimize the impact of incorrect information or misconceptions regarding proposed development or expansion of freight activities. The public does not need more outreach, rather public and private sector entities need to do a better job at coordinating outreach efforts and in explaining how separate projects relate to broader goals.

The priority freight nodes and corridors identified in this plan are a starting point for presenting a variety of activities and initiatives from a systems perspective, but more work needs to be done. MPO freight committees, university research centers, the NJDOT Logistics Council, and the proposed Cabinet Committee are potential mechanisms for expanding work in this area.

Local Technical Assistance: In New Jersey, the inclusion of a circulation element in a town's master plan is optional. Towns which do have circulation elements usually do not all have the guidance or resources necessary to address freight issues in great detail. There is clearly a need to provide cost effective means for towns to appropriately address freight issues in their land-use and transportation planning process.

Several of the recommendations contained in this plan will advance freight planning at a macro level, but the information needs to be in the hands of decision makers at the County and Municipal level. Partnership with the state and local entities is necessary to improve the integration of freight data and analysis into the local planning process. For example: "best practice" guidance and analytic tools could be developed to support freight-related activities at the local level, including land development, zoning requirements, operations, and truck and train movement issues.

Optimizing the economic value of freight development in balance with community objectives is a key concept to enable freight industry growth. Sustained and proactive leadership to deliver inclusive collaboration that builds on full articulation of issues from all affected parties' perspectives is critical to securing local acceptance of regionally significant or private market driven freight infrastructure and / or warehousing, distribution or value-added facilities.

The plan recommends the following action:

- **The NJDOT should participate in initiative to formulate and Implement Education, Outreach, and Local Technical Assistance programs**
- **The department should explore ways to better integrate freight and economic development strategies to create enhanced value for communities through collaboration and communication**

□ **Promote a New Jersey Logistics Economic Development Program.**

Warehousing and distribution center development has expanded to areas outside the core port areas of the New York metropolitan region in significant part due to the absence of alternatives closer to the port areas. A concerted effort to convert brownfields and greyfields sites to warehouses and distribution centers will relieve pressures for expansion elsewhere in New Jersey and outside the state. It can have the additional benefits of returning fallow lands to economic productivity and improving labor access.

The Portfields program, oriented towards tying warehouse development and the international marine cargo movement closer together, begins the process of encouraging the reuse of appropriate underutilized and brownfield sites for new value added distribution center development. Given the anticipated increases in marine cargo and the associated potential for value added warehouses in the vicinity of the ports, development of the most promising sites should be given priority attention.

Comparable to northern New Jersey, the advancement of redevelopment of brownfields and greyfields for logistics purposes require immediate attention in southern New Jersey. The completion of the Southern New Jersey Waterfront Master Plan by the DRPA is one step toward framing choices in this region, but more can be done on a broader regional basis. There are synergistic benefits between successful strategies in the north and south that coordination in a strategic initiative can encourage.

State agencies can lead this effort in collaboration with the port authorities, MPOs and local jurisdictions. The Plan recognizes that not all new warehouse development will occur on brownfield property and, therefore, urges that the identification and designation of desired warehouse node areas within New Jersey be given priority. The NJ Economic Development Authority, the port authorities, and the MPOs could implement this action.

A program should be established to facilitate the approval processes within the State, including expedited environmental and site approvals, one-stop contacts, and financial incentives in certain locations, as well as building partnerships with host communities. A state agency, such as the NJEDA, could lead this effort with assistance from the port authorities.

The plan recommends the following actions:

- **Actively Facilitate Warehouse development in the State**
- **Support the PANYNJ Portfields effort**
- **Support EDA and DEP brownfields efforts**
- **Identify opportunities around Northern and Southern Node port facilities.**
- **Give Priority to an Underutilized / Brownfield property development program**

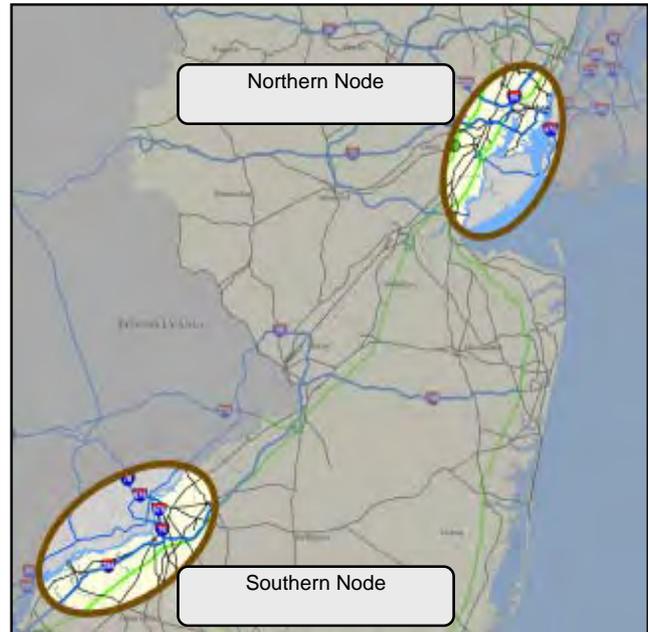
Priority Freight Nodes

- **The States priority freight nodes are assets which must be protected: Previously identified projects need to be completed and proposed projects need to be advanced.**

Our state’s intermodal rail yards and port facilities are areas of concentrated freight activity. Congestion, bottlenecks, access problems, or limited modal options can prevent these nodes from operating at full efficiency. These nodes must seamlessly integrate into the broader freight transportation network.

For discussion purposes, this freight plan groups the facilities comprising the primary nodes into two categories: Northern node facilities and a Southern Node facilities

Much work has been done to assess the infrastructure needs around the state’s Northern node. Several port related project are proposed or are now under development by the NJDOT, the NJTPA, the PANYNJ, County and local Governments. The Portway and the Portway Extension projects are infrastructure improvements targeted at highway freight and the linkage to Port Newark / Elizabeth. (See appendix C). Projects were identified through the CPIP study and were also proposed by the PANYNJ to facilitate flows and network access at the port. Additional rail, maritime, and aviation needs in the northern node are addressed in other sections of this report.



New Jersey’s southern node freight facilities have not benefited from the same degree of multi-modal analysis. Given the growth of the South Jersey Port Corporation facilities, expansion (such as Port Paulsboro), the potential for port facilities to be an employment / economic catalyst, and the critical role played by the southern facilities (both on the New Jersey and Pennsylvania side of the Delaware river), additional collaborative work in the areas of facility ingress and egress, intra-facility movements, highway connections, rail accessibility, land-use, and community issues is warranted. These efforts, if undertaken, would need to be coordinated with previous work and existing planning activities underway.

The plan recommends the following action:

- **Complete Portway Phase 1 projects in NJDOT pipeline according to priority**
- **Advance Portway Extensions recommendations through NJDOT Project Development process and subsequently through the pipeline according to priority**
- **Promote external agency Extensions projects through appropriate channels according to priority**
- **Seek ways to collaboratively advance economic development around the Southern port area**

Priority Freight Corridors

In 2003, approximately 465 million tons of goods moved by Truck, 42 million tons by Rail, 112 million tons by Water, and 1 million by Air. New Jersey's priority freight corridors are vital conduits through which much of these goods can flow into, out-of, through, and within the State. For purposes of discussion, the priority corridors are divided modally: Highway, Maritime, and Rail. Some of the highway corridors are multi-modal and have a rail component as well. Air freight corridors were not addressed.

Highway Corridors

□ **Develop specific infrastructure and operational action plans for the six priority highway freight corridors identified in the Plan.**

The Freight plan identified six priority freight corridors: I-78, the New Jersey Turnpike, I-80, I-287, I-295, and Route 17. These corridors are significant for more than just freight: they are heavily utilized by commuters; they are the main highway conduit for the flow of goods into, out-of and through the state; and, they serve to connect the state's freight nodes to the regional system. Congestion, bottlenecks and other system deficiencies on these corridors negatively impacts all users of the transportation system.

To identify and address corridor needs, a corridor assessment program and project development process is proposed. For each corridor:

- Traffic flow conditions and needs should be thoroughly investigated and modeled.
- A data collection program targeting vehicle classification and an operational assessment program should be established
- Management system information and field reviews should be utilized to identify and quantify operational deficiencies, both related to auto and commercial vehicles.
- Unique characteristics of the corridors should be identified, as they relate to the composition of traffic (Inter- and Intra- state flows) and the demand for the movements of people and good in the corridor.
- The impact of non-commercial vehicle growth must also be quantified. Planning improvement projects to address this need, and exploring methods to ensure freight oriented improvement projects do indeed benefit freight traffic, must be included in the planning effort.
- The program and project development process must also take into account the impact of other actions proposed throughout this plan in order to develop a coordinated bundle of investments. For examples, actions to reduce the growth in peak period demand for truck travel, such as shifting a portion of truck traffic to rail, or utilizing off peak period capacity, as well as localized capacity improvements can be assembled into an action plan for each priority corridor or areas of significant freight activity.
- Improvement programs and projects (multi-modal if applicable) should be formulated based on the results of the assessments, and should consider the assessment of multi-modal alternatives to meet existing and future demands.

Projects identified through this process should receive priority funding treatment and could be implemented through a collaboration of NJDOT and other transportation agencies such as the PANYNJ, DRPA, and the NJTA. NJDOT can lead the assessment of the facilities.

The plan recommends the following actions:

- **Initiate a corridor assessment and project development process on the following priority freight corridors: I-78, the New Jersey Turnpike, I-80, I-287, I-295, and Route 17**

Rail Corridors

□ **Ensure that the priority rail projects / initiatives identified in the plan are appropriately represented in capital priorities and advanced.**

Many existing rail freight capacity needs have been identified. These include:

- The New Jersey State Rail Plan. This is a program of direct investments by NJDOT in the state's rail system.
- The Mid-Atlantic Rail Operations Study (MAROps). This is the result of a cooperative process to identify transportation solutions across boundaries. It is the joint product of five states (Virginia, Maryland, Delaware, Pennsylvania, and New Jersey), the I-95 Corridor Coalition, and three railroads (NS, CSXT, and Amtrak). The study formulated a program of systemwide rail investments in all five states; and recommends a public-private partnership to fund and implement the improvements.
- The New England Rail Operations Study (NEROps). This is the New England equivalent of MAROps. This is significant to New Jersey since it includes CSX's primary route into the state, improves rail shipments between New Jersey and New England, and impacts traffic passing through New Jersey.
- North Jersey Development Plan projects: This is a series of projects to expand capacity in the North Jersey Shared Assets Area. Phase I projects are being funded jointly by the Port Authority of New York and New Jersey, CSX, and NS. Funding for Phase II and III has not been committed.
- PANYNJ Improvements. The expansion and modernization of ExpressRail and other facilities serving Port Newark, Port Elizabeth, and the New York Container Terminal (formerly Howland Hook).
- Portway Extensions. These were developed for NJDOT and consist primarily of highway recommendations, although there are suggestions (not projects) to explore the possibility of new freight rail services.

It is imperative that these critical projects move forward. The ability to implement modal options such as PIDN (by rail), rail shuttles, and sprint trains may be hindered if these projects are not completed. The NJDOT will serve as a champion of those projects, coordinating with both public and private entities to facilitate the advancement of the projects, including exploring innovative financial arrangements.

The plan recommends the following actions:

- **Secure funding for the remaining North Jersey Development Plan projects**
- **Support / Promote PANYNJ on dock rail express rail improvements**
- **Champion advancement of Out-of-State MAROps projects**

□ **Begin to develop a more coordinated mechanism for the planning and management of the rail system.**

In addition to advancing the previously identified rail projects, a more coordinated mechanism for the future planning and management of the rail system is necessary. The NJDOT's freight planning process can serve as the medium for soliciting input and gaining the participation of all stakeholders of rail freight services in crafting and funding capacity improvement projects. A coordinated project development process is necessary for identifying and improving priority rail corridors. This process should:

- Identify overlaps and / or conflicts among previously proposed improvement programs, classify additional critical chokepoints, identify opportunities for joint funding, and identifying critical capacity constraints beyond New Jersey's borders.
- Systematically assess the rail network to establish goals for basic standards for weight-carrying capacity and height / width dimensions (plate size) that should be adopted across the entire New Jersey rail network. These parameters set the stage for addressing the inter-operational issues of the system, and to identify locations where there is a lack of seamlessness.
- Address at-grade rail crossings and the safety and operational issues occurring at these locations. A prioritized list of locations where improvements are necessary needs to be developed, working with NJTransit and through the assembly of a safety review action team.
- Facilitate the identification and resolution of passenger-freight rail operating and program support conflicts on lines where new or expanded services is being considered.
- Providing a forum for institutional coordination and cooperation and increased dialogue among Class I and shortline railroads, passenger rail service operators, and the users of these services regarding all operational issues.

The plan recommends the following actions:

- **The NJDOT should begin to develop a more coordinated mechanism for the planning and management of the rail system by engaging in the following activities:**
 - **Adopt standards for Rail weight-carrying capacity and height / width dimensions**
 - **Identify / prioritize at-grade crossing operational / safety improvements along key rail corridors**
 - **Create a rail freight capacity oriented project development process**
 - **Align the rail assistance program (State Rail Plan) project priorities to broader system objectives**

Waterway Corridors

□ Support maintenance of key waterway Channels

The waterway channels are an important component of the State’s marine transportation system: they serve freight and non-freight users, have operational and environmental constraints, require maintenance and sometimes deepening and expanding.

Adequate channel depths and channel maintenance programs are needed for cargo vessels to safely access New Jersey’s port terminals.

In northern New Jersey Fifty-foot channel depths are now a necessity in some channels for handling the new generation of container vessels. Channel deepening projects are advancing.

In southern New Jersey, the proposal to deepen the Delaware River channels to 45 feet is currently being debated.

With or without deepening, attention must also be given to ensuring sufficient funds and programming for continual maintenance of all the state’s waterway channels.



The plan recommends the following actions:

- NJDOT should continue to support the Northern port area’s channel deepening efforts.
- NJDOT must await resolution regarding Delaware River channel deepening.

□ Promote / advance the beneficial uses of dredged material

Maintenance of waterways through dredging is a critical activity which preserves the states waterways as transportation assets. Promoting the innovative and beneficial uses of dredged materials is a sound strategy for addressing the dredged material with is a direct consequence of this important activity.

The plan recommends the following action:

- Continue to support maintenance dredging and the beneficial use of dredged material

System Optimization Strategies

□ Advance mode shift and time-shift strategies:

Mode Shift: Trucks are the predominant mode in moving freight, and are operating on an increasingly congested highway network. Increasing the use of other modes to move goods is a sound compliment to strategies designed to address future highway congestion. Encouraging the use of rail freight and barge options increases the efficiency of the overall inland distribution system, but they must have sufficient capacity and be economically viable to perform that role. Planned investments in New Jersey’s rail freight network aimed at removing operational bottlenecks and increasing system capacity should be advanced expeditiously. Completion of on-dock rail facilities should also be a priority, as should the PANYNJ’s roll out of PIDN services and advancement of rail shuttles between the northern port terminals and key warehouse / distribution center nodes. Implementation will require the collaboration of multiple entities including the port authorities, MPOs, and local governments

The plan recommends the following actions:

- **Support the establishment of appropriate PIDN service, in South Jersey and outside of the State**
- **Advance evaluation of sprint trains and rail shuttles, both within and outside of the State**

Time Shift: There is a significant advantage to be gained in improving the efficiency of moving goods by highway if the range of operating hours can be increased, thus utilizing the available Off-Peak period roadway capacity. Trucks will be better able to take advantage of the off-peak capacity, and will face less competition for the use of facilities from auto traffic. Currently, the Logistic Council’s Extended Hours Task Force is investigating how to expand the hours of operation on a large scale. NJDOT can advance the timely adoption of extended hours of operation by allocating resources to support the Logistics Council’s extended hours Task Force and to assist in implementing the recommendations. Advancing the program will require the cooperation of the PANYNJ, port operators, warehouse / distribution center operators, NJMTA, and local governments.

In addition to off-peak highway efforts, there are substantial benefits to Supporting maritime terminal time-shift strategies. Programs such as Maher terminals' extended gate hours and the PierPass program in southern California encourage the use of existing roadway capacity during less congested off-peak periods. With efficiencies at the marine terminals to ensure quick pick ups and drop offs of containers, truck drivers could make more trips using less congested roadways, thus increasing their earnings and equipment utilization.

The plan recommends the following actions:

- **Allocate resources to support the Logistics Council’s extended hours Task Force and to assist in implementing recommendations**
- **Support efforts at marine terminals to extend gate hours**
- **The NJDOT should continue support for PANY&NJ and SJPC agency and / or tenant efforts to advance adoption of extended hours of operation and other time shift strategies at the maritime cargo terminals, coordinated with the Logistics Council extended hours initiative**
- **Proposed legislative and regulatory schemes designed to promote or mandate extended hours of operation need to be evaluated for applicability to New Jersey port faculties**

Policy and Planning Strategies

Policy

□ **Truck rest stops**

It was generally agreed among stakeholders that there is a lack of adequate number of support facilities to serve the trucking community. Truck rest stops along major truck corridors are necessary. Locating these facilities, both public and private, has met with local resistance. It is both a regional and local issue, with work being conducted by the North Jersey Transportation Planning Authority in their region to assess the need for truck rest stops.

It should be the policy of NJDOT to advance additional truck support facilities by working with the motor carriers and local officials, leading the assessment of need and location, and working to overcome barriers to the development of new facilities. NJDOT will work with the MPOs to quantify the need and promote measures to improve the ability to locate these critical facilities.

The plan recommends the following action:

- **The NJDOT should continue to work with The North Jersey Transportation Planning Authority in their study to analyze the needs of the trucking industry for rest/service stops in the 13-county NJTPA region.**
- **At the conclusion of the above work, the NJDOT should consider a similar study for other areas of the State.**

□ **Heavier and wider trucks**

Accommodating truck traffic safely and efficiently requires facilities designed to properly and adequately provide the necessary clearances for trucks. Heavier and wider trucks using roadways not designed for the imposing requirement of these larger vehicles often results in unsafe conditions, vehicle conflicts, adverse traffic flow performance, and environmental impacts. As such, it is important that trucks be limited on NJ roadways, except in designated routes specifically identified for such purpose and subject to predetermined regulatory and / or other compliance restrictions.

The plan recommends the following action:

- **The NJDOT should make it policy that heavier and wider trucks are not appropriate for NJ roadways, except in designated routes specifically identified for such purpose and subject to predetermined regulatory and / or other compliance restrictions**

Planning

□ Elevate the consideration of freight issues / impacts in the highway improvement planning and prioritization process utilized by NJDOT.

NJDOT and partner agency Management Information Systems (MIS) and other decision / prioritization tools need to take into consideration the needs and issues of freight movement. An increased emphasis on freight needs and issues must be integrated into the Department's planning and design process to provide better data on the locations where freight movement is a significant activity and where efforts should be made to better accommodate it. Designating primary and secondary truck corridor and facilities that warrant special consideration of goods movement issues, and establishing procedures to elevate the prioritization of work programs on these facilities, as well as adequate funding, is necessary.

The plan recommends the following action:

- **The NJDOT should systematically examine the degree to which freight system needs, particularly in the priority corridor and node areas of the state are captured and weighted in the variety of (MIS) and other decision / prioritization tools used by the NJDOT and planning partners**

□ Explore modal options to support warehouses and distribution centers (DCs), individually and as part of corridor efforts to better connect clusters with port facilities.

The operation of scheduled, double-stack container service between the maritime terminals in northern New Jersey and key concentrations of warehouses and distribution centers as an alternative to trucking containers to and from these areas should be explored. Rail-based container shuttle service has been proposed in the Portway Extensions Concepts Study and by Maher Terminal at Port Newark / Elizabeth. This type of service would offer an alternative to trucking containers to and from these areas. Rail shuttles between warehouse clusters at Interchanges 8A and 7A and the northern New Jersey maritime terminals can significantly reduce the amount of truck trips occurring at these facilities and can have significant economic development benefits. PIDN service (by barge) also can serve as a transport mode that supports warehouses and distribution centers

The plan recommends the following actions:

- **Advance Rail Shuttles and PIDN alternatives**
- **Identify targeted infrastructure improvements as part of corridor studies**

□ Determine where future warehousing and distribution center facilities can best be located within the state

From an economic development perspective, it is better to encourage warehouse and distribution center development within New Jersey rather than have the facilities and associated jobs generated outside the state. Working together, public agencies and the private sector must determine where additional warehousing / distribution space can be accommodated in New Jersey.

Several agencies and private developers have emphasized the reuse of brownfield or underutilized properties as at least a partial solution to this problem, and the continued use of "greenfield" sites near

existing warehouse clusters is also anticipated. However, following a decade's long trend, as properties become more expensive and / or less available, warehouse development shifts outwards. In New Jersey, this trend has translated into greater development in the southern and central portions of the state. The Portfields initiative, described previously, helps address this issue for distribution centers that make use of the port terminals in the northern portion of New Jersey

The objective of this strategy is to maximize the economic development benefits accruing to New Jersey as a result of the concentration of freight activity in the state. This would be done in close cooperation with industry associations, property owners, developers, and localities.

The plan recommends the following actions:

- **The NJDOT, in collaboration with planning partners should initiate a study (or mechanism) which determined where future warehousing and distribution center facilities can best be located within the state**

□ **Advance the adoption and integration of freight Intelligent Transportation System (ITS) and other technologies.**

ITS offers the opportunity to extract more practical capacity from our transportation system by operating the system in a more efficient manner. EZPass, an electronic toll collection system that is part of the ITS family of components, has been implemented throughout New Jersey's toll roads and border crossings. CVISN, the Commercial Vehicle Information System Networks, is an example of an ITS program specifically designed to improve motor carrier safety, efficiency, and convenience, by providing detailed information on vehicle contents and who the mover is.

CVISN is an existing initiative of the FMCSA, and part of FHWA's national architecture. NJDOT will advance this initiative by integrating and funding the program in the State. NJDOT will also explore other ITS measures to extract the maximum capacity and traffic flow from the existing system

The plan recommends the following action:

- **The NJDOT should expand its efforts to Advance the adoption and integration of freight Intelligent Transportation System (ITS) and other technologies. This would encompass initiatives such as: CVISN; weight, size, and count devices; and, innovative technologies such as Idle Air**

□ **Incorporate funding considerations early in the planning process**

As freight projects can involve multiple public agencies and jurisdictions and the private sector, it is advisable to consider funding mechanisms early, as promising projects and programs emerge, strengthening their viability to advance in the programming process. Early planning can identify multiple funding sources for major freight projects and programs. While it may be preferable and simpler to have a single source of funds, the limited budgets of individual agencies, the federal government, and private sector entities makes the multiple-source financing a necessity for large scale freight projects and programs.

The plan recommends the following action:

- **The department should explore ways to incorporate funding considerations and partnerships early in the planning process**

Data Collection and Multimodal Analysis Tools

□ Improve Data Collection and Multimodal Analysis Tools

The need for freight data exceeds the amount (and some time quality) of data currently available. When data is available, it is not always compatible with other data sets. Coordination among transportation agencies is required. The agencies need to identify a core set of data or questions that must be collected, coordinate the collection process, and develop a common format for data files and protocols for data sharing.

However, collecting common data is not enough. The development of improved data and analysis tools could help determine where it is best to target infrastructure improvement to mitigate current and forecast congestion. A comprehensive data collection and assessment program will provide vital information on how well the freight system is performing and how system performance changes over time, as well as providing a measuring stick to assess the effects of current and future initiatives.

Significant analytical capabilities will need to be developed to analyze the freight transportation system as a whole. An analytical tool is needed to assess the impact of a change on the highway or rail freight system and its resulting impact to the rail system, the highway and truck freight systems, and intermodal transfer locations. This tool will be required to gain a better understanding of the relationship among improvements in capacity, travel times, and reliability at points, corridors, and Interstate routes (or freight lanes) and the impacts on freight movements as part of the overall logistics supply-chain

The plan recommends the following actions:

- **The department should continue with its efforts to conduct a five year Large Truck Monitoring Program to monitor truck volumes and patterns statewide**
- **Create a mechanism for sustained data and analysis coordination and sharing**
- **Develop improved highway freight analysis tools, data collection programs, and monitoring: Leading towards the creation of a multi-modal analysis tool**

Safety and Security

□ Hazardous Materials

The movement of hazardous materials through all modal elements of the goods movement system presents a safety and security concern. The means to have more information on this movement can result in proactive measures to improve safety and security, but will require close coordination among the public and private sectors involved, such as the New Jersey Department of Labor, the NJDEP, the NJDOT, the toll authorities, and the PANYNJ and DRPA.

The plan recommends the following action:

- **The NJDOT, in partnership with Federal and State Agencies, should evaluate measures it could take to enhance the tracking and control of hazardous materials movement**

□ Enforcement

There is an increased emphasis on safety and security throughout the transportation industry. Goods movement has drawn particular attention. An increase in the enforcement of rules and regulations regarding the condition and operation of commercial vehicles is critical to the safety and security of the motoring public and residents of the state. The ability to conduct inspections without disrupting traffic flow or endangering people requires provisions adequately separated from the traffic stream. NJDOT will pursue a program of developing adequate locations where inspections can occur.

The plan recommends the following action:

- **The NJDOT should make it policy that adequate facilities must be provided for the State Police to conduct safety, security, and other routine enforcement stops along major Truck Corridors**
- **The NJDOT should partner with law enforcement to identify needs and develop a action plans.**

□ Monitor and respond to emerging federal aviation security requirements

The air cargo industry is already being buffeted by changes in supply, demand and mode substitution. New federal security requirements may further alter the situation, as well as change on- and off-airport infrastructure.

The plan recommends the following action:

- **The NJDOT, in coordination with the PANY&NJ needs to monitor evolving federal security requirements and appropriately respond to the freight impacts associated with Air Cargo security requirements.**

□ Advance Domestic Preparedness

With the enactment of the New Jersey Domestic Preparedness Act, New Jersey through the Department of Law and Public Safety and the Office of Homeland Security and Preparedness has taken an active role in assessing physical security and critical infrastructure protection as they relate to the Transportation Sector within the state. NJDOT has a major supporting role in advancing these safety and security initiatives.