The New Jersey Comprehensive Statewide FREIGHT PLAN




Appendix

September
2007

New Jersey Department of Transportation

Governor Jon S. Corzine

Commissioner Kris Kolluri

TECHNICAL APPENDICES

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PREPARATION OF THIS REPORT WAS FUNDED BY
Federal Highway Administration
New Jersey Transportation Trust Fund Authority

The preparation of this report has been financed in part by the U.S. Department of Transportation, Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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CAMBRIDGE SYSTEMATICS

New Jersey 2003 Statewide Freight Data Profile

final

report

prepared for

New Jersey Department of Transportation

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Cambridge Systematics, Inc.

September 26, 2005

www.camsys.com

final report

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September 26, 2005

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1.0 Introduction

1.1 Purpose and Need

An important step in evaluating the impact of freight movements on New Jersey's transportation system is to develop an understanding of the commodity flow patterns affecting the state. To inform the New Jersey Statewide Freight Plan and establish data benchmarks, the New Jersey Department of Transportation (NJDOT) directed Cambridge Systematics, Inc. (CS) to prepare this New Jersey Statewide Freight Data Profile.

1.2 Data Sources and Limitations

The primary data source for this Freight Data Profile is the TRANSEARCH commodity flow database purchased by NJDOT. TRANSEARCH is a commercial data product developed by Reebie Associates (now a part of Global Insight, Inc.). TRANSEARCH provides estimates of county-to-county and state-to-state freight flows by truck, rail, air, and water. TRANSEARCH also provides separate estimates for different commodity types. TRANSEARCH utilizes proprietary data to estimate truck flows, Federal Railroad Administration Waybill Sample data for rail flows, and other public sources for air and water flows.

The TRANSEARCH data captures domestic commodity tonnage moving within the United States. It does not capture "non-freight" vehicle movements (empty trucks or railcars, service vehicles, etc.). Nor does it capture international movements. However, the effect of cross-border truck and rail moves are in the data, as domestic moves from the point where they entered the U.S.. Similarly, the "domestic leg" of international air cargo and waterborne cargo – the moves to and from airports and seaports – are covered in the data. All "linked" trips – such as cargo that moves by rail to a New Jersey terminal, then by truck to a local destination – are reported as separate and distinct trips.

The TRANSEARCH-processed waybill data was not available for this analysis, so CS directly processed and analyzed waybill data provided to NJDOT under separate authorization by the Surface Transportation Board. Also, because TRANSEARCH does not include international waterborne and international air traffic, CS utilized supplemental waterborne data from the U.S. Army Corps of Engineers (ACOE) and air cargo data from the Port Authority of New York and New Jersey (PANYNJ), which does include both domestic and international tonnage. Aggregated data covering all of New Jersey's marine terminals was available, but data for New Jersey's cargo airports was available only for Newark, and not with directional specificity.

1.3 Analytical Approach

A quantitative commodity flow analysis provides the means to better understand freight movements into, out of, within, and through the state by identifying the volumes and types of commodities moving in the state, the modes on which those commodities are traveling, and the origins and destinations between which they are transported.

An analysis of commodity flows by weight is the fundamental approach to a freight study, as the weight of commodities is important in understanding the ways in which freight vehicles are using the transportation system and how those vehicles affect the freight infrastructure. Understanding how freight vehicles travel along New Jersey's transportation infrastructure is also critical when addressing factors such as congestion, capacity, infrastructure investment, economic development, and quality of life. All data is reported for calendar year 2003. All tonnages quoted in this report represent short tons (2000 lbs). For trucks, truckload equivalents are also presented.

To gain a more complete picture of the characteristics of freight movements within New Jersey, however, it is also important to consider the value of the products being transported into, out of, within, and through the state. While the TRANSEARCH commodity flow database purchased for this study did not include a value component, estimates of average commodity values per ton were derived from the Bureau of Transportation Statistics 2002 Commodity Flow Survey (CFS), inflated to 2003 values, and applied to the truck and rail data using the proprietary FreightTools$_{CS}$ software package. The ACOE-sourced waterborne data and PANYNJ-sourced air cargo data did not provide sufficient commodity-level detail to permit application of tons-to-dollars conversion factors; other methods (described in Section 2) were used to develop order-of-magnitude approximations for purposes of this report. Also, it is important to remember that since most of the state's waterborne and airborne cargo has a linked truck or rail trip (delivery to/from the airport or seaport), the value of most air and water tonnage is actually captured in the truck or rail data.

1.4 Organization of this Report

The remainder of this report is organized as follows:

- Section 2.0 – Statewide Freight Data;
- Section 3.0 – Analysis of Modes;
- Section 4.0 – Analysis of Commodities;
- Section 5.0 – Analysis of Trading Partners; and
- Section 6.0 – Conclusion.

2.0 Statewide Freight Data

2.1 Overview

Over 620 million tons of freight were transported into, out of, within, and through New Jersey in 2003, representing roughly $860 billion in value of goods transported. Tables 1 and 2 below provides a summary of this information by mode.

Table 1. Summary of Estimated 2003 Statewide Freight Flows by Weight

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**

Source: Cambridge Systematics analysis of various data sources:

* Truck estimates were derived from the TRANSEARCH database.

** Rail estimates were derived from the Federal Railroad Administration Waybill Sample.

*** Water estimates were derived from the U.S. Army Corps of Engineers data. Outbound tonnage includes 27,522,000 tons domestic plus 8,157,000 tons international exports. Inbound tonnage includes 18,581,000 tons domestic plus 53,488,000 tons international imports. The U.S. Army Corps of Engineers provides through tonnage for certain navigation channels, but not for the state as a whole.

**** Air estimates were derived from the Port Authority of New York and New Jersey's 2003 Airport Traffic Report, which included domestic and international revenue freight and revenue mail totals, but not by direction. The percentage of outbound tonnage was estimated at 44% based on year 2000 data from the Port Authority of New York and New Jersey (total Newark Liberty International Airport tonnage of 1,193,392 tons freight and mail) and the Bureau of Transportation Statistics "New Jersey Transportation Profile" (enplaned Newark Liberty International Airport tonnage of 527,655 tons freight and mail); inbound tonnage was estimated at 100%-44% = 56%. Estimates of intrastate and through tonnage could not be derived from these sources.

Table 2. Summary of Estimated 2003 Statewide Freight Flows by Value

Flow Type	Total	Estimated Value ($ Billions)			
		*Truck	**Rail	***Water	****Air
Inbound	411	262	36	90	23
Outbound	312	232	17	45	18
Intrastate	137	131	1	5	0
Through	Unknown	Unknown	Not Estimated	Unknown	Unknown
TOTAL	**860**	**625**	**54**	**140**	**41**

Source: Cambridge Systematics analysis of various data sources:

* Truck estimates were derived from the TRANSEARCH database and FreightTools$_{CS}$. The value of through tonnage could not be determined from available data.

** Rail estimates were derived from the Federal Railroad Administration Waybill Sample and FreightTools$_{CS}$.. The value of through tonnage was not estimated.

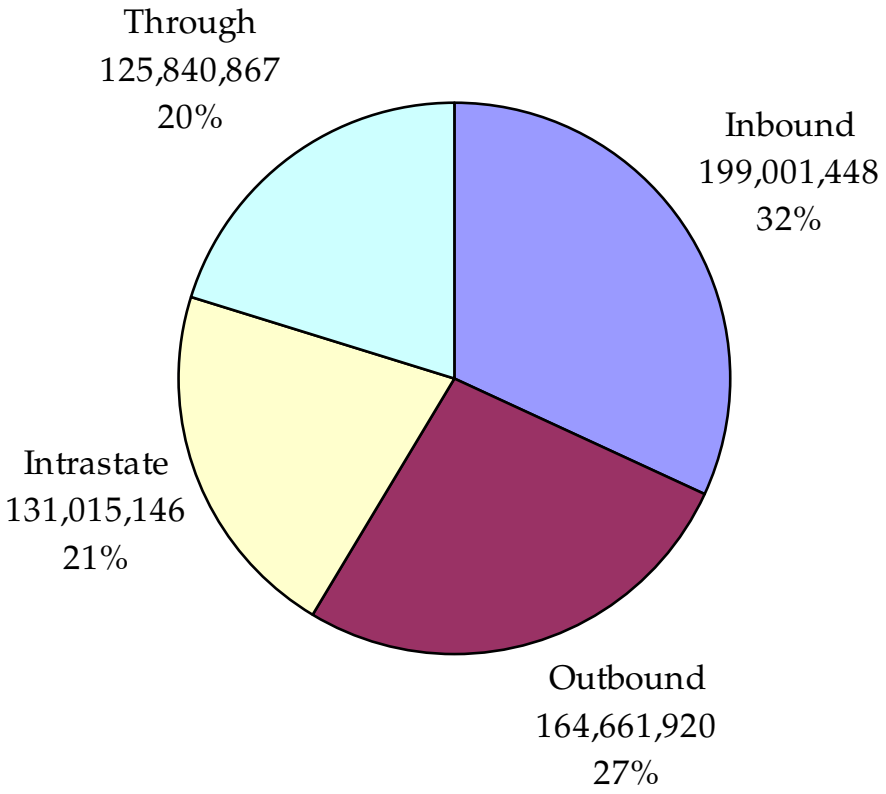
*** Water estimates were derived using the Bureau of Transportation Statistics "New Jersey Transportation Profile," which reports the value of import/export cargo through the bi-state Port of New York and New Jersey (PONYNJ) at $80.9 billion in year 2000. The Port Authority of New York and New Jersey website reports import/export tonnage of 64,817,274 tons for PONYNJ in year 2000. This yields a value factor of approximately $1,250 per ton. This factor was applied to all New Jersey waterborne tonnage, including public and private terminals, and including both international and domestic traffic; the composition and corresponding unit values of different ports and of international and domestic traffic may differ, so the resulting estimate should be used only for generalized order-of-magnitude comparison purposes.

**** Air estimates were derived from the Port Authority of New York and New Jersey's 2003 Airport Traffic Report, which reports 252,120 tons of international freight for Newark Liberty International Airport in year 2000, and from the Bureau of Transportation Statistics "New Jersey Transportation Profile," which reports a value of $10.6 billion for international trade through Newark Liberty International Airport. This yields a value factor of approximately $42,000 per ton. This factor was applied to all Newark Liberty International Airport tonnage, including both international and domestic traffic; the composition and corresponding unit values of international and domestic traffic may differ, so the resulting estimate should be used only for generalized order-of-magnitude comparison purposes.

2.2 Directional Summary

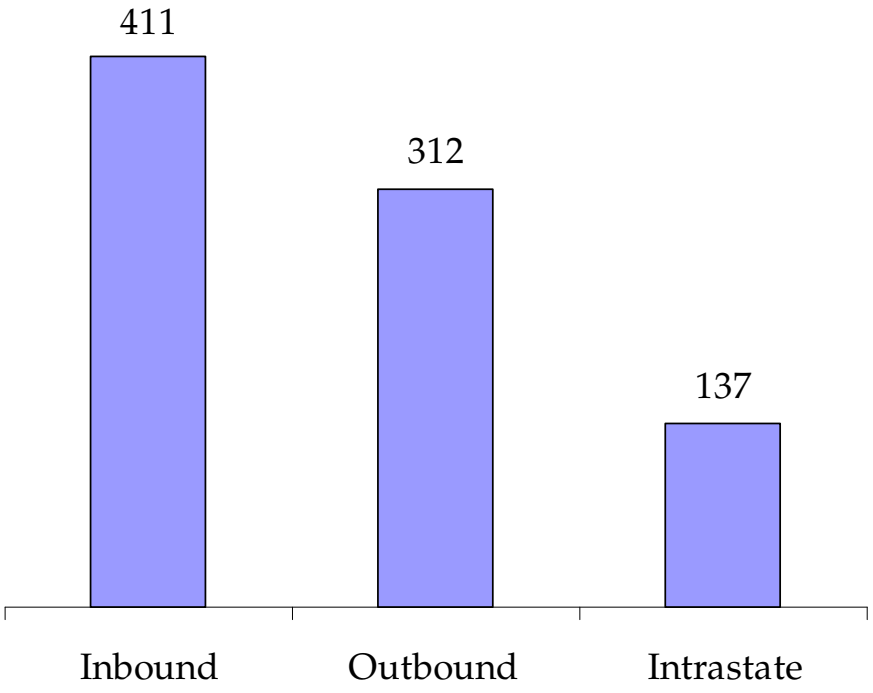
Inbound moves represent the largest share of tonnage and value. On a tonnage basis, each type of move – inbound, outbound, intrastate, and through – makes a significant contribution to total freight flows.

Figure 1. Direction of Estimated 2003 Statewide Freight Flows 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.

Figure 2. Direction of Estimated 2003 Statewide Freight Flows in Dollars ($ billion)



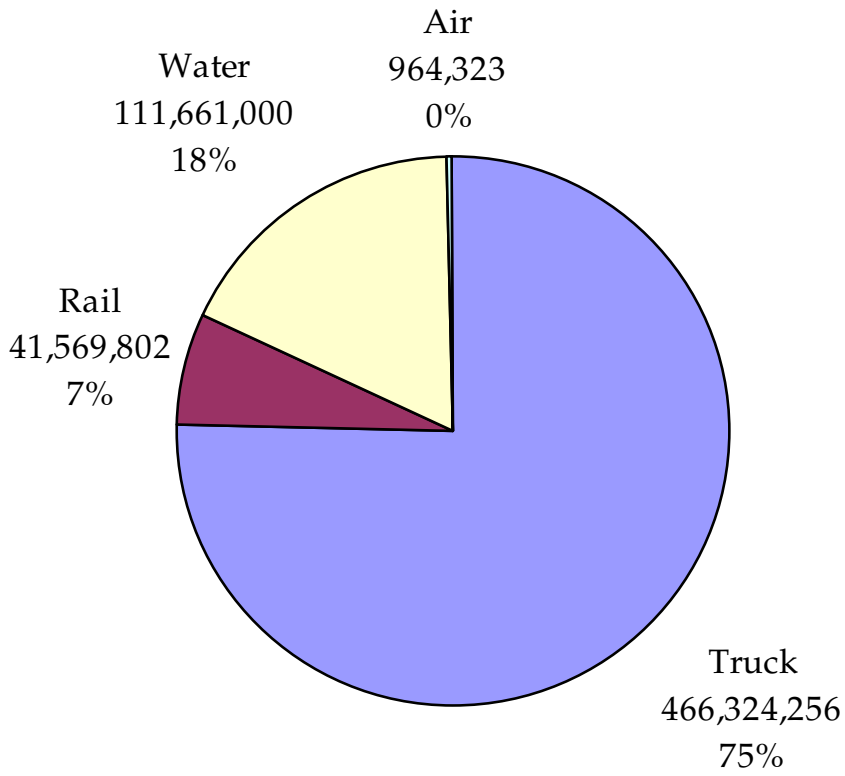
Source: Cambridge Systematics analysis of TRANSEARCH, Federal Railroad Administration, U.S. Army Corps of Engineers, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics data. Tonnage data was processed with additional conversion factors from FreightTools$_{CS}$, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics. These are order of magnitude estimates for comparison purposes only.

Notes: Through value could not be estimated due to limitations of data sources.

2.3 Mode Share Summary

Like most states, New Jersey is highly dependent on trucks for movement of much of its freight. But New Jersey is also well-represented by other modes, which are critically important to its overall intermodal goods movement system. Note that air cargo accounts for less than 1% of tonnage but almost as much value as rail.

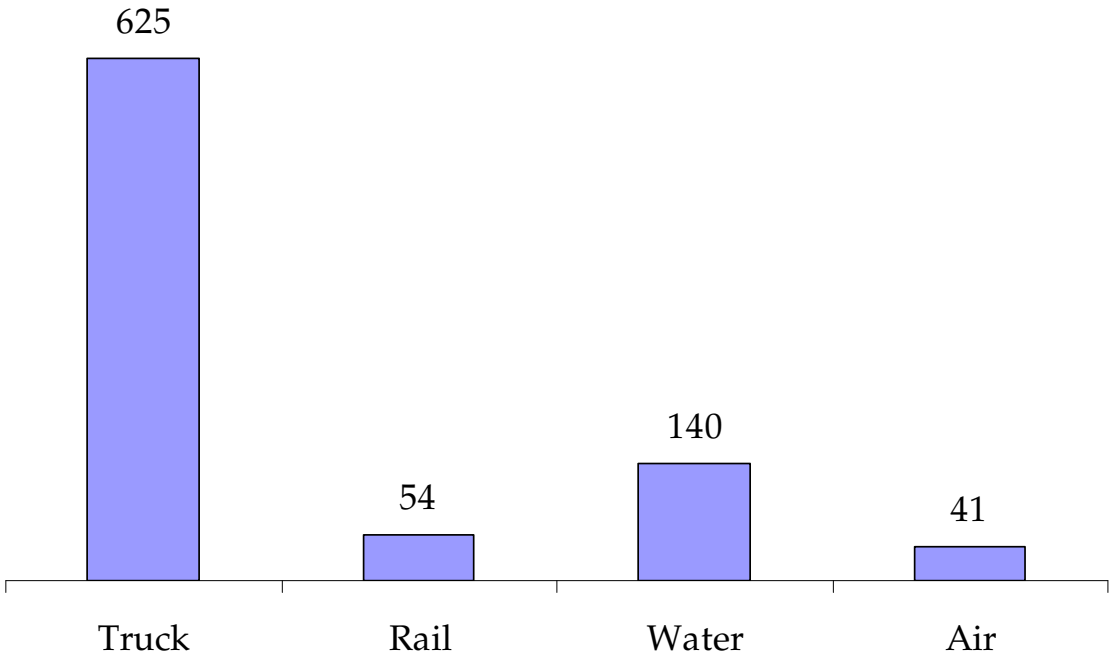
Figure 3. Estimated Statewide 2003 Freight Flows by Mode in Short Tons



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.

Figure 4. Estimated Statewide 2003 Freight Flows by Mode in Dollars ($ billion)



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. Tonnage data was processed with additional conversion factors from FreightTools$_{CS}$, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics. These are order of magnitude estimates for comparison purposes only.

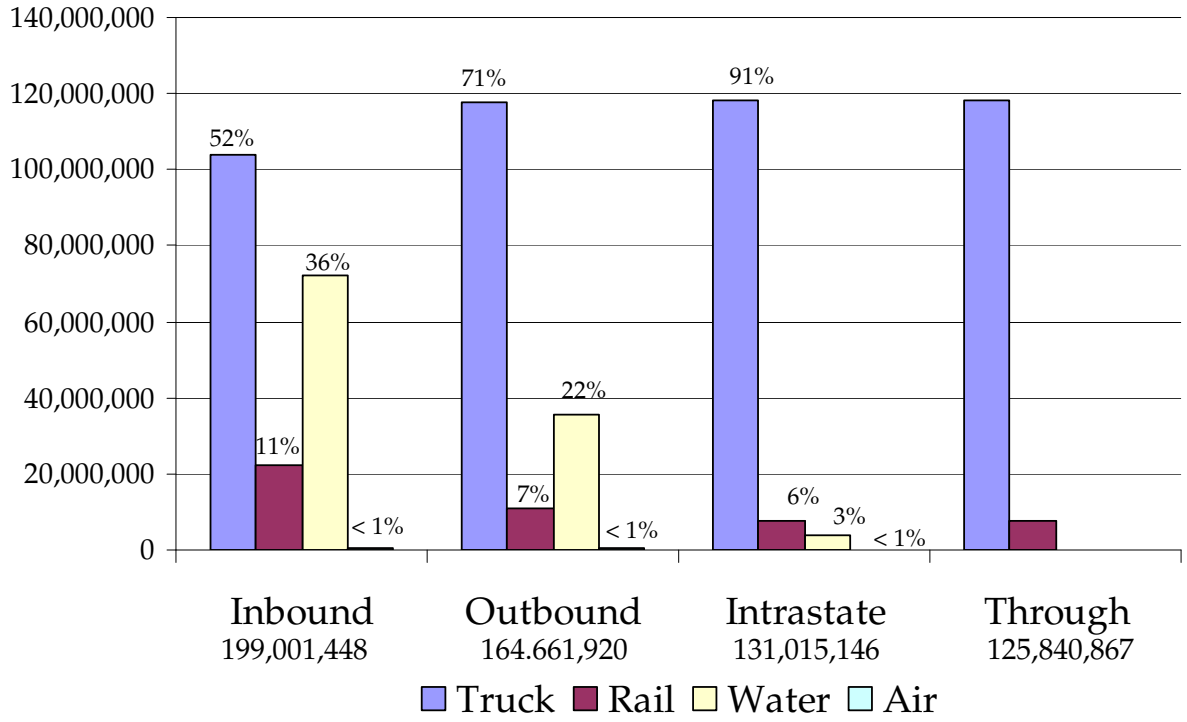
Notes: Through value could not be estimated due to limitations of data sources

Mode Share of Tonnage by Direction

Trucks represent an estimated 52% of inbound tonnage, 71% of outbound tonnage, 91% of intrastate tonnage, and the majority of through tonnage that can be estimated based on available data sources. Trucking is clearly the dominant overall mode, although other modes carry significant shares of tonnage, especially on the inbound side. Much of the tonnage moving inbound via rail and water generates corresponding tonnage moving intrastate or outbound via truck; also, intrastate moves are of a sufficiently short distance that other modes are disadvantaged compared to truck.

Rail represents an estimated 11% of inbound tonnage, 7% of outbound tonnage, 6% of intrastate tonnage, and a portion of through tonnage that can be estimated based on available data sources. Water represents an estimated 36% of inbound tonnage, 22% of outbound tonnage, and 3% of intrastate tonnage. Air represents less than 1% of tonnage.

Figure 5. Estimated 2003 Statewide Freight Flows by Direction and Mode in Short Tons *(Percentages Represent Share of Traffic by Each Mode)*



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. As a result, modal shares (percentage) of through tonnage are not shown.

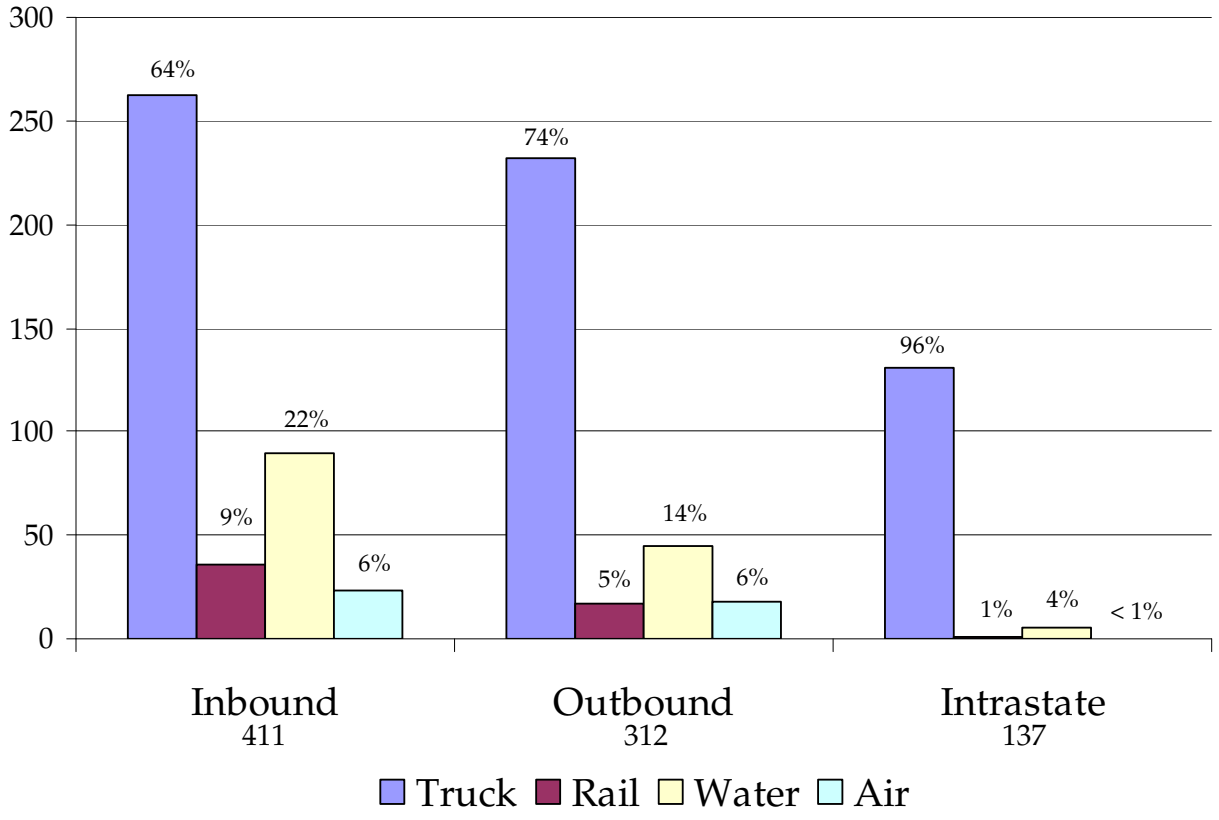
Mode Share of Value by Direction

Trucks represent an estimated 64% of inbound value, 74% of outbound value, and 96% of intrastate value. Truck shares of value are higher than truck shares of tonnage, indicating that on average, trucks carry relatively high-value commodities.

Rail represents an estimated 9% of inbound value, 5% of outbound value, and 1% of intrastate value. Water represents an estimated 22% of inbound value, 14% of outbound value, and 4% of intrastate value. Rail and water shares of value are lower than rail and water shares of tonnage, indicating that on average, rail and water carry lower-value commodities. These modes do handle high value intermodal shipments, but lower value bulk shipments account for the majority of their tonnage, as discussed in Section 3.

Air represents less than 1% of tonnage, but accounts for 6% of inbound and 6% of outbound value. Air specializes in high-value, low-weight commodities.

Figure 6. Estimated 2003 Statewide Freight Flows by Direction and Mode in Dollars ($ billion)
(Percentages Represent Share of Traffic by Each Mode)



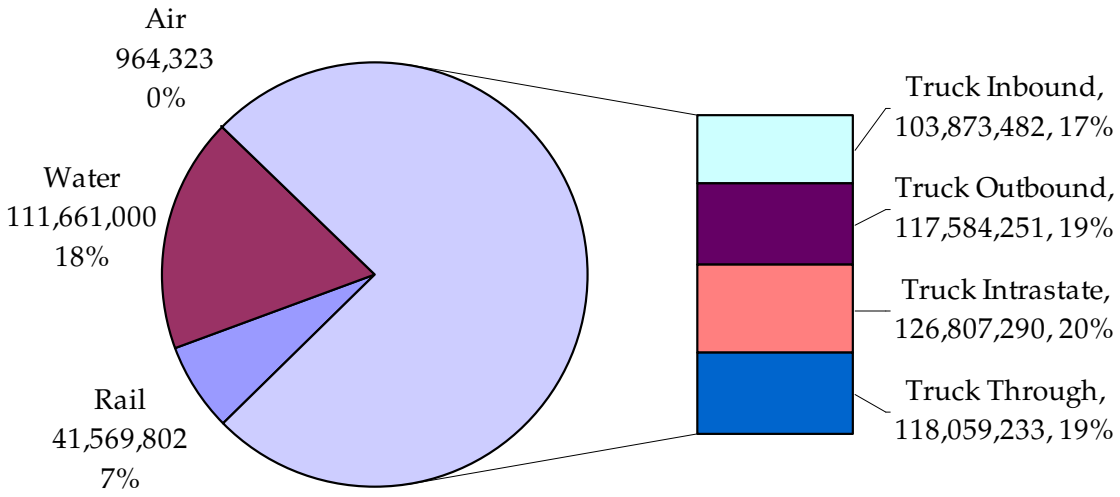
Source: Cambridge Systematics analysis of TRANSEARCH, Federal Railroad Administration, U.S. Army Corps of Engineers, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics data. Tonnage data was processed with additional conversion factors from FreightTools$_{CS}$, Port Authority of New York and New Jersey, and Bureau of Transportation Statistics.
Note: Through value could not be estimated due to limitations of data sources.

3.0 Analysis by Mode

3.1 Truck Mode

Trucks represent approximately 75% of New Jersey tonnage (around 466 million tons), and provide critical first mile/last mile connections for rail, water, and air cargo. This 75% is relatively evenly divided between inbound (17%), outbound (19%), intrastate (20%), and through traffic (19%) components.

Figure 7. 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.

Inbound Truck Movements

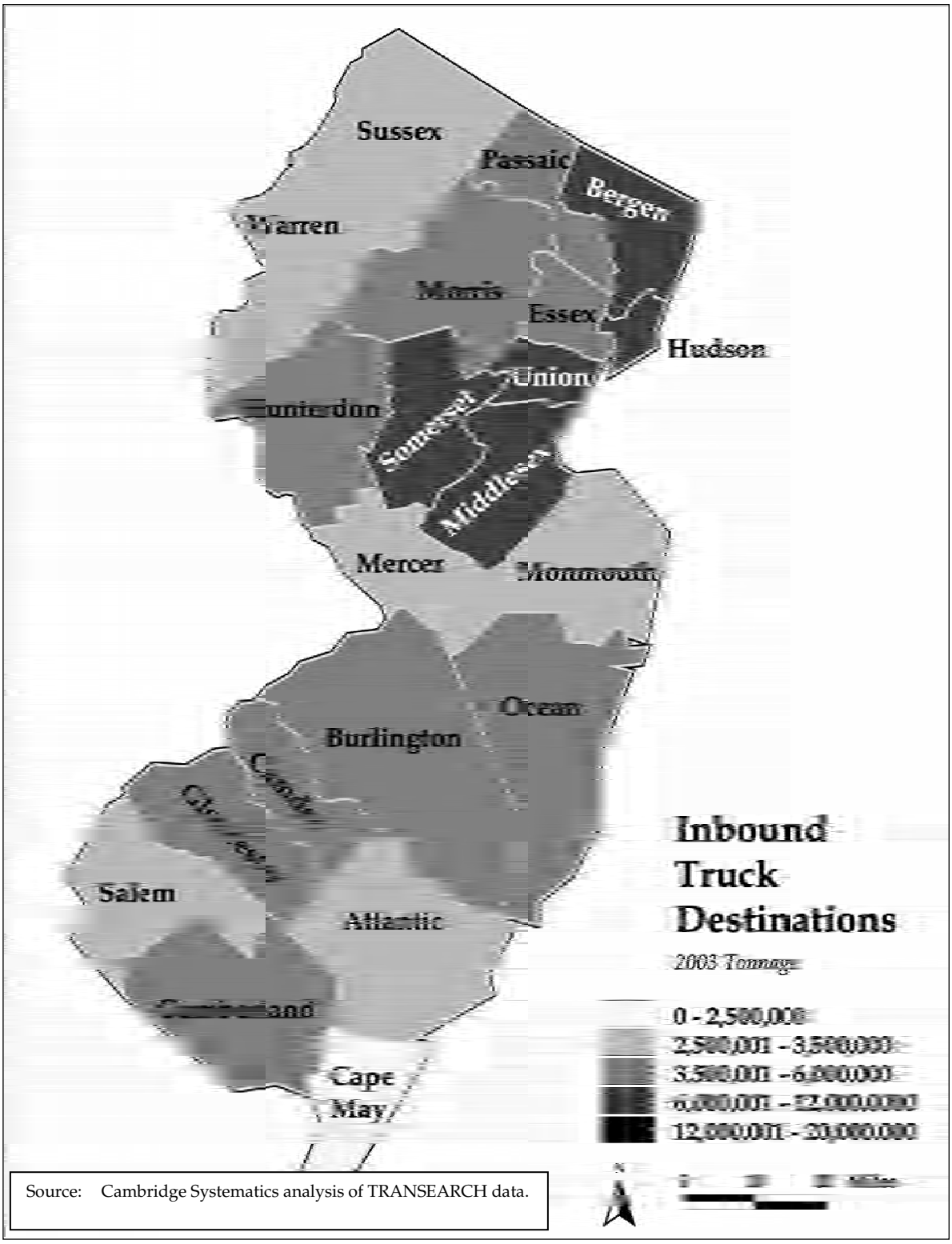
Every county experiences a significant level of inbound truck movement. In terms of truckload equivalents (truck tonnage divided by the average payload weight for a given commodity class), the greatest impacts are on Bergen, Middlesex, Hudson, Union, and Somerset counties.

Table 3. Destination Counties for Inbound Truck Moves (by Truckload Equivalents, Weight, and Value), 2003

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 8. Destination Counties for Inbound Truck Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of TRANSEARCH data.

Outbound Truck Movements

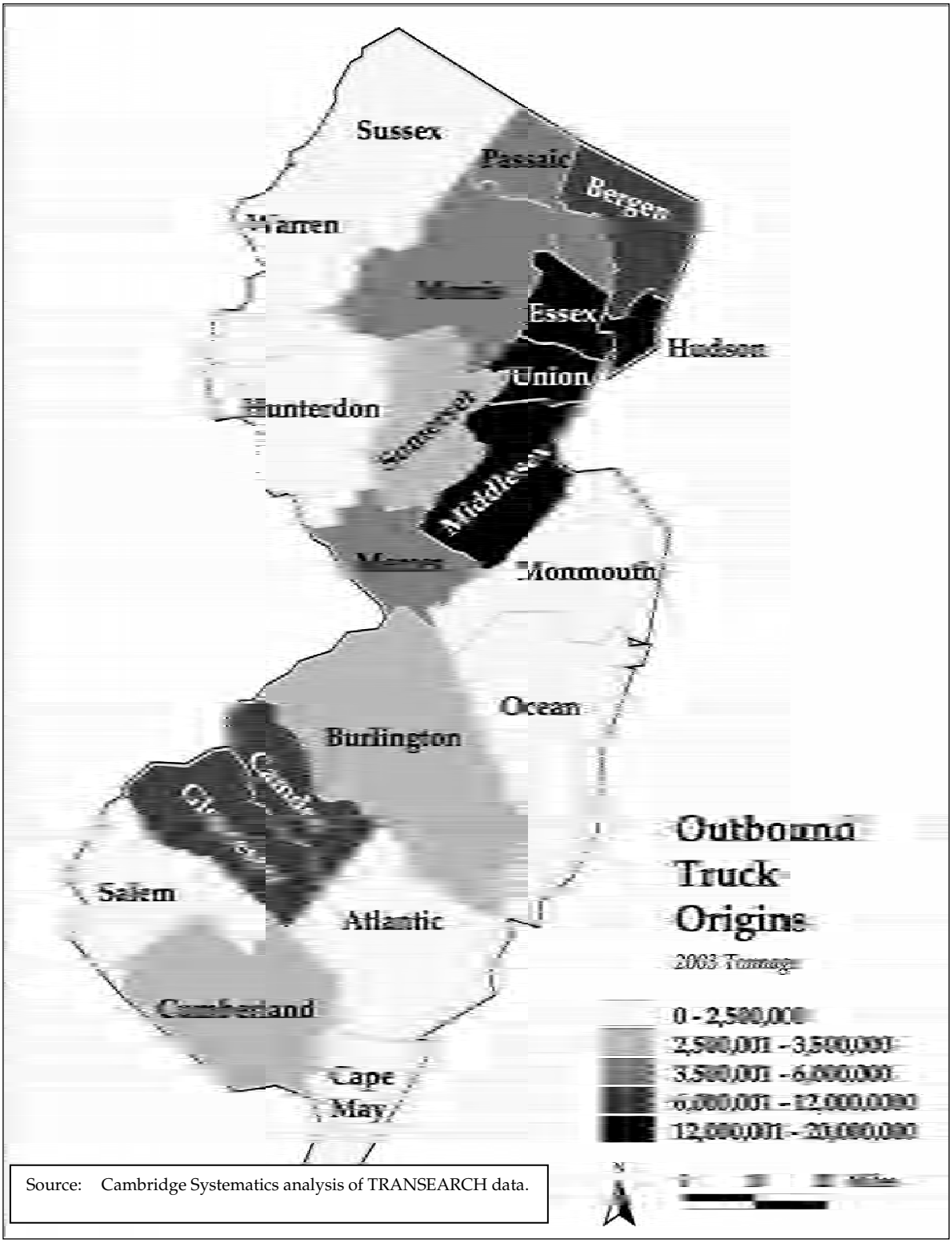
As can be seen in Table 4 below and Figure 9 on the following pages, there are significant differences between counties in terms of outbound truck tonnage – much more so than was seen for inbound truck tonnage. Much of this difference has to do with the location of key industrial clusters and intermodal facilities (seaports, airports, railyards, and warehouse/distribution centers) that generate significant numbers of outbound trucks.

Table 4. Origin Counties for Outbound Truck Moves (by Truckload Equivalents, Weight, and Value), 2003

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 9. Origin Counties for Outbound Truck Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of TRANSEARCH data.

Intrastate Truck Movements

The truck mode is by far the dominant mode for shipments between points within New Jersey, comprising around 96% of intrastate tonnage. There are many different shipment pairs that are important – the top 20 comprise just 33% of total intrastate truckloads.

Table 5. Top 20 Origin-Destination Pairs for Intrastate Truck Traffic, 2003

Origin County	Destination County	Total Truckloads	Share of Truckloads	Weight (Short Tons)	Value ($ Billions)
Cumberland	Gloucester	572,552	5%	7,785,901	$0.6
Cumberland	Mercer	451,739	4%	3,655,009	$0.5
Cumberland	Camden	417,802	3%	5,675,082	$0.6
Hudson	Morris	244,679	2%	2,057,758	$0.4
Hudson	Middlesex	224,294	2%	1,887,266	$0.4
Cumberland	Cumberland	220,943	2%	2,992,535	$0.5
Gloucester	Middlesex	199,281	2%	1,696,771	$0.6
Hudson	Union	195,346	2%	1,643,035	$0.4
Cumberland	Burlington	185,384	1%	2,473,294	$0.7
Cumberland	Salem	158,740	1%	2,143,246	$0.5
Middlesex	Morris	145,824	1%	1,269,639	$0.6
Union	Morris	142,483	1%	1,193,003	$0.8
Middlesex	Middlesex	127,805	1%	1,079,234	$0.5
Hudson	Bergen	124,793	1%	1,037,692	$0.2
Ocean	Hudson	124,517	1%	1,016,232	$0.3
Middlesex	Union	122,565	1%	1,088,066	$0.5
Union	Hudson	121,316	1%	1,033,501	$0.8
Union	Middlesex	115,816	1%	986,560	$0.7
Middlesex	Hudson	114,193	1%	1,020,128	$0.6
Cape May	Gloucester	112,693	1%	1,538,556	$0.3
Subtotal of Top 20 Pairs		4,122,767	33%	43,272,506	$10.5
Subtotal of Other Pairs (421)		8,405,441	67%	83,534,787	$121.5
TOTAL		**12,528,208**	**100%**	**126,807,293**	**$132.0**

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

Through Truck Movements

TRANSEARCH through data was obtained separately from the primary database. Basically, the entire TRANSEARCH dataset (all counties to all counties, everywhere) had to be assigned to a national highway network. Next, the flows that "touch" New Jersey were identified and reported out of the data as a series of origin-destination pairs with associated tonnages. CS then worked with this data to identify and tabulate just those origin-destination pairs where both ends of the trip were outside of New Jersey.

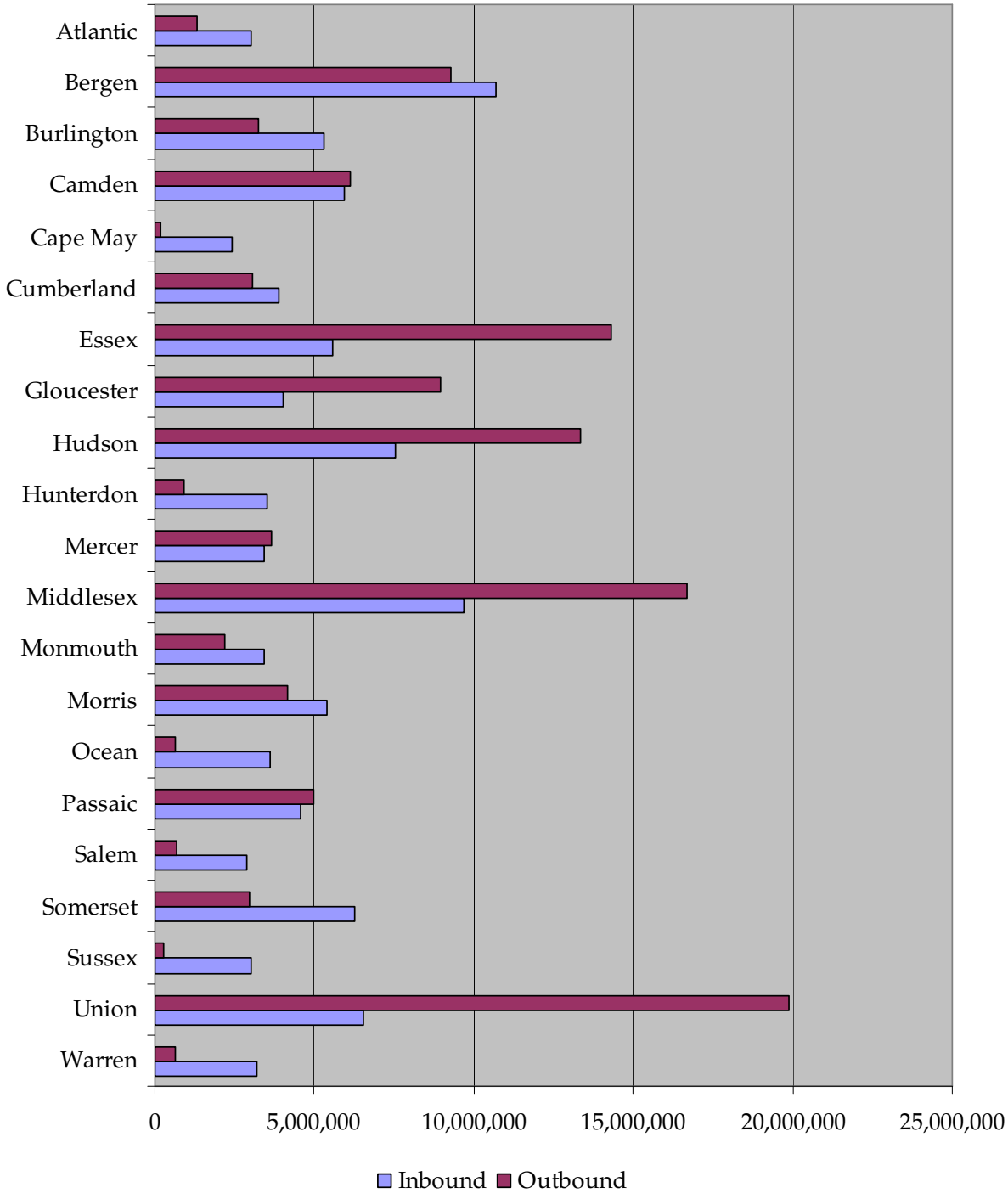
Through truck tonnage is estimated at over 118 million tons, and represented roughly one-fourth of all truck tonnage for New Jersey. While inbound, outbound, and intrastate moves include a mix of shorter and longer trips, through traffic is primarily moving substantial distances within the state. Therefore, the actual impact of through traffic, in terms of vehicle miles traveled over New Jersey highways, is clearly greater than 25%.

The actual routing assignments of the through tonnage were not obtained, but this information may be of future interest in identifying the extent to which critical corridors – I-95/New Jersey Turnpike, I-78, I-80, I-287, et al – are impacted.

Summary of Truck Movements by County

Figure 10 on the following page illustrates inbound and outbound truck tonnages by county. Note the relatively even distribution of inbound truck tonnage, relative to the significant differences with respect to outbound truck tonnage.

Figure 10. Estimated Inbound and Outbound Truck Tonnage (Short Tons) by County, 2003

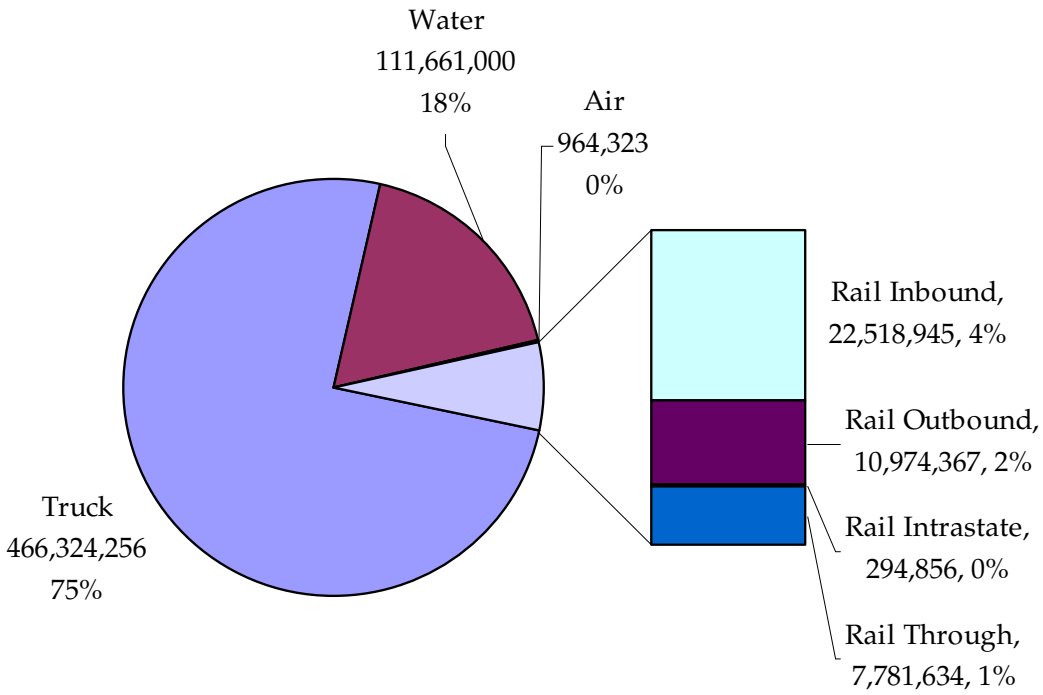


Source: Cambridge Systematics analysis of TRANSEARCH data.

3.2 Rail Mode

Rail represents nearly 7% of total tonnage (around 43 million tons). It serves high-weight commodities, accommodates long-haul movement of containers and autos, and links seaports with inland markets. Around half the tonnage is inbound (54%); around one-quarter is outbound (26%); a small share is intrastate (1%); and the rest is through (19%).

Figure 11. Estimated 2003 Statewide Freight Flows by Direction in Short Tons
(With Breakout of Rail 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.

Inbound Rail Movements

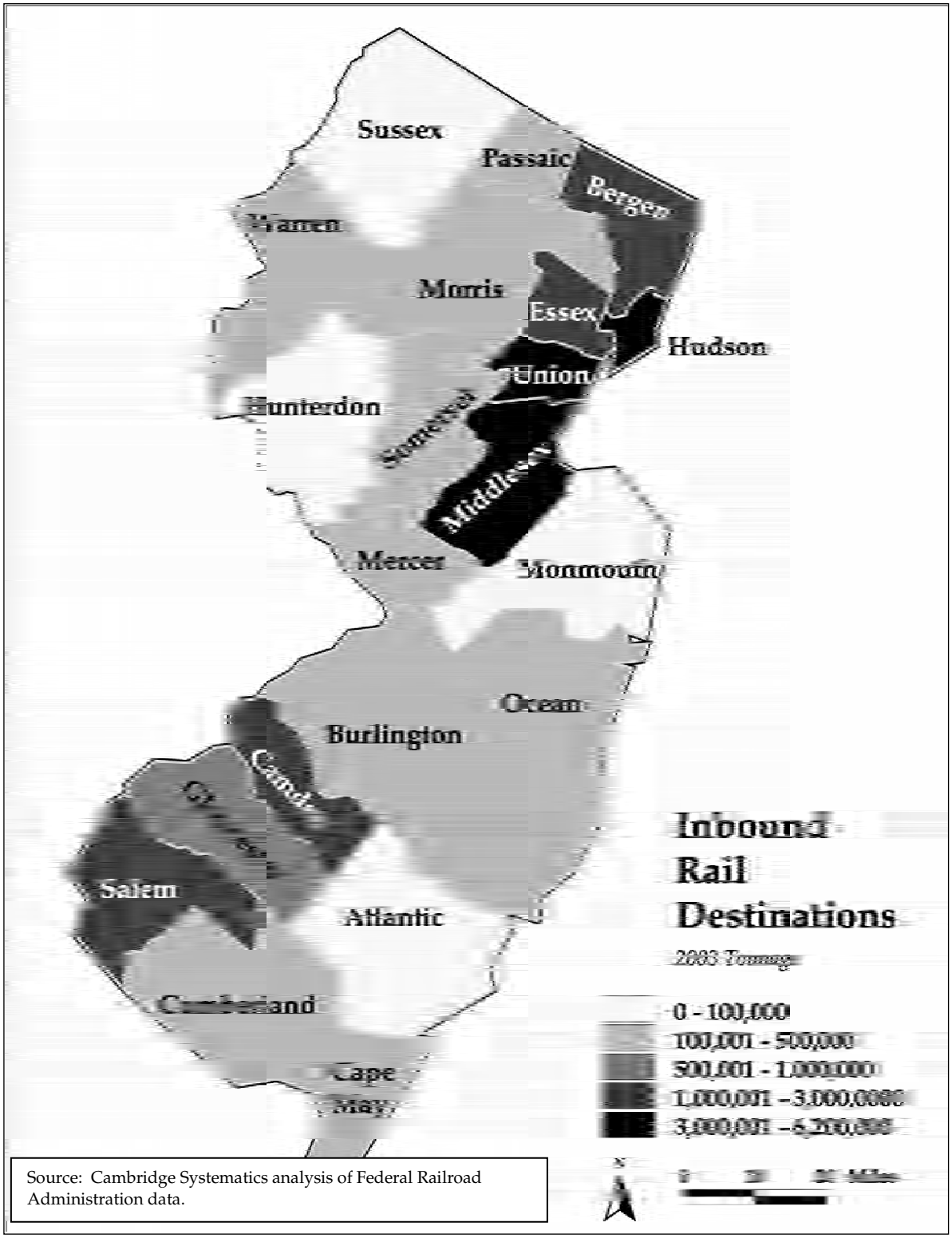
Rail represents around 22.5 million tons (11% of New Jersey's inbound tonnage). Rail is often broken out into different "submodes" – intermodal (the movement of shipping containers), unit bulk (long trains carrying a single bulk commodity such as coal or grain), and carload (different types of railcars and commodities). Non-intermodal shipments comprise 66 percent of inbound rail tonnage to New Jersey, while intermodal shipments comprise 34 percent. On average, non-intermodal railcars carry substantially more tonnage (around 50 tons for a loaded car) than intermodal railcars (around 15 per loaded container) so the percentage of intermodal traffic is substantially higher on a per-unit basis. Facilities in Middlesex, Essex, and Hudson counties are the top recipients of carload tonnage, while Hudson and Union Counties are the dominant receivers of intermodal.

Table 6. Destination Counties for Inbound Rail Moves (by Railcars, Weight, and Value), 2003

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 FreightTools$_{CS}$.
Note: Columns may not sum precisely to totals due to rounding.

Figure 12. Destination Counties for Inbound Rail Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

Outbound Rail Movements

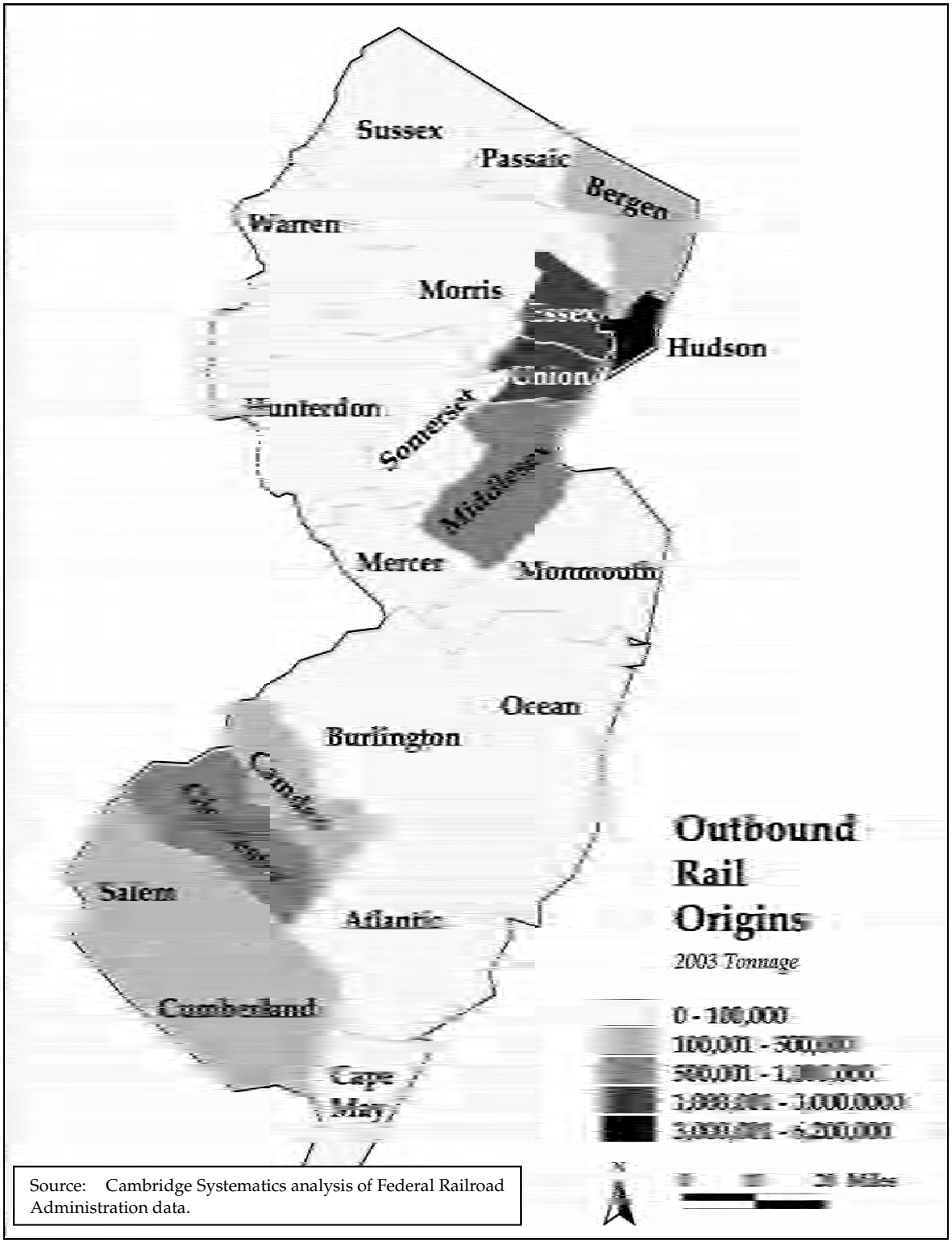
Rail shipments account for around 11 million tons (nearly 7%) of New Jersey's outbound tonnage. The majority of tonnage originates from rail terminals in Hudson, Union, and Essex counties. Intermodal rail shipments comprise 54 percent of all outbound rail tons while carload shipments account for the remaining 46 percent. Facilities in Essex, Gloucester, Middlesex, Union and Hudson counties are the top shippers of carload tonnage, while Hudson and Union Counties are the dominant shippers of intermodal.

Table 7. Origin Counties for Outbound Rail Moves (by Railcars, Weight, and Value), 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 FreightToolsCS.
Note: Columns may not sum precisely to totals due to rounding.

Figure 13. Origin Counties for Outbound Rail Tonnage (Short Tons), 2003



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

Intrastate Rail Movements

Intrastate rail shipments currently account for around less than one percent of New Jersey's intrastate tonnage (0.3 million tons).

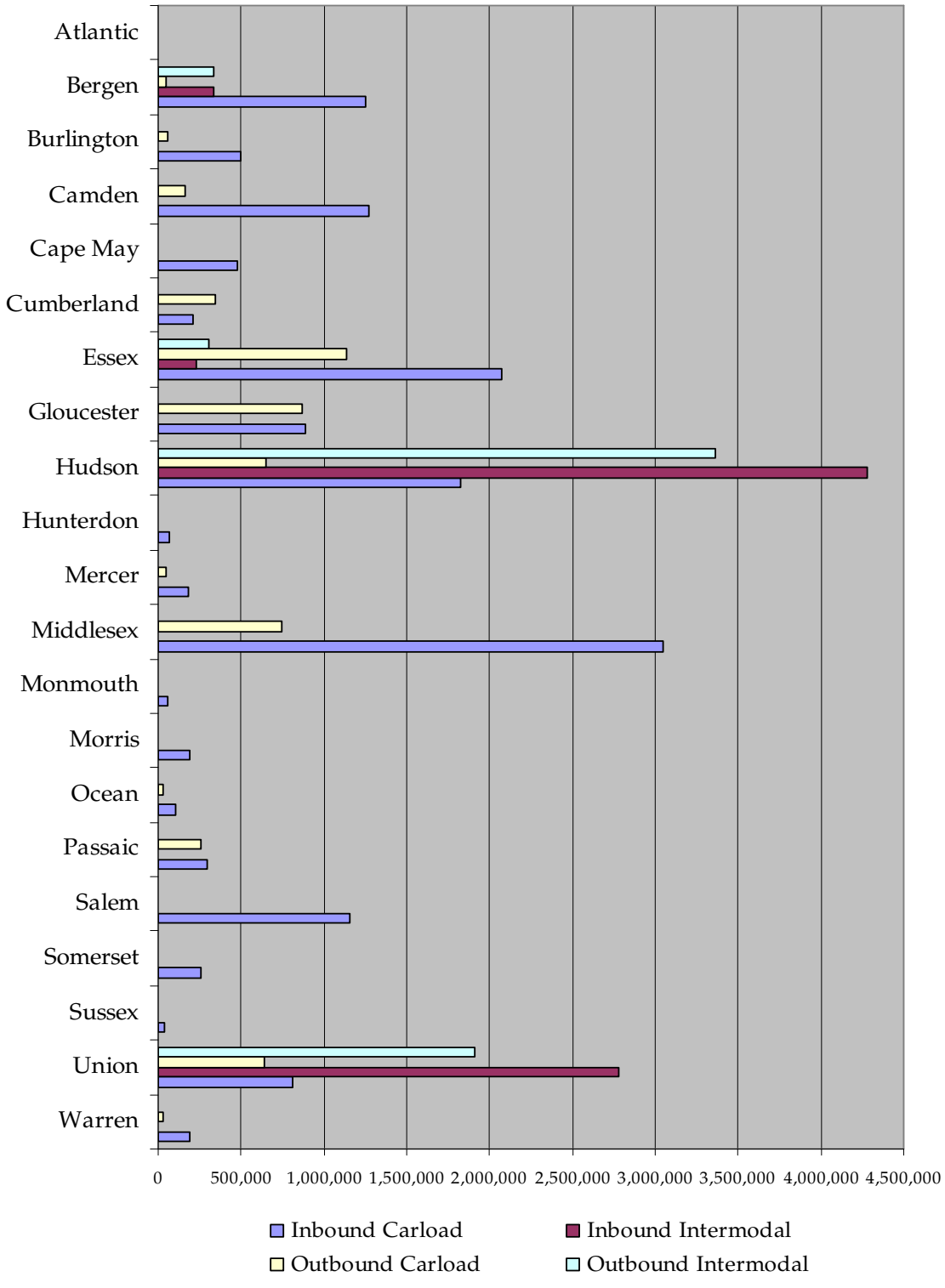
Through Rail Movements

Around 7.8 millions tons of rail traffic are pass-though, primarily between upstate New York and points south and west. This is only 2 percent of New Jersey's through traffic by weight, but it reflects a substantial share (around one-fifth) of all New Jersey rail tonnage.

Summary of Rail Movements by County

Figure 14 on the following page illustrates inbound and outbound rail tonnages by county. Note the dominance of inbound tonnage compared to outbound, and the clustering of carload and intermodal tonnage in selected counties.

Figure 14. Estimated Inbound and Outbound Rail Tonnage (Short Tons) by County, 2003



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

3.3 Water Mode

Water represents around 18% of tonnage (nearly 112 million tons). New Jersey hosts some of the nation's leading port facilities, which accommodate major international trade as well as important domestic coastwise shipping activity. Nearly two-thirds of waterborne tonnage is inbound (65%); nearly one-third is outbound (32%); and a small share is intrastate (4%). Through tonnage is not represented in the waterborne data.

County-level detail on origins and destinations of waterborne freight is not available, but functional distinctions can be made based on type and direction of traffic. According to the ACOE, total tonnage (domestic plus international) for New Jersey is around 111.7 million tons. Around 61.7 million is international and around 50.0 million is domestic. Inbound tonnage is dominated by international traffic (53.5 million tons international, versus 18.6 million tons domestic). Outbound tonnage is dominated by domestic traffic (27.5 million tons domestic, versus 8.2 million tons international). This appears to be the result of two factors: international trade that heavily favors imports over exports; and re-shipment of inbound international commodities (primarily petroleum and petrochemical) to other states (primarily facilities in New York).

The TRANSEARCH waterborne data does not cover international traffic, but its domestic totals are very close to the ACOE's totals. TRANSEARCH reports around 49.1 million domestic tons, compared to around 50.0 for ACOE.

Table 8. Comparison of 2003 Statewide Waterborne Commerce Data

	Tonnage (Short Tons)					
		Outbound		Inbound		Internal
Source	Total	Domestic	Foreign	Domestic	Foreign	Domestic
U.S. Army Corps of Engineers	111,661,000	27,522,000	8,157,000	18,581,000	53,488,000	3,913,000
TRANSEARCH	49,147,844	28,139,454	N/A	16,474,935	N/A	4,533,455

Source: Cambridge Systematics analysis of U.S. Army Corps of Engineers data (Waterborne Commerce of the United States, National Summary for Year 2003, Part Five), and TRANSEARCH data.

The ACOE also reports separate tonnage for three leading New Jersey ports (Camden/Gloucester, Paulsboro, and New York/New Jersey). The total tonnage through all three ports is 180 million – roughly 68 million higher than the 112 million tons reported by the ACOE for all of New Jersey. Much of this difference is due to the fact that the New York/New Jersey total also includes tonnage moving through facilities in New York.

Table 9. Waterborne Commerce Data for Leading New Jersey Ports, 2003

Port Name	Tonnage (Short Tons)			
		Foreign		
	Total	Inbound	Outbound	Domestic
Camden-Gloucester, New Jersey	6,818,849	3,764,289	570,077	2,484,483
New York, New York, and New Jersey	145,889,166	70,251,263	9,433,511	66,204,392
Paulsboro, New Jersey	27,283,400	17,908,339	310,168	9,064,893
TOTAL	**179,991,415**	**91,923,891**	**10,313,756**	**77,753,768**

Source: Cambridge Systematics analysis of U.S. Army Corps of Engineers data (Waterborne Commerce of the United States, National Summary for Year 2003, Part Five).

3.4 Air Mode

Air cargo through Newark Liberty International Airport (EWR) represents less than 1% of New Jersey tonnage (at less than 1 million tons), but is far more important than its tonnage share would suggest. Air specializes in low-weight, high-value, time-sensitive commodities. Over the past decade, air cargo has been the fastest-growing segment of the national freight market, and is critically important to New Jersey's businesses and consumers in New Jersey. The PANYNJ reports over 964 thousand tons of air cargo loaded and unloaded at EWR; this figure does not include through traffic. TRANSEARCH reports less than 337 thousand tons of air cargo for the entire state of New Jersey. Part of the discrepancy is due to the fact that TRANSEARCH does not capture international air cargo.

Table 10. Comparison of Statewide Air Cargo Tonnage (Short Tons, Newark Liberty Airport Only), 2003

Source	Total	Foreign	Domestic			
		All	Inbound	Outbound	Internal	Through
Port Authority of New York and New Jersey	964,323	185,927		778,396		
TRANSEARCH	336,947	N/A	181,572	155,375	N/A	N/A

Source: Cambridge Systematics analysis of Port Authority of New York and New Jersey "2003 Airport Traffic Report" and TRANSEARCH data.

4.0 Analysis by Commodity

4.1 Overview

In addition to understanding the overall volume of freight moving within New Jersey, it is also important to understand the types of commodities being moved along the state's freight transportation infrastructure.

Different data sources typically use different classification schemes to report tonnage by commodity. The TRANSEARCH database provided commodity information at the four-digit STCC level for truck, water, and air. Rail data obtained from the STB also provided commodity detail that allowed for classification according to the same scheme. Commodities were grouped and analyzed by two-digit commodity groups, shown in Table 11 on the following page. While the commodity flow data reported various flows by as many as 18 commodity groups, for the sake of simplicity only the top ten groups are highlighted in this analysis.

The ACOE waterborne cargo data and PANYNJ air cargo data did not support the same level of commodity-specific analysis. Alternative sources have been used where possible to fill in the data gaps. This allowed for an order-of-magnitude assessment of water and air commodities, but not to the same level of detail as truck and rail commodities. Consequently, it was not possible to select a specific commodity group and determine what share of that commodity group is moving by truck versus rail versus air versus water. Further work to process and refine the air and water data would be needed to develop this information.

Table 11. Major Commodity Groups Used in the New Jersey 2003 Statewide Freight Data Profile

Number	Commodity Group Name	Standard Transportation Commodity Codes Included
1	Agriculture	1 (Farm products) 8 (Forest products) 9 (Fresh fish)
2	Metallic Ores	10 (Metallic ores)
3	Coal	11 (Coal)
4	Petroleum and Nonmetallic Minerals	13 (Crude petroleum, natural gas, gasoline) 14 (Nonmetallic ores or minerals)
5	Food	20 (Food and kindred products)
6	Nondurable Manufactured Goods	21 (Tobacco products) 22 (Textile products) 23 (Apparel) 25 (Furniture or fixtures) 27 (Printed matter)
7	Lumber	24 (Lumber or wood)
8	Paper	26 (Pulp or paper)
9	Chemicals	28 (Chemicals)
10	Products of Petroleum and Coal	29 (Petroleum and coal products)
11	Rubber/Plastic	30 (Rubber or plastic)
12	Durable Manufactured Goods	31 (Leather) 35 (Non-electrical machinery) 36 (Electrical machinery) 38 (Instruments) 39 (Miscellaneous manufactured products)
13	Clay/Concrete/Glass/Stone	32 (Clay, concrete, glass, or stone)
14	Primary Metals	33 (Primary metals)
15	Fabricated Metals	34 (Fabricated metals)
16	Transportation Equipment	37 (Transportation equipment)
17	Miscellaneous Freight	40 (Waste or scrap) 41 (Miscellaneous freight) 42 (Empty containers) 43 (U.S. Postal Service) 44 (Freight forwarder traffic) 45 (Shipper Association traffic) 46 (Mixed freight) 47 (Small packaged freight) 48 (Waste hazardous materials)
18	Warehousing	51 (Traffic from/to warehousing and other secondary distribution facilities) 52 (Drayage traffic from/to intermodal rail yards) 53 (Drayage traffic from/to airports)

4.2 Truck Commodities

Table 12 below shows New Jersey's top truck commodities (for inbound, outbound, and intrastate moves), ranked by truckload equivalents and weight. The rankings show slight differences, due to differences in the tons to truckload conversion factors associated with the various commodity groups.

By a wide margin, the top truck commodity in terms of truckloads is warehousing, which includes a mix of high and low value goods moving to/from warehouses, seaports, and airports. Warehouse goods account for around 30% of all truckload equivalents. Second is petroleum and nonmetallic minerals, which includes crude petroleum, gasoline, natural gas, and various ores and minerals. Third is products of petroleum and coal, which includes kerosene, heating oil, asphalt, etc. Fourth is food and food products. Rounding out the top five is clay/concrete/glass/stone. In terms of tonnage, the same groups comprise the top five, with warehousing again leading by a wide margin.

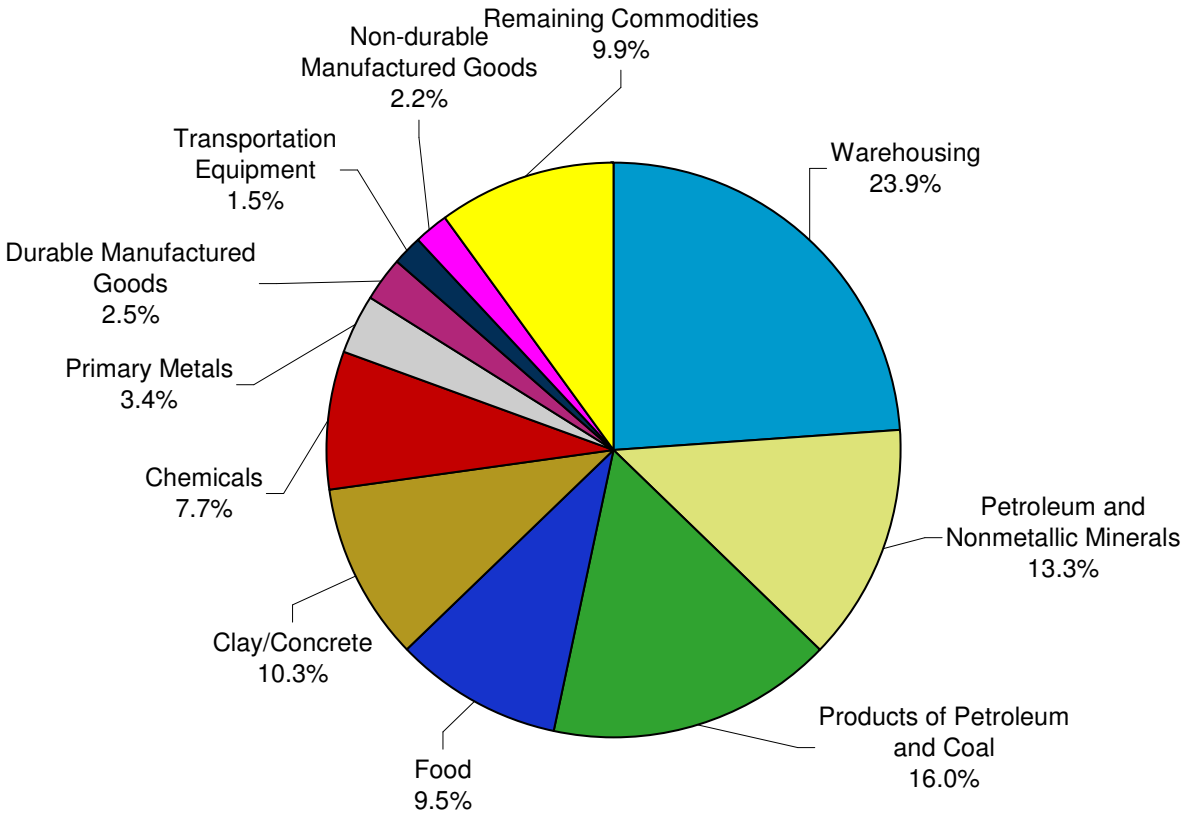
Table 12. Top Truck Commodities (Inbound, Outbound, and Intrastate), 2003

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.

For inbound traffic, the leading commodity group is food, with warehousing a close second; there is a relatively even distribution of tonnage among the commodity groups, with none clearly dominant. For outbound traffic, the leading commodities are warehousing and products of petroleum and coal, which represent a dominant share of truckloads and tonnage. For intrastate traffic, the leading commodities are warehousing and petroleum and nonmetallic minerals, which represent a dominant share of truckloads and tonnage. These patterns highlight the importance of trucking to three of New Jersey's most critical industries – food, warehouse/distribution, and petroleum/petrochemical.

Figure 15. Truck Commodities by Weight (Short Tons), 2003
(Inbound, Outbound, and Intrastate)



Source: Cambridge Systematics analysis of TRANSEARCH data.

Table 13. Top Inbound Truck Commodities, 2003

Number	Commodity Group	Truckload Equivalents	Share	Short Tons
5	Food	1,345,743	19%	19,976,264
18	Warehousing	931,968	13%	12,427,752
13	Clay/Concrete/Glass/Stone	830,584	12%	13,190,563
9	Chemicals	789,433	11%	12,454,229
10	Products of Petroleum and Coal	492,945	7%	9,728,580
1	Agriculture	446,274	6%	4,885,005
7	Lumber	371,968	5%	7,092,805
14	Primary Metals	304,382	4%	4,748,047
4	Petroleum and Nonmetallic Minerals	294,253	4%	4,399,953
16	Transportation Equipment	275,172	4%	2,377,613
	Remaining Commodities	840,489	12%	12,592,672
TOTAL		**6,923,212**	**100%**	**103,873,482**

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

Table 14. Top Outbound Truck Commodities, 2003

Number	Commodity Group	Truckload Equivalents	Share	Short Tons
18	Warehousing	2,352,284	29%	28,807,759
10	Products of Petroleum and Coal	1,838,412	23%	31,600,660
13	Clay/Concrete/Glass/Stone	906,948	11%	12,641,409
9	Chemicals	721,755	9%	12,482,411
5	Food	576,715	7%	7,922,471
12	Durable Manufactured Goods	332,655	4%	4,151,425
6	Nondurable Manufactured Goods	257,642	3%	3,656,947
14	Primary Metals	239,161	3%	4,341,956
8	Paper	217,895	3%	2,915,523
16	Transportation Equipment	184,945	2%	1,513,985
	Remaining Commodities	427,334	5%	7,549,705
TOTAL		**8,055,746**	**100%**	**117,584,251**

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

Table 15. Top Intrastate Truck Commodities, 2003

Number	Commodity Group	Truckload Equivalents	Share	Short Tons
18	Warehousing	4,775,281	38%	42,002,858
4	Petroleum and Nonmetallic Minerals	3,543,820	28%	41,709,424
10	Products of Petroleum and Coal	1,096,499	9%	14,511,486
13	Clay/Concrete/Glass/Stone	707,312	6%	9,876,428
5	Food	597,809	5%	5,013,639
14	Primary Metals	350,695	3%	2,764,720
9	Chemicals	260,369	2%	1,855,037
16	Transportation Equipment	257,570	2%	1,206,189
6	Nondurable Manufactured Goods	254,521	2%	1,979,890
8	Paper	188,527	2%	1,699,994
	Remaining Commodities	495,805	4%	4,187,625
TOTAL		**12,528,208**	**100%**	**126,807,290**

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

4.3 Rail Commodities

Table 16 on the following page shows New Jersey's top rail commodities (for inbound, outbound, and intrastate moves) ranked by tonnage. By a wide margin, the top rail commodity is "miscellaneous freight." This includes a mix of goods typically shipped in containers. These container moves reflect three basic submarkets: international containers that arrive at west coast seaports and move by rail to Northern New Jersey (in an operation known as "mini-landbridge") and then are returned west; international containers that arrive at the Port of New York and New Jersey and are moved inland via rail, and vice-versa; and other container moves between New Jersey and North American origins and destinations. Intermodal accounts for 34% of inbound rail tonnage and 54% of outbound rail tonnage. Aside from miscellaneous freight, the leading rail commodities are: chemicals; food; transportation equipment (autos and trucks moving in specialized railcars); paper; lumber; products of coal and petroleum; coal; and petroleum and nonmetallic minerals.

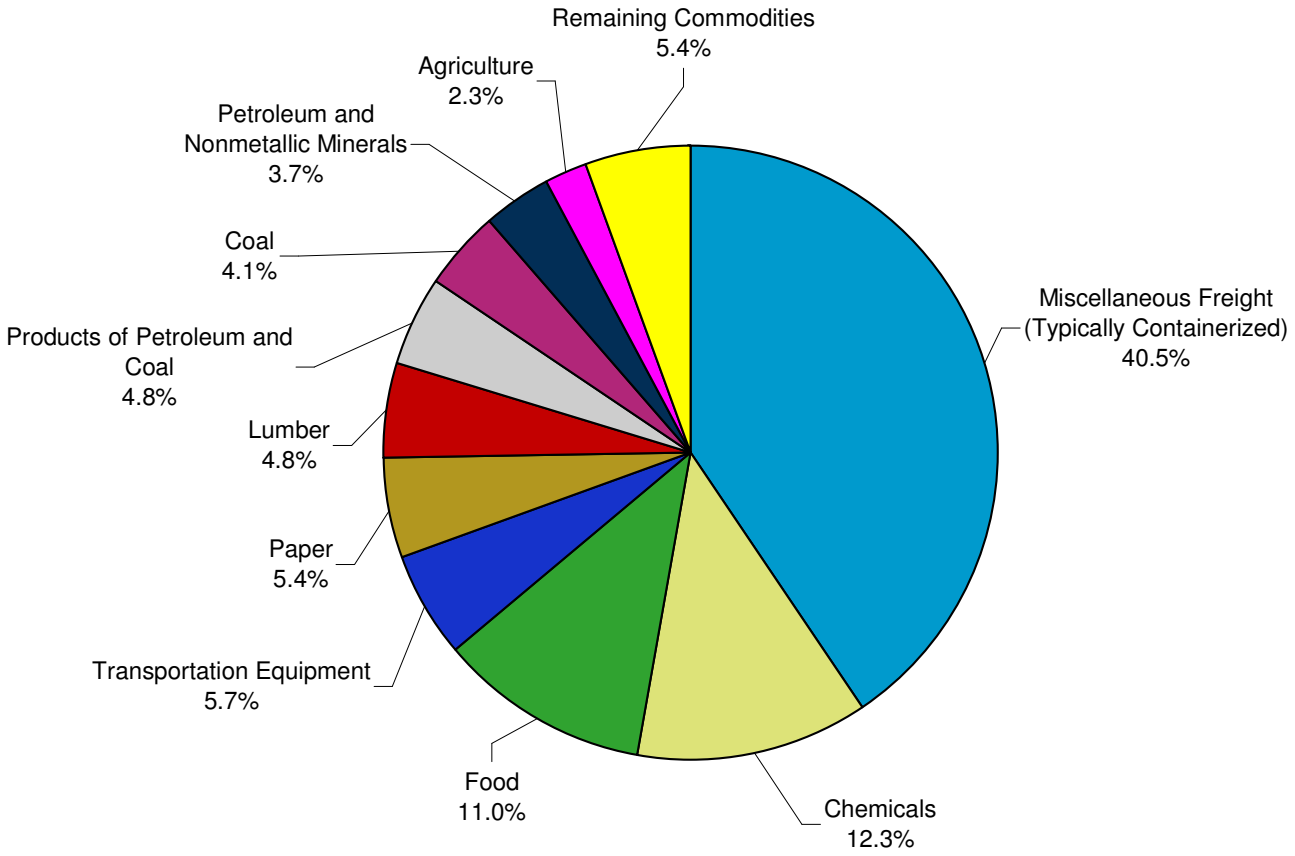
Table 16. Top Rail Commodities (Inbound, Outbound, and Intrastate), 2003

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.

For inbound traffic, the dominant commodity group is miscellaneous freight, followed by food and chemicals. For outbound traffic, the dominant commodity group is miscellaneous freight, followed by chemicals. For intrastate traffic – which represents a very small share of total rail traffic – the leading commodities are chemicals and products of petroleum and coal. There is almost no intrastate movement of containers by rail. These patterns highlight the importance of rail as part of the logistics chain for intermodal containers, and as a critical mode in handling higher-weight bulk commodities; they also highlight its current function as being longer-haul services, as opposed to intrastate or shorter-distance services.

Figure 16. Rail Commodities by Weight (Short Tons), 2003
(Inbound, Outbound, and Intrastate)



Source: Cambridge Systematics analysis of Federal Railroad Administration data.

Table 17. Top Inbound Rail Commodities, 2003

Number	Commodity Group	Short Tons	Share
17	Miscellaneous Freight	6,502,784	29%
5	Food	3,498,108	16%
9	Chemicals	2,918,472	13%
16	Transportation Equipment	1,691,652	8%
8	Paper	1,645,840	7%
7	Lumber	1,539,260	7%
3	Coal	1,300,533	6%
4	Petroleum and Nonmetallic Minerals	883,936	4%
10	Products of Petroleum and Coal	706,212	3%
1	Agriculture	556,128	2%
	Remaining Commodities	1,276,020	6%
TOTAL		**22,518,945**	**100%**

Source: Cambridge Systematics analysis of Federal Railroad Administration data.

Table 18. Top Outbound Rail Commodities, 2003

Number	Commodity Group	Short Tons	Share
17	Miscellaneous Freight	7,180,284	65%
9	Chemicals	1,063,720	10%
10	Products of Petroleum and Coal	827,564	8%
4	Other Minerals	369,810	3%
14	Primary Metals	365,812	3%
16	Transportation Equipment	222,196	2%
1	Agriculture	217,287	2%
5	Food	192,360	2%
8	Paper	164,820	2%
3	Coal	99,954	1%
	Remaining Commodities	270,560	2%
TOTAL		**10,974,367**	**100%**

Source: Cambridge Systematics analysis of Federal Railroad Administration data.

Table 19. Top Intrastate Rail Commodities, 2003

Number	Commodity Group	Short Tons	Share
9	Chemicals	161,680	55%
10	Products of Petroleum and Coal	82,316	28%
5	Food	30,260	10%
4	Other Minerals	7,960	3%
14	Primary Metals	3,720	1%
8	Paper	2,960	1%
16	Transportation Equipment	2,640	1%
17	Miscellaneous Freight	2,440	1%
7	Lumber	880	0%
TOTAL		**294,856**	**100%**

Source: Cambridge Systematics analysis of Federal Railroad Administration data.

4.4 Water Commodities

As discussed previously in Section 3.3, the TRANSEARCH data appears to be very consistent with the ACOE data with regard to the amount of domestic tonnage handled by New Jersey's ports.

TRANSEARCH does provides a breakdown of this domestic waterborne tonnage by commodity type, as shown in Table 20 on the following page. The leading commodity class is products of petroleum and coal, most of which is moving outbound from New Jersey ports to other marine terminals in New York City and along the East Coast. Miscellaneous freight shipments account for the second largest total, followed by chemicals and petroleum and nonmetallic minerals.

Table 20. Domestic Waterborne Commodities (Inbound, Outbound and Intrastate) by Weight (Short Tons), 2003

	Commodity Group	Total	Inbound	Outbound	Intrastate
10	Products of Petroleum and Coal	38,270,081	8,848,508	25,524,533	3,897,041
17	Miscellaneous Freight	8,215,045	5,479,520	2,304,396	431,129
9	Chemicals	2,225,958	1,710,148	310,524	205,286
4	Petroleum/Nonmetallic Minerals	436,759	436,759	0	0
TOTAL		**49,147,843**	**16,474,935**	**28,139,453**	**4,533,456**

Source: Cambridge Systematics analysis of U.S. Army Corps of Engineers data.

The ACOE data on international waterborne freight does not allow for a directly comparable breakdown of tonnage by commodity, because the ACOE data is aggregated differently. New Jersey hosts many different active marine cargo terminals, both public and private. Some (like the Port of New York and New Jersey) are counted as part of the New York District; others (like the ports of Camden, Gloucester, and Paulsboro) are counted as part of the Philadelphia District.

A facility-level inventory would be needed to conclusively determine what international commodities and volumes are moving through New Jersey's marine terminals. The data used in this study support only the following findings:

- The ACOE estimates New Jersey's international waterborne tonnage at around 61.7 million tons – 53.5 million tons import and 8.2 million tons export.

- A recent study for the North Jersey Transportation Planning Authority estimated New Jersey's share of PONYNJ container and automobile traffic at 18.5 million tons – 12.8 million tons import and 5.7 million tons export. Containers handle a wide variety of manufactured products and materials.

The amount of New Jersey international waterborne tonnage that cannot be assigned to a specific commodity class is therefore around 43.2 million tons. The commodities associated with this tonnage may – or may not – be distributed in a manner similar to the district-wide totals, as shown in Table 21 below. Imports through both port districts are clearly dominated, in terms of tonnage, by the import of petroleum and petroleum products. Please note that Table 21 includes all facilities located within these port districts, including facilities in New York, Pennsylvania, and Delaware.

Table 21. 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	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.

4.5 Air Commodities

As discussed previously in Section 3.4, the PANYNJ reports over 964 thousand tons of air cargo for EWR. The only commodity-level information available for this 964 thousand tons is from the PANYNJ, which distinguishes between revenue freight and revenue mail.

Table 22. Air Cargo Commodities (Inbound, Outbound, and Intrastate) by Weight (Short Tons, Newark Liberty Airport Only), 2003

Cargo Type	Total Tons	Domestic Tons	International Tons
Revenue Freight	890,712	712,458	178,254
Revenue Mail	73,611	65,938	7,673
TOTAL	**964,323**	**778,396**	**185,927**

Source: Cambridge Systematics analysis of Port Authority of New York and New Jersey data.

Additional commodity-level detail is provided by TRANSEARCH; however, this information only covers the 337 thousand tons of air cargo included in the dataset. Around half of the tonnage is associated with miscellaneous freight (which includes mail and express).

Table 23. 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.

5.0 Analysis by Trading Partner

5.1 Overview

In addition to the commodity flow data reported above, it is also important to identify New Jersey's key trading partners by weight and by value. Trading partners include top origins for flows into New Jersey, as well as top destinations for flows outside of the state. For this report, trading partners for truck and rail moves could be reliably identified.

Table 24 shows the top trading partners for external freight movements into and out of New Jersey in 2003 by weight (truck and rail modes only), while Table 25 shows the ranking by value (truck and rail modes only). Figures 17 and 18 show the top trading partners by weight and value, respectively. The top ten trading partners accounted for 46 percent of inbound and outbound flows by weight, or 117 million tons, and about 33 percent of flows by value, or $183 billion. Illinois ranked as the top trading partner in total weight and value, with two-thirds of its overall tonnage and value attributed to inbound movements into New Jersey.

In terms of total weight (inbound and outbound tonnage), top trading partners also included New York West (14.5 million), New York East (13.8 million), and Pennsylvania South (13.2 million). When only considering inbound tonnage coming into New Jersey, a rather different pattern emerges among the key trading partners. While Illinois still retains its place as the top trading partner (13 million), it is followed by Louisiana (10.5 million) and California (5.6 million). In contrast, the largest outbound tonnage flows from New Jersey were destined for New York East (12.4 million), New York West (11.7 million), and Illinois (6.4 million).

The top trading partners by total value (inbound and outbound value) are Illinois ($24.2 billion), Ohio ($19.5 billion), Virginia ($19.1 billion), and Texas ($18.3 billion). In terms of inbound value only, the top trading partners included Illinois ($16 billion), Louisiana ($13.5 billion), Virginia ($11.7 billion), and Texas ($11.5 billion). In contrast, the largest outbound value flows from New Jersey were destined for New York West ($10.3 billion), Ohio ($8.7 billion), Pennsylvania North ($8.4 billion), and Illinois ($8.3 billion).

The figures on the following pages provide additional illustrative detail on these key trading state relationships.

Figure 17. Trading Partners by Weight (Short Tons) (Truck and Rail Only), 2003

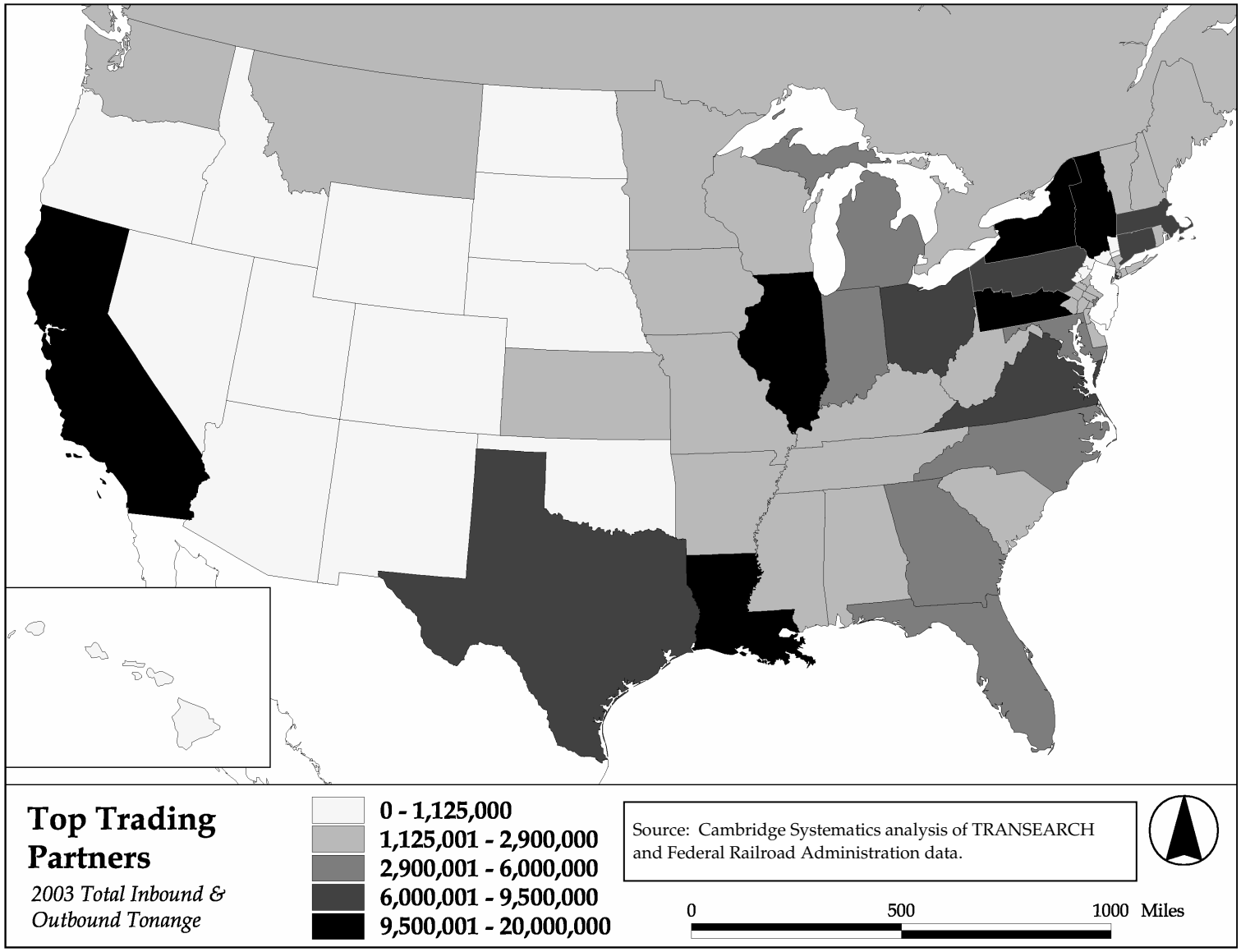


Figure 18. Trading Partners by Value (Truck and Rail Only), 2003

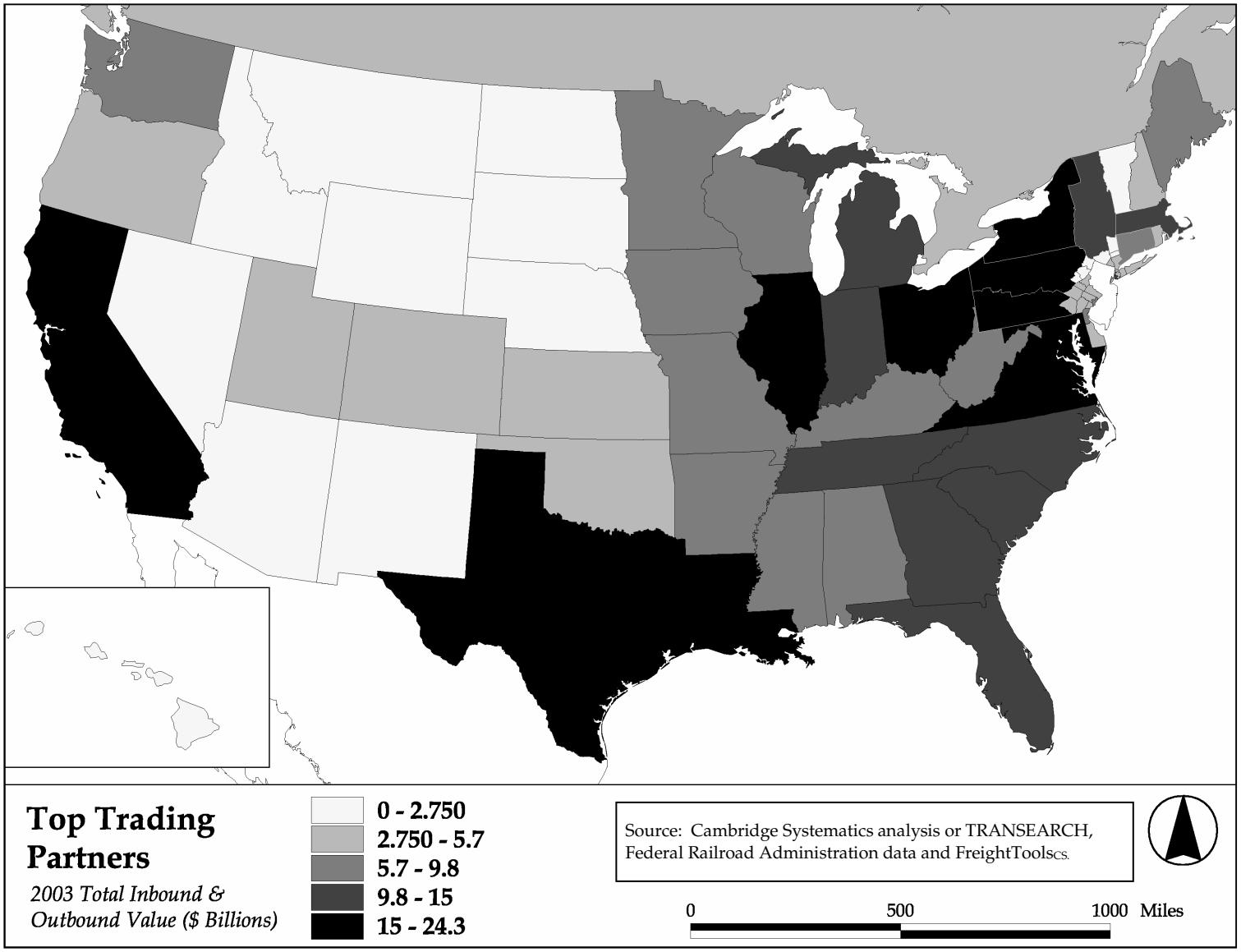


Table 24. Top Trading Partners by Weight (Short Tons, Truck and Rail Only), 2003

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 25. 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$_{CS}$.

5.2 Truck Trading Partners

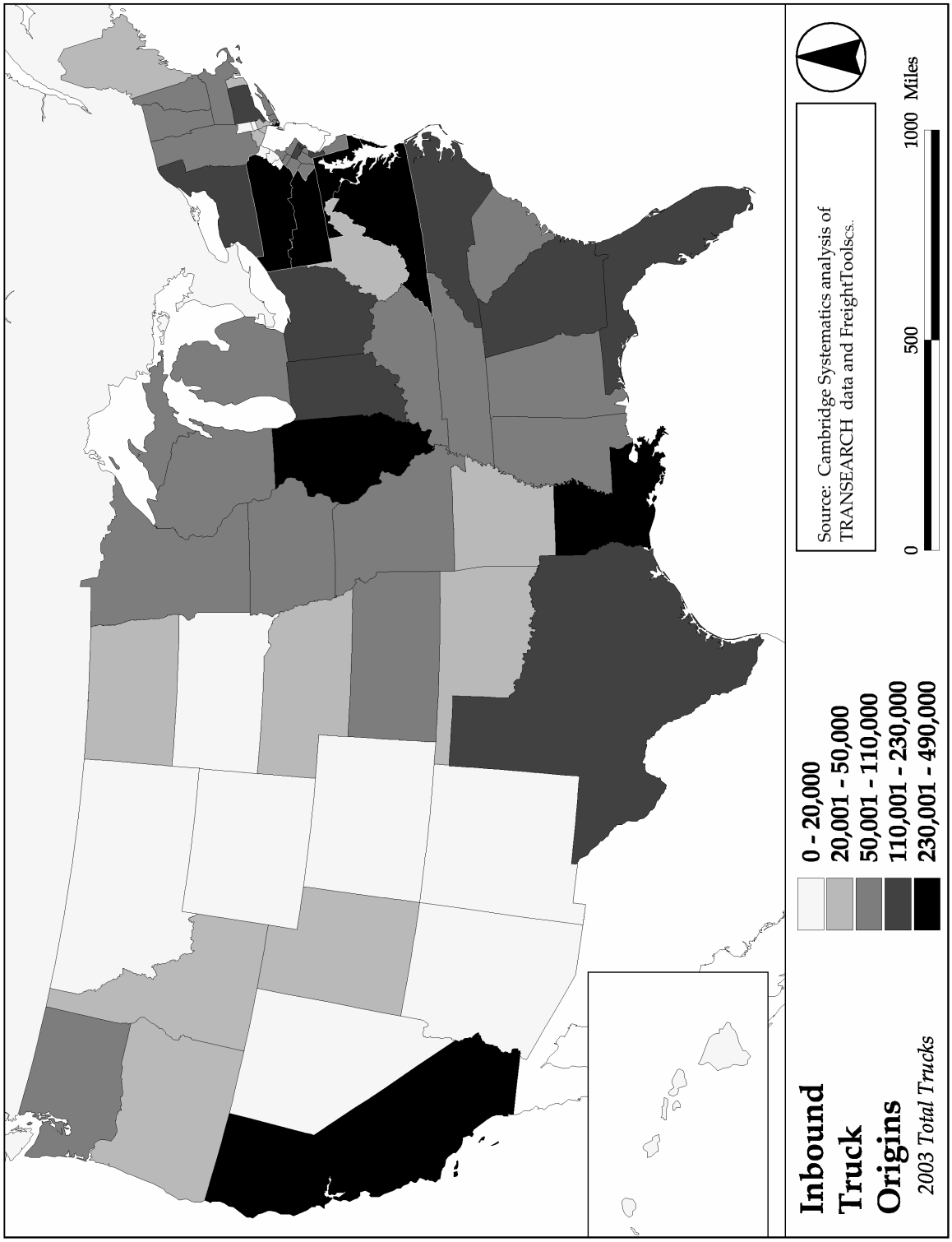


Figure 19. Inbound Truck Origins by Truckload Equivalents, 2003

Figure 20. Outbound Truck Destinations by Truckload Equivalents, 2003

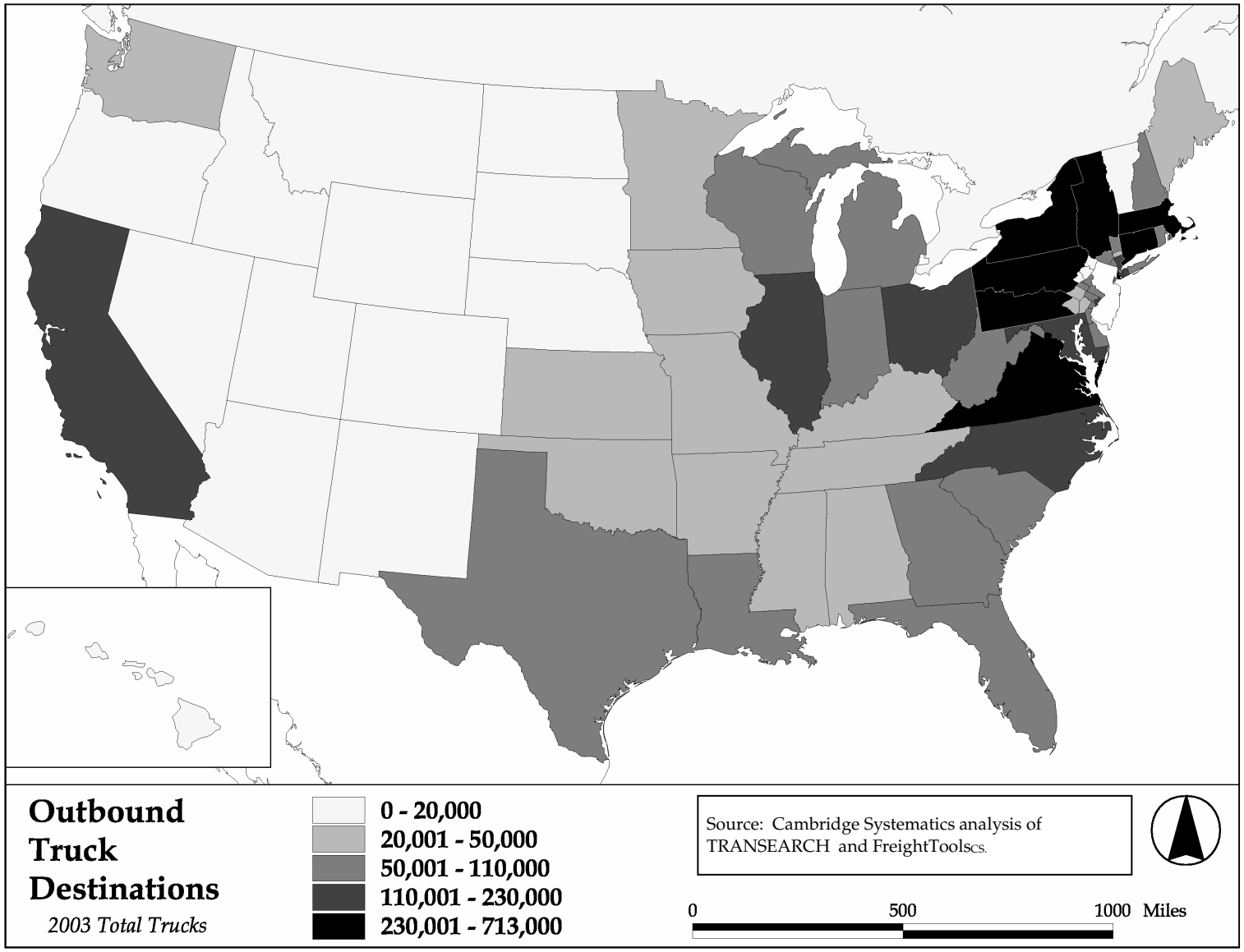


Figure 21. Inbound Truck Origins by Tonnage (Short Tons), 2003

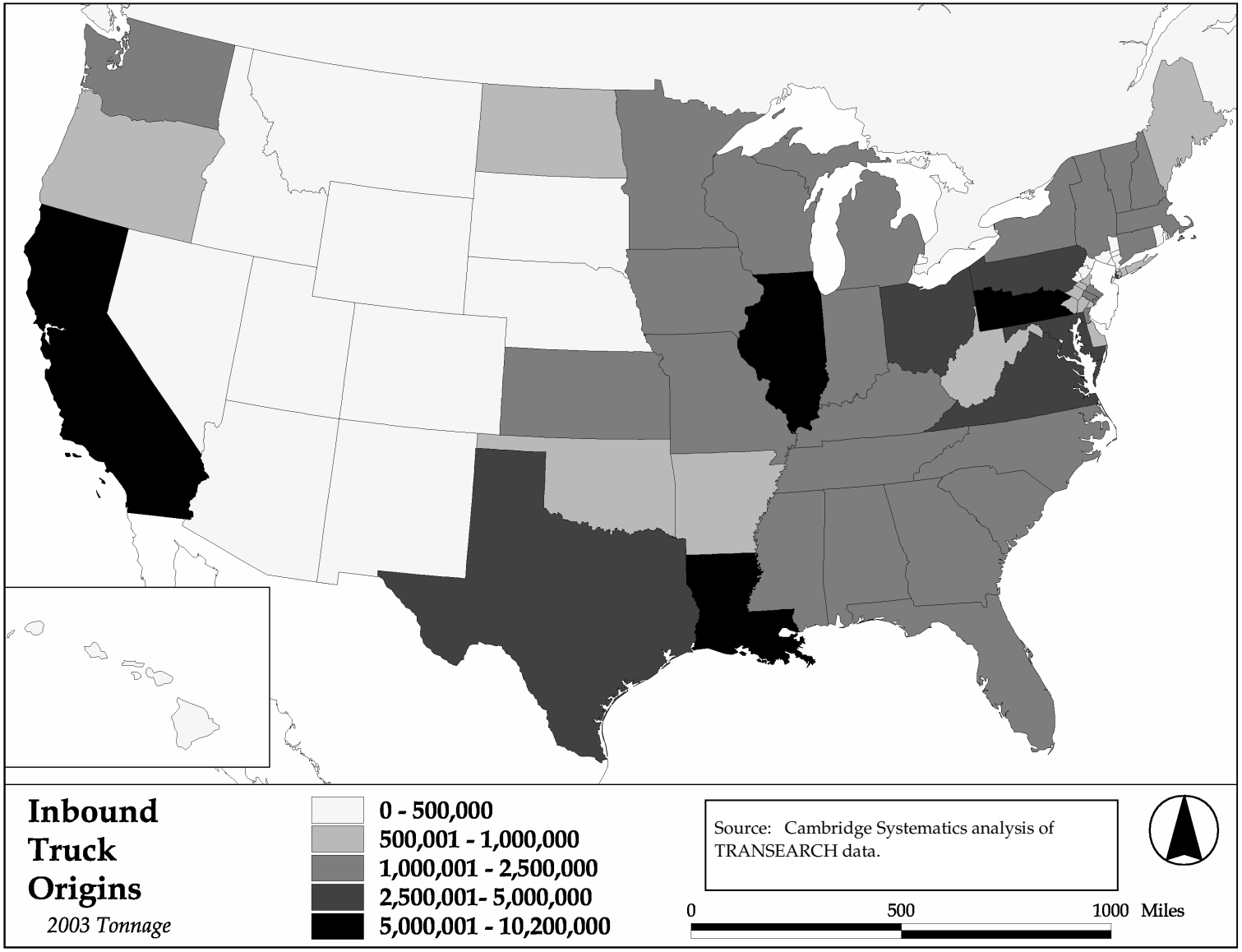


Figure 22. Outbound Truck Destinations by Tonnage (Short Tons), 2003

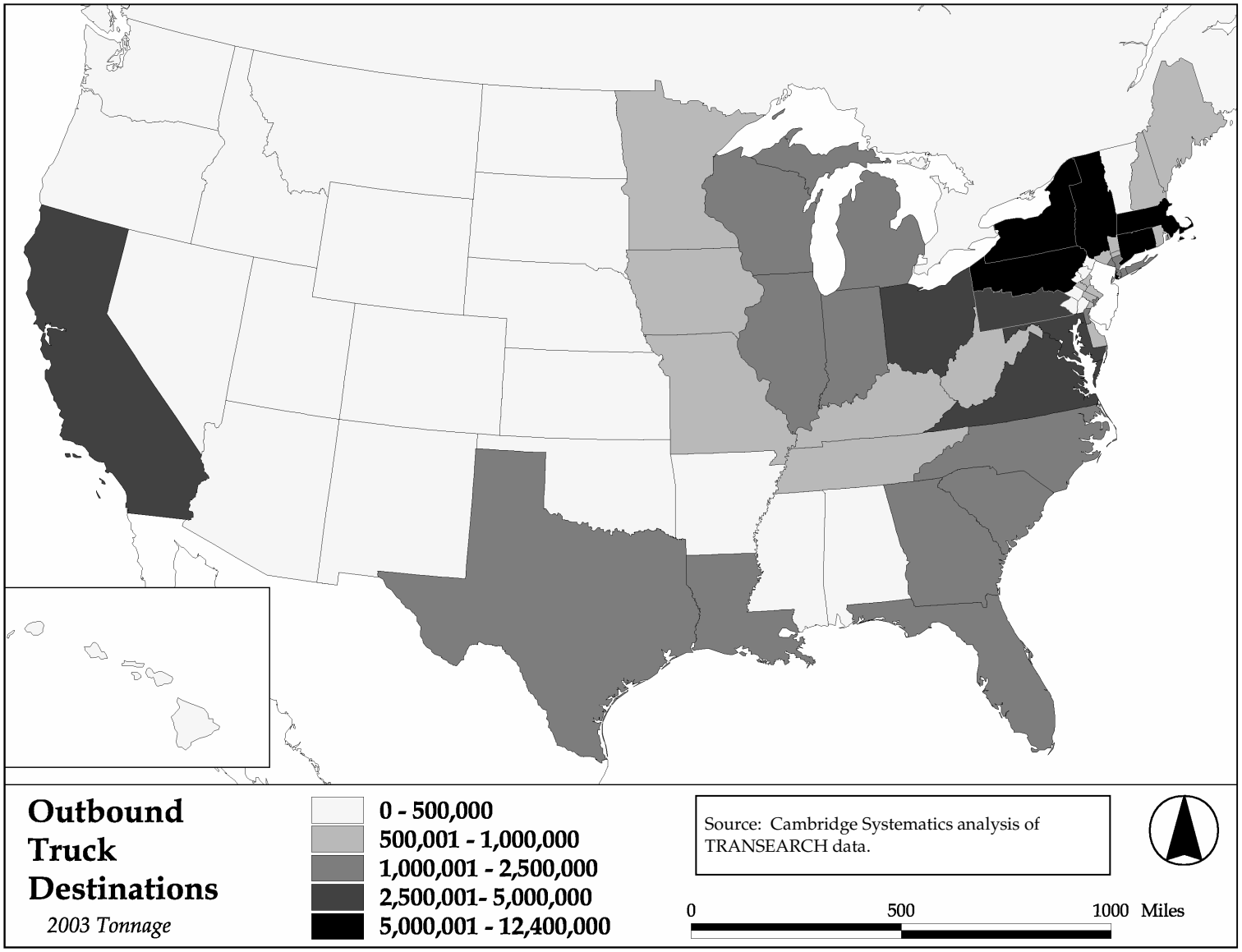


Figure 23. Inbound Truck Origins by Value, 2003

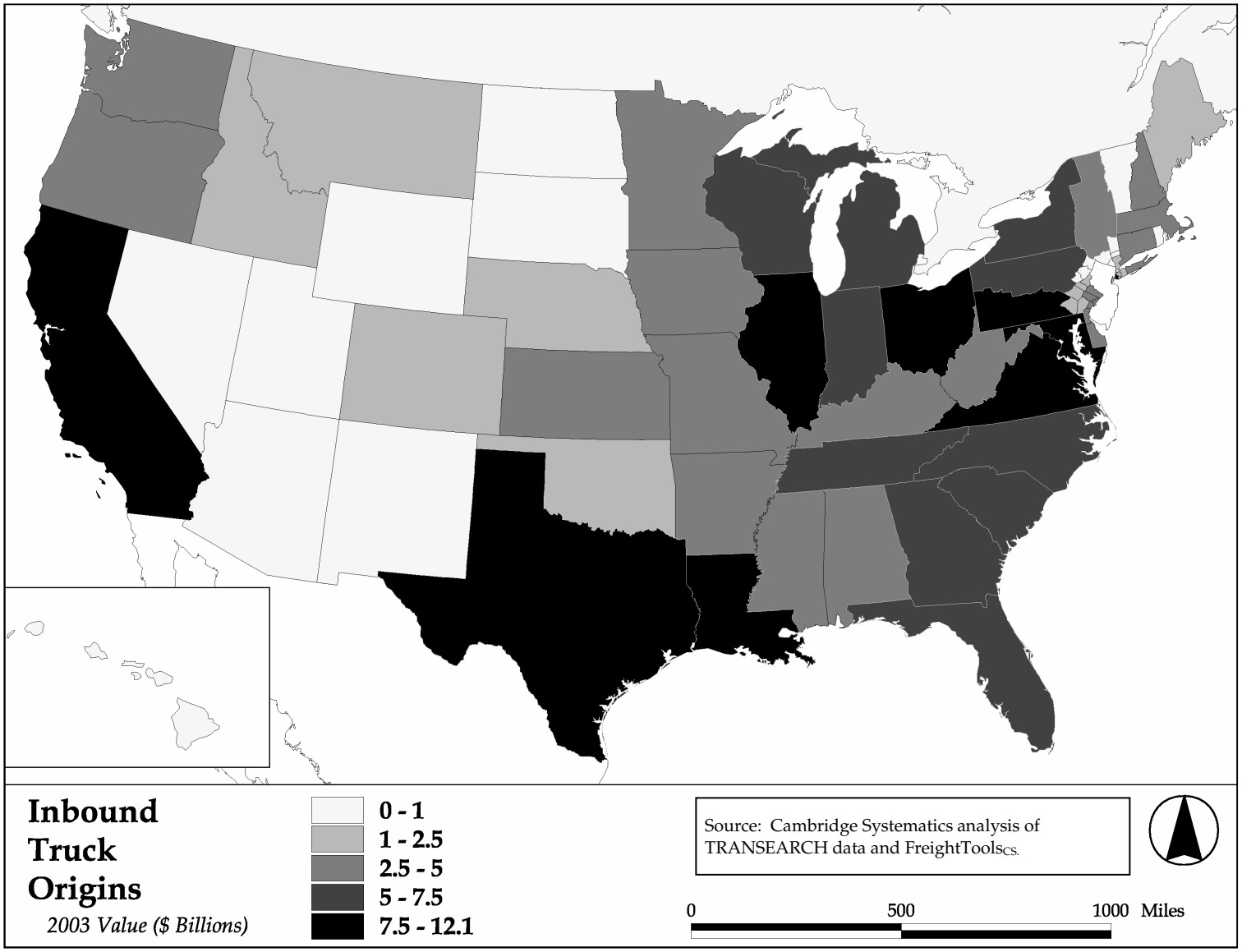
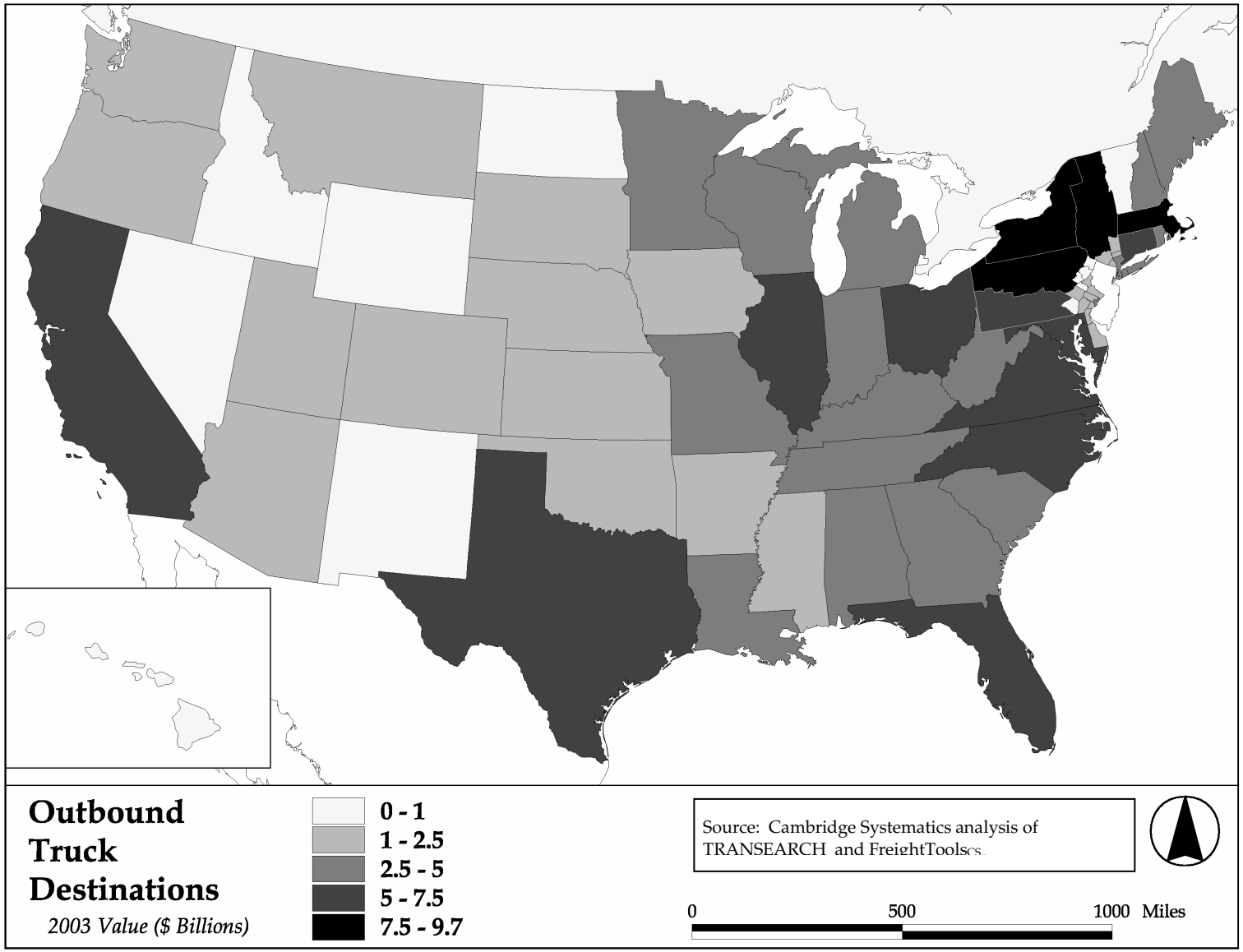


Figure 24. Outbound Truck Destinations by Value, 2003



5.3 Rail Trading Partners

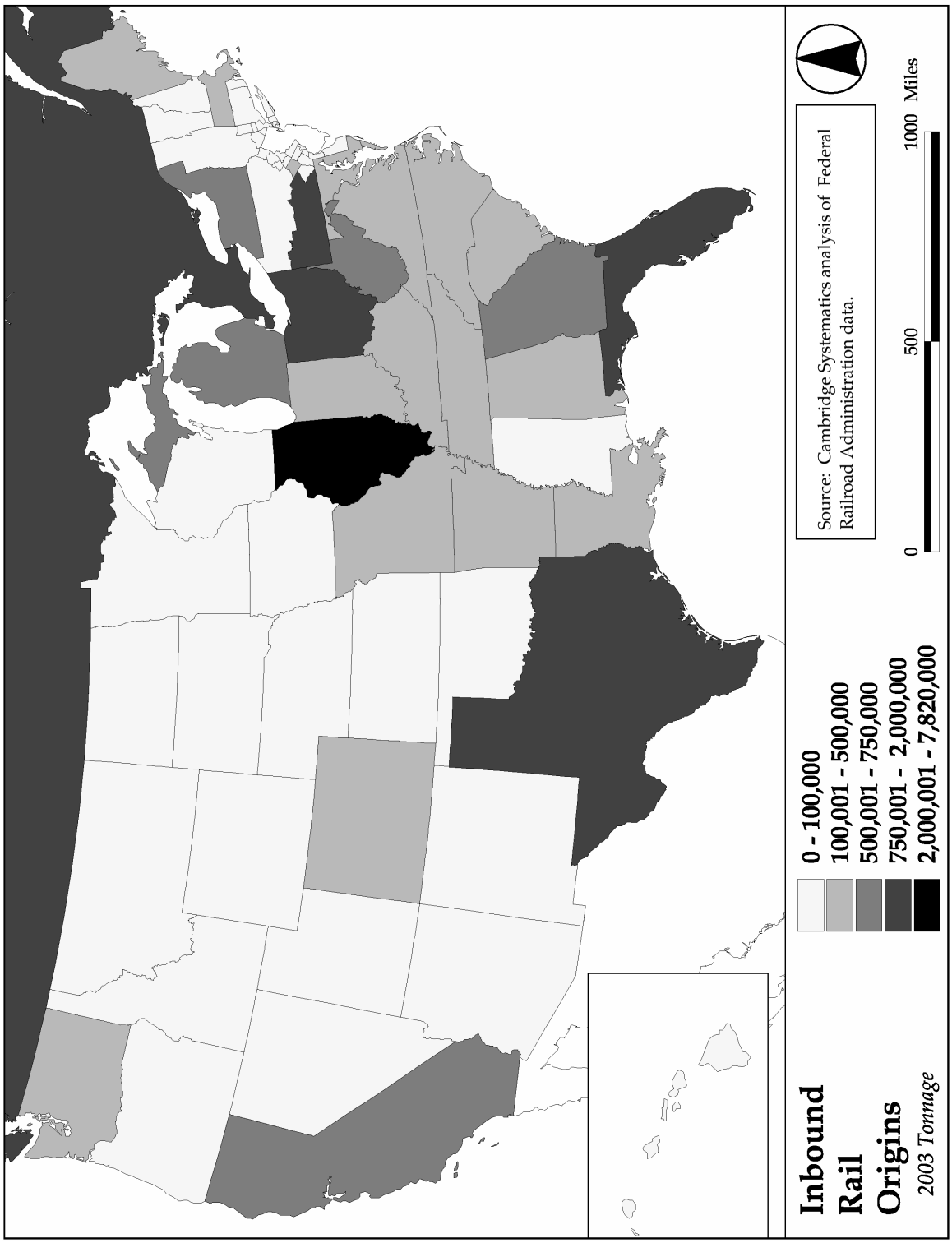


Figure 25. Inbound Rail Origins by Tonnage (Short Tons), 2003

Figure 26. Outbound Rail Destinations by Tonnage (Short Tons), 2003

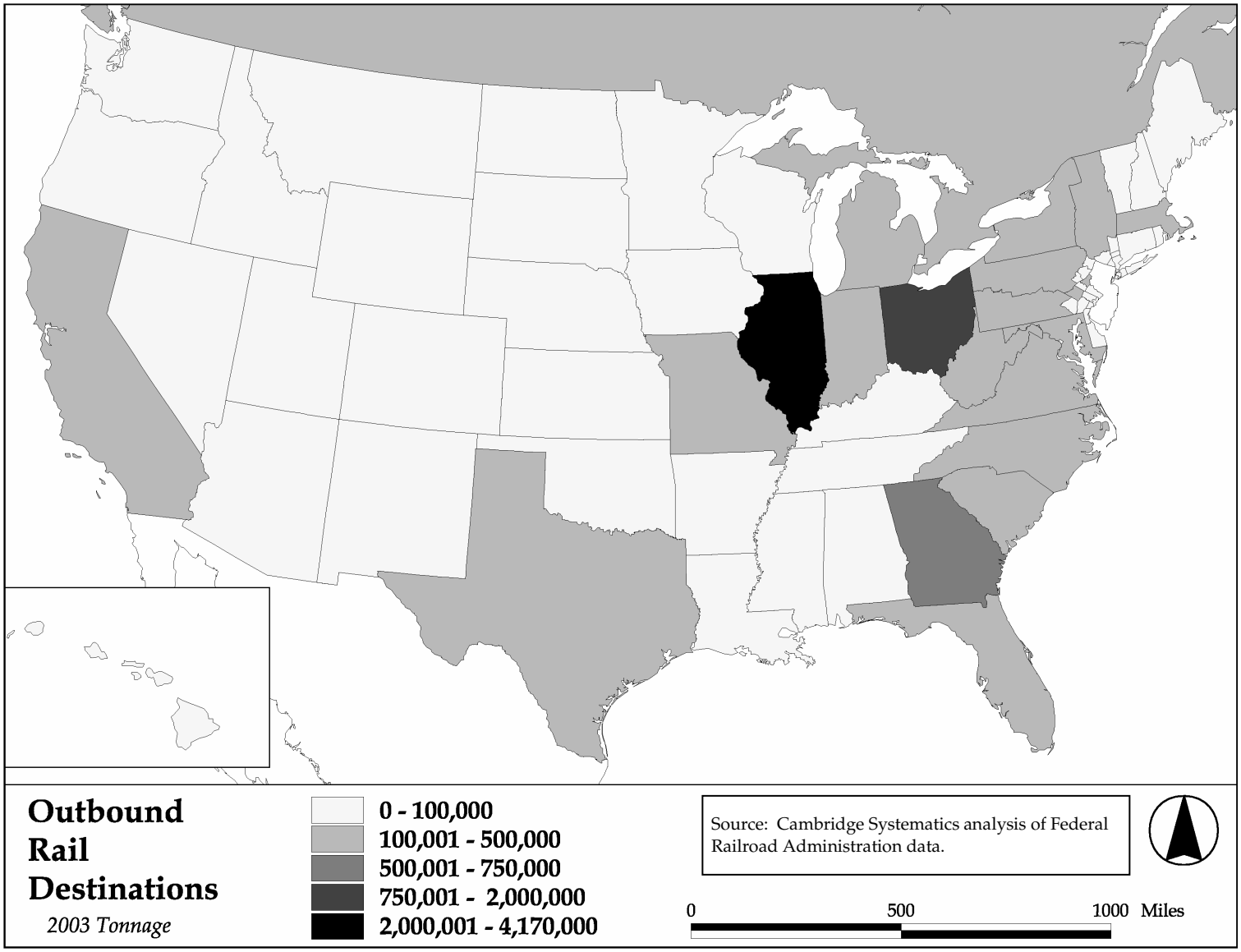


Figure 27. Inbound Rail Origins by Value, 2003

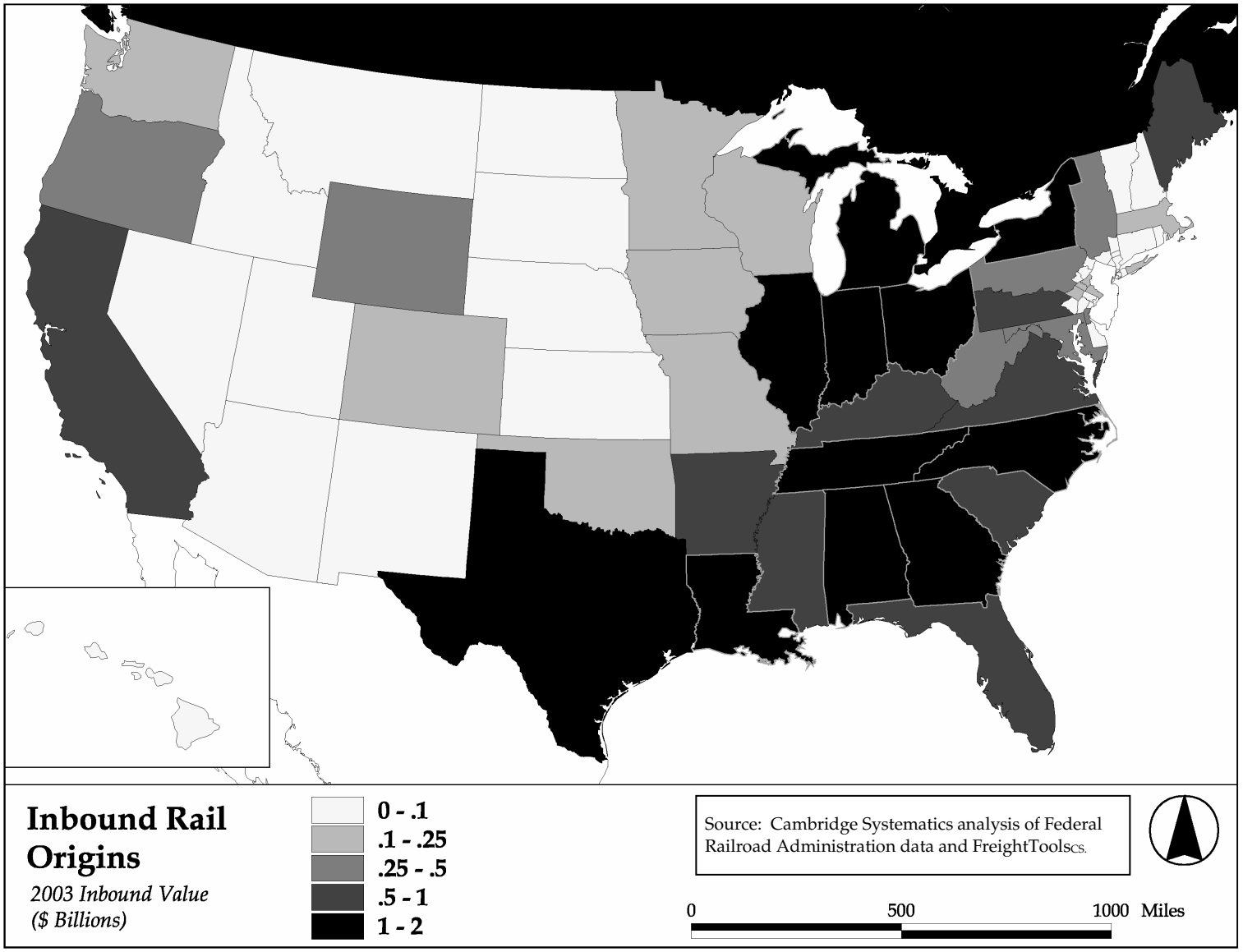
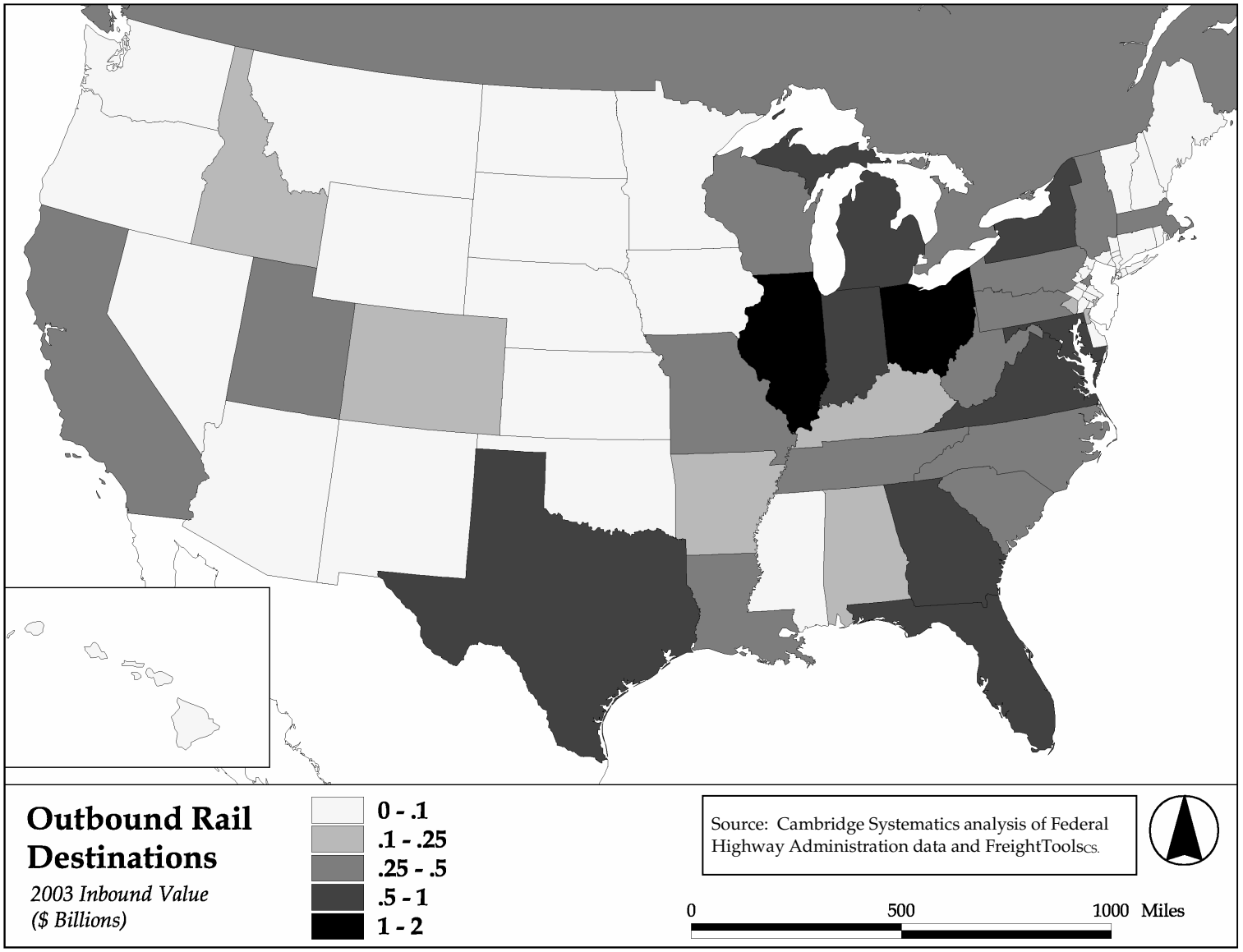


Figure 28. Outbound Rail Destinations by Value, 2003



6.0 Conclusion

Freight data analysis is not a simple procedure. There are multiple modes and multiple sources of data to contend with. The analysis involves considerable effort, and the results can seem abstract. So: what does this all mean for New Jersey?

- The state handles a huge amount of freight – over 620 million tons in year 2003.

- Freight is moving in different directions, for different purposes – around 32% inbound, around 27% outbound, around 21% intrastate, and around 20% through. The inbound and outbound tonnage supports economic activity between New Jersey and other national and international markets. The intrastate tonnage supports New Jersey's internal economic activity. The through tonnage takes up space on New Jersey's scarce transportation infrastructure.

- All modes of transportation are important. On a tonnage basis, around 75% is handled by truck; around 18% is handled by water; and around 7% is handled by rail. Even though less than 1% is handled by air, it is significant because of the specialized service it provides to high-value, time-sensitive commodities.

- A huge variety of commodities – from high-value freight carried by air and in shipping containers, to lower-value petroleum and similar bulk commodities – are critical to the production, consumption, and intermediate processing of goods in New Jersey.

- Every county in New Jersey is impacted by freight movement. The effects differ with respect to mode (truck, rail, water, or air), type (inbound, outbound, or through), and intensity (high, moderate, or low impact) – but it is a significant issue for all counties.

Understanding the nature and magnitude of the freight movements that must be accommodated over New Jersey's transportation infrastructure is the first step in developing coordinated, lasting plans and programs to ensure that the state's current and future freight needs are appropriately addressed.

Appendix A

About NJDOT's TRANSEARCH Data Purchase

About NJDOT's TRANSEARCH Data Purchase

NJDOT's TRANSEARCH data purchase was based on the following specifications.

Geographic Coverage

All flows of domestic U.S. and Canada and Mexico cross-border freight that originate, terminate, or pass through the state of New Jersey.

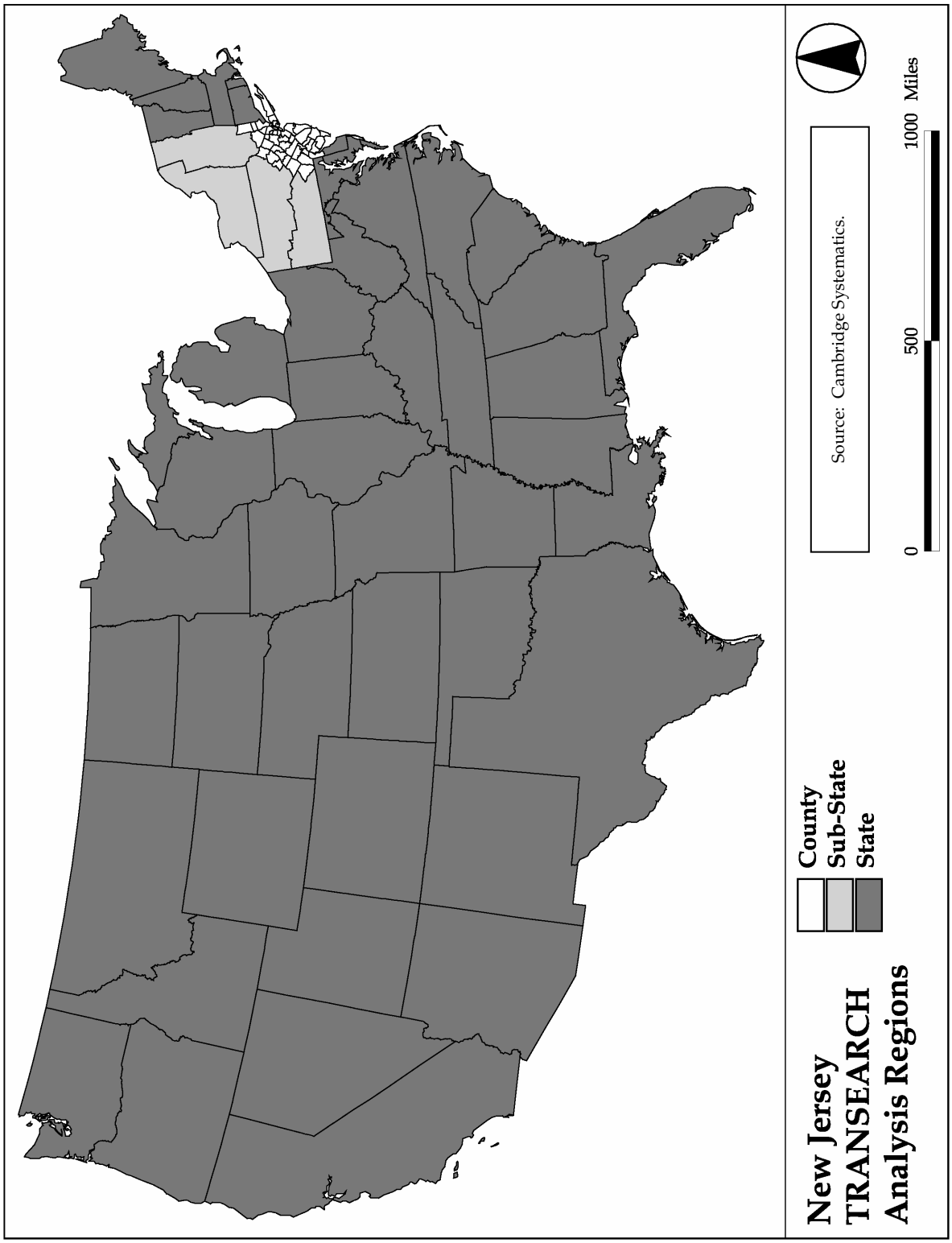
Geographic Market Detail

Origin and destination markets defined at the county-level for all of New Jersey, plus the following out-of-state counties:

- New Castle, Delaware;
- Bronx, New York;
- Dutchess, New York;
- Kings, New York;
- Nassau, New York;
- New York, New York;
- Orange, New York;
- Putnam, New York;
- Queens, New York;
- Richmond, New York;
- Rockland, New York;
- Suffolk, New York;
- Westchester, New York;
- Berks, Pennsylvania;
- Bucks, Pennsylvania;
- Carbon, Pennsylvania;
- Chester, Pennsylvania;
- Delaware, Pennsylvania;
- Lancaster, Pennsylvania;
- Lehigh, Pennsylvania;
- Monroe, Pennsylvania;
- Montgomery, Pennsylvania;
- Northampton, Pennsylvania;
- Philadelphia, Pennsylvania; and
- Pike, Pennsylvania.

Out-of-state U.S. markets are defined by state (with the above counties netted from Delaware, New York and Pennsylvania), and New York State is split into an East and West region, while Pennsylvania is split into North and South regions.

Figure A.1. TRANSEARCH Analysis Regions



Appendix B - Trends

B.1 International Freight Trends and Implications

International Trends	Implications for New Jersey
Increase in global trade, resulting from reduced trade barriers (NAFTA, Favored Nation status), growth of multi-national corporations, internationalization of supply chains, and transfer of manufacturing activities to other nations.	• As a leading gateway and consumer hub, New Jersey can anticipate increased international trade volumes through its ports and Newark Liberty International Airport. If international trade flows through gateways outside New Jersey, the state can anticipate increased volumes on its road and rail freight networks. • The growth in the global economy will require significant increases in the capacity and productivity of the state's ports, and consequently the inland truck and rail systems that serve these major international gateways. • With final customization and customer-readiness activities occurring near market hubs, New Jersey can build on its strength in warehousing and distribution center activity. Employment in these facilities can reach the level associated with light manufacturing facilities.
Tracking technology is more fully integrated in goods movement.	• GPS and radio frequency identification tags are becoming more common as companies seek increased information on shipments. US supplying firms and transportation facilities may need to adapt to emerging standards.
International economic forecasts see the highest economic activity in Asia (with the exception of Japan). The US could also lead the world out of recession. Japan and Europe are seen as mature economies with aging populations. Economic issues continue in South America.	• The international markets and freight providers will focus increasingly on serving the emerging Asian markets. • Trade with Asia will continue to favor use of the West Coast ports as international gateways. Accordingly, landbridge rail terminals will continue to bring a large percentage of international goods into New Jersey. If New Jersey does not have the rail freight capacity or if the national (Class I) railroads change their distribution strategies, New Jersey could see increases in truck traffic associated with international cargo.

International Trends	Implications for New Jersey
Vessels are getting larger. Vessels capable of handling 9,000 or more containers are entering service.	• While these vessels will first enter the Pacific routes, it is anticipated that they will eventually serve US East Coast ports, including New Jersey. Channels are being deepened to accommodate these vessels. The Bayonne Bridge will eventually need to be modified or replaced to provide the necessary air draft for the vessels.
Freight providers are becoming more multimodal or developing strategic alliances.	• Integrated carriers, such as FedEx and UPS, are expanding internationally. • International companies are purchasing US freight providers. • New Jersey will see increased demand for efficient intermodal connections, as well as new freight carriers.
International containers may be increasingly heavier than the loads allowed on US roads.	• The New Jersey Turnpike does not permit these heavier containers unless the chassis has an additional axle. Chasses of this type are of limited availability and cost more in terms of tolls. • New roadways designated for container movement may be necessary to handle the heavier loads. • Alternatively, heavier containers can be transloaded into containers/trailers of acceptable weights at the port and/or moved by rail (short and long distances).

B.2 National Freight Trends and Implications

United States Trends	Implications for New Jersey
Security and safety are growing concerns. The events of September 11, 2001, have focused attention on the importance of our nation's transportation infrastructure in times of emergency and their vulnerability to both natural and man-made disasters.	• Public agencies are spending increasing percentages of their capital and construction funds on new security and safety requirements, limiting the availability of funds for other freight system requirements. • New processes and requirements may result in increased training/staffing requirements at New Jersey freight facilities and in communities hosting freight facilities. • Some modal shifts may occur depending on the impacts of new security rules on elements of the freight system (particularly air cargo). • Security measures will increase the costs of freight transportation, especially international freight movements. Given New Jersey's strategic location and major airport and ports, the cost impacts of security will have a greater impact than for states further inland or to the south.
More substitution and competition between modes is occurring – trucks instead of air for some cargo and rail for long distance freight movements.	• New Jersey will need to focus on optimizing the efficiency of all transportation modes, as well as ensuring efficient intermodal connections/ facilities, including focused investment to support the system. • New types of facilities and patterns are emerging. For example, facilities for multimodal handling of time-definite shipments are locating near airports.
Communities are less tolerant of the increased amount of freight moving through their areas.	• "Good neighbor" practices for freight facilities and operations may become part of the planning and approval processes for freight facilities in the future. Integrated land use and freight transportation planning can produce better-informed decisions.
Ports are pursuing major warehouses to secure the international trade associated with these facilities.	• New Jersey is one of the prime locations for North American distribution. However, properties in the vicinity of the port are limited. In addition, other states and ports are actively marketing the availability of properties for this activity. New Jersey will need to more actively compete to retain and capture warehousing activity.

United States Trends	Implications for New Jersey
Capacity and service issues with the US rail freight system may lead to increased use of all-water routes for vessels between the East Coast and Asia.	• Currently, the state receives 62% of its international goods through its rail freight facilities from the West Coast. A greater percentage "over the wharf" could increase the demand for port terminal facilities in New Jersey. The maritime terminals have invested in expanding and increasing the efficiency of their operations. Greater efficiencies or new terminals may be needed in the future.
Increased environmental requirements are being placed on the freight system.	• "Green port" practices are beginning to be implemented at the New Jersey marine terminals, including the use of electric cranes and alternatively fueled yard handling equipment. More stringent requirements in California (such as electrical hook ups for vessels so that their engines are not running while docked and low-profile cranes) could become mandated in New Jersey. • Electrical hook ups for trucks at rest areas could be mandated to reduce emissions. • New technologies to reduce locomotive emissions and eliminate idling engines could be implemented.
Financial issues continue with the railroads, trucking firms, and airlines, and Wall Street pressures on the industry are increasing.	• The freight railroads will increasingly seek public funds to augment capacity • Motor carriers will have less financial ability to handle "user fees." Depending on time/delivery requirements, trucking firms may seek to avoid toll roads when possible. • With larger trucking firms going out of business, increased use of owner-operators may occur. Owner/ops may have older equipment, which could produce higher levels of emissions.
Congestion on roadways continues to grow and investigation of possible alternatives, such as short-haul rail and short-sea shipping, is occurring.	• Short-haul rail concepts are being explored in New Jersey through the Portway project and by major maritime terminals. • Short-sea shipping could support New Jersey's growth as a hub port. New sites in New Jersey could emerge as terminals for short-sea shipping. • Shortline railroads could become more important.

United States Trends	Implications for New Jersey
New hours of operation rules have been implemented for truck drivers.	• More rest areas will be required to accommodate the more stringent requirements so drivers don't pull to the side of roads or onto local streets to rest. • Some firms are considering or moving to more use of rail because of the rule changes.
Competition for limited federal funding for transportation projects will continue.	• New Jersey may need to organize its projects and develop multi-agency support for key initiatives. Multi-state coalitions for certain projects may increase their potential for funding. • Greater local matches may be required for new projects. • New Jersey may need to identify and implement alternative funding mechanisms to finance freight transportation projects.

B.3 New Jersey Freight Trends and Implications

New Jersey Trends	Implications for New Jersey
As a densely developed state, New Jersey experiences competition for the use of land and potentially limited availability of space for freight facilities.	• Brownfield and grayfield reuse may provide opportunities. Several strategic transportation improvements may be needed to increase the competitiveness of certain sites. Increased incentives and streamlining of remediation may be required to advance brownfield reuse for freight purposes. • Minimal property will be available for expanding the ports. • Some facilities may locate in other states, such as Pennsylvania, which could result in increased truck volumes in New Jersey as freight moves through the state to these facilities. • Policies may need to be developed that will preserve or designate land for freight-related activities.
Uncoordinated and competing freight initiatives are being pursued or proposed within the region.	• Federal funding for a rail freight tunnel between New Jersey and Brooklyn, NY, could affect federal funding for other New Jersey freight and transportation projects. • If Pennsylvania is more successful than New Jersey in pursuing warehousing and intermodal facility development, truck traffic could increase in the state without economic benefit.
State and local transportation infrastructure has become increasingly congested as travel demand has outpaced investment in system capacity.	• New Jersey faces a major and increasing challenge to meet the financial requirements to maintain and expand the freight infrastructure.

Appendix C – Portway Synopsis

I. INTRODUCTION

This document has been prepared as a synopsis of the extensive planning, feasibility assessment and infrastructure design efforts that constitute the Portway Program. The Portway Program may be viewed as a comprehensive assessment of the future market demand for goods, the associated impacts to the transportation infrastructure of moving those goods, evaluation of physical, operational improvements to facilitate the movement of containerized goods, and quantification of the negative economic implications if action is not taken.

The independent, yet interrelated infrastructure improvements that make up Portway Phase I are in various stages of advancement. While specific details associated with the independent projects continue to evolve, the *Preliminary Concept Development Report – Improvements to the Portway Corridor*, prepared for the NJDOT Bureau of Project Scope Development May 1999, remains an accurate summary of the individual projects that make up Portway Phase I.

The Portway Extensions Concept Development and CMS Study built upon the Portway Phase I plans, projecting container movements into the future and developing a series of policy, operational, infrastructure and alternative mode concepts to facilitate the movement of international and domestic containerized goods. These initiatives and recommended improvements were detailed in the Portway Extensions Concept Development Study, September 2003, with additional economic impacts assessed and discussed in the Portway Extensions Economic Impact Assessment, February 2004.

The following sections describe the Portway Program purpose, need, benefits and economic implications of not advancing the program in greater detail

I.1 THE PORTWAY PROGRAM - A REGIONAL MOBILITY AND ECONOMIC PERSPECTIVE

The Portway area, inclusive of the existing and planned maritime port facilities in Newark, Elizabeth, Jersey City and Bayonne, and the major Intermodal Railyard facilities in Newark, South Kearny, Secaucus and Jersey City, represents the front door to global and domestic commerce for New Jersey and greater metropolitan New York. This maritime port and railyard system is currently the largest center for the import/export and transfer of containerized freight on the east coast, and the second largest (after Los Angeles/Long Beach) in the United States. Although containers do not represent the majority of freight traffic in the region, container movement is the basis for a substantial share of job creation and economic activity in the study area, and supports a vast array of business enterprises. **Failure to efficiently accommodate the anticipated growth in goods movement will have serious negative consequences on the local economy, stifling growth and impacting quality of life.**

In 2003, North Jersey's marine container terminals generated nearly 13,000 truck movements each day. The number of containers moved each day by truck is expected to continue to grow. According to recent projections, the number of container-related trucks generated by port activity could increase to upwards of 28,000 per day. This represents a 225 percent increase in the volume of container truck trips on an already congested roadway system.

In addition to the movement of containers through the maritime ports, over one-half of the region's international containers enter and exit the Port District via the west coast ports and the national intermodal "landbridge" rail network. Still more containers are moved throughout the region on trucks originating from or destined to other east coast ports. Finally, containers also handle high volumes of purely domestic freight moving into, out of, within and through the study area.

The roadway network serving the Portway Area is already stretched to near capacity. Some of the key roadways connecting the container handling facilities to each other and to the regional and national transportation infrastructure have only one lane in each direction and have not been improved for many years. **The poor condition of these roads and their inability to properly serve current and future traffic can be expected to negatively impact the port industry if not addressed.** With the anticipated increase in international container traffic, the question of the existing transportation infrastructures ability to safely and efficiently accommodate the demand that will be placed upon it in the future has taken center stage.

In conjunction with improving the roadway network in the Portway area, there are plans to expand the marine terminals of Port Newark, Port Elizabeth, and the Bayonne Peninsula. The North Jersey Transportation Planning Authority (NJTPA) is investigating local Brownfields that could be redeveloped into value-added warehouse/manufacturing sites that would serve the goods movement industry and generate increased commerce. The Brownfield initiative would not only improve the environment within and proximate to the Portway area, but would significantly stimulate economic growth. Working together, these improvements would result in more efficient movement of containers with the required distribution mechanisms located nearby.

Clearly, significant improvements are vital to the future of the goods movement industry and the hundreds of thousands of jobs that are created by this industry. These improvements cannot be limited strictly to roadway infrastructure. In addition, enhancements must be made not only in the modes of transportation utilized for the movement of containers, but also in how the movement of these containers is managed.

I.2 PORTWAY PHASE I – PURPOSE AND NEED

Creation and maintenance of a multimodal network for the transport of the containers that move through the Portway area is of paramount importance to the continued mobility and economic vitality of the region. In recognition of the need to safely and efficiently move containers through the region, the Portway concept was born.

Portway Phase I was initially conceived in 1996 as a roadway/intermodal connector facility that would strengthen highway and inter-facility access between the Newark/Elizabeth Seaport Complex and major intermodal rail and trucking distribution facilities throughout the region. In the early stages of development, Portway Phase I was envisioned primarily as a dedicated roadway network designed to accommodate oversize and overweight trucks. The Portway Phase I concept was intended to serve the many Brownfields properties along and proximate to its alignment and thereby facilitate their re-use for value added processing and other good movement logistics purposes.

The initial components of Portway Phase I included numerous roadway network enhancements to increase safety and support seamless connections by separating heavy truck traffic flows from other traffic flows. A series of eleven (11) projects, each having independent utility are in various stages of the project implementation pipeline. These individual projects ranges from minor widening and drainage improvements to existing roadways, to bridge replacement, to construction of new roadway segments.

The Portway Phase I Corridor, as depicted in Figure 1, extends from the Seaport northward to the rail facilities in Hudson and Bergen Counties. The broad purpose of the Portway project is to facilitate the movement of freight from portside to intermodal rail facilities and local value-added warehouse/ distribution centers; and other major regional highways and simultaneously, to reduce congestion along the general purpose roads forming the entire corridor impacted by Port related traffic and separate heavy truck traffic at selected locations from the general traffic flow. Specifically, Portway Phase I was intended to relieve current high levels of congestion in the busy intermodal freight service corridor and to meet growing future demand for access generated by increased activity at port facilities, rail yard and distribution centers.

The status of each independent utility project is summarized in Table 1, with additional descriptions of the individual projects following.

figure 1.jpg (5500x8492x24b jpeg)

	Project Description
1	Doremus Avenue Reconstruction - Port Street to Wilson Avenue
2	Doremus Avenue Reconstruction - Wilson Avenue to Raymond Boulevard
3	Charlotte Circle Elimination and Reconstruction of Tonnelle Circle
4	Route 1&9 St. Paul's Avenue Bridge Replacement
5	**Route 7** Wittpenn Bridge Replacement
6	NJ Turnpike Interchange **15-E** Access Improvements
7	Route 1&9 / Doremus Avenue Interchange Reconstruction
8	New Passaic River Crossing - Doremus Avenue to Central Avenue
9	Central Avenue Corridor and Interchange Improvements
10	Pennsylvania Avenue and Fish House Road Improvements
11	New Road from St. Paul's Avenue to Secaucus Road

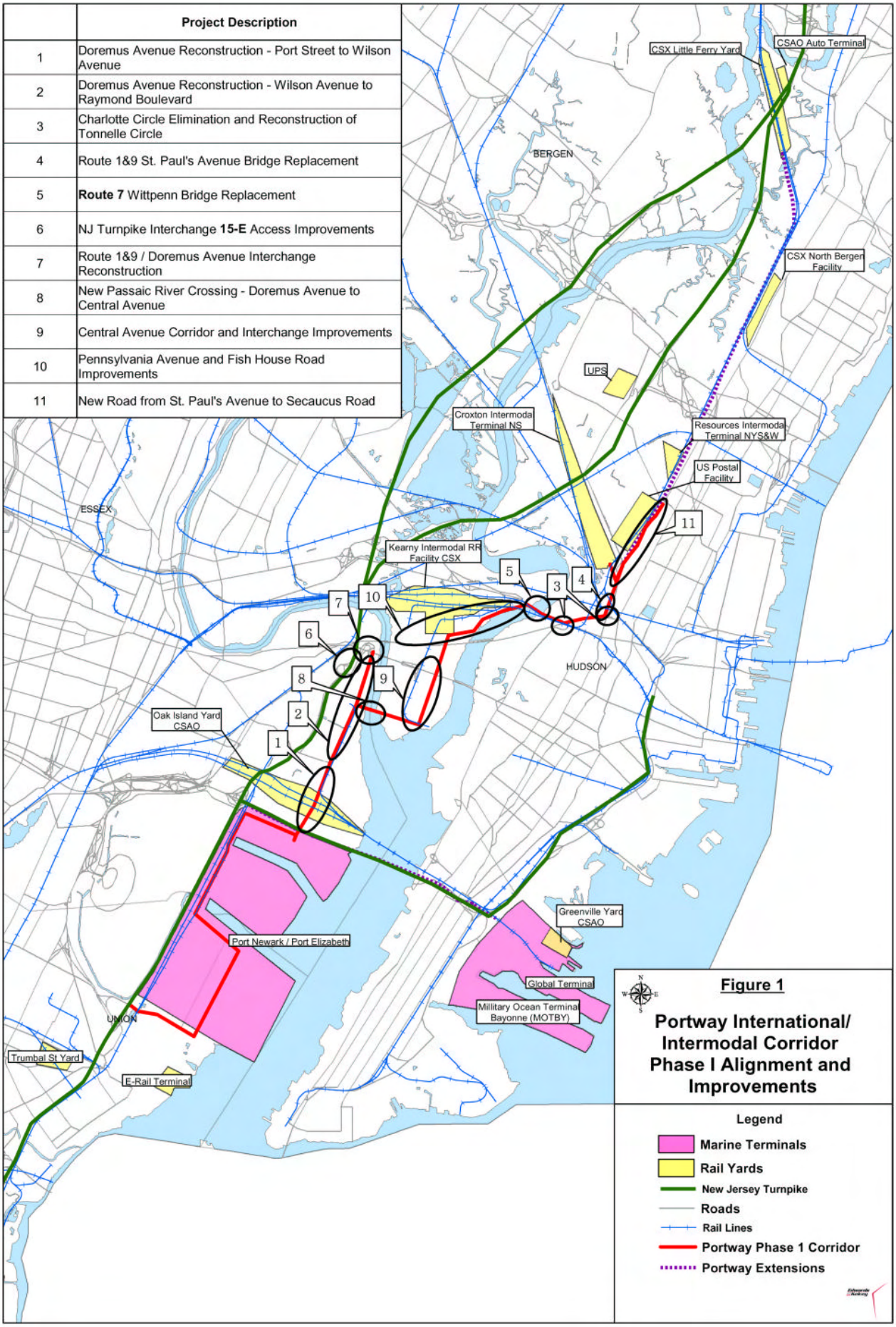


TABLE 1
PORTWAY PHASE I PROJECTS STATUS

Map Code *	Project	Functional Class	Status / Completion
1	Doremus Avenue Reconstruction - Port Street to Wilson Avenue	Drainage, Safety	Complete
2	Doremus Avenue Reconstruction - Wilson Avenue to Raymond Boulevard	Drainage, Safety	Complete
3	Charlotte Circle Elimination and Reconstruction of Tonnelle Circle	Capacity, Safety, Geometric Deficiencies	Complete
4	Route 1&9 St. Paul's Avenue Bridge Replacement	Structural Deficiency	2010
5	Route 7 Wittpenn Bridge Replacement	Structural Deficiency	2012
6	NJ Turnpike Interchange 15-E Access Improvements	Safety, Geometric Deficiencies	TBD
7	Route 1&9 / Doremus Avenue Interchange Reconstruction	Safety, Geometric Deficiencies	TBD
8	New Passaic River Crossing between Doremus Avenue and Central Avenue	New Infrastructure	TBD
9	Central Avenue corridor and interchange improvements	Drainage, Safety	TBD
10	Pennsylvania Avenue and Fish House Road Improvements (access to Kearny Intermodal RailYard)	Drainage, Safety	TBD
11	New Road from St. Paul's Avenue to Secaucus Road (access to Croxton Intermodal Railyard)	New Infrastructure	TBD

* SEE FIGURE 1.

PORTWAY Phase I - PROJECTS COMPLETED OR UNDER CONSTRUCTION

1. Doremus Avenue reconstruction and bridge replacement, from south of Port Street to north of Wilson Avenue. The primary driver for this project was the need to replace the existing Doremus Avenue bridge over the Oak Island Yards. The original bridge included a roadway width of approximately 25-feet, and was determined to be structurally deficient and functionally obsolete. The widened bridge and improvements to the approach roadways provided improved sight distances, improved drainage and the ability for passing of slower vehicles, thereby reducing queuing. The project was completed in 2003.

2. Doremus Avenue reconstruction and widening, from north of Wilson Avenue to north of Raymond Boulevard. This section of Doremus Avenue was characterized by insufficient lane widths, poor sight distance, and inadequate drainage. This roadway is heavily utilized by trucks as a connection between the maritime ports and the NJ Turnpike Interchange 15-E. The project was completed in 2004.
3. Construction of operational improvements to the Tonnelle Circle and elimination of the Charlotte Circle. Operational deficiencies and limited capacity within the Charlotte Circle created recurring congestion and delays along the section of Route 1&9 (T) south of the circle. Elimination of the Charlotte Circle was completed in 2003. Ramp improvements and the construction of a direct flyover from Tonnelle Avenue southbound to the Pulaski Skyway were completed in 2004.

PORTWAY PHASE I - PROJECTS IN FINAL DESIGN OR PRELIMINARY DESIGN

4. The Route 1&9 St. Paul's Avenue Bridge Replacement. The existing viaduct over St. Paul's Avenue and the Conrail line was determined to be structurally deficient and functionally obsolete. Operationally, the existing configuration hampered connection with Tonnelle Avenue and the Pulaski Skyway. Replacement of the bridge on a new alignment, along with significant improvements to the approach roadways and proximate interchange ramps will significantly improve traffic flow through this chronically congested area. This project was advanced to design in 2003, with construction scheduled to commence in 2005.
5. The Route 7 Wittpenn Bridge Replacement. This project, currently in Final Scope Development, spans the Hackensack River from the interchange of Fish House Road with Route 7 to the west, to the interchange with Routes 1&9 (T). This 2,100 foot long bridge with a central lift span is structurally deficient and functionally obsolete. The new bridge will include six travel lanes with significantly increased waterway clearance, minimizing the number of bridge openings required.

PORTWAY PHASE I - PROJECTS IN FEASIBILITY ASSESSMENT

6. Enhanced access to NJ Turnpike interchange 15-E. Via Doremus Avenue, the NJ Turnpike Interchange 15-E is a key access point to the maritime ports. Redundant routes of similar length are non-existent in this area, making capacity reducing incidents that occur frequently in this interchange area particularly detrimental to the movement of trucks and containerized goods. A series of ramp improvements to increase ramp capacity, improve safety and facilitate increase volume flows would result from this project, reducing the adverse spill-back effects of congestion at this

location onto other roadways. Feasibility assessments have not yet been completed, and as such a construction schedule has yet to be determined.

7. Reconstruction of the Doremus Avenue Interchange with Routes 1&9 (T). Associated with the NJ Turnpike Interchange 15-E improvements, improvements to the interchange of Doremus Avenue with Routes 1&9 (T) would serve to improve safety, reduce congestion causing incidents, and enhance the ability of tracks to travel through the area. This project will not dramatically increase the capacity of the interchange, but would significantly improve throughput via increase ramp radii and improved merge conditions.

8. New crossing of the Passaic River. To affect congestion relief on the existing Routes 1&9 (T) bridge over the Passaic River, the feasibility of a new crossing is under investigation. The new crossing would supplement the existing Route 1&9 Truck crossing, connecting Doremus Avenue and Central Avenue. This project would reduce travel time for trucks using Route 1&9 (T), divert approximately 400 trucks per hour during peak travel periods from the existing crossing, and improve safety on the ramps between Doremus Avenue and Routes 1&9 (T). Construction of this project could commence as early as 2008.

9. Central Avenue improvements. In conjunction with the planned new Passaic River Crossing, improvements to the Central Avenue corridor would be required. Widening of the existing Central Avenue to provide wider travel lanes, shoulders, improved sight distance and improved drainage, and ramp improvements at its interchange with Routes 1&9 (T) would allow this roadway to effectively accommodate the increase in travel demand that would result from the construction of the new Passaic River crossing.

10. Enhancement of Pennsylvania Avenue and Fish House Road. While existing traffic volumes along these roadways are relatively low, geometric deficiencies and recurring flooding due to poor drainage diminish the potential utility of these roadways. Access to the Kearny Intermodal Railyard would be significantly enhanced by this improvement.

11. A New Road connecting St. Paul's Avenue to Secaucus Road. Access from Routes 1&9 (T) / Tonnelle Avenue to the Croxton Intermodal Railyard is restrictive due to limited capacity along Tonnelle Avenue and the intersections to County Road. Construction of a new roadway paralleling Tonnelle Avenue would significantly enhance connectivity to the railyard, drawing traffic away fro the already congested Tonnelle Avenue corridor. Reductions in congestion and queuing are expected to translate into improved safety and reduced travel times. Feasibility assessment of this roadway and determination of the associated construction schedule have not yet been completed.

I.3 PORTWAY EXTENSIONS CONCEPT DEVELOPMENT STUDY

Purpose and Need for Portway Extensions

The movement of containers has implications not only within the Portway Phase I area, but also throughout New Jersey and the entire Mid-Atlantic region. While the mobility enhancements and traffic safety improvements that will result from the Portway Phase I improvements are significant, the geographic area of influence of the Portway Phase I improvements is limited. The *Portway Extensions Concept Development Study* was initiated in recognition of the wide spread geographic area affected by container movements to and from the port district.

As a first step in defining just what the area of influence is, forecasts on the future volume, origins and destinations of containers were developed for the years 2010 and 2025. Several data sets were integrated to define the flow of containers and included:

- **TRANSEARCH Projections**
- **Port Import Export Reporting System (PIERS) data**
- **Comprehensive Port Improvement Plan (CPIP)**
- **Industry Stakeholder Interviews**
  - Major container shippers and receivers;
  - Warehouse and distribution facility operators;
  - Third-part logistics providers;
  - Marine terminal and vessel operators;
  - Motor carriers and truckers

The future container movement forecasts, as summarized in Table 2, formed the basis for definition of the Portway Extensions Study Area. The Portway Extensions model was developed as a combination of the North Jersey Regional Transportation Model and the NJDOT Statewide Truck Tool. Future container flow projections were loaded into the Portway Extensions roadway network model to quantify the increases in container flows on specific segments of the roadway network within the primary study area. As discussed previously, this study focused on the movement of containers from their point of entry to their place of first rest.

Table 2
Future Container Movement Forecasts

	Existing	2010 Forecasts			
		Low	Factor	High	Factor
International via PONYNJ Marine Terminals					
Low Rail (no PIDN, 89% Truck)	12,885	17,756	1.38	20,477	1.59
High Rail (with PIDN, 57% Truck)	12,885	11,325	0.88	13,092	1.02
International via Landbridge Rail	6,163	10,475	1.70	12,236	1.99

	Existing	2025 Forecasts			
		Low	Factor	High	Factor
International via PONYNJ Marine Terminals					
Low Rail (no PIDN, 89% Truck)	12,885	22,686	1.76	28,430	2.21
High Rail (with PIDN, 57% Truck)	12,885	14,504	1.13	18,176	1.41
International via Landbridge Rail	6,163	16,942	2.75	21,344	3.46

Includes Port Newark/Elizabeth, Global, MOTBY, Howland Hook, Red Hook
Includes NS Croxton and CSX Kearny

Subsequent to advancement of Portway Phase I, previously envisioned Portway Phases 2, 3 and 4 were consolidated into the Portway Extensions. The Portway Extensions Concept Development Study was framed around the following objectives and benefits that highlight the importance of, and need for, the Portway Extensions:

- Develop value-added infrastructure and systems/operational efficiency to create a modern, seamless intermodal connection between port, rail and truck transfer facilities and the regional and national container distribution routes.
- Create an intermodal service platform that will generate economic opportunity and a higher quality of life through congestion reduction, Brownfield reuse and transportation related employment growth.
- Facilitate a reduction in congestion and avoidance of “freightlock”.
- Increase safety through improved ROW and roadway geometry, incident management and greater separation of trucks and automobiles.
- Support expansion of freight related economic development tied to access improvements, Brownfield remediation, and adaptive reuse of land and facilities.
- Forge new, long term public and private sector working relations tied to active industry and community stakeholder partnerships.
- Develop a recommended alternative improvements package focusing on system management, operations, information, and improvement.

The analysis and concept development process looked beyond current conditions in anticipation of future policy directions, and the role that New Jersey will play in the ever-changing global economy. The primary goal of the study was to identify realistic solutions to real problems, and lay the groundwork for long-term investment to ensure that the stream of commercial and consumer goods traveling to and through the state may be transported efficiently.

When considering the Portway Extensions, it is important to understand the limitations of the study. The study focused primarily on the northern portion of New Jersey, and specifically considered trucks carrying containerized goods between the railyards and maritime ports and their place of first rest. Transport of bulk and liquid commodities were considered as part of the overall travel demand background.

The study was specifically designed to take a system-wide look at the future of container growth and transport to, from and through the region, and to facilitate identification, prioritization and implementation of improvements based upon the point in the future when the anticipated need would become reality. As part of the system-wide regional planning approach, the scope of the study was designed to:

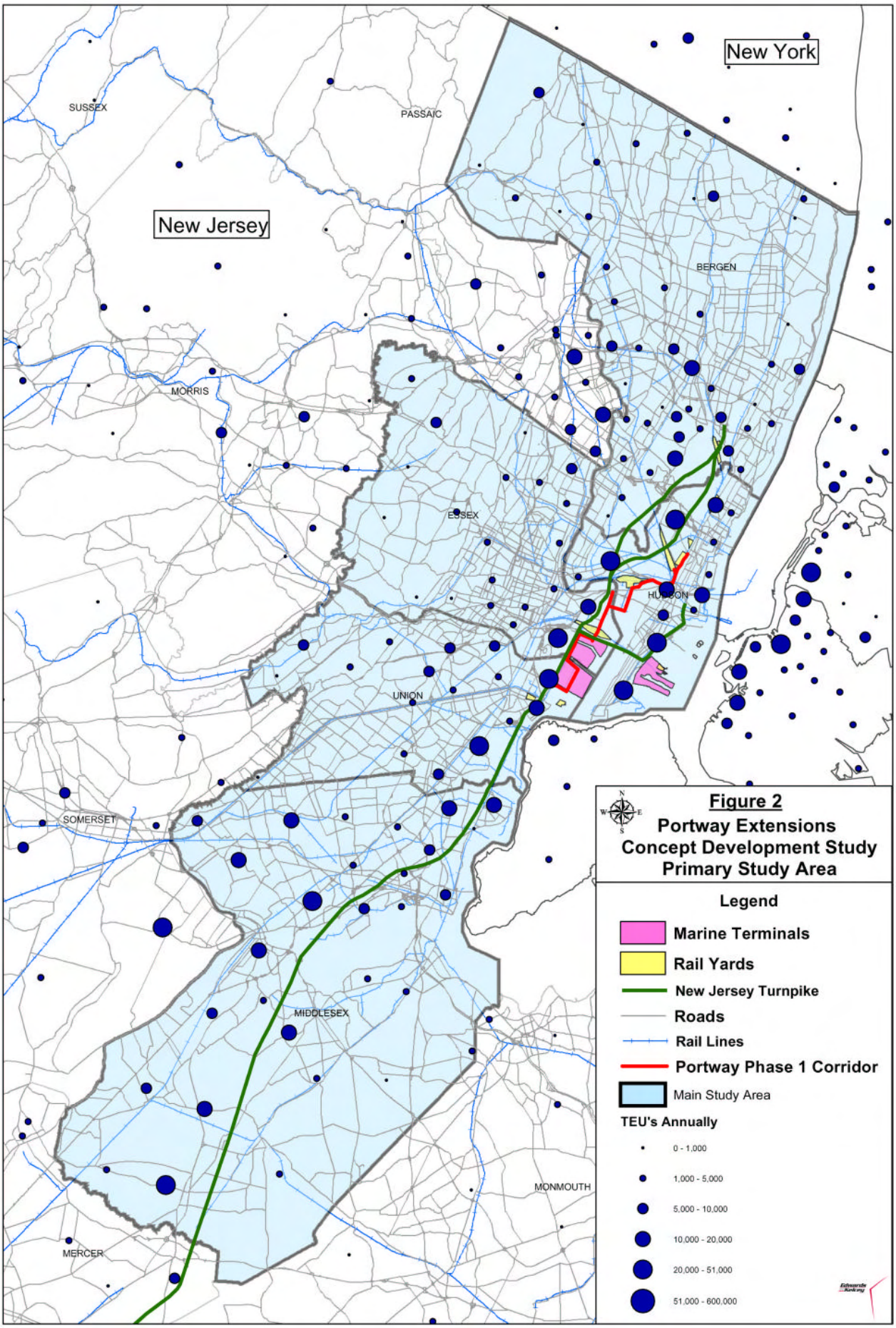
- Define and document existing and future container movements to, from and through the Portway Extensions Study Area.
- Identify and assess infrastructure improvements already being advanced by others.
- Develop a series of multimodal infrastructure, system and operational solutions to accommodate the projected container flow demands, relieve current high levels of congestion in this busy intermodal freight service corridor, meet growing future demand for access generated by increased activity at port facilities, rail yard and distribution centers, promote economic development, and create jobs along the Portway corridor.
- Prioritize the improvements based upon a series of performance measures and lead-time requirements for implementation.
- Involve a wide range of stakeholders including municipal and county planning officials, agency representatives, and affected industries in the planning and decision making process.
- Develop consensus for recommended concepts and prioritization.

I.4 PORTWAY EXTENSIONS - PRIMARY STUDY AREA

Prior to commencing application of the four-step planning process, it was necessary to define the primary study area. For the purposes of this initiative, the primary study area was defined to encompass a five county area including Bergen, Essex, Hudson, Middlesex and Union. The delineation of the primary study area was based upon an evaluation of the existing origin and destination points for the movement of containers. This area is depicted in Figure 2.

The dots in the figure represent international container arrival and departure volumes by zip code throughout northern New Jersey. This aggregation is effectively a representation of the distribution of container movement activity associated with the Portway Extensions Study Area. It was determined that the primary activity centers would remain relatively intact, thereby defining the geographic area of primary interest.

figure 2.jpg (5500x8492x24b jpeg)



I.5 PORTWAY EXTENSIONS – GUIDING PRINCIPLES, CONCEPT CATEGORIES AND EVALUATION CRITERIA

Guiding Principles in Concept Development

Focusing upon the findings of the container flow model application for the future conditions, a series of improvement concepts were developed to serve the primary study area. A series of guiding principles was developed to focus and facilitate the concept development process. The basic principles applied included:

- Enhance multi-modal access and connectivity between marine ports, intermodal rail yards, warehouse/distribution dense trade clusters, and the regional transportation network.
- Utilize and enhance existing rail and roadway infrastructure to the maximum extent possible.
- Build upon infrastructure improvement plans already in the planning stage.
- Create "positive system redundancy" and multiple travel paths and mode options between marine ports, intermodal rail yards, warehouse/distribution dense trade clusters, and the regional transportation network.
- Minimize adverse environmental impacts that would result from the implementation of physical infrastructure improvements.

Concept Categories

From the beginning, it was the intent of this study to develop a wide range of improvements that do not rely solely on the ability of the roadway network to accommodate container movements by truck. It was recognized early on that a wide array of non-roadway improvements would likely provide significant benefit without requiring the construction of new or expanded roadway capacity. Accordingly, a series of improvement concepts was developed for evaluation in this study. The categories were defined as:

- **Systems / Operational Improvements**
  - ITS System Architecture
  - Off-Peak Freight Operations – "Temporal Shift"
  - Container Management Strategies

- **Non-Roadway Infrastructure**
  - Elimination of height, weight, other capacity constraints – particularly on key rail links
  - Short Line/Short Haul Corridor Enhancements
  - Intermodal Yard Connectivity
  - PIDN Rail/Barge
- **Roadway**
  - Truck Priority / Truck Only Facilities
  - NJTPK Interchange Enhancements
  - "Last-Mile" and Major Facility Connectors
  - Bridges (new or improved)

Concept Evaluation Criteria

Throughout the study process, numerous ideas were put forth as potential improvement concepts. A set of criteria was developed to focus the evaluation process and quickly identify concepts for advancement in the process. The criteria included:

- ***Mobility/Redundancy*** – Will the candidate concept being considered result in enhanced mobility for the movement of containers, either regionally or at a local level? Will the concept provide an alternative or redundant travel mode or travel path to that which already exists?
- ***Freight Logistics*** – Can the logistical and/or institutional barriers that exist today or that would be created, be overcome, primarily with respect to the systems / operational and non-roadway concepts?
- ***Environmental*** – Does the concept involve construction of new or expanded infrastructure that would result in adverse environmental impacts, including such issues as wetlands impacts, residential neighborhood impacts, displacement of homes or businesses, etc.? If so, are the anticipated impacts minor in nature? Do the potential benefits outweigh the potential impacts?
- ***Security*** – Does the concept enhance or hinder the ability of port security to be improved?
- ***Technology/Operations*** – Does the concept involve the application of existing, proven technologies? Would reliance upon as yet unproven systems be required?

I.6 DEVELOPMENT OF RANGE OF IMPROVEMENT CONCEPTS

Once the future constraints to container movements were identified under the various growth scenarios, a series of conceptual improvements were developed to meet the future container movement demand. These improvement concepts assumed numerous forms, employing both traditional and non-traditional measures and technologies. Incorporating the results of the assembly and review of previous studies, input obtained from the first stages of the stakeholder outreach process, and observations from the aerial reconnaissance program, the initial range of alternatives was subjected to a preliminary fatal flaw screening, with concepts that passed the initial screening subjected to a more rigorous operational analysis

Growth in port activity and the volume of container movement through the study area is not expected to be linear over time. Rather, as individual port expansions come on line, increases in container movements will occur in relatively discrete “jumps” over the next 20 years. Accordingly, an alternative ranking and implementation prioritization was developed for those alternatives that were found through the detailed analysis to provide significant operational improvements to the movement of containers. This ranking and prioritization was be based upon a combination of the timing of the specific anticipated port activity growth components and the point in the future at which operational improvements will be necessary to efficiently accommodate the increases in container movement.

I.7 RECOMMENDED IMPROVEMENTS

As discussed previously, improvement concepts fell into three (3) basic categories:

- **Systems / Operational Improvements**
- **Non-Roadway Infrastructure**
- **Roadway**

Systems / Operational Improvements

A series of systems and operational improvement concepts were developed as part of the Portway Extensions Concept Development Study. These concepts are considered to be feasible and implementable in the near term, and hold the potential for providing significant congestion relief and enhancement to the movement of international containers. While aggregated into the same broad category, the individual components of the concept set will require advancement along different tracks with involvement from a range of agencies and jurisdictions.

- **Intelligent Transportation System Architecture (Near-Term Improvement Concept)**

  ITS technologies and applications represent a set of powerful tools to ensure that existing infrastructure is utilized as efficiently as possible, and can help reduce or delay the need for new infrastructure development. Although there are several operational ITS systems in NJ, the Portway area lacks a strong communication network. The current ITS systems are located on Route 80 (MAGIC), NJ Turnpike (I-95), and Route 21 (Main Line and Regional). NJ Department of Transportation (NJDOT) owns the MAGIC, Route 21 Main Line and Route 21 Regional ITS systems. The initiative would best be advanced through a 3-step process to develop a 5-year "project pipeline" of real Intelligent Transportation System (ITS) construction projects supporting the goal and objectives of the user services.

  The ITS components described above form a comprehensive program of non-infrastructure improvements that optimize the existing transportation system. Collectively, the system components comprise Market Packages that are consistent with the definitions put forth by the Federal Highway Administration. While not all of the individual user requirements have the same importance, implementation of a complete market package, in this case, *Advanced Traveler Monitoring System (ATMS)* and *Advanced Traveler Information System (ATIS),* yields maximum system

flexibility and utility. Therefore, it is recommended that the complete packages be advanced in the near term.

- **Off-Peak Freight Operations (Near-Term Improvement Concept)**

Container-related truck traffic tends to be spread more or less evenly throughout the daylight hours. But the negative impacts of container truck traffic are felt most during the AM and PM peak hours, when the highway system is most heavily used by other traffic. At off-hours, when background traffic is light and highway capacity is available, container trucks have relatively little impact.

The opportunity here is to examine strategies that encourage container trucks to increase their utilization of the highway system when capacity is available. This is not a simple issue, because different types of trucks have different travel time requirements, and their ability to shift travel time is limited by a number of factors including:

- Local ordinance restrictions on pickup and delivery hours
- Availability of truck rest areas
- Impact of work zones
- Per trip payment or per hour shorthaul
- Pickup and delivery hours

- **Container Management Strategies (Near-Term Improvement Concept)**

Container logistics involves a substantial number of non-freight carrying moves. There are a variety of management strategies that could help reduce the number of these non-freight moves, thereby reducing the level of demand on the region's transportation system without reducing the positive economic benefits associated with the movement of containerized goods in the region.

- Internet-based and ITS systems for exchanging empties and equipment outside of major terminals
- Information systems for scheduling and coordinating truck pickup and delivery
- Alternatives for the handling of empty boxes
- Alternatives for the handling of overweight containers
- Development of chassis pools and chassis terminals
- Consolidation and development of container activity at "Container Freight Villages."
- "Inland Port" operations

Non-Roadway Infrastructure

Short-haul rail service for containers would serve several potential applications:

- Substitution for trips that would otherwise occur by truck, primarily to dense regional warehouse and distribution clusters that could generate sufficient levels of rail traffic to make the service economically viable. This is, in essence, a "local" version of the Port Inland Distribution Network (PIDN) concept being advanced by the Port Authority of New York & New Jersey.
- Support for the creation of freight villages, the management of empty containers, and the redevelopment of portfield sites.
- Support for the development of inland port facilities.

The concept of the shorthaul rail network may be summarized as a means to move containers between the dense, congested urban core surrounding the maritime ports and intermodal railyards and locations where warehouse/distribution activity either is, or could be, aggregated without the use of trucks. Shifting a significant portion of container movements from truck to rail mode would serve to reduce vehicle miles of travel by truck, make use of underutilized capacity on the rail system, encourage portfield and brownfield development, and provide greater flexibility to shippers and port operators. Additional study is required to more fully define the physical improvements that would be required, as well as the specific constraints and needs of shippers and terminal operators.

Several existing and emerging warehouse/distribution center locations of particular note may be investigated as models for the implementation of shorthaul rail service. These sites include:

- Raritan Center Industrial Campus located near NJ Turnpike Interchange 10 in Middlesex County.
- Forsgate Center International Trade Zone located around NJ Turnpike Interchange 8-A in Middlesex County.
- Tremley Point, located proximate to NJ Turnpike Interchange 12 in Union County.

Maximizing the utilization of the extensive existing rail network, and coordinating operations between a variety of rail line owners and operators would serve to allow the efficient movement of containerized freight without the use of trucks. Impacts to the roadway infrastructure would be significantly reduced There are numerous challenges involved in short-haul rail service for containers – overcoming the perceived cost and service advantage provided by trucking, developing suitable institutional and business relationships among the railroads, demonstrating how the concept can benefit truckers and customers (by potentially eliminating the most congested, most costly, and least profitable part of the trip), identifying the necessary rail infrastructure and improvements, and ensuring that short-haul rail operations are compatible

with other uses of the regional rail system. Applying innovative rail technologies and operating practices will be the keys to making rail effective and competitive over shorter distances. Development of the physical infrastructure of the shorthaul rail spine, and institutional policies governing its operation, is strongly recommended for near term advancement. Currently, a Geographic Information System (GIS) geodatabase incorporating physical and operational data related to the rail system in New Jersey is being compiled. When complete, this queryable analysis tool will allow for database will facility evaluation of necessary system improvements and informed investment decision.

A conceptual short-haul rail network utilizing existing railroad rights-of-way is depicted on Figure 3. The rail lines depicted on Figure 3 as appropriate for implementation of shorthaul rail service were identified based upon the following criteria:

- The rail infrastructure is currently in place (existing line) with relatively modest improvements necessary (if at all) for the operation of shorthaul container service.
- Rail lines provide the most direct connection between the seaport complex, the Class I intermodal railyards and existing or anticipated dense warehouse/distribution centers.

While the potential may exist for expanding or enhancing the shorthaul rail system through additional rail lines, acquisition of new rail right of way was not anticipated nor considered in the identification of the shorthaul rail network depicted on Figure 4.

figure 3a.jpg (5500x8492x24b jpeg)

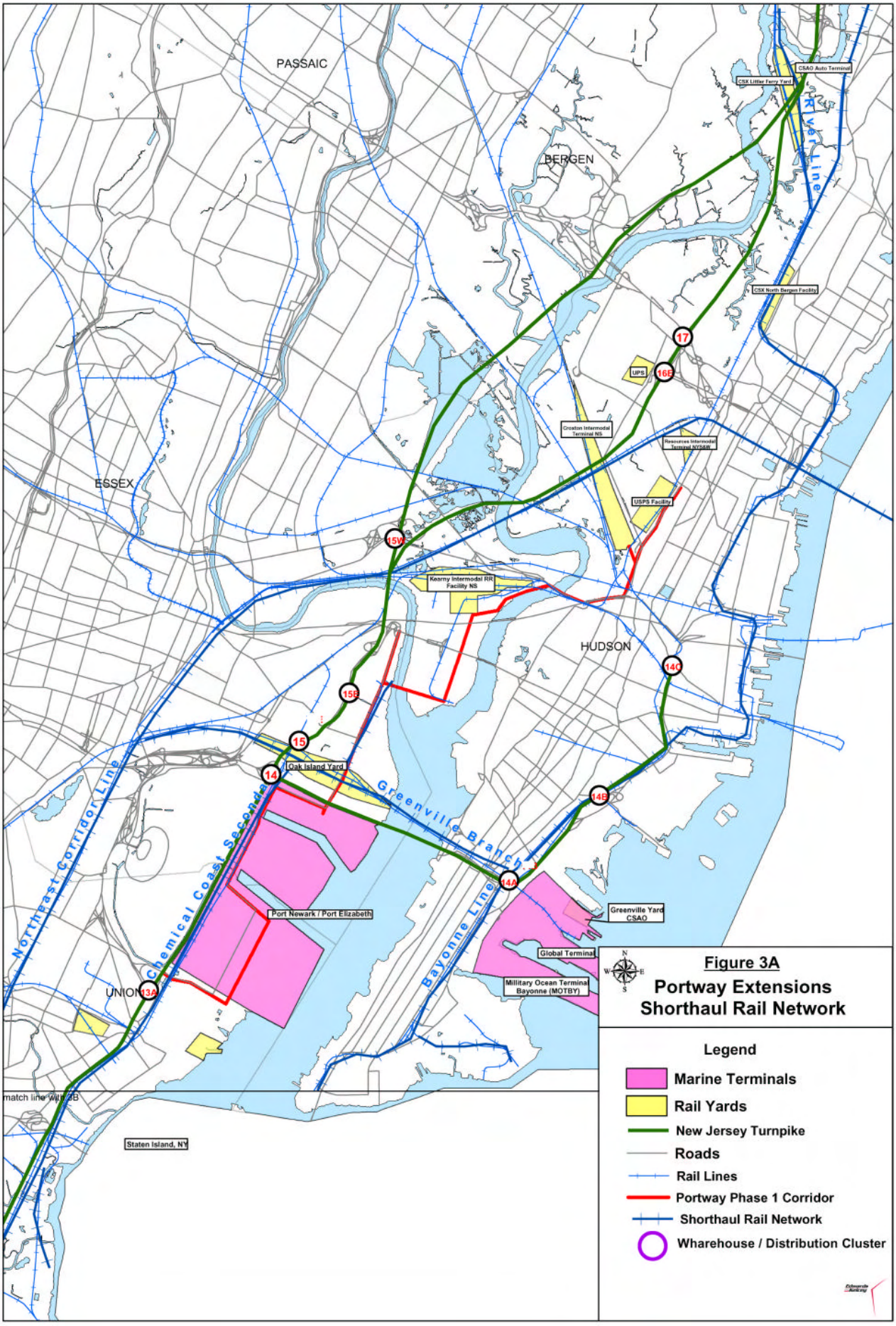
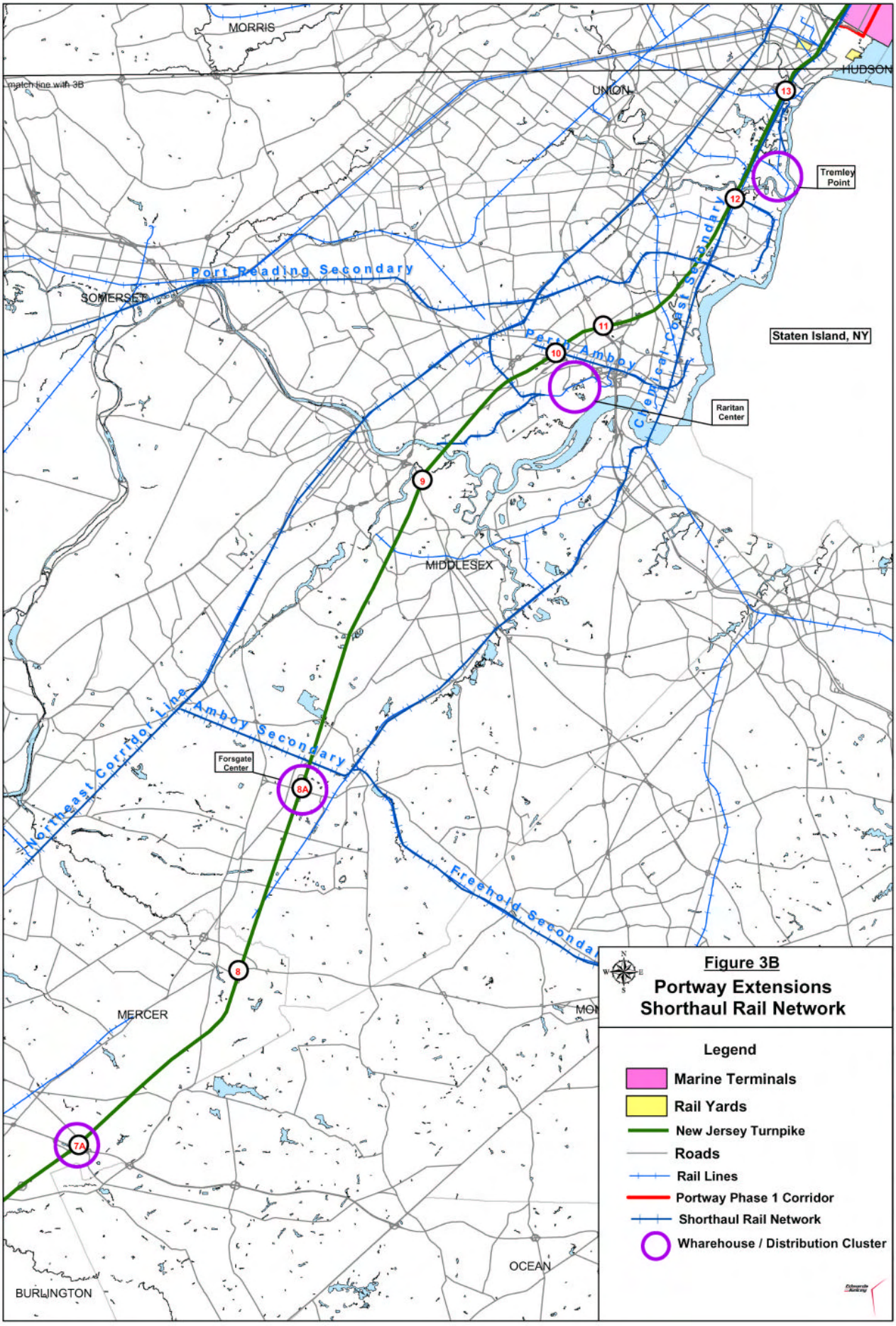


figure 3b.jpg (5500x8492x24b jpeg)



Roadway Infrastructure Improvements

While the systems, operational and non-roadway infrastructure improvements will reduce the overall magnitude of container trips being made by truck during the peak periods, a significant volume of container truck trips will remain on the roadway network. These movements will be competing for available capacity with a tremendous volume of background traffic and non-goods movement related trips. Accordingly, physical improvements to the roadway infrastructure will still be required. Accordingly, a number of roadway infrastructure improvements were identified that would significantly enhance the mobility of container trucks as well as the motoring public at large. An overview of the roadway improvements concepts recommended as part of the Portway Extensions is depicted on Figure 4.

The following is a description of the physical improvement concepts recommended by the Portway Extensions analysis for further study and feasibility investigation. While each of the recommended improvement concepts can stand on its own merit as an isolated improvement, these recommendations have been aggregated for the purpose of graphical representation on Figures 5 through 9. It is important to note that the functional areas depicted on the figures do not represent any form of concept prioritization for the advancement of the individual concepts. Even though individually each recommendation would provide significant mobility improvements, maximum benefit would result from implementation of all of the concepts, particularly those that would serve to compliment each other.

Bayonne Peninsula Access Improvement Concepts

Due to the near term growth potential associated with the MOTBY peninsula and potential expansion of the Global Marine Terminal, extension of the Portway network to points east would yield significant operations improvement and congestion relief. Recommended concepts that would support the growth of container movement on the Bayonne Peninsula are depicted on Figure 5 and include:

- **NJ Turnpike Interchange 14-A Improvements**

  The Bayonne Local Redevelopment Authority (BLRA) is investigating the redevelopment potential of the Military Ocean Terminal, inclusive of the creation of a container port along the northern shore of the MOTBY peninsula. Additional development will likely consist of a mix of residential and commercial land uses, all of which are expected to generate extensive additional traffic volumes, both automobile and truck. Two concepts have emerged as having significant merit in terms of feasibility and mobility enhancement, both of which center around major reconfiguration of the NJ Turnpike Interchange 14-A and connections to the local roadway network.

- **NJ Turnpike Newark Bay Bridge**

  At one time, the Newark Bay Bridge operated with three travel lanes in each direction. As an interim measure, replacing the existing fixed median barrier with a movable median barrier would allow the creation of a reversible center lane. Three travel lanes would be maintained eastbound during the a.m. period, with three travel lanes being maintained in the westbound direction during the p.m. period. Operations would be similar to that which is currently in place on the Tappan Zee Bridge.

- **Bayonne Bridge Elevation**

  While operational improvements were not found to be necessary in terms of roadway capacity, it is recognized that the channel clearance of the bridge at mid-section is only one hundred fifty feet. Plans are underway to increase the depth of the channel by dredging at this location, allowing larger vessels to access Port Newark/Port Elizabeth. Some of these larger vessels will require increased clearance under the bridge.

  The proposed improvements for the Bayonne Bridge include replacing the bridge at a higher elevation to increase the vertical clearance. This would involve reclamation of area at the base of each side of the bridge, including several residential properties, to obtain the required grade modifications.

Railyard Access Improvement Concepts

In recent years, significant growth in warehousing and distribution activities has occurred in the region west of the port district. Much of this growth is located in eastern Pennsylvania, particularly the Bethlehem and Allentown PA region. Similarly, significant growth is anticipated in the level of container activity arriving and departing from the regions Intermodal Railyards. The following recommended improvement concepts, depicted on Figure 6, would provide significant improvement in truck accessibility to the railyards, as well as enhanced access to and from the Interstate 280 corridor.

- **NJ Turnpike Interchange 15-W Connectivity**

  This improvement concept, dubbed “the wishbone” due to its design appearance, would utilize right-of-way currently occupied by the under-utilized Newark Industrial track and the east end of the Boonton Line. Utilizing a portion of Harrison Avenue, direct connections would be created between the NJ Turnpike Interchange 15-W and the two major intermodal rail yards. Creation of these truck haul roads would alleviate congestion along portions of Route 7 and other small commuter roadways. Additionally,

through creation of a new roadway segment and intersection with Harrison Avenue, this concept would facilitate provision of access to existing brownfield sites.

- **Hackensack River Bridge – Central Ave to Route 440**

  Portway Phase I includes the construction of a new bridge across the Passaic River. The bridge would supplement the existing Route 1&9 Truck crossing, and provide a connection between Doremus Avenue and Central Avenue. A logical extension to this improvement is the construction of a bridge across the Hackensack River connecting Central Avenue with Route 440 in the vicinity of Culver Avenue. This new bridge, coupled with the Portway Phase I improvements would create an alternative pathway between Jersey City and the Bayonne Peninsula and the Port Newark/Elizabeth area and NJ Turnpike Interchange 15-E. This would create a redundant, alternative routing that would alleviate congestion on the Newark Bay Bridge as well as the NJ Turnpike Interchange 14 area.

NJ Turnpike Mainline Interchange Improvement Concepts

Several areas roughly proximate to the NJ Turnpike corridor south of the seaport complex were identified as high growth areas for warehouse and distribution center development. This growth in industrial land uses is expected to generate significant increases in truck traffic, particularly container trucks, to and from these dense industrial areas. While the shorthaul rail network is particularly well suited to accommodate a portion of this growth, improvements to the roadway infrastructure will still be required, including the following concepts as depicted on Figure 7.

- **NJ Turnpike Interchange 13 Improvements**

  The Goethals Bridge, linking Staten Island to New Jersey, accommodates heavy volumes of automobiles and trucks. Plans are being advanced to replace the Goethals Bridge, providing six travel lanes as opposed to the existing four travel lanes. This increased capacity on the bridge itself necessitates additional supporting improvements at the approach and departure roadways.

- **NJ Turnpike Interchange 12 Area Improvements**

  Tremendous industrial development is anticipated in the near future within Tremley Point and the existing industrial complexes of Carteret and Port Reading. In recognition of this growth potential, major reconstruction of the NJ Turnpike Interchange 12 is currently under design. While these improvements will facilitate access to and from the Turnpike, the local connector roadways between the interchange area and the local industrial complex require significant enhancement.

In addition to the short haul rail spine discussed previously, expansion and extension of Roosevelt Avenue and Industrial Avenue are necessary to provide access for trucks to Carteret and Port Reading. With the advent of enhanced rail activity, Roosevelt Avenue would be widened to allow trucks greater access to the turnpike to and from the local rail yard.

- **NJ Turnpike Interchange 10 Improvements**

Raritan Center in Woodbridge is one of the largest single industrial park complexes in the United States, with tremendous potential for continued growth. The complex is reasonably well served by a number of major regional roadways, as well as currently active shortline rail service. Under the future growth scenarios, the volume of traffic, including container trucks, accessing the complex is expected to increase significantly. The NJ Turnpike Interchange 10 is expected to receive significant volumes of additional traffic flows.

The conceptual improvements to the Interchange 10 area would enhance connections for trucks between the interchange toll plaza and Industrial Avenue. This enhanced connectivity would serve not only container trucks destined to and from the facility, but also the tremendous volume of local trucks that characterize the local environment.

- **NJ Turnpike Interchange 8A Improvements**

The area in the immediate vicinity of New Jersey Turnpike Exit 8A is characterized by light industrial development. Within the Exit 8A area, a total of approximately 4,500 acres of land is zoned as industrial. A considerable number of light industrial uses have been developed within the industrially zoned land in the Exit 8A study area, with development of a significant number of new light industrial uses anticipated. Presumably, many of these future developments will be distribution centers. These new developments collectively would generate a sizable number of truck trips to the area. The construction of Route 92, which will connect the Turnpike at Exit 8A to Route 1, will help to increase the attractiveness of this area for distribution centers. No improvements are currently planned for the Exit 8A toll plaza or ramps. Additional local connector improvements will be developed as more detailed plans for the development of the region and a location for a potential short haul rail yard is identified.

- **NJ Turnpike Interchange 7A Improvements**

The area surrounding NJ Turnpike Interchange 7A is experiencing similar development of warehousing and distribution centers as the area surrounding Interchange 8A. No

improvements are currently planned for the Exit 8A toll plaza or ramps. Additional local connector improvements will be developed as more detailed plans for the development of the region and a location for a potential short haul rail yard is identified.

Meadowlands and New York State Access Improvement Concepts

Dense development and routinely congested roadways characterize the region north of the seaport complex. Several concepts were identified that build upon the Portway Phase I corridor and provide significant improvements to container truck travel between the seaport complex, the intermodal railyards and points north in Bergen County and New York State. These concepts are depicted on Figure 8 and include:

- **New Road Extension to Little Ferry**

  One key component of the Portway Phase I improvements is the creation of a new roadway linking St. Paul's Avenue to County Road in Secaucus in the vicinity of the Croxton Intermodal Railyard. Under Portway Phase I, this roadway is being investigated for extension further north to terminate at Secaucus Road. Extending this roadway further to the north and creating direct connections to the NJ Turnpike in the vicinity of the Vince Lombardi Park-n-Ride would effectively create a third north-south spine for travel between the Port District and points north. This improvement would alleviate congestion along the Tonnelle Avenue corridor as well as along the Route 3 corridor east of Route 17.

- **Routes 1&9 NB with Delancy Street**

  Northbound Routes 1&9 north of Interstate 78 experiences recurring congestion. A key cause of this condition is spillback from the intersection of the Route 1&9 northbound ramp with Delancy Street. This partial diamond interchange provides minimal storage between the ramps, with large vehicles often grid-locking the interchange area for short periods of time. The improvement concept for this location consists of widening of the northbound off ramp, and provision of greater separation between the signalized intersections of the ramps with Delancy Street. A dedicated flyover would be constructed to allow vehicles exiting Route 1&9 northbound to access South Street without affecting the two signalized intersections.

- **Paterson Plank Road/Route 3 Corridors**

  Two conceptual improvements were determined to have merit with respect to relieving congestion and facilitating the movement of containers. Reconstruction of the former Paterson Plank Road bridge over the Hackensack River would create a new corridor for

travel between Route 17 north of Route 3 and the Tonnelle Avenue/Paterson Plank Road interchange area.

Seaport Access Improvement Concepts

NJ Turnpike Interchanges 14 and 13-A represent the key portals for container trucks traveling between the Turnpike and the seaport complex. As such, the efficient operation of these interchanges is critical to the mobility of container traffic. The two recommendations developed to advance this goal are depicted on Figure 9 and include:

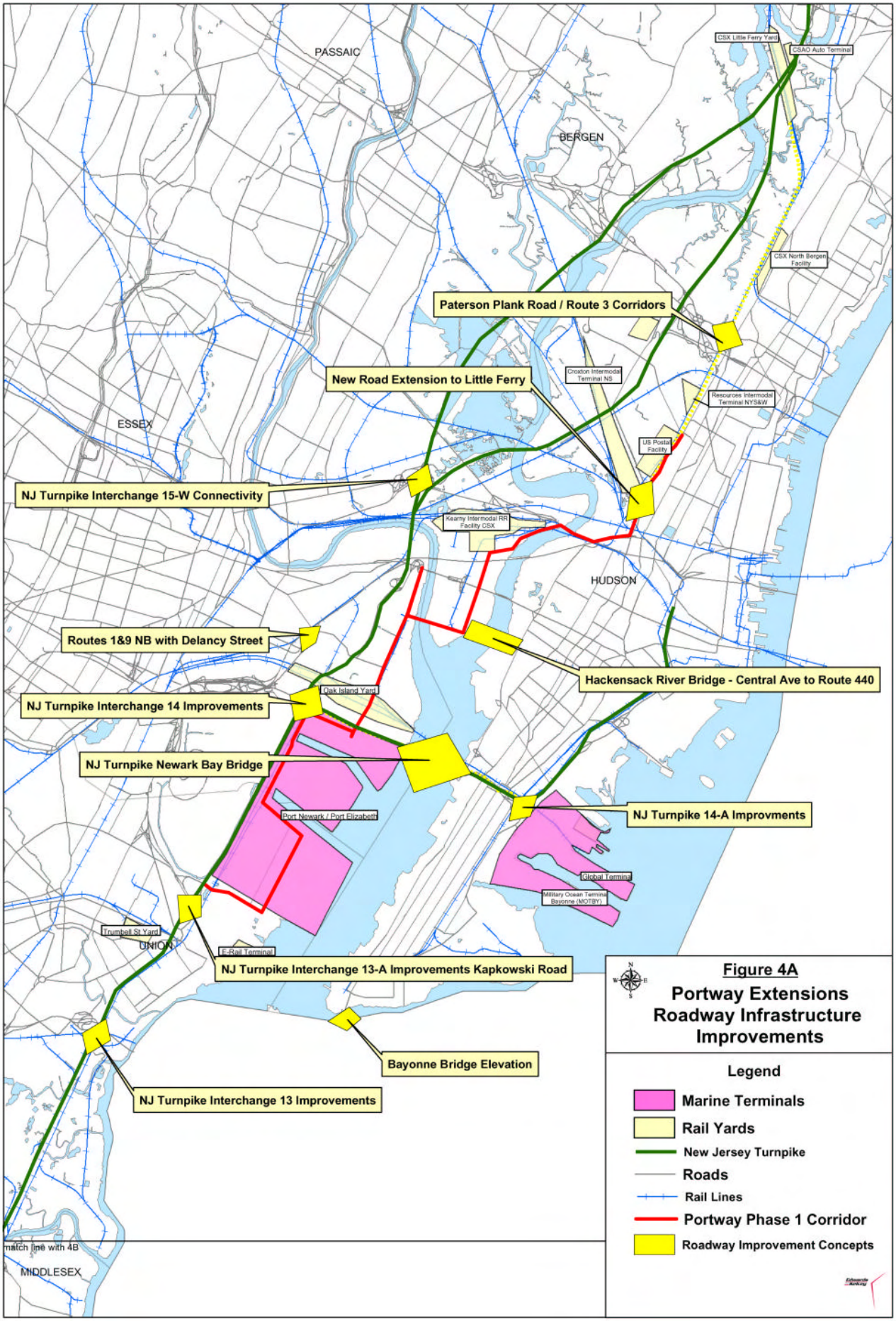
- **NJ Turnpike Interchange 14 Improvements**

  Interchange 14 connects the NJ Turnpike with Interstate 78 and Routes 1&9. Adjacent to the interchange is the beginning of the Portway Phase I improvements, which link Port Newark/Port Elizabeth to the Kearny, Croxton and Little Ferry Rail Yards. The proposed improvements to Interchange 14 facilitate movements from Interstate 78 eastbound and the NJ Turnpike exit plaza to Brewster Road, Port Street and the Newark/Elizabeth Seaport Complex. In addition, a direct connection would provide truck only access from Port Street to the NJ Turnpike toll plaza, thereby reducing the volume of trucks within the interchange itself.

- **NJ Turnpike Interchange 13-A Improvements – Kapkowski Road**

  An analysis of the transportation needs of this area identified a series of both transportation capital and systems management projects for the area and has advanced select priority projects into preliminary engineering. The set of proposed improvements most pertinent to the Portway Extension project are located in the North Avenue corridor. The Kapkowski Road study has developed a series of improvements that substantially improve the vehicular flows on the North Avenue corridor and separate port from non-port traffic.

figure 4a.jpg (5500x8492x24b jpeg)



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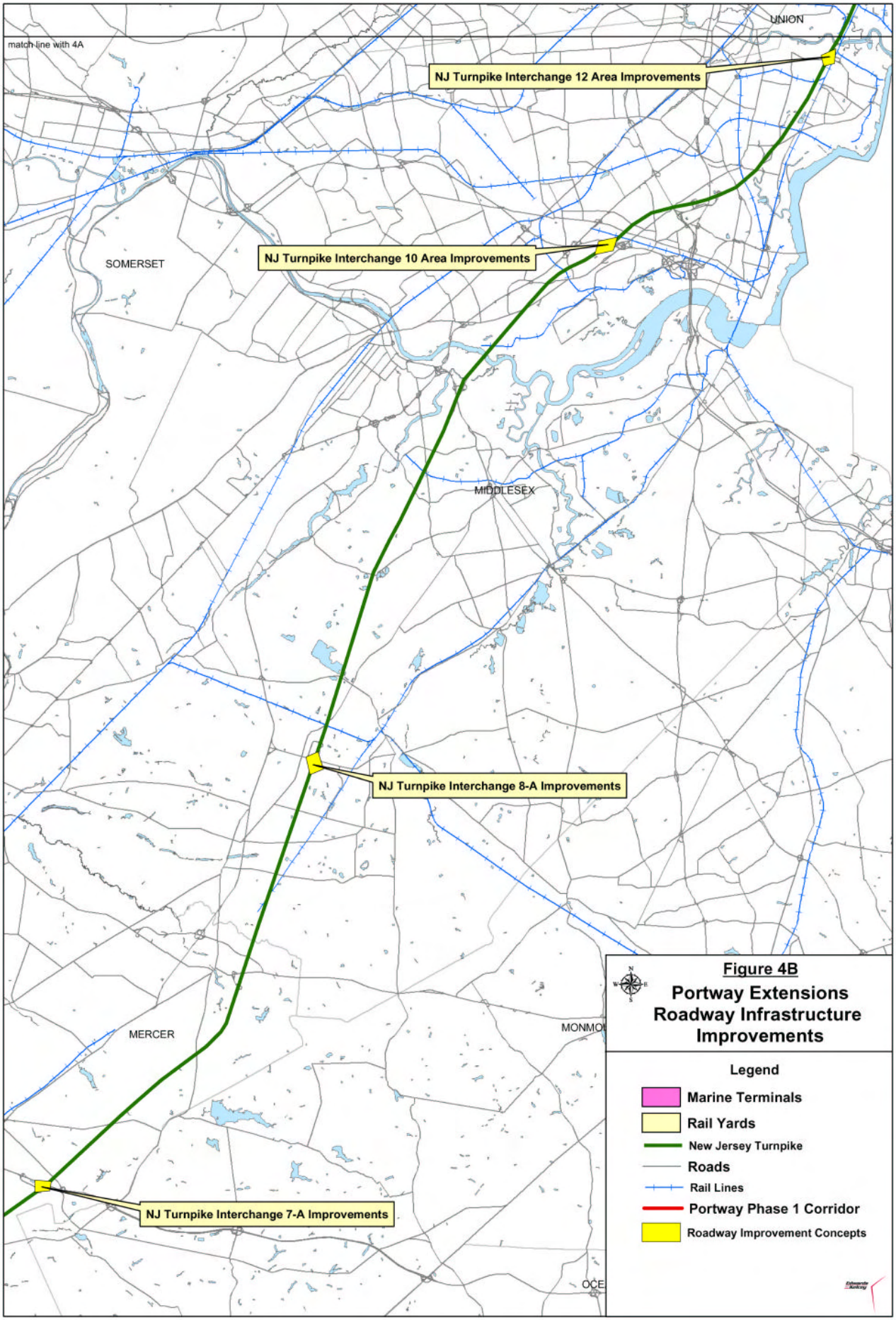

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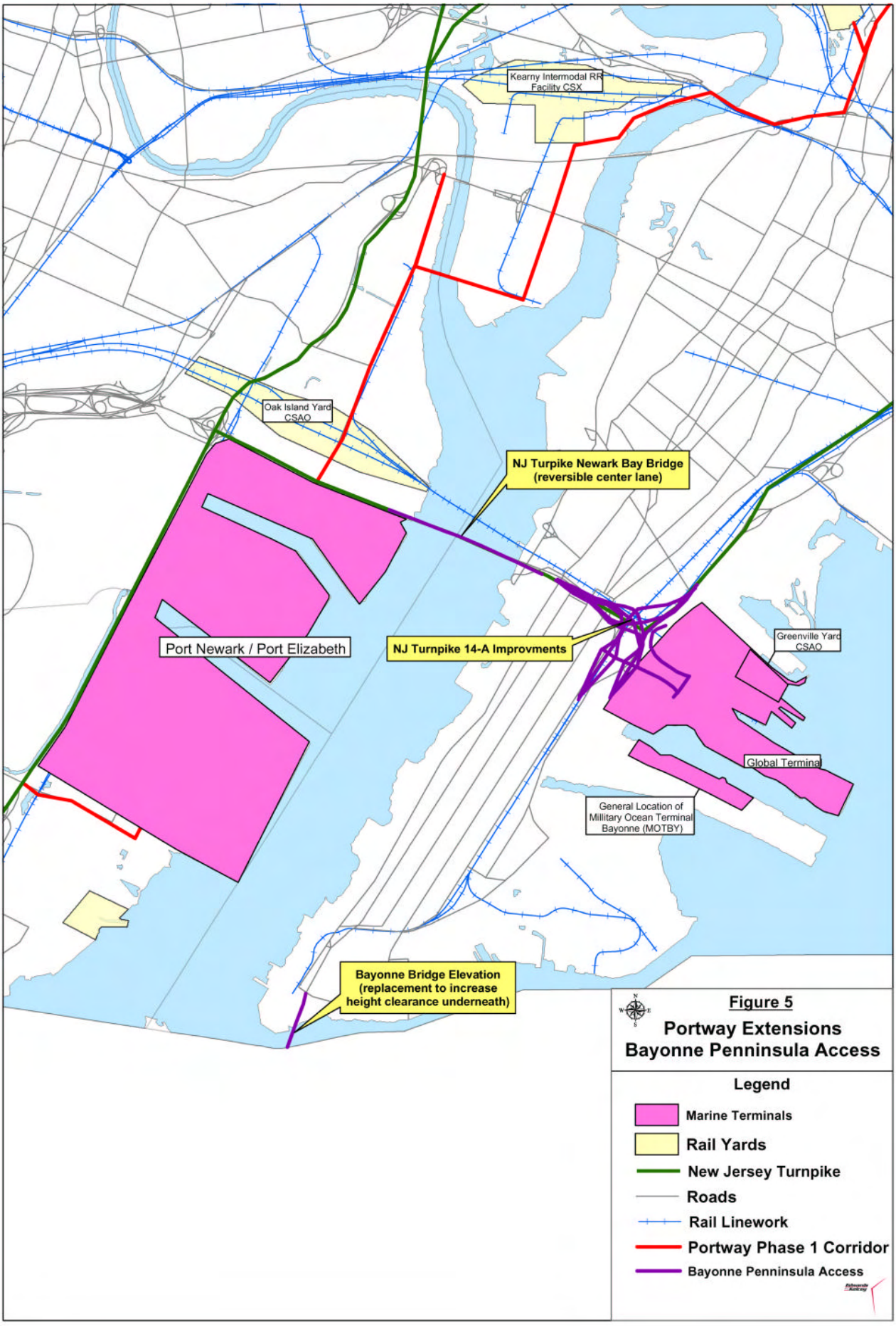

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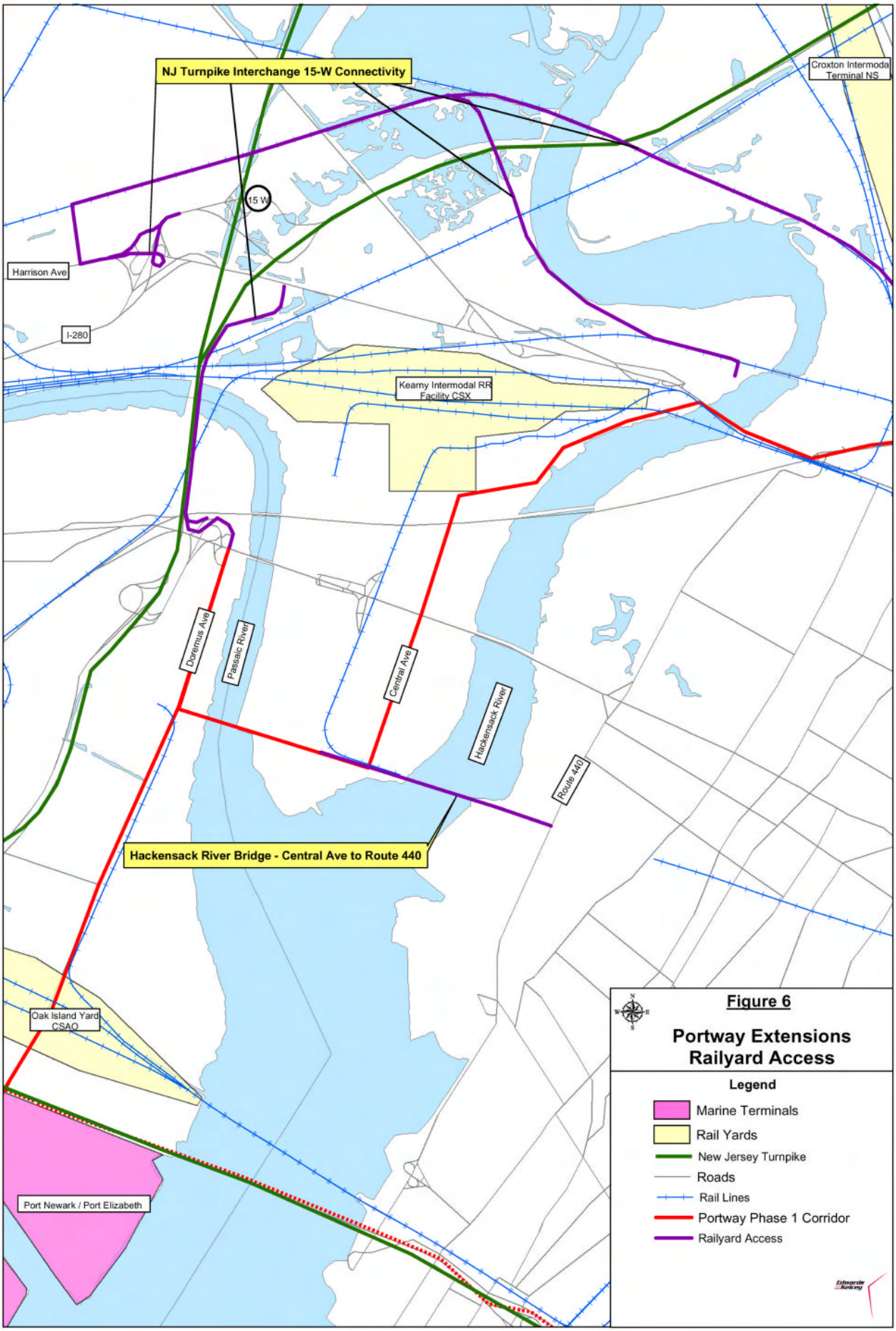

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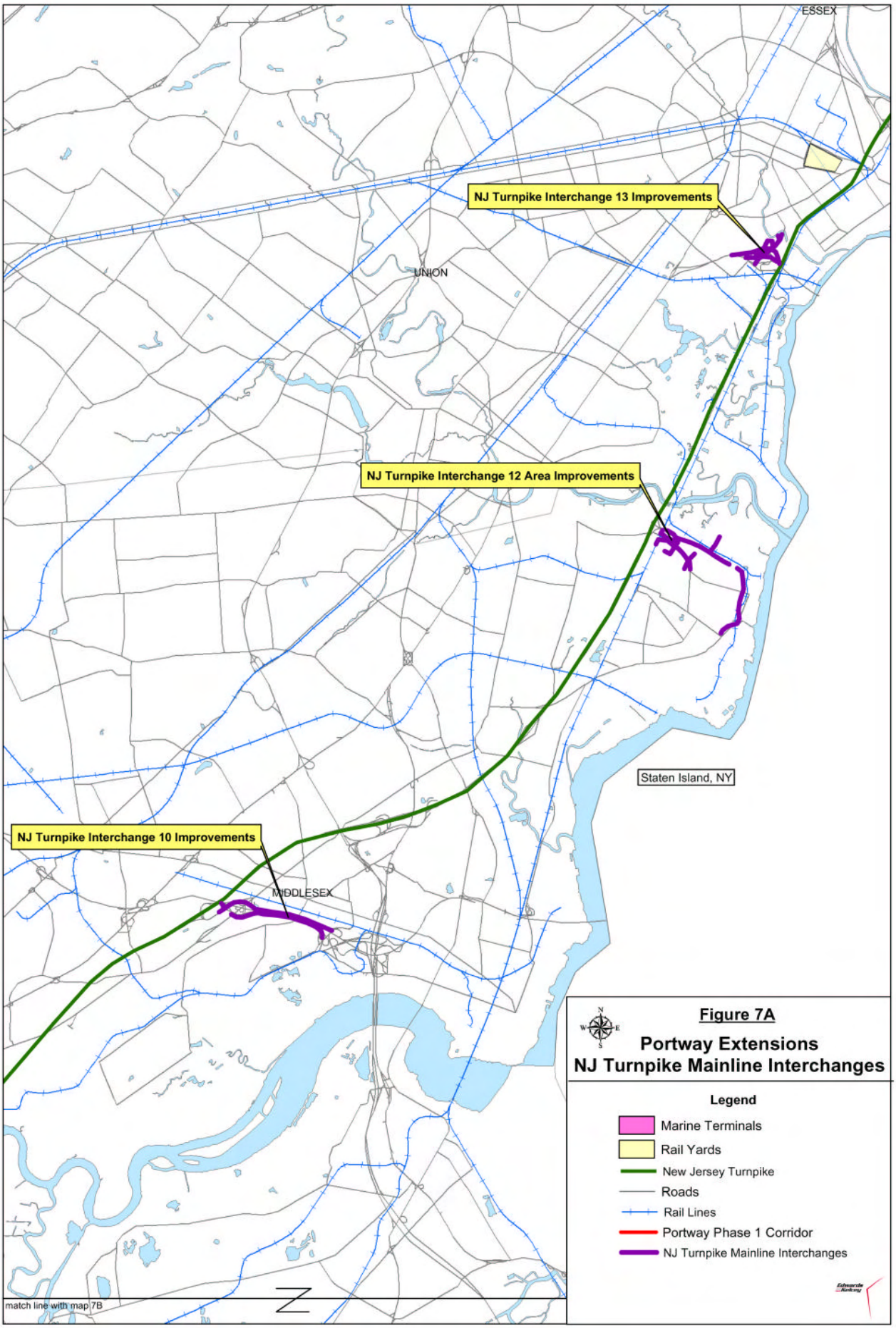

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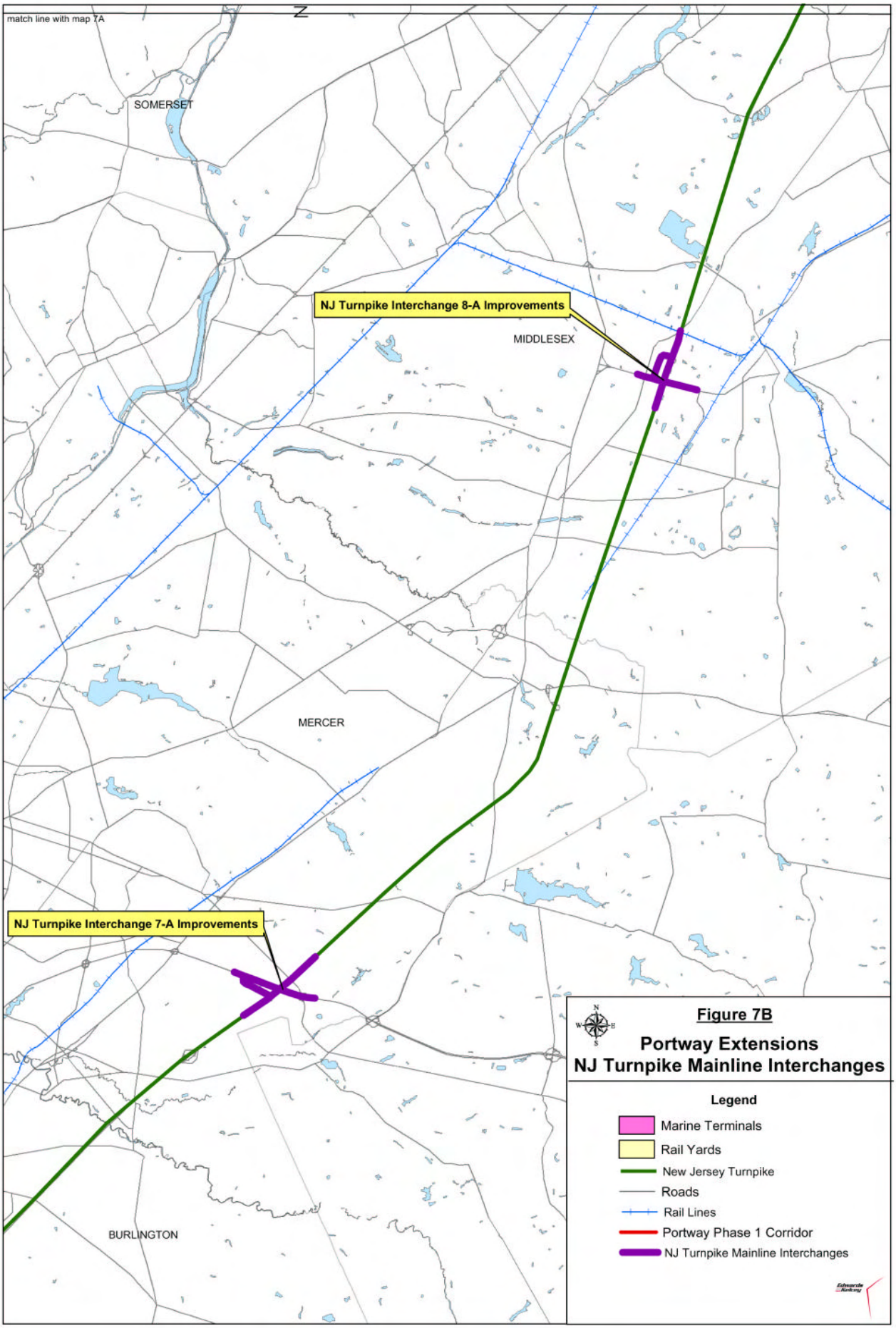


figure 8.jpg (5500x8492x24b jpeg)

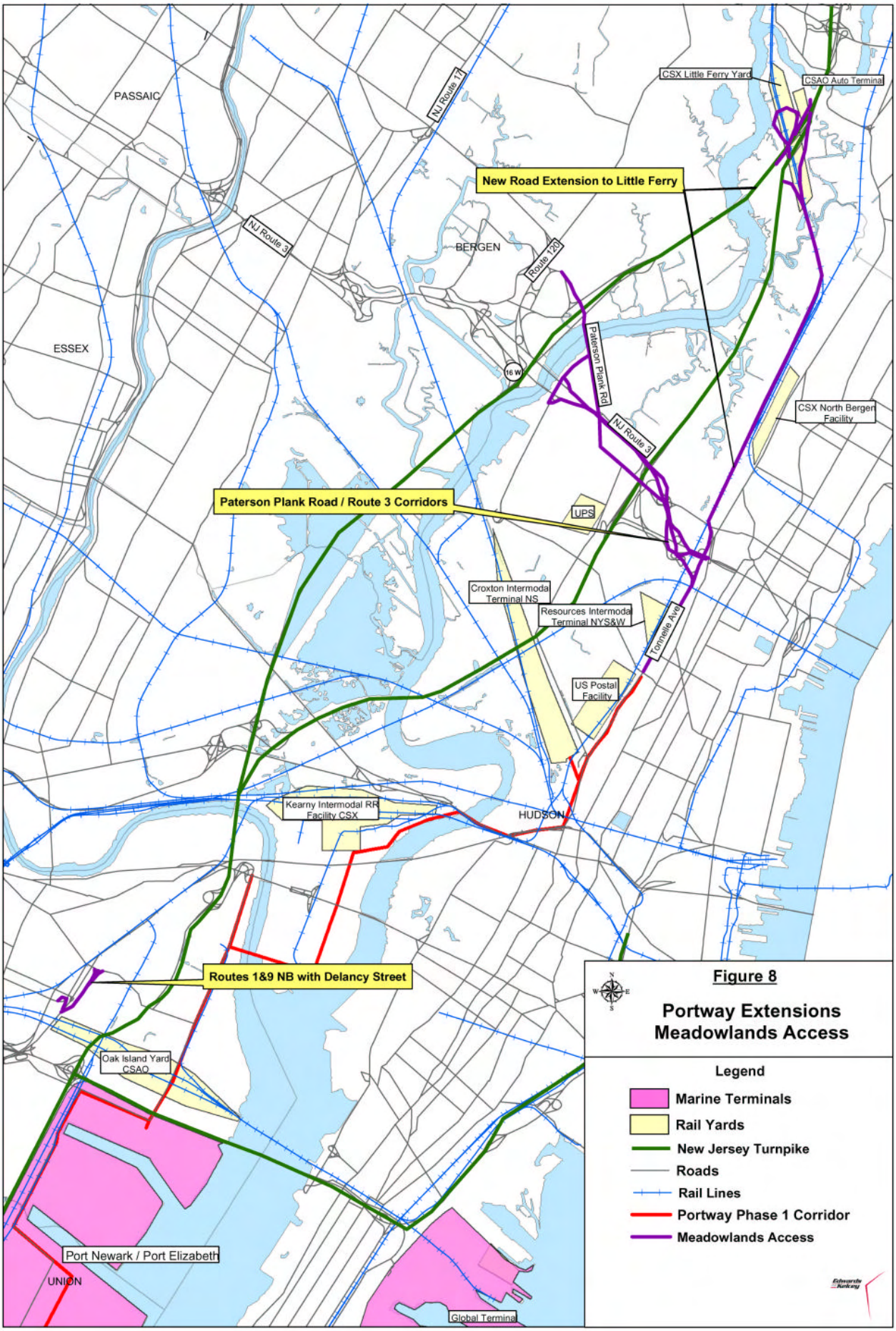
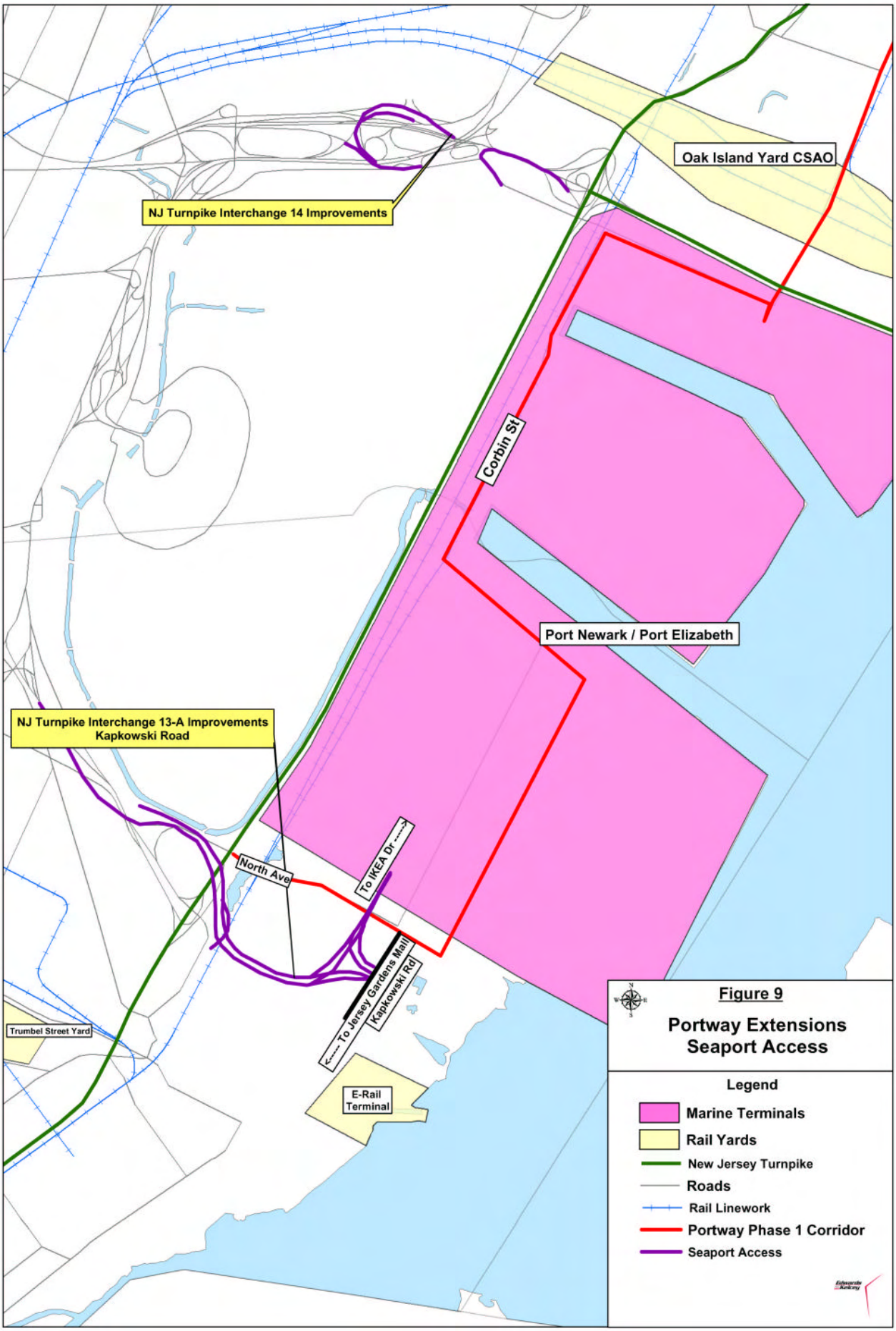


figure 9.jpg (5500x8492x24b jpeg)



I.11 CONCEPT PRIORITIZATION

The movement of containers through New Jersey is a dynamic process, with origins, destinations and volumes depending on numerous factors. Relatively few of these factors that dictate demand are within the control of the State of New Jersey. Private sector market demands, as well as global trade trends are major driving factors in goods movement. Creation and maintenance of a transportation infrastructure to adequately address these demands and encourage and support growth in the goods movement industry is critical in leverage the associated jobs and economic benefits that can accrue to the State.

Growth in the number and distribution of container movements over the next 20 years is not expected to be linear. Sudden spikes in growth, or redistribution of origins, destinations and travel paths will be a function of actions taken by the ports and the warehouse/distribution centers. It is not possible or practical predict with certainty just when, and in what order, these influencing actions will occur. While by the year 2025, all of the recommended improvements are expected to have become necessary, flexibility must be maintained in the prioritizing and implementing of recommended improvements.

In the near term, several actions have been identified as imminent, pointing to several improvements concepts that are recommended for prioritized advancement. These include:

- Growth in container port activity on the Bayonne Peninsula is expected to occur over the next several years. This growth is attributed to the potential development of a container port on the MOTBY peninsula, and expansion of the Global Marine terminal. This near-term growth points to a need to prioritize and advance improvements to the NJ Turnpike Interchange 14-A and the creation of a movable barrier along the NJ Turnpike Hudson County Extension over Newark Bay.
- Tremley Point in Union County has been the focus of extensive study for the development of an industrial district that could house several million square feet of industrial warehouse and distribution center space. The NJ Turnpike is currently advancing plans for improvements to the NJ Turnpike Interchange 12, which will serve as the primary roadway access to Tremley Point. Additional improvements recommended through the Portway Extensions Concept Development Study should be prioritized for near term advancement.

Further prioritization of improvement concepts will be the subject of further monitoring of developments in the goods movement industry, with individual concepts advanced in response to the next anticipated spikes in long-term growth.

I.12 BENEFIT-COST ASSESSMENT

A comprehensive Economic Impact Analysis was conducted to define and quantify the positive benefits that may be attributed to the Portway program. The analysis results may be summarized as follows:

Cost Side (non-escalated 2003 $)

- Total Program Cost Estimated at approximately $2.8 Billion over 20-year implementation period.
- Approximately $1.4 Billion required over first 10 years.
- Additional $1.4 Billion required in subsequent 10 years.
- Roadway Infrastructure costs total approximately $2.1 Billion, with $1.1 Billion required in initial 10 years.
- Systems/Operations/ITS Communications Improvement costs total approximately $90 Million to be invested over initial 10 years.
- Short Haul Rail Infrastructure and Rolling Stock costs total approximately $500 Million, with $290 Million required in initial 10 years.

Table 3 summarizes the associated costs by improvement concept. The cost estimates were generated following the standard NJDOT preliminary construction cost estimating procedures, Class I – New Construction. The cost estimated include Major Construction Item costs for such elements as:

- Earthwork
- Pavement
- Bridges
- Drainage
- Incidental Items
- Landscape
- Noise Abatement
- General Items

The additional costs were estimated for the following line items estimated based upon a percentage of the estimated Major Construction Item cost:

- Lighting, Striping, Signing (3% Sub)
- Maintenance of Traffic (1.5 % Sub)
- Training (1 % Sub)
- Mobilization (10% Sub)
- Progress Schedule

- Clearing Site
- Construction Layout

Finally, engineering and contingencies costs were calculated based upon a percentage of the total of the Major Construction Item and additional costs, and included items such as:

- Contingencies & Escalation
- Construction Engineering
- Change Order Contingency
- Utility relocation

Due to the preliminary nature of the recommended concepts, it was not deemed practical or appropriate to estimate costs for such items as right-of-way acquisition and environmental remediation. However, it is anticipated that these costs could be substantial based upon the location and the nature of the improvements recommended.

Table 3

Portway Extensions Concept Development Study
Recommended Improvements
Preliminary Construction / Implimentation Cost Estimates

CONCEPT DESCRIPTION		Cost Estimate
SYSTEM/ITS/COMMUNICATIONS IMPROVEMENTS		
Systems/Operational/Communications		
Communications Infrastructure (approx 55 miles of communication network)	$	55,000,000
Truck Stops /Lay-by Areas (3 areas)	$	36,000,000
SYSTEM/ITS/COMMUNICATIONS TOTAL	**$**	**91,000,000**
SHORTHAUL RAIL SERVICE IMPROVEMENTS		
Short Haul Rail Spine Improvements		
Rolling Stock (4 train sets)		
Locomotives (4)	$	10,000,000
Cars (12 cars - 3 per trains set)	$	9,600,000
Local Intermodal Railyards		
New Railyards (3)	$	51,000,000
Upgraded Railyards (2)	$	24,000,000
Maintenance Facitily (1)	$	6,000,000
Line Upgrades (286Klb, height, weight, etc.)		
Track Rehabilitation/Upgrade	$	240,000,000
Bridge Replacement/Rehabilitation	$	160,000,000
SHORTHAUL RAIL SERVICE TOTAL	**$**	**500,600,000**
ROADWAY INFRASTRUCTURE IMPROVEMENTS		
Eastern Extensions		
NJTPK Interchange 14-A Reconstruction	$	70,000,000
Reversible Center Lane Between NJTPK Interchange 14 and 14-A	$	341,500,000
Elevation of Bayonne Bridge to Accommodate Larger Maritime Vessels	$	600,000,000
Western Extensions		
Dreyage Roads from NJTPK Int 15-W to Croxton Yard and South Kearney Yard	$	340,500,000
Bridge Crossing of Hackensack River between Central Avenue and	$	490,000,000
Southern Extension		
New and reconstructed connections betweek Goethals Bridge and Arterial roadways	$	74,000,000
Connection between reconstructed Interchange 12 and Port Reading/Cartaret via Industrial Aver	$	12,000,000
Truck ramps/enhanced connections between NJTPK Int 10 and Raritan Center via Industrial Hig	$	19,000,000
Northern Extension		
Extension of New Road From Secaus Road to NJTPK (Parallel Route to Tonnelle Ave)	$	86,000,000
Interchange Improvements - Route 1&9 northbound to Delancy Street	$	6,000,000
Western Extension		
Roadway connections between NJTPK 13-A and Elizabeth Industrial waterfornt area	$	88,000,000
NJTPK Interchange 14 Improvements	$	8,000,000
ROADWAY IMPROVEMENT TOTAL		**$2,135,000,000**
GRAND TOTAL		**$2,726,600,000**

Benefit Side

Substantial economic benefits are expected to accrue to the implementation of the Portway Extensions concepts. Positive economic impacts that would accrue to New Jersey were quantified in three (3) primary categories: regional congestion relief, localized congestion relief, and job creation.

Regional Congestion Relief

To assess benefits that would accrue through reduction of regional congestion, the *Surface Transportation Efficiency Analysis Model (STEAM)* was employed. The travel demand output from the Portway Extensions model was used as the primary input to STEAM. The user benefits of the regional congestion relief that would result from the implementation of the Portway Extensions recommendations were estimated to be approximately $13,000,000 annually. Future truck traffic represents approximately 8% of the peak period vehicle miles of travel (VMT) in the network, but reap about 30% – 40% of the user benefits. The balance of the benefit would accrue to non-truck traffic.

Localized Congestion Relief

Annual benefits associated with the localized interchange were based upon the STEAM model correlations to reductions in vehicle miles and hours of travel for both truck and non-truck traffic. The user benefits of the localized congestion relief that would result from the implementation of the Portway Extensions recommendations were estimated to be approximately $8,000,000 annually. Improvement to the future truck traffic flows would account for approximately 29% of the annual benefits accrued through implementation of the recommended improvements. The remaining benefit would accrue to the other non-truck vehicle flows.

Job Creation / Employment Growth

The third and most significant component of the benefit side of the economic impact assessment identifies and quantifies associated with capturing of the container-related warehousing space that could be developed in the State. There exists a very real opportunity for New Jersey to leverage the benefits of being a leading global gateway situated at the heart of one of the largest consuming centers in the world. The recommended transportation improvements provide the connectivity to facilitate container movements and encourage warehouse development and the creation of jobs.

The potential new job generation represents a wide spectrum of occupations, ranging from entry-level positions, jobs requiring specific technical training, and senior level managerial positions. These jobs offer opportunities to all New Jersey residents. The new activity associated with and supported by the Portway Extensions concepts is anticipated to:

Generate Jobs

- Nearly 55,000 New Permanent Jobs
- 38,000 Direct Jobs
- 17,000 Indirect and Induced Jobs
- $2.4 Billion in Annual Personal Income

Public Revenue and Gross State Product

- Nearly $6.2 Billion Annual Business Activity
- Nearly $2.8 Billion in Gross State Product Annually
- Over $354 Million in Federal Tax Revenues Annually
- Over $157 Million in State Tax Revenues Annually
- Over $223 Million in Local Tax Revenues Annually

As can be seen, the annual State Tax revenues alone would more than compensate for the required expenditure to implement the Portway Extensions program.

APPENDIX D – PUBLIC OUTREACH

STAKEHOLDER PARTICIPATION

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, 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.

More specifically, 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.

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, information in GIS format, traffic data and travel demand models.

Our 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 MPO Freight Committees
- Logistics Council

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 (NJTPA, DVRPC, 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, NJ Transit, NJTPA, DVRPC, SJTPO, FHWA, PANYNU, and SJPC.

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. The findings from these groups are discussed in more detail below.

STANDING MPO FREIGHT COMMITTEES

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

LOGISTICS COUNCIL

The New Jersey Logistics Council provided private-sector expertise by way of its recommendations to NJDOT and a key meeting held after a considerable amount of other research and outreach had been conducted. This public/private committee of key members of the freight community worked for almost a year analyzing issues and developing recommendations in three arenas: regulatory, statutory, and finance; infrastructure and operations; and land use.

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

As noted above, discussions about highway-specific issues were conducted with public agencies (Tier 1) and the private sector (Tier II). The Tier II group was hosted by the New Jersey Motor Truck Association 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. The issues identified by these two groups are briefly summarized below:

- Congestion in general is increasing the cost of freight movement and limiting its efficiency in New Jersey.
- Limited hours of operation of shipping and consignee facilities is leading to less efficient use of the transportation system.
- Lack of capacity at state crossings – Bottlenecks are common at entry/exit points into/out of New Jersey.
- Lack of interstate coordination – New Jersey and New York have different policies regarding truck permissible roadways particularly for large trucks. It has been cited that trucks that are allowed on New Jersey's roadways and into the tunnels are not allowed on the streets of Manhattan just outside the tunnels on the New York side of the border. Unfortunately, this disconnect in the roadway system causes delays and inefficiencies in the delivery of freight.
- Costs and demand drive the need for facilities to operate extended hours.
- Delays caused by the increased emphasis on security and safety.
- Lack of truck routes/signage – Once trucks have left the National Highway System they often find it difficult to navigate the secondary and local street system to reach their destinations. There is a lack of signing and wayfinding systems for trucks to use in major end-user locations. This often leads to confusion and trucks driving on restricted local roadways as they attempt to navigate back onto truck-permissible facilities.
- Tolling – Toll pricing is a factor in the routing choices of truckers, specifically smaller trucking companies. Trucks often use non-toll roads to bypass toll facilities (e.g., trucks use Route 130 to bypass the New Jersey Turnpike).
- Low E-ZPass usage – Many trucks from outside the region do not have E-ZPass, or use another electronic toll collection system that is not compatible with E-ZPass.
- High cost of doing business in New Jersey – Neighboring states are seen as more "freight-friendly" than New Jersey and they are attracting firms that had previously done business in New Jersey. This means a loss of manufacturing and value-added businesses. It means that businesses cannot respond

as quickly to market changes because they are located farther from their customer base. This also adds both time and cost to the delivery of freight because support facilities are located farther away from the end-users.

- Local municipal ordinances that limit truck delivery hours are seen as an impediment to making efficient use of off-peak roadway capacity.
- Hours-of-service changes are restricting the length of time individual truckers can work, leading to a need for more trucks and drivers to satisfy demand.
- The public perception of the role of trucks on our roadways needs to be changed.

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

The issues identified by participants in the two issue groups were broad-ranging and touched on operations, funding, planning, and institutional relationships. The issues listed below reflect the predominant perceptions of those individuals who participated:

- Inability to operate with car-loads up to 286,000 pounds (the standard for major (Class I) railroads in the United States) on all rail lines in the state, including those owned by NJ TRANSIT over which numerous shortline railroads operate.
- Lack of adequate vertical clearance along major portions of the rail network to allow double-stacking.
- Limited connections between the northern and southern sections of the rail network, and beyond New Jersey.
- Urgency of advancing rail infrastructure investments identified in the MAROPs and Portways projects more quickly to take advantage of private-sector partnering opportunities.
- Operational constraints for shortlines operating over rail lines owned by NJ TRANSIT
- Concerns and uncertainty regarding the Conrail Shared Asset Areas
- Constrained capacity on the rail network that limits the ability to handle future growth in rail traffic.
- Conflicts with adjacent communities which restrict the railroads' ability to expand their facilities and operations.
- Concern about security, redundancy, and emergency preparedness for both cargo and transportation.
- A broad range of institutional issues affecting both public- and private-sector stakeholders in rail freight facilities and services:
  - Relative roles and responsibilities of stakeholder groups.
  - Willingness to use public funding for projects involving freight railroads.
  - Risks and returns (value capture) allocated to each partner in rail freight improvement programs and projects.
  - Different timeframes and processes for gaining approval for proposed rail freight facility expansion/improvement projects.
  - Constitutional, legislative, and regulatory impediments to public-sector involvement in public-private partnerships involving railroad companies.
- Direct linkage between economic development potential and the availability and quality of rail transportation services.
- Intermodal interdependency and the continuing impacts of deregulation on rail system rationalization and competition.

- Impacts of new technologies on cargo tracking, shipment examination, electronic forms and billing, etc.
- Economic and service implications of intermodal facility placement and operations.
- A desire for a "champion" to emerge from among the many parties with an interest in rail freight to provide direction and focus, foster partnerships among major stakeholders, and serve as a catalyst for change.

These issues, and similar concerns generated for warehousing and air and water cargo, the provided the basis for information provided to a special meeting of the Logistics Council for its comments. By this point, the information had been refined to the following:

HIGHWAY

- Inadequate connectivity and redundancy of truck network creates problems in access/egress to important nodes
  - Large truck network disconnects between New Jersey and New York
  - Inconsistent or inadequate signing
  - Weight restrictions not always enforced
- Disconnect between Shippers and Consignees leads to system inefficiencies
  - Inefficient use of available (off-peak) capacity
  - Consignees and port hours are limited and linked
  - Locals discourage night time deliveries
- Increased emphasis on security has a ripple effect on trucking industry
  - Operational efficiency reduced
  - Pool of truck drivers reduced
  - Coordination between enforcement agencies
- Present and new policies affecting trucking industry
  - "Hours of Service" have changed the logistics of deliveries
  - Port facility gate hours of operations
  - Trucks on local roads – Potentially because of toll structure
  - E-ZPass penetration rates low for trucks
- Lack of support facilities making shipping harder on trucking industry
  - Perceived gap in the coverage of rest areas, other truck support facilities
  - Air quality problems for idling trucks
  - Lack of truck support facilities in areas of major warehousing
- Congestion and Reliability
  - Highway congestion impedes freight flow along major corridors
  - Incidents/ Lack of redundancy/ Lack of information
  - Increased travel time and costs associated with new warehouse locations outside of New Jersey

RAIL

- Lack of rail network interoperability and standardization impedes more direct access to shippers and potential viability of shortlines
  - Weight carrying capacity (263K - 286K -315K)
  - Bridge and tunnel clearances for high-wide loads
  - Military base access

- Constraints to throughput capacity of rail mainlines, yards, intermodal terminals, and crossovers impedes travel times and reliability of service, the potential to handle rail traffic growth, and the ability to take more trucks off New Jersey's highways
    - Delair Bridge
    - MAROPs projects
    - CPIP/Portways projects
    - Redundancy for security enhancement
- Limits on rail network and operational differences between different owners and operators (passenger and freight owners and carriers) where there is/will likely be joint use and the potential for development of rail rights-of-way
    - Weight limits
    - Signal systems
- Competitive pressures and uncertainty regarding future of Conrail Shared Assets affects access to shippers among rail and motor carriers and impedes efficient interlining between railroads and ability to gain greater competitive opportunities
    - Roles and responsibilities of private and public sectors regarding disposition of Conrail
    - Operational and service location decisions in New Jersey and beyond that affect rail use in the State
    - Control over infrastructure and operations
- Fragmented institutional relationships between the public and private sectors in rail infrastructure and service planning and other related modes
    - Roles and responsibilities for policy, planning, ownership, operation, and funding
    - Competitive pressures between carriers and expressed need for confidentiality
    - Legacy of mistrust between public and private sectors
- Inadequate financial resources among any one stakeholder group to address needed rail network improvement projects
    - Many stakeholder groups with separate funding sources
    - Public distrust/opposition to use of public funds for private infrastructure improvements
    - Federal, State, regional, and local interests – and rail company, shipper/consignee, warehouse/terminal, and other modal interests
    - Potential of public-private and public-public partnerships

LAND USE/SMART GROWTH

- Market and business-based locations decision for logistics land uses often conflict with Smart Growth objectives
    - Access to customers (the market) is a primary location driver
    - Regional critical mass of customer base
    - Accessibility to rail/highway network to reach customers
    - High congestion in regions of the state or metro area can diminish accessibility and increase operation costs
    - Land values and land development costs a location driver: Greenfield's versus alternative urban sites
- Freight node needs and local planning objectives often conflict
    - Land acreage and characteristics, site access, operational impacts
    - Limited plans/zoning for warehousing, distribution and value-added activities
    - Planning for compatibility – working out a strategy up-front with buffering, transitional land uses

- Tensions between local plans/zoning (especially major retail) and concerns over local truck flows
  - Planning and approval processes need to present truck impacts of zoning changes and development proposals
  - Local planning tool box needs guidance on impacts and ways to address them

PUBLIC PERCEPTIONS

- How can we accommodate the increasing volumes of freight and maintain/improve the quality of life in communities?
  - Segregation of truck traffic from passenger vehicle traffic
  - Management of truck movement to minimize impacts on residential areas and local roads
  - Management of rail issues, such as noise and emissions, to benefit communities
  - Accommodations for increasing rail freight flows and demand for rail served industrial sites?
  - How do we balancing warehouse needs with other land uses?
- What do we do when special interest groups continue to disrupt rather than seek collaborative solutions?
  - Informing the public about the choices?
  - Informing decision-makers about the impacts/benefits/trade-offs

FREIGHT NODES

- The cost of remediation and/or access locations in some brownfield locations may hinder their use.
- Level of economic development priority given to warehousing/distribution centers in New Jersey should be higher
  - Potential job generation benefits
- Lack of accommodation for the demand for warehousing space in New Jersey
  - Competition from other uses
  - Less interest in this land use
- Transportation implications of warehouses locating outside New Jersey
  - Increased congestion levels
  - Increased travel costs
  - Increased travel to out-of-state facilities
- Inability to implement time and mode shift alternatives in the market place
  - Inability of rail to handle increased traffic or short haul moves
  - Hours of operations at inland destinations restricted
- Need for additional and strategically located truck rest areas/stops in the State
  - Need for balancing the development of truck rest areas/strops with the concerns of surrounding communities

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, priorities, and recommendations presented in this plan.

CAMBRIDGE SYSTEMATICS

New Jersey Freight Rail Issues and Programs

final

report

prepared for

New Jersey Department of Transportation

prepared by

Cambridge Systematics, Inc.

November 11, 2005

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November 11, 2005

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1.0 Introduction

1.1 Critical Choices for New Jersey's Freight Rail System

New Jersey's freight rail system provides a vital linkage connecting critical New Jersey industries to their suppliers and customers. The rail system reduces highway congestion, improves safety, and protects environmental quality by hauling thousands of tons of freight daily that would otherwise move over the highways. It allows New Jersey's ports, chemical manufactures, farmers, and other industries to extend the markets for their goods. It hauls petroleum to refineries, goods to retail stores, and wastes products out of the region, helping to reduce the cost of living in New Jersey. It provides an alternative transportation system to highways, thereby increasing security and providing relief in times of disasters. The rail system provides competition, thus lowering shipper logistics costs and promoting industry expansion and job creation.

Freight traffic has been growing at an average of 3% per year, and is expected to continue this growth. This leads to a near doubling of freight traffic every twenty years, far outpacing the growth in passenger travel. While this growth is good for the economy, it places tremendous strains on the transportation network. The nature of this freight is changing, too. As the U.S. becomes more dependent on the service industry to supply jobs, freight movement is more and more driven by population growth. The greatest growth in freight will occur in consumer goods, and not in low-value, high-tonnage bulk commodities such as lumber, grain, and coal where rail historically has had a competitive advantage. Without capacity improvements, elimination of chokepoints, and upgrading to modern standards, rail's share of the new freight transportation market will decline.

Decisions made today will impact how goods move in the future. New Jersey is not alone in this decision. Other states and the Federal government are debating whether the public sector should take a more active role in developing a freight rail system that better supports industry, provides jobs, reduces roadway congestion, improves safety and the environment, and reduces highway costs. The choice was best summarized by the AASHTO *Freight-Rail Bottom Line Report,*[1] which presented two paths for the nation's freight rail system:

[1] American Association of State Highway and Transportation Officials, "Transportation Investment in America: Freight-Rail Bottom Line Report." Washington, D.C., January 2003.

- **Market-Driven Evolution –** A rail industry that continues to be stable, productive, and competitive with enough business and profit to operate, but not to replenish its infrastructure quickly or grow rapidly, or focus on the provision of public benefits; or

- **Public-Policy-Driven Expansion –** A rail industry that meets private business and public purpose objectives by providing cost-effective transport needed to serve national and global markets, helping relieve pressure on overburdened highways, and supporting social, economic, and quality-of-life goals.

Some states have the luxury of deferring this choice until future years. New Jersey does not. A combination of factors -- growing freight volumes, increasing highway congestion, economic development competition from other states, aging rail infrastructure, accommodation of growing passenger traffic, shrinking funds for transportation investment, environment-driven public policy pressures, and increased potential for public-private investment strategies – demand that these questions be addressed now:

- What sort of rail freight system does New Jersey need and want?

- How will it go about getting it?

- What are the benefits? What are the avoided costs?

1.2 About this Report

The New Jersey Department of Transportation (NJDOT) tasked Cambridge Systematics Inc. (CS) with developing baseline freight rail information to inform ongoing and future planning efforts. This report is intended to:

- Place critical information about freight rail issues, needs, choices, and costs within a larger public policy context;

- Communicate these messages to a wide range of potential audiences in a concise and readable manner; and

- Provide a starting point for developing policy options and recommendations related to the future of freight rail in New Jersey.

Section 2 of this report provides an introductory overview of freight rail information and key issues. Section 3 discusses major initiatives, system needs, and funding options. Appendices A and B provide additional detail on system needs.

2.0 Freight Rail Information and Key Issues

2.1 Infrastructure and Operations

Overview

Today, New Jersey's freight rail system consists of:

- Mainlines, accommodating higher-volume, higher-speed traffic;
- Branches, secondary tracks, running tracks and industrial tracks, accommodating lower-volume, lower-speed traffic and last mile connections to industrial customers;
- Intermodal terminals that exchange rail containers with trucks and marine terminals; "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 breaking longer trains into shorter trains, and vice-versa.

New Jersey's freight railroads own 919 miles of road across the state, serving the major population centers. NJ Transit owns 982 miles and Amtrak owns another 58 miles; both accommodate freight movement over selected portions of their systems. When trackage rights are considered, New Jersey railroads operate over 2,798 miles of road. (The term "miles of road" is distinguished from "miles of track" by counting multiple track (e.g. double or triple track) only once.)

Table 1 on the following page below provides a listing of the freight railroads operating in New Jersey, along with the miles of road operated and railroad class.

Table 1. New Jersey Railroads, Mileage, and Class (2003)

Railroad Name	Railroad Abbreviation	Miles of Road* Operated in New Jersey	Railroad Class**
Ashland Railway	ASRY	unknown	Switching & Terminal
Belvidere & Delaware River	BDRV	16	Class III
Black River and Western	BRW	17	Switching & Terminal
Canadian Pacific	CPRS	68	Class I
Conrail	CR	831	Switching & Terminal
CSX Transportation	CSXT	648	Class I
Durham Transport	DRHY	Now RCRY	Switching & Terminal
East Jersey Railroad & Terminal	EJR	2	Switching & Terminal
Morristown & Erie	ME	42	Class III
New Jersey Rail Carrier	-	0.5	Switching & Terminal
New York Cross Harbor	NYCH	4	Switching & Terminal
New York & Greenwood Lake	NYGL	2	Class III
New York, Susquehanna & Western	NYSW	78	Class II
Norfolk Southern	NS	933	Class I
Port Jersey Railroad	PJRR	5	Switching & Terminal
Raritan Central	RCRY	16	Switching & Terminal
SMS Rail Services	SLRS	11	Class III
Southern Railroad of NJ	SRNJ	71	Class III
Winchester & Western	WW	54	Class III
Totals		**2,798**	

Source: Association of American Railroads, 2003

*The term "miles of road" is distinguished from "miles of track" by counting multiple track (e.g. double or triple track) only once.

**Railroad Class is determined by the Surface Transportation Board. In 2003: 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 1. New Jersey Freight Rail Network (Abandoned Lines Not Shown)

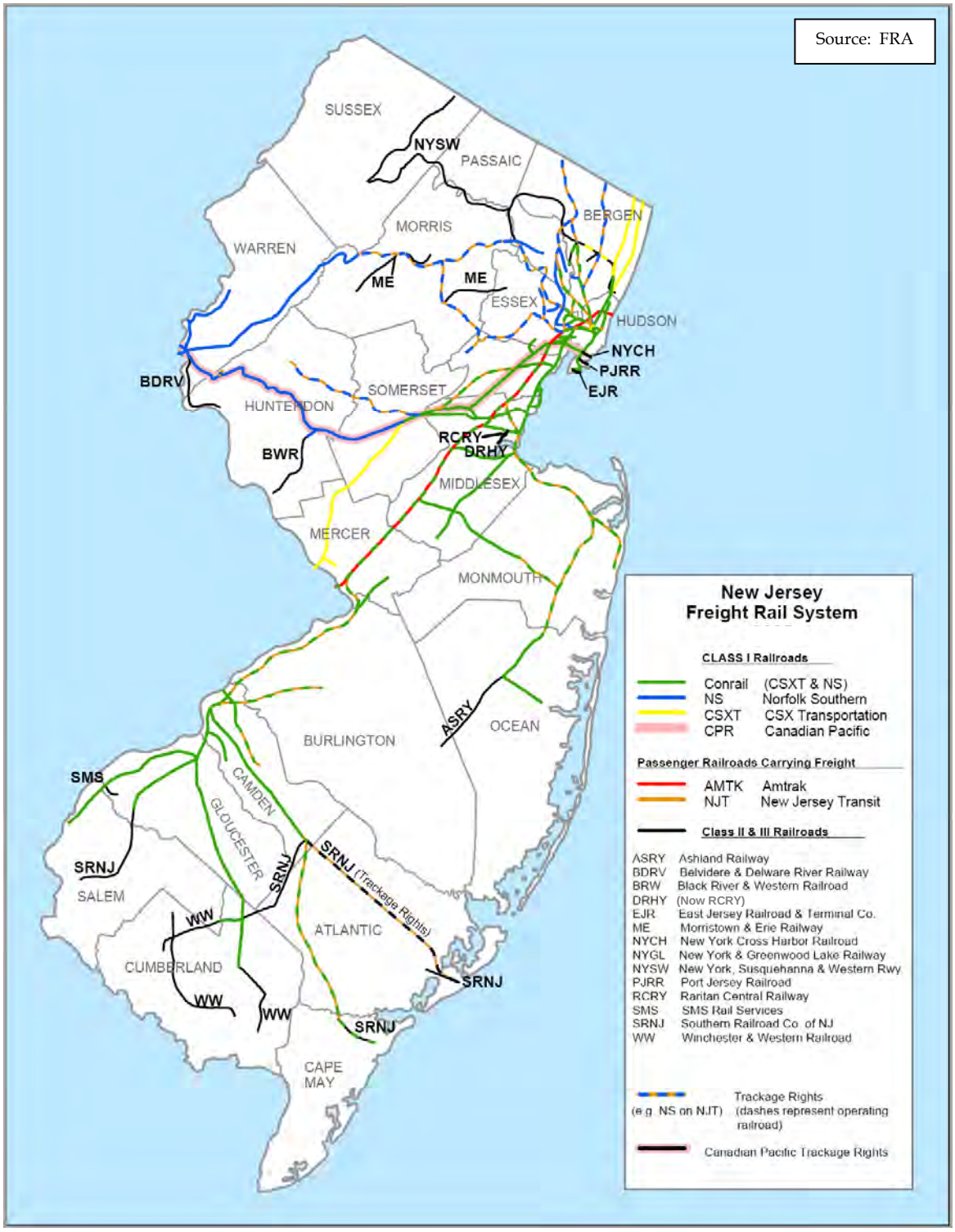


Figure 2. New Jersey Freight Rail Terminals (Abandoned Lines Not Shown)

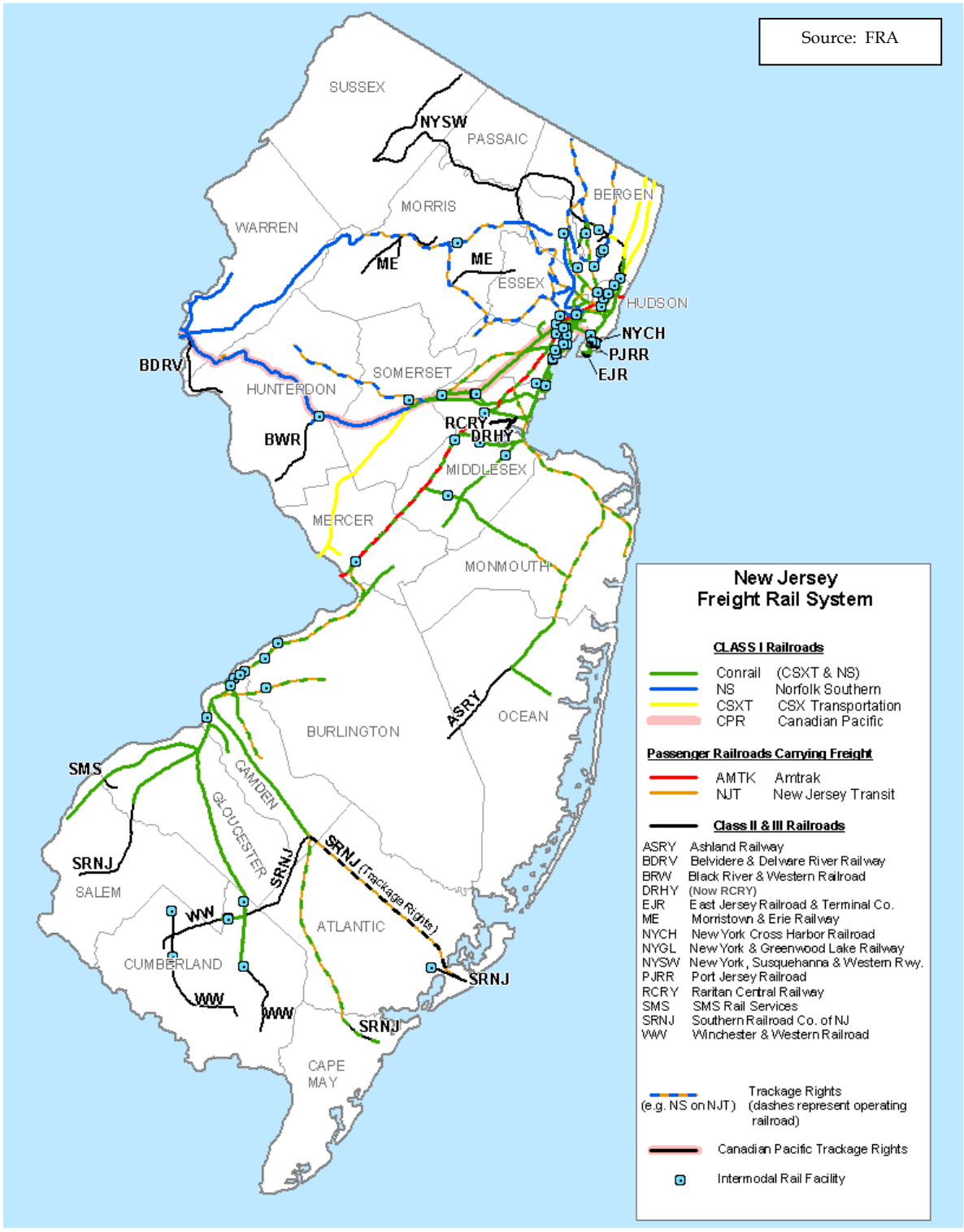
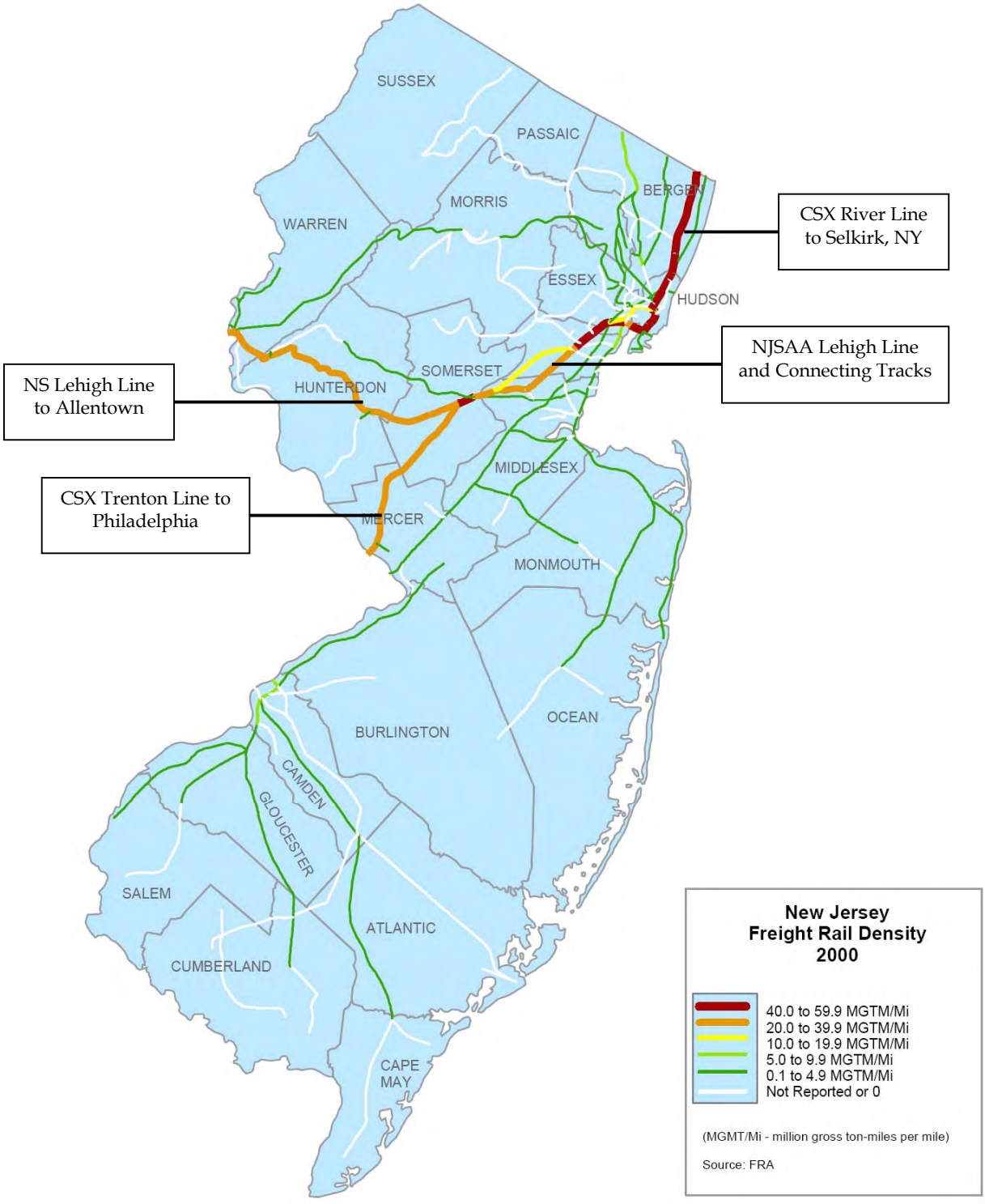


Figure 3. Freight Rail Traffic Density Estimates, Year 2000



Source: FRA. Density estimates are developed by FRA by assigning Waybill Data to the national rail network using a modeling process. Estimates may vary from actual line-by-line conditions.

As shown in Figure 3 on the preceding page, according to FRA year 2000 estimates, the highest-tonnage lines in the State are the CSX River Line, the North Jersey Shared Asset Area (NJSAA) portion of the Lehigh Line, the NS portion of the Lehigh Line, and the CSX Trenton Line. These four lines constitute the main "spine" of New Jersey's freight rail system, and serve New Jersey rail shippers and receivers through a network of secondary and branch lines.

The North Jersey Shared Asset Area (NJSAA)

Much of New Jersey's rail freight activity is concentrated in the North Jersey Shared Asset Area (NJSAA). Previous work performed by R. L Banks and Associates (for the Port Authority of New York and New Jersey) and by R. L. Banks and Cambridge Systematics (for the North Jersey Transportation Planning Authority) developed the following functional description of the North Jersey Shared Asset Area.

- The NJSAA segment of the Lehigh Line and connecting tracks serve as the main "spine" for serving the Northern New Jersey industrial area, including its extensive seaports and major rail terminals. This spine serves Bergen, Hudson, Essex, Union, and Middlesex counties – the five counties with the largest rail tonnages in the State. It connects the main NS and CSX routes into and out of New Jersey, and also accommodates New Jersey Transit traffic between NJT's Raritan Valley Line and Amtrak's Northeast Corridor. One section of the NJSAA Lehigh Line is double tracked; another (from Potter to Bound Brook) is single-tracked. Key connecting tracks include:
  - The Chemical Coast Secondary, which serves waterfront industries, Port Newark/Elizabeth, and major railyards including ExpressRail and E-Rail
  - The Lehigh Connecting Track, Passaic and Harrimus (P&H) Line, Westbound Running Track, Northern Branch, and Northern Running Track provide access between the Lehigh Line and the CSX River Line, serving major railyards including Oak Island, Croxton and Kearney.
- The CSX River Line connects to this spine in Bergen County from the north, providing connections to a major CSX east-west line (the "Water Level" route) at Selkirk, NY, and also providing connections to New England railroads. The line features a single track with several extremely long passing sidings and maximum train speeds that range between 30 and 50 miles per hour.
- The CSX Trenton Line connects to this spine in Somerset County, from the south, providing connections to Philadelphia and points south and west. There are sections of single, double, and triple track; the single-track segment of the Trenton Line contains only one passing siding in the 22 miles between Port Reading Junction and CP Wing. Maximum authorized freight train speeds range between 25 and 50 miles per hour.
- The NS segment of the Lehigh Line connects to this spine in Somerset County, from the west, at the same point as the CSX Trenton Line. It provides connections to

Allentown, PA and points west and south. The line features a mix of single and double main track sections between Port Reading Junction and the New Jersey/Pennsylvania border; the line is double track between the New Jersey/Pennsylvania border and Bethlehem, Pennsylvania. Maximum authorized freight train speeds range between 10 and 30 miles per hour. CP has trackage rights over the NS Lehigh Line, continuing onto the NJSAA Lehigh Line.

We can think of these as the "Big Four" of New Jersey rail operations. There are also several "reliever" or bypass routes to the Big Four. These include:

- The Port Reading Secondary, which provides a direct connection between the NJSAA Lehigh Line and the Chemical Coast line.

- The National Docks Branch, which provides a direct connection between the NJSAA Lehigh Line (at Oak Island Yard) and the Northern Running Track (at Croxton Yard).

Freight traffic also uses passenger rail lines to provide additional capacity. These include:

- Amtrak's Northeast Corridor, which provides alternative freight access to and through Philadelphia.

- NJ Transit's Raritan Valley Line, which accommodates shared asset freight traffic between Aldene and Bound Brook.

- NJ Transit's Main Line and Bergen County Line, connecting to the NS Southern Tier Line at Suffern, NY. NS has trackage rights over NJ Transit, which link its Southern Tier route to Buffalo with the NJSAA Lehigh Line and connecting tracks.

All of North Jersey's major railyards, which originate and terminate rail traffic, are accessed via the NJSAA Lehigh Line and connecting tracks:

- Conrail's Oak Island Yard, which is the major merchandise (carload) freight classification yard for railroads serving the region;

- NS's Croxton Yard (primarily international containers moving from/to the west coast via landbridge services, along with carload traffic) and E-Rail (primarily domestic intermodal traffic);

- CSX's Kearney Yard (primarily international containers moving from/to the west coast via landbridge services), North Bergen Intermodal Terminal (primarily domestic intermodal traffic), Ridgefield Heights Auto Terminal (auto handling), Elizabethport/ Trumbull Street Yard (bulk transfer for industrial customers), and Manville Yard (bulk and merchandise traffic);

- Conrail's ExpressRail, Portside Yard, Port Newark Yard, and Doremus Avenue Auto Terminal, which provide on-dock and near-dock rail service for the marine terminal complex at Port Newark/Elizabeth, and primarily handle containers and autos;

- Conrail's Bayway Yard, Port Reading Yard, Brown's Yard, Ford Yard, Metuchen Yard, and Linden Yard, which provide bulk and merchandise service for various industrial customers;

- Conrail's Greenville and Port Jersey Yards, which are leased to the New York Cross Harbor Rail Road to support its rail float operation to Brooklyn;

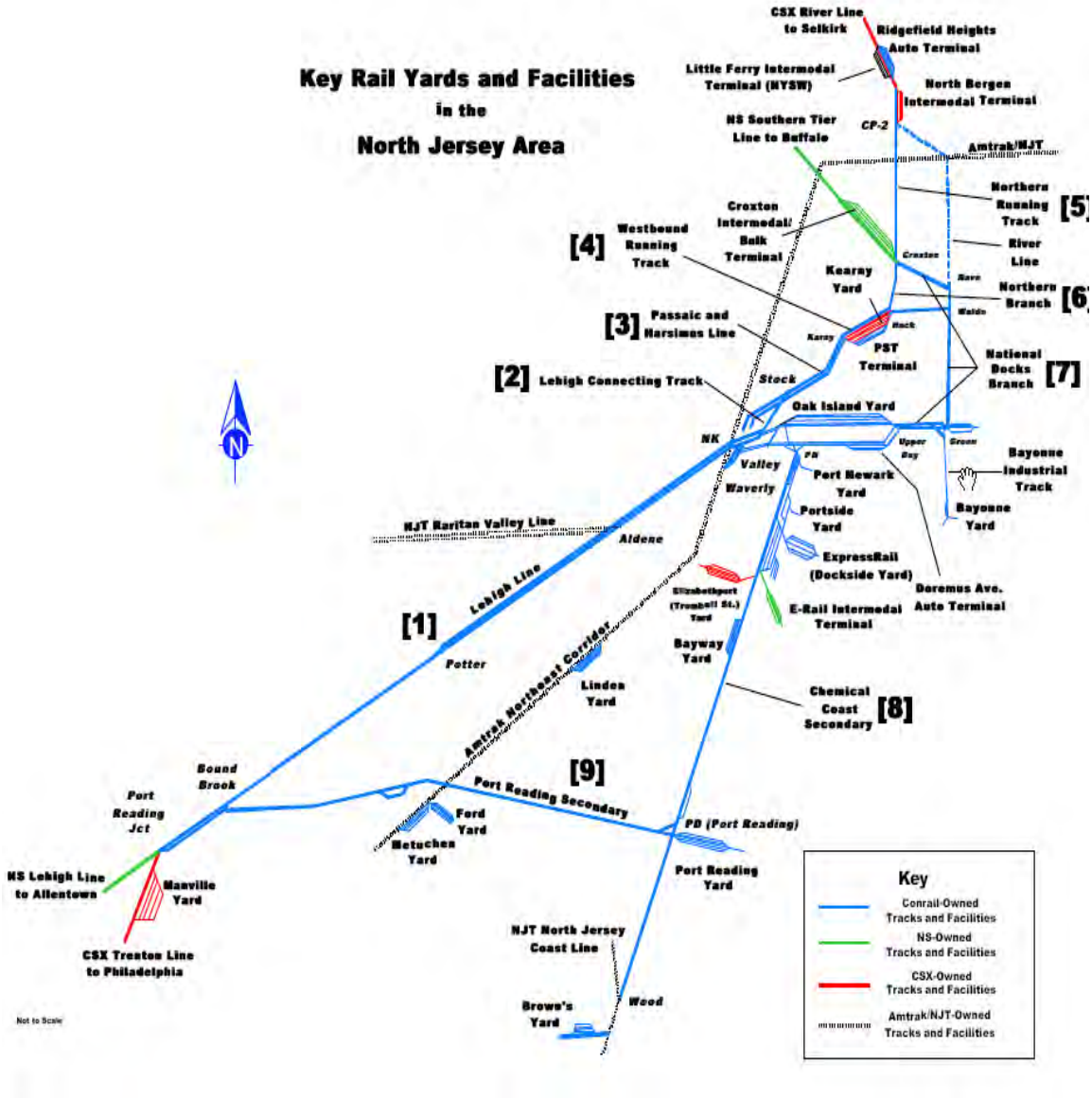
- The NYS&W's Little Ferry Intermodal Terminal, which primarily handles domestic intermodal traffic;

- The Howland Hook Marine Terminal, where an on-dock intermodal terminal for international containers is under development; and

- The Military Ocean Terminal at Bayonne (MOTBY), where existing rail facilities may be adapted or redeveloped to serve international containers associated with the Global Marine Terminal and MOTBY.

Figure 4 on the following page is a depiction of major system elements in the NJSAA, developed by R.L. Banks Associates for the Port Authority of New York and New Jersey. The NJSAA Lehigh Main is labeled as item 1; the main connecting tracks are labeled as item 8 (the Chemical Coast Secondary) and items 2 through 6 (Lehigh Connecting Track, Passaic and Harrimus (P&H) Line, Westbound Running Track, Northern Branch, and Northern Running Track). The main bypass routes (National Docks Secondary and Port Reading Secondary) are labeled as items 8 and 9.

Figure 4. Major System Elements in the NJSAA



Source: R.L. Banks Associates, for the Port Authority of New York and New Jersey

Estimates of daily train moves and capacity by rail line within the NJSAA were developed by R.L. Banks Associates as part of the NJTPA's *Freight System Performance Assessment Study*, and are summarized in Table 2 below. Information on railyard activity and capacity is not readily available, although some estimates have been published by the PANYNJ, and by the *NYMTC Regional Freight Facilities Inventory*, the *Comprehensive Port Improvement Plan* technical documents, and the *Portway Extensions and CMS Study*. The PANYNJ's ExpressRail facility has recently been expanded to accommodate increasing levels of international container traffic; capacity constraints have been reported at other terminals as well.

Table 2. Estimated NJSAA Rail Line 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 2003	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

2.2 Selected Key Issues

Some of the key issues facing rail in New Jersey are discussed in this section. Although this report did not develop a new inventory of critical issues with respect to the statewide rail system, issues relevant to northern New Jersey have been adapted from work performed by Cambridge Systematics, Inc. and R.L. Banks Associates Inc. as part of the NJTPA *Freight System Performance Assessment Study*. A summary of issues relevant to southern New Jersey are also presented.

Rail System Issues in Northern New Jersey

System Capacity, Performance, Safety, and Reliability

- **Rail capacity and performance shortfalls in the NJTPA region.** Within the NJTPA region, several rail lines are already at capacity, and future growth forecasts suggest that significant improvements will be required to accommodate additional traffic.
  - Without capacity improvements, capacity shortfalls are anticipated on the NS Lehigh Line, the Shared Asset Lehigh Line, P&H Line, Northern Running Track, Chemical Coast, and CSX River Line.
  - Planned improvements (as discussed in Section 5 of this report) will address constraints on the P&H Line, Northern Running Track, and Chemical Coast, but would still be present on the NS Lehigh Line, the NJSAA Lehigh Line, and the CSX River Line.
  - Railyard capacity constraints must be identified and overcome.
- **Rail capacity and performance issues at the national level.** Rail service and capacity developments on a broader, national context have significant implications on north Jersey transportation. If rail traffic cannot get to and from the region because of constraints in the national system, then that traffic has to get to and from the NJTPA region some other way.
  - Large (Class I) railroads are enjoying solid traffic increases this year. According to the Association of American Railroads, "[F]or the first eight months of 2004, total U.S. railcar loadings of 11,388,043 units were up 3.3 percent (368,951 carloads)." The AAR, which does not include rail intermodal shipments in its carload count, further reports "U.S. intermodal traffic in 2004 through August totaled 7,048,452 trailers and containers, up 9.5 percent (612,938 units) over 2003."
  - In recent years, most major railroads have struggled at some point with operational problems and capacity constraints. Currently, in 2005, increased traffic is straining rail capacity in some areas and corridors. Union Pacific (UP), in particular, has struggled with rail congestion and employee downsizing issues, which, in turn, created gridlock problems and major slowdowns on the major routes. According to UP Executive Vice President-Marketing and Sales, Jack Koraleski, "UP had underestimated the economy's growth and traffic on UP lines, underestimated employee retirement rates had no practical mechanism to limit volume growth and suffered from bad weather" (Trains Magazine, August 2004).
  - Current service problems have caused major slow downs in train speeds that translate into a loss of resources and revenues. On average, freight train speeds are down due to congested infrastructure and strained capacity. UP estimated that a loss of one mile per hour across its entire network equates to 250 locomotives and 180 train-service employees (Trains Magazine, August 2004). Other railroads have been feeling the strain as well. Burlington Northern Santa Fe, UP's largest competitor, also experienced a decline in its service this past spring. While the rail-

roads insist that the situation is improving with average train speeds on the rise again, significant improvements in infrastructure are necessary to handle the overall forecasted growth in freight volumes.

Land Use and Economic Development

- **In-region railyard capacity vs. outlying intermodal terminals.** The concept of "freight sprawl," as previously noted, is starting to impact rail operations. For example:

  - NS opened its $31 million Rutherford Intermodal Terminal (near Harrisburg, PA) in the summer of 2000. It serves at least two strategic roles in NS's intermodal network. First, it serves as a sorting point where railcars are swapped among trains in order to send solid trainloads to appropriate terminals. Similarly, trailers or containers may be moved from flatcar to flatcar to accomplish the same purpose. Second, eastbound trailers or containers may be unloaded from railcars at Rutherford and trucked to destinations in the region.
  - Such activity avoids potential congestion on the rail network and at the North Jersey intermodal terminals. However, the trailers transported over the road between Rutherford and North Jersey customers to avoid rail congestion add to highway congestion, particularly on I-78.
  - The development and use of the Rutherford terminal is not unique. Similar developments have occurred or are underway in Los Angeles, Chicago, and Memphis, where outlying terminals have been developed to supplement older terminals nearer to the city and/or port. Other similar projects are under consideration by railroad or municipal sponsors. Outlying terminals are attractive to railroads, because land is both available and less expensive, and, whether a new greenfield site or a brownfield site, may offer the opportunity to purchase sufficient land to both handle future expansion and provide a buffer, so that neighbors are not unduly affected by noise and lights. Municipalities and railroads both see an opportunity to develop logistics and light industrial business adjacent to such facilities, hopefully generating employment, tax revenue, and rail carload and/or intermodal traffic.
  - As rail intermodal traffic continues to grow, it will become more feasible and more beneficial to segregate traffic groups like international, domestic, traffic bound to the core of the region versus traffic bound to outlying customers. This trend, along with scarce capacity at older/near-city/port-area terminals, will favor the construction and expansion of outlying terminals like Rutherford. Many fear this is part of an overall decreased emphasis on rail service for close-in areas; some (including NJTPA, in a filing with the STB) argue that this has already occurred within the shared asset area.
  - In view of this trend, it is vital to preserve and expand capacity at the NJTPA region's close-in rail facilities, which provide the least-VMT truck trip to and from the end user. The greater the capacity and the lower the costs of operating and accessing close-in terminals, the less need there is to focus activity at outlying ter-

minals. With this strategy, there can be a productive and mutually-supporting relationship where close-in facilities are used to serve close-in demand, and outlying facilities can be used to serve other demand and accommodate overflow traffic as needed. The development of new outlying facilities might be planned and developed to generate the most economic benefits (rail and trucking jobs, warehouse/DCs, and retention/attraction of rail-served industries) within the NJTPA region. The goal would be to accomplish this with the highway impact, and the greatest use of underdeveloped "freight opportunity" sites. This type of strategy acknowledges an industry trend that probably cannot be reversed, and turns it to the region's advantage.

Industry Competitiveness and Performance

- **Intermodal access and connectivity.** Rail is a vital gateway for domestic and international trade, and provides critical access to the region's seaports and rail-dependent industries.

- **Class I railroads operate as for-profit businesses, not public purpose agencies.** Unlike the highways, which are publicly-owned, the nation's freight rail system is – with limited exceptions – a privately-owned system, operated on a for-profit basis, and accountable to its shareholders. With very high costs to maintain and operate its private system, and faced with strong competition from over-the-road trucking, railroads have evolved their business strategies – and made difficult choices – in response to changing conditions and market demands. As previously mentioned in Section 2, some of these evolutionary pressures include:

  - System rationalization. The railroad industry as a whole has reduced the number of miles it operates, pruning lower-profit lines and services and allowing it to focus on higher-profit lines. Railroads have merged to consolidate their services and improve their operating economies. And increasingly, larger railroads are focusing on "hub-to-hub" service strategies that aim to concentrate as much traffic as possible on selected corridors, leaving smaller railroads (regionals, shortlines, and switching railroads) or trucks responsible for "last mile" pickup and delivery.
  - Diversification of commodities and services. Historically, rail focused on heavy, lower-value commodities moving in bulk – such as coal, stone, lumber, and chemicals – where per-mile transportation cost is critical, and speed and reliability of delivery are often less important. In recent years, however, the rail industry has evolved to serve higher-value shipments – such as intermodal shipping containers, truck trailers, and automobiles – where speed and reliability of delivery are significant factors. Many railroads have instituted premium scheduled services, and some are exploring strategies to become more competitive with trucking over shorter distances.
  - Partnership with other modes. Throughout its history, rail has been a key partner for the nation's seaports, primarily for shipment of bulk materials such as coal, petroleum, or chemicals. With the rapid expansion of international container markets beginning in the 1970s (and continuing today), railroads have become key

partners for moving containers to and from seaports, offering double-stack container (DST) and container-on-flatcar (COFC) services. They have also become key partners for the trucking industry, handling a variety of domestic intermodal traffic in the form of trailers (trailer-on-flatcar) and truck chassis ("piggyback") services.

- Strategic marketing and captive shipping. In order to make the most profitable use of assets, railroads aggressively market their best customers and most profitable services, offering their best service and price. It is sometimes argued that smaller customers, less profitable services, and "captive shippers" are not marketed as aggressively, or offered the most competitive possible price and/or service. Within the NJTPA region, it has been argued that the Class Is have been insufficiently focused on marketing and serving customers within the shared asset area. On the other hand, it must also be noted that rail volumes for selected NJTPA markets – such as PANYNJ intermodal traffic – have reached record levels.
- Capacity allocation among market segments. In situations where market demand is growing but capacity is not, logic dictates that the railroads will assign the most capacity to their most profitable markets, leaving their least profitable markets with reduced access to rail. This is simple supply and demand, and it appears to underlay the "demarketing" issue discussed in the last paragraph. If the NJTPA region fails to expand rail capacity, we can expect that the rapidly-growing and highly-profitable international container services will get priority for available capacity, to the potential detriment of carload services – and the numerous industries that depend on them, and can ill-afford to move their products by truck. Interestingly, the use of outlying intermodal terminals such as Rutherford could help address this issue – by reducing the number of intermodal trains transiting the NJTPA region, more capacity will be retained for carload traffic and related industries. We would argue that to effectively serve the region's rail needs over the coming decades, a combination of close-in and outlying rail capacity will be vital. The key question is: where and how to develop outlying capacity to minimize transportation system (highway and rail) impacts, while maximizing economic benefits?

- **Shortline railroad issues.** The future holds both opportunities and challenges for shortline railroads in North Jersey.

  - One opportunity likely afforded many small railroads is the potential to provide additional "last-mile" contract switching services; whereby, the shortline performs intraplant switching services on behalf of large rail users. Other opportunities include development of transload and warehousing functions. Transloading is a concept that allows railroads to distribute products to companies, which: 1) may not have access to a rail siding, 2) ship smaller volumes of products, or 3) prefer the flexibility of truck delivery. Many such customers may have been unaware of viable rail shipping options or simply no longer consider rail. Transloading is not limited to shortline railroads; Class I railroads can, and do, provide that same function in several locations.

  - The most pressing issue, however, is also likely the most challenging: the need to upgrade shortline infrastructure to accommodate 286,000 pound railcar loads. North Jersey shortlines are not alone in this need: many small railroads across the country cannot accommodate this new industry standard. The inability of small and medium-sized railroads to accept larger railcars from Class I connections will have a major impact not only on the North Jersey rail system capacity, but it also may force some shortlines out of business in the longer term.
  - Another potential need as traffic increases may be improving the connections between Class I carriers and shortlines. As traffic volumes grow, so too will the infrastructure requirements necessary to facilitate interchange (the exchange of freight cars from one railroad to another). Inadequate facilities would dampen the possibility of capturing and providing new business that may become available.

- **Short-haul service opportunities.** Rail is generally considered to be increasingly competitive with trucking as distances increase, with the "break even" point typically put at 400 to 600 miles. However, there are certain kinds of rail moves – generally unit trains – that have proven competitive at much shorter distances. Many communities are exploring the possibility of running short-distance intermodal trains on defined high-volume corridors between major container generators and receivers, as public-private partnerships with the railroads. Absent public participation, the degree to which the railroads might be interested in this concept is uncertain. The recent NJDOT Portway Extensions Study suggested further exploration of this rail market strategy.

Environmental, Community, and Security Issues

- **Environmental and community concerns related to growth in rail traffic.** As with trucking, rail operations and investments are subject to increasing public attention. An efficient rail system helps reduce the amount of freight that has to be moved by truck. Maintaining current levels of rail traffic, and growing these levels in the future – through both long- and shorter-haul services – is important in managing regional congestion. However, the provision of rail services to achieve these regional benefits can also have local impacts – in the form of at-grade crossings, noise, vibration, and other effects. To the extent practical, these location-specific effects should be addressed and offset, so that the system-level benefits of rail freight can be achieved without the downside costs.

- **Grade crossing safety and cargo security.** As with trucking, these are paramount concerns, given the fact that the NJTPA region's rail activity takes place within a densely-populated area, and that a substantial share of cargo handled by its trucks has an international origin.

Implementation and Delivery

- **Potential need for substantially increased public investment in rail capacity.** Public investment in rail capacity may be the necessary response to the growing demands on the industry, which collectively has not earned its cost of capital in many years.

- An article published on August 16, 2004 in *The American Journal of Transportation* offers the perspective on the railroad industry's lack of capacity investment that, "the industry's reluctance in recent years to make large investments in capacity is understandable. Facing competition from other modes of transport, railroad pricing has gone down every year for the last 30 in real terms through 2002, with companies putting the emphasis on consolidation and cost-savings."
- NS has been one of the stronger financial performers, except in the wake of the difficult division of Conrail assets and operations. However, "NS has not earned its cost of capital for a number of years, and when NS or any company fails to earn its cost of capital, reinvestments in the company are more limited than they would be otherwise," said NS Chairman and CEO David Goode in his letter responding to the STB's request, which went to all major U.S. and Canadian railroads on June 9, for a status report on capacity issues. "If demand continues to grow at this pace," Goode added, "the rail industry will need to invest substantially more in locomotives, information technology (IT) systems, yards and terminals, railcars, track, etc. than it is doing today. However, increased investment in additional capacity cannot always be justified economically in the current cost of capital environment. Therefore, if demand continues to grow without the industry earning enough to sustain its capital requirements for growth, it may have little choice but to ration capacity in the future."
- The *AASHTO Freight Rail Bottom Line Report* states that historically, "public participation in rail system investments has addressed the bottom of the system: grade crossings, branch lines, and commuter rail services. The present need is to treat the key elements at the top of the system: nationally significant corridor choke points, intermodal terminals and connectors, and urban rail interchanges. Investments at this level hold the most promise of attracting and retaining freight-rail traffic through improvements in service performance." In some cases, states have already taken a public policy-driven approach in the form of public-private partnerships. The next step involves alliances among railroads, states, and the Federal government.

Rail System Strategies from the NJTPA Freight System Performance Assessment Study

The following rail system enhancement strategies were recommended as part of the NJTPA Freight System Performance Assessment Study:

1. *Optimize rail system capacity, performance, safety, and reliability through a combination of physical, operational, economic, and institutional solutions that address current and future market needs, in partnership with the region's railroads.*

2. *Identify and implement "smart growth" land use and economic development strategies for the expansion, development, and utilization of rail facilities to minimize highway VMT impacts, reduce the need for highway system investments, and maximize economic opportunity and benefit for the NJTPA region as a whole.*

3. *Promote the competitiveness and performance of NJTPA's railroads and rail-served industries through infrastructure improvements and other strategies as appropriate.*

4. *Ensure that environmental/community issues (congestion, emissions, noise, vibration, grade crossings, equity, etc.) and security issues are fully addressed in current and future rail planning and operations.*

5. *Develop transportation programming and funding processes that take full account of public-private partnership opportunities for rail freight investments, and allow for their evaluation within a larger multimodal investment strategy.*

Rail System Issues in Southern New Jersey

In northern New Jersey, the extensive network of rail facilities serve not only northern New Jersey, but connect the entire New York metropolitan region with the rest of North America. Freight rail services in southern New Jersey, in contrast, predominantly serve southern New Jersey businesses and provide local benefits to residents.

This single largest issue facing the railroads in southern New Jersey is the need to modernize track to handle heavier railcars and longer trains. Both of these changes are driven by economic needs to improve system productivity and to keep pace with Class I railroad standards. Another important issue for southern New Jersey railroads is security improvements.

- The 286,000 pound issue, which is also an issues in northern New Jersey and across the country, refers to the maximum loaded weight of railcars. The previous standard of 263,000 pounds was used to design much of the track and bridges forming the nations short line system. To improve productivity, and better compete with heavier and longer combination trucks, the Class I railroads now use 286,000 pounds as the standard. This has forced the short line railroads to upgrade track and bridges to handle cars interchanged with the Class Is. Given the often tenuous financial condition of many short lines, this has been an area where public support has been very beneficial to the railroads and local industries. Oldman's tressel and the Paulsboro branch on the Southern Railroad of New Jersey (SRNJ), and the Seashore branch of the Winchester & Western Railroad (WW) are locations needing infrastructure improvements to support heavier railcars.

- The ability to handle longer trains (more railcars per train) is another way of increasing railroad productivity. By handling larger blocks of cars the railroads are able to lower the per railcar costs. In southern New Jersey, the Bridgeton Junction Yard Track project on the WW addresses the problem of train lengths exceeding yard capacity.

- Another critical issue for railroads in southern New Jersey is the need to improve security. This is especially true for railroads hauling chemicals, petroleum, and other flammable and hazardous materials. The SRNJ project to

provide secure storage tracks and fencing for railcars hauling hazardous materials is an example of a need driven by security concerns.

3.0 Rail Initiatives and Programs

3.1 Major Initiatives

There is no one agency or stakeholder responsible for planning for rail. 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. Some of the major initiatives, apart from routine maintenance and state-of-good-repair projects undertaken by the railroads on a continuing basis, include the following.

- The New Jersey State Rail Plan (NJSRP). This is a program of direct investments by NJDOT in the state's rail system.

- The North Jersey Development Plan (NJDP). This is a series of rail 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.

- PANYNJ Improvements. The PANYNJ has undertaken 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.

- 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 (representing these five states and seven others in the NEC), and three railroads (NS, CSXT, and Amtrak). The study identifies opportunities to better utilize the region's existing rail assets; formulates 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 variant of MAROps. This is significant to New Jersey since it includes CSX's primary route into the state (River Line in New York), improves rail shipments between New Jersey and New England, and impacts traffic passing through New Jersey.

These various initiatives generally aim to achieve one of the following major purposes.

Maintain or Upgrade Existing Short Line Rail Services

The single largest problem facing short line railroads across the country is the need to upgrade track and bridges from the former standard of 263,000 lb carloads to the new standard of 286,000 lb carloads. Some short line moves are local to the short line, but the majority of moves are switched to another railroad, and most often this is a Class I carrier. Class I's have universally adopted 286,000 lb on their main lines as a way of lowering the costs per ton-mile, and are even beginning to move to newer cars capable of handling 315,000 lbs loads. Short lines, and Class I railroad branch lines, unable to send or receive these higher capacity cars are at a disadvantage when competing for business.

A related problem involves clearance restrictions, especially related to double-stack containers. Railroads that are unable to haul fully loaded double-stack cars or tri-level auto carriers loose some of the cost advantages they maintain over trucks. Most of the clearance issues expensive to correct since they are related to roadway overpasses, tunnels, or catenary lines for electric powered passenger trains. CSX's primary route into North Jersey (the River Line running west of the Hudson between Albany and New Jersey) and NS's primary route into North Jersey (the Lehigh Line from Harrisburg through Phillipsburg) are the only fully double-stack cleared Class I main lines in the state.

Privately funding weight and clearance improvements is often beyond the financial ability of the railroads, especially the short lines. Loans are difficult to obtain because the banking industry generally views a rail line as poor collateral, since it has few other profitable uses.[2] New Jersey has an added complicating factor in that New Jersey Transit owns approximately half of the rail lines in the state, and passenger trains do not require the higher weight and clearance standards needed by freight trains. This often becomes a case of the public sector making choices regarding Market-Driven Evolution or Public-Policy-Driven Expansion, as discussed in the Introduction.

Examples of existing needs in this category include: upgrading sections of the EJR to 315,000 lbs to serve a petrochemical plant; replacing timber pilings with steel on a SRNJ bridge to safely accommodate 286,000 lbs loads; double-stack clearance of the Waldo and Bergen tunnels on CR to provide improved service to the ports; and 286,000 lbs upgrades on the SLRS and WW to better serve existing customers.

Improve Intermodal Connectors

[2] Most rail debt is due to rolling stock (locomotive, cars), which are viewed as valuable assets.

The most extensive bottlenecks in a freight network occur at modal connections. Transfers from ship to rail, or truck to rail, consume a disproportionate share of the total transit time and transportation cost. "Meltdowns" in the system, as occurred at the West Coast ports, often result from the inability to efficiently shift from one mode to another. The Federal government has realized the significance of this problem and has created funding opportunities for improving intermodal connectors.

This again becomes a case of Market-Driven Evolution or Public-Policy-Driven Expansion. A market-driven evolution will in many cases attempt to minimize modal transfers. Since trucks often provide the "last mile" of service, minimizing transfers means eliminating rail long-hauls. A public-policy-driven expansion would help reduce the time and cost of modal transfers, thereby creating a multimodal network that uses all modes to their fullest advantage. Some of the existing needs in this category include:

- Building a grade separation for a road crossing the rail line at Croxton Yard. NS must currently break their trains into two segments to prevent blocking the road as it loads and unloads intermodal containers. This improvement will speed the loading/unloading time and help relieve area congestion.

- Expansion of a truck parking area for a transloading facility on the ME to increase operations; improvements to a bulk loading facility on the NYSW; and, rehabilitation of two rights of way on the RCRY to allow for transloading of plastic resins and food grade products, such as flour and sugar.

- Improvement of rail-rail connections on the Port Reading Line to facilitate Port access; installation of the Waverly loop track to provide better access to chemical industries and improve double-stack rail access.

Expand Rail Service in the North Jersey Shared Assets Area

In 1997 and 1998, there was concern that taking Conrail apart would create capacity issues in Northern NJ.[3] At that time, Conrail controlled three distinct routes into North Jersey:

- Lehigh Line – traversing Pennsylvania and approaching North Jersey from the south;

- Southern Tier (Erie Lackawanna) – through southern NY and approaching North Jersey from the northwest; and,

- River Line (NY Central's West Shore route) – through NY to Albany and then down the west side of the Hudson River.

[3] This discussion of the NJSAA was adapted from conversations with William Goetz of CSX Transportation.

Transportation planners at Conrail could make tactical decisions about how to route traffic to maximize capacity of the system. Today, these decisions are made commercially based on carrier selection. This results in imbalances on the routes.

As previously discussed, CSX's primary access into North Jersey is via the River Line. A secondary CSX route is over the West Trenton Line, and then sharing the NJSAA Lehigh Line with NS. NS's primary access to North Jersey is via the Lehigh Line. NS also owns the Southern Tier route, but this is lightly used.

In addition to less efficient use of the rail infrastructure (for reasons described above), traffic volumes have greatly increased in North Jersey. Intermodal container demand has grown dramatically, generating significant capacity problems.[4] This makes the entire region susceptible to problems, because there is no holding capacity for surges in traffic. Trains can back up in Harrisburg and Syracuse during peak times or during accidents/incidents. Also impacting capacity is a very active commuter rail operator. The heavily used Lehigh Valley Line, for example, supports NS and CSX freight trains, and NJ Transit commuter trains between Newark and Cranford.

In the 1997-1998 time frame, an effort began to identify projects in the NJSAA to support both NS and CSX. This lead to a program of projects in the NJSAA estimated at the time to cost $132.5 million. The major objective 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. Another objective is to enhance the secondary route over the Port Reading Line to better serve the ports. The ultimate vision is a system that would accommodate merchandise traffic on an efficient double-tracked spine (the NJSAA Lehigh Main), while utilizing bypass routes (Port Reading Secondary and National Docks) to support port-related traffic.

The projects include double tracking to eliminate chokepoints, adding new switches, and upgrading signals along some sections. Out of the total program, a series of Phase I projects were selected based on importance and ability to advance towards construction, up to a $50 million cap. Another consideration was that projects should not upset the competitive balance between CSX and NS. Phase I is proceeding, with the PANYNJ contributing $25 million, and CSX and NS each contributing $12.5 million.

Improve National Rail Corridors

As previously discussed, rail service in New Jersey is highly dependent on the performance and condition of the national rail system. There are significant system-level chokepoints throughout the Mid-Atlantic and New England regions that limit the ability of rail to efficiently access and serve New Jersey, and prevent it from reaching its full potential in terms of private profitability and provision of public benefit. The MAROps

[4] Source: Port Authority of NY & NJ, as quoted by William Goetz of CSX Transportation.

program includes $6.2 billion dollars in freight and passenger improvements in five states, to be implemented over a 20-year period. The NEROps project has not yet developed its program recommendations

3.2 System Needs

Categories of Investment Needs

Although there are always exceptions, the typical rail operation works on a hub and spoke system. A rail yard acts as the hub, providing space to assemble outbound trains, breakdown inbound trains, and store rail cars and containers between trains. The main lines provide the primary high-speed conduits moving traffic long distances between yards. Branch lines and trucks provide collector/distributor services for the yards. A network is only as strong as its weakest link. Any chokepoint or capacity constraint can impact the entire network, and enhancements are often aimed at improving capacity at the most critical locations. Therefore, rail improvements must address a variety of different needs:

- **Access/Connectivity** – can either be between modes, such as a truck-rail transloading facility or rail access at a port. Can also include improved rail-to-rail connections.

- **Clearance/Weight** – clearance typically is for double stack containers or multilevel auto carriers on main lines or branch lines. Weight is more likley a branch line issue related to upgrading track and bridges to handle standard 286,000 pound rail car loads, or the higher weight 315,000 pound loads. Both clearance and weight enhancements increase the capacity of the line.

- **Facility Capacity** – includes expansion of yards to add additional track or extend existing track. Acquisition of land for track or storage is often involved.

- **Line Capacity** – the most common form of line capacity improvement is to double track (on existing ROW) a line which had previously been turned from a multiple to single track main line. This allows trains to run bidirectional, greatly expanding capacity. This also reduces the amount of time that trains spend idling at a siding or in a yard waiting for the track to clear. Line capacity improvements also include improved signaling, allowing trains to run at shorter headways.

- **Line Rehabilitation** – is directed at capacity retention, rather than expansion. Normal replacement of ties, realigning or replacing track, refilling and grading ballast, and rehabilitating bridges all fall into this category.

- **Other** – other improvements can include safety, security, and new technology.

Unconstrained System Needs

Railroad needs, for the purposes of this rail plan, are defined as unconstrained capital needs and do not include operating expenses or subsidies, which typically are not part of freight rail public support programs. A capital need is a need regardless of whether it is privately or publicly funded, or remains unfunded.

At the time of this report, a total of $352 million dollars in needs on the New Jersey freight rail network have been identified from known initiatives. These include needs reported through the New Jersey State Rail Planning Process (FY 2006 update), MAROps, and the NJSAA planning efforts. Only needs physically located in New Jersey are included. Inclusion of a need in this document does not constitute a commitment on the part of NJDOT or the State of New Jersey to provide funding. Thus, the needs included in this assessment should be considered "unconstrained" needs that have no funding commitments.

This document also does not include all freight rail needs. The freight railroads are private, for-profit businesses and in some cases do not share all their capital needs for inclusion in public documents. This is especially true in cases where private capital is available to fully fund planned improvements, where the railroads believe that public involvement in specific projects is less likely, and where disclosure of a need could adversely affect strategic plans.

A complete listing of system needs identified by type is presented in Appendix A. Maps showing the locations of these needs are presented in Appendix B.

Analysis of Unconstrained Needs

As illustrated in Figure 5 on the following page, rail needs have been divided the six categories discussed in the previous section. If a project could be included in more than one category, the primary category was selected. The categories are:

- **Line Capacity** – A total of $270 million, representing 70%, of the needs are related to expanding line capacity. Most of these project involve adding a second main line to congested areas. Also included are capacity enhancements realized from signal system upgrades and adding or lengthening passing sidings.

- **Clearance/Weight** – The $36 million in clearance/weight projects include upgrading of track to accommodate 286,000 lb or 315,000 lb standards, and providing clearance for double-stack intermodal or multilevel auto carrier service.

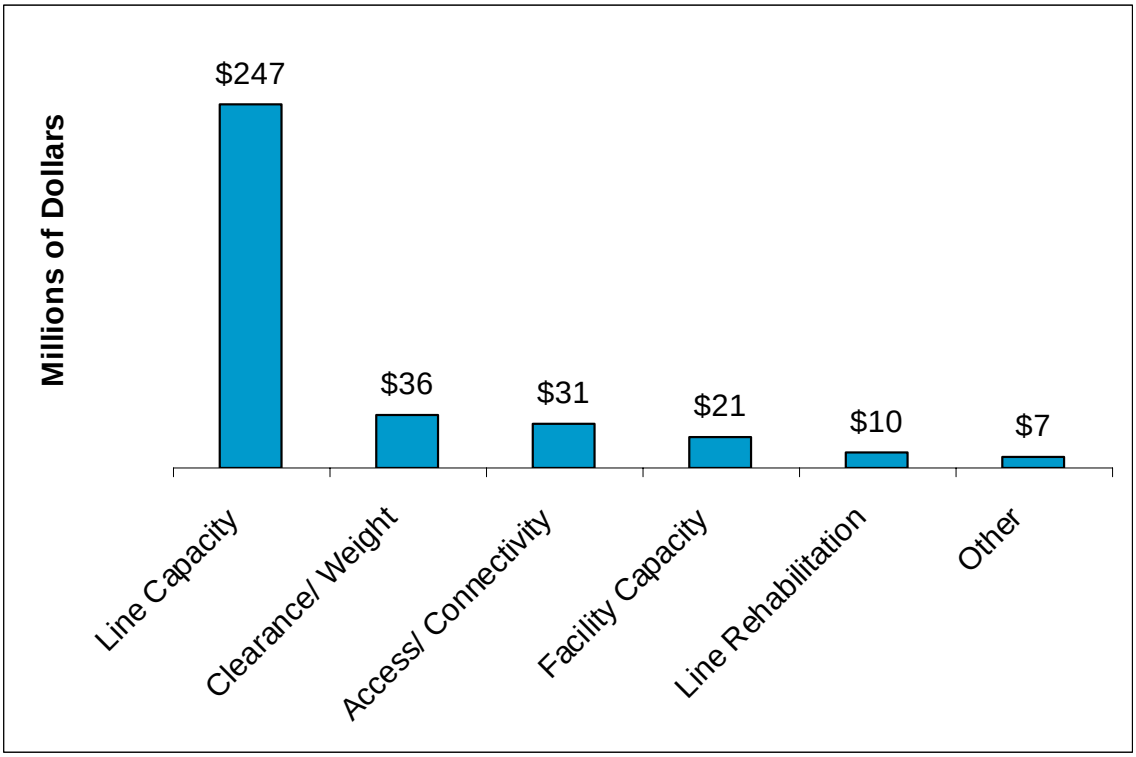
- **Access/Connectivity** – Includes $31 million in projects that improve multimodal connections. These include rail to rail connections (e.g., Port Reading Junction), truck to rail connections (e.g., transloading facility), or port to rail connection.

- **Facility Capacity** – Projects that expand rail yards and other facilities, either through land acquisition or addition of more track, total $21 million.

- **Line Rehabilitation** – The $10 million for rehabilitation includes tie and track replacement and repair, fixing or replacing switches, providing continuously welded rail, bridge rehabilitation and repairs, and maintenance issues.

- **Other** – The $7 million in other needs consists of preliminary engineering studies, land acquisition, installation of weight-in-motion scales, highway-rail grade crossing elimination to improve safety, and security improvements.

Figure 5. NJ Freight Rail Needs by Category (in millions of 2005 dollars)

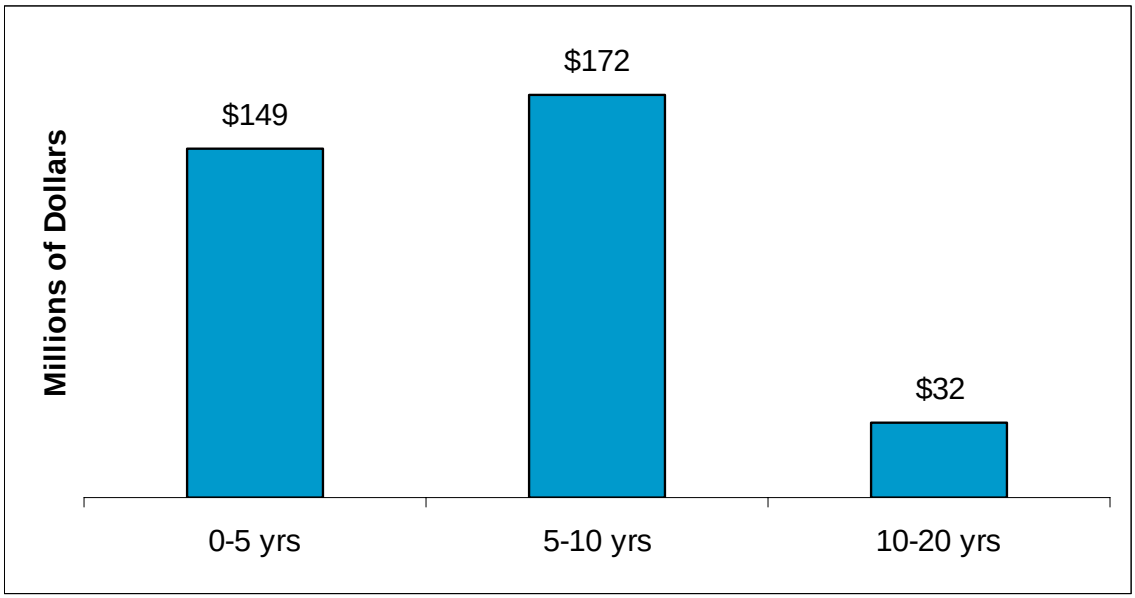


The $352 million in needs includes $149 million (42%) required within 5 years, $172 million (49%) between 5 and 10 years, and $32 million (9%) beyond 10 years.[5] As can be

[5] MAROps projects used these time frames. All projects from the New Jersey rail planning process were assumed to be short term (0-5 years). NJSAA projects were designated as Phase I or Phase II (see map, Appendix B). Phase I projects were assumed to be in the 0-5 year time frame and Phase II projects in the 5-10 year time frame.

seen in Figure 6 on the following page, most of the projects are needed within the next 10 years. This compressed time frame represents a backlog of existing capacity expansions and upgrades to keep pace with current traffic, rather than having the luxury of long range planning for future growth.

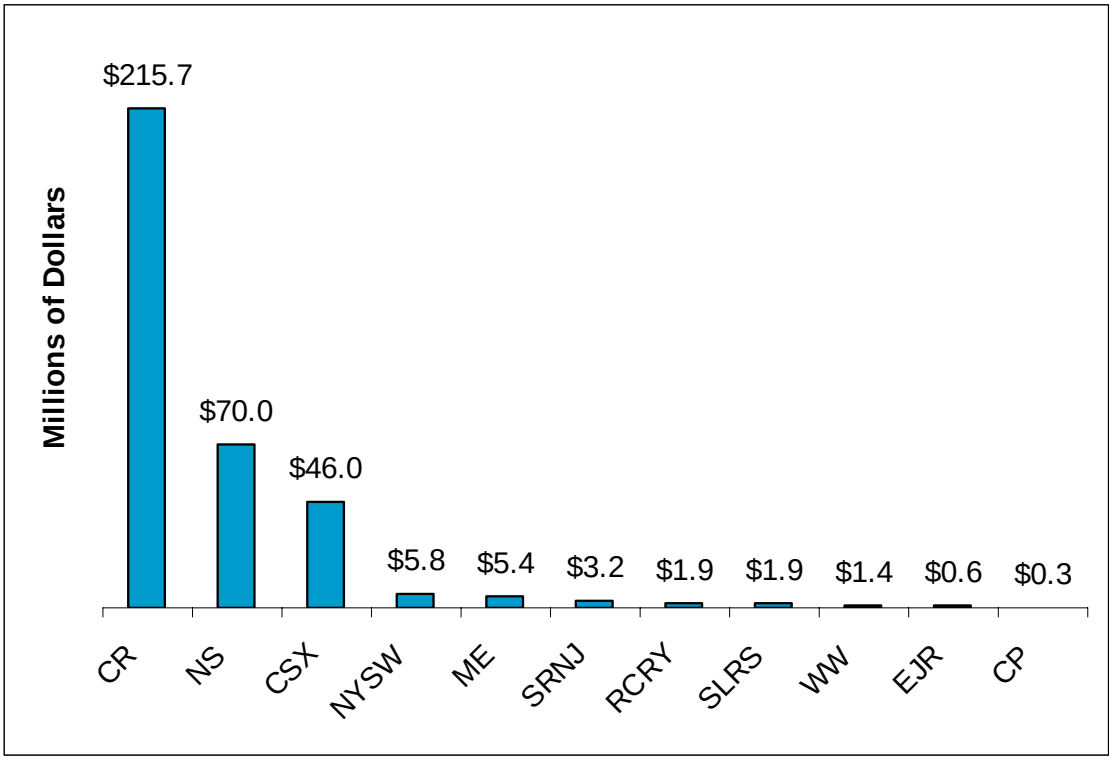
Figure 6. NJ Freight Rail Needs by Period (in millions of 2005 dollars)



With respect to dollar amounts, projects to enhance capacity and improve connections on the NJSAA (Conrail) represents 61% of all needs ($215.7 million) as shown in Figure 7 on the following page. Needs for all railroads were obtained from existing sources and no effort was made to identify new needs.[6]

[6] CSX did identify a need to improve a bottleneck in Teaneck. No cost estimate was provided, thus it is not reflected in the CSX $46 million total.

Figure 7. NJ Freight Rail Needs by Railroad (in millions of 2005 dollars)



3.3 Funding Options

New Jersey DOT has been active in preserving and improving the freight rail network in the State. Since 1975 they have developed annual editions of the *New Jersey State Rail Plan*, which identifies many system needs. Beginning in 1983, NJDOT began dispersing state funds to eligible projects. All projects must exhibit a public benefit/cost ratio of greater than one to be eligible. The state will provide a grant for 90% of the total project cost, with the project sponsor (railroad or locality) providing the 10% match. Currently, the state rail freight assistance programs provide $10 million in annual funding.

New Jersey has a backlog of over $350 million in freight rail repairs, upgrades, and capacity expansion projects necessary to keep pace with existing and growing demand for goods movement. A more comprehensive gathering and assessment of needs would likely lead to a significant increase in this total. Even with public-private cost sharing and leveraging potential new Federal sources, the needs far outdistance available state support. It is, therefore, necessary to maximize the use of all potential funding sources.

Funding for rail needs can be divided into four separate tiers:

1. **Dedicated Funds** are those needs that receive dedicated ongoing Federal or state funding. The NJDOT state rail assistance programs fall into this tier, though appropriations must be renewed annually. This tier also includes the Federal Section 130 program, which provides dedicated annual funding for highway-rail grade crossing improvements. The Federal Local Rail Freight Assistance Program was in this tier, but Federal appropriations ceased in 1995.

2. **Competitive Funds** are those needs historically funded through appropriations by a legislative body. These are typically transportation funds shared by all modes. Freight rail projects must compete with passenger, highway, airport, and marine port needs.

3. **Major Capital Project Funds** are those needs met through one-time capital outlays, either at the Federal or state level, and include such programs as:

   - The Federal Borders and Corridors program, which can be applied to rail improvements;
   - The Federal CMAQ program, which can be used for rail improvements that improve air quality;
   - Special Federal earmarks, especially through TEA-21 or reauthorization;
   - Highway construction mitigation programs; and
   - Statewide flexible funding.

4. **Private Funds** have and will continue to be the most prevalent source of freight rail capital improvements. Public support has largely been relegated to highway-rail grade crossing safety and short line assistance in the form of economic development and job growth funds. Currently, public-private partnerships are being explored for large-scale project that leverage public and private investments into public and private benefits. Unique to this region is the Port Authority of NY & NJ, which due to it's revenue generation sources often behaves as a private entity. As previously noted, the Port Authority is providing $25 million of the first $50 million needed for Phase I of the NJSAA projects.

Table 3 on the following page contains a strategy for maximizing the use of each funding source.

Table 3. Funding Commitment Tiers

Tier	Funding Sources	Types of Projects
1. Dedicated Funds	NJ Rail Assistance, Federal Government	NJ rail assistance programs directed at weight and clearance improvements, track rehabilitation, and smaller modal connection improvements. Federal Section 130 Rail Grade Crossing Safety program must be used for road-rail grade crossing safety improvements.
2. Competitive Funds	State and Possible Competitive Federal Grants	These funds should be used for projects that: improve connections with other modes, thus creating a stronger multimodal transportation system; enhance the total freight capacity and reliability of New Jersey's transportation network; and, support modern rail industry standards to ensure an efficient system. Competitive Federal grants have been available in the past for specific demonstration of new or emerging technologies.
3. Major Capital Project Funds	Mostly Federal, possibly state, local	One-time allocations for Borders & Corridors, CMAQ, and Federal earmarks, especially for projects of regional or national significance.
4. Private Funds	Private railroads	The railroads will fund projects that are "mission critical" to their strategic plan and projects that offer sufficient return on investment. The Port Authority of NY & NJ, essentially behaving like a private entity, can provide funding for freight rail improvements benefiting Port Authority activities.

Appendix A

Freight Rail Needs

Appendix A: Freight Rail Needs

Needs are summarized in Table A-1 on the following pages.

Table A-1. Summary of Freight Rail Needs Compiled From Available Sources

Index	NJSRP	NJDP	MAROps	Other	Project Name/Location	Project Description	Time Frame	Cost ($ millions)	Railroad	Problem Solved/ Intended Function	Project Type
1		■	■		Portside to E-Port (Chemical Coast, CP Port)	Add 2nd main & TCS	0-5 yrs	6.4	CR	Currently a single track with sidings, causing capacity problems. The present siding are often needed for storage of equipment. An additional track would eliminate delays.	Line Capacity
2		■	■		Pike to Portside (CP PN & Pike)	Add 2nd main, TCS, & reconfigure PN interlocking	0-5 yrs	9.1	CR	Currently a single track with sidings, causing capacity problems. The present siding are often needed for storage of equipment. An additional track would eliminate delays.	Line Capacity
3		■	■		Valley to Pike (includes Bay Line Yard)	Double track Lehigh Line segment.	0-5 yrs	10.6	CR	The route is 1.5 miles of single track to reach the Chemical Coast from the Lehigh Line. Double tracking would reduce delays for CSX, NS and the Shared Assets.	Line Capacity
4		■	■		Stock to Valley (Lehigh Connection Track)	Double track Leigh Line connecting track (1.0 mi)	0-5 yrs	5.5	CR	This is a single track connection with insufficient capacity for CSX to Northeast and Karny/North Bergen intermodal facilities and for NS for Southern Tier and Croxton intermodal facility. This bottleneck currently causes delays to trains.	Line Capacity
5		■	■		Plank to Stock	Add TCS to both mains	0-5 yrs	0.9	CR	TCS P&H Branch segment (1.9 mi). This would be done in conjunction with another main between Stock and Hack to expand line capacity.	Line Capacity
6		■	■		Potter to Bound Brook	Add 10.7 miles of 2nd main track	0-5 yrs	21.4	CR	This is a single track, forcing only one train at time for NS trains to Croxton intermodal and Southern Tier and CSX trains to Northeast and North Bergen and Karny intermodal facilities. The improvement will permit simultaneous train movements to improve through service.	Line Capacity
7		■	■		Oak Island Rail Property	Acquire Raff property/build yard/expansion for container terminal	5-10 yrs	7.7	CR	Will allow Oak Island use of land now being used for container traffic. This will increase yard capacity at Oak Island, thus reducing delays.	Facility Capacity
8		■			n/a	Preliminary engineering and property acquisition for Phase II projects	5-10 yrs	5.7	CR	Engineering design and property acquisition.	Other
9		■	■		Hack to Karny	Double track P&H Branch segment (1.8 miles), extend 3 yard tracks, and add 1 yard track	5-10 yrs	12.8	CR	Eastbound main is assigned to yard service to/from APL and CSX at Karny. Construction of another main would eliminate delays using this single track main, thereby improving on-time performance.	Line Capacity
10		■	■		Port Reading Junction	Connect siding on Port Reading Secondary to Trenton Line	5-10 yrs	2.4	CR	There is single track to double track between these two locations to a point of connection with the CSX Trenton Line. Creates access/capacity restrictions to one train at a time between Shared Assets, NS, and CSX. This project will allow direct moves NS/CSXT to Shared Assets, Lehigh Line, & Port Reading Secondary.	Access/ Connectivity
11		■	■		Marion (St. Paul's Ave) to Hack	Double track this 0.5 mi elevated segment (Marion Connection)	5-10 yrs	24.4	CR	Only one train at time can move for NS to Croxton intermodal and Southern Tier and CSX to Northeast and North Bergen and Karny intermodal facilities over this single track segment. This project will permit simultaneous train movements to improve through service.	Line Capacity
12		■	■		Waverly	Build loop track	5-10 yrs	13.6	CR	There are currently no operations possible between P&H Branch and Chemical Coast. The installation of the Waverly loop would facilitate trains off the P&H line to reach the Chemical Coast. Will allow full double stack service from port facilities for CSX.	Access/ Connectivity
13		■	■		Oak Island Rail Property	Acquire Raff property/build yard/expansion for container terminal	5-10 yrs	9.8	CR	Will allow Oak Island use of land now being used for container traffic. This will increase yard capacity at Oak Island, thus reducing delays.	Facility Capacity
14		■			Port Reading Secondary	TCS & upgrade rail	5-10 yrs	9.1	CR	Improve capacity and reliability of Port Reading Secondary.	Line Capacity
15		■			Port Reading Secondary	Extend siding with spring switches	5-10 yrs	3.7	CR	Improve capacity and reliability of Port Reading Secondary.	Line Capacity

Table A-1. Summary of Freight Rail Needs Compiled From Available Sources

Index	NJSRP	NJDP	MAROps	Other	Project Name/Location	Project Description	Time Frame	Cost ($ millions)	Railroad	Problem Solved/ Intended Function	Project Type
16		■	■		Bayway to PD (Port Reading)	Add 2nd main & TCS (4 mi)	5-10 yrs	12.4	CR	Currently single track with sidings. This project will create an alternate clearance route to North Jersey.	Line Capacity
17				■	Teaneck	Add 2nd main track on River Line	-	-	CSX	Eliminate chokepoint in Teaneck, reducing delay and improving transit times on CSX.	Line Capacity
18			■		New County Road, west end of Croxton Yard	Roadway overpass	0-5 yrs	12.0	CR	Remove road crossing rail storage tracks. Prevents NS from having to break trains as they wait for port traffic.	Access/ Connectivity
19			■		Manville to Trenton	Central Jersey 2nd main track	0-5 yrs	46.0	CSX	Double track line to improve CSXT capacity and transit times.	Line Capacity
20			■		Manville to Phillipsburg	Various improvements (track, bridge rehabilitation, crossovers, etc.) on Lehigh Line	5-10 yrs	70.0	NS	Increase capacity through double tracking and other improvements. Includes Pattenburg tunnel and sidings on both ends of tunnel. This will permit simultaneous train movements to improve through service for NS.	Line Capacity
21			■		Bergen & Waldo tunnels	Increase clearance	10-20 yrs	32.0	CR	Clear for double stack service, providing alternative port access.	Clearance/ Weight
22			■		Port Reading Junction (Bound Brook to Woodbridge)	TCS and upgrade rail (15.9 mi) and extend Durham siding (1.5 mi); TCS, siding extension, new rail in Port Reading Junction	0-5 yrs	12.8	CR	Restricted to one train at a time along this 16 mile, single track line. TCS and extension of the 2,800 foot siding will allow multiple trains, allowing direct moves by NS/CSX to Shared Assets, Lehigh Line, & Port Reading Secondary (providing alternate clearance route to North Jersey.)	Line Capacity
23	■				Rail Safety Scale	Installation of weight-in-motion scale at Oak Island Yard.	0-5 yrs	0.2	CP	Will assure proper car weights, preventing overloads and averting accidents. The scale is particularly helpful for expanding businesses at the yard.	Other
24	■				Concrete Pad	Construction of concrete pad to facilitate truck to rail transfer of solid waste.	0-5 yrs	0.1	CP	Improved intermodal connectivity, especially truck-rail connectivity for solid waste. The project serves the growing solid waste business.	Access/ Connectivity
25	■				Robbinsville Track Rehabilitation	Rehabilitation of 5.5 miles of track and associated facilities between MP 26.7 and 32.2 in Bordentown and Yardville	0-5 yrs	2.5	CR	This project will rehabilitate track between Bordentown and Yardville, serving six customers. Includes installing new ties and rail, improving some grade crossings and removing others, improving and replacing turnouts, and installing a runaround track.	Line Rehabilitation
26	■				Tie Replacement on the Southern Secondary	Replace ties between MP 58 and 66 on the Southern Secondary, including the Toms River Industrial Track, in the Lakehurst area.	0-5 yrs	0.5	CR	The repairs will maintain service levels on the existing track serving seven customers. Part of this section of track is owned by Conrail and the remainder is owned by NJ DOT.	Line Rehabilitation
27	■				Pemberton Industrial Track Runaround	Construct a 1300 foot runaround in the Hainesport Industrial Park, eliminating three grade crossings.	0-5 yrs	0.5	CR	By eliminating three grade crossings, safety will be improved and train speeds will increase. This section of track serves four customers.	Other
28	■				Station 1 Rehabilitation	Rehabilitating 1714 feet of track, rebuilding 5 turnouts, repaving a crossing and installing 1200 feet of concrete by the loading/off-loading racks to accommodate 315,000 pound railcars.	0-5 yrs	0.5	EJR	This project will update older rail infrastructure serving 5 loading/off-loading spurs at a petrochemical facility to handle 315,000 pound railcars.	Clearance/ Weight
29	■				Shook Track	Reconstruct 780 feet of existing track to safely and efficiently accommodate 315,000 pound rail cars.	0-5 yrs	0.1	EJR	Upgrade to handle 315k railcars, thus increasing safety and efficiency for larger car loads.	Clearance/ Weight
30	■				Kenvil Sucasunna Branch Rehabilitation	Rehabilitate 4 miles of track, switches and a runaround.	0-5 yrs	3.8	ME	This line brings in supplies for Holland manufacturing and serves a new lumber distribution facility. Four other customers use portions of the line.	Line Rehabilitation

Table A-1. Summary of Freight Rail Needs Compiled From Available Sources

Index	NJSRP	NJDP	MAROps	Other	Project Name/Location	Project Description	Time Frame	Cost ($ millions)	Railroad	Problem Solved/ Intended Function	Project Type
31	■				Cedar Knolls-Siding, Scale, Track	Construction of a new 1800 foot siding, a new scale, and 2500 feet of track rehabilitation.	0-5 yrs	1.3	ME	This project will provide 25 additional car unloading spaces, the ability to accurately weigh loaded railcars and trucks, and associated track rehabilitation.	Line Rehabilitation
32	■				Kenvil Transloading	Expansion of an existing truck parking area by 800 feet.	0-5 yrs	0.2	ME	Will allow transloading facilities for an additional 11-12 rail cars.	Access/ Connectivity
33	■				Sparta Sidings	Provide a 1500 foot siding and a 3000 foot siding as well as four turnouts to support various customers and car loadings.	0-5 yrs	0.6	NYSW	These additional sidings are needed to support new rail business.	Line Capacity
34	■				Public Bulk Facility at Sparta	Grading, site work, construction of 1300 feet of track, and construction of two switches at a bulk facility.	0-5 yrs	0.9	NYSW	Will serve several customers unloading various bulk commodities.	Access/ Connectivity
35	■				Expansion of Intermodal Facility	Demolition of a sewage facility and relocation of a sewer line to expand and upgrade the intermodal facility between 43rd Street and Secaucus Road.	0-5 yrs	3.0	NYSW	Removal of sewage facility and relocation of sewer line will free up land for expansion of an intermodal facility.	Facility Capacity
36	■				Welded Rail Elmwood Park to Sparta	Six miles of weld-in-place rail between Elmwood Park and Sparta.	0-5 yrs	1.3	NYSW	These six miles of weld-in-place rail will complete the program, and the NYSW will be entirely welded rail between Little Ferry and Sparta NJ.	Line Rehabilitation
37	■				Rehabilitation of Main Line	Work includes replacing 500 LF of track and rebuilding the Clover Place crossing.	0-5 yrs	0.1	RCRY	This line handles all the traffic on the Raritan Central Railway between the classification yard and Parkway Place.	Line Rehabilitation
38	■				HO-RO/Riviana	The project calls for replacing 1720 LF of track, including one switch and a rebuilding the Raritan Center Parkway crossing.	0-5 yrs	0.3	RCRY	This section serves Riviana and US Gypsum/Ho-Ro Trucking between the classification yard and Raritan Center Parkway.	Line Rehabilitation
39	■				Rehab of Riviana/KTN Lead	Rehabilitation of 516 feet of track and a crossing of Raritan Center Parkway.	0-5 yrs	0.1	RCRY	This line serves Riviana from the turnout to Raritan Center Parkway.	Line Rehabilitation
40	■				Rebuild Pershing Avenue Extension Tracks	Replace 6307 LF of old track bed with 7541 LF of new track and two #8 turnouts.	0-5 yrs	1.3	RCRY	This project will rehabilitate two old rights of way off Pershing Avenue to allow for transloading of plastic resins and food grade products, such as flour and sugar.	Access/ Connectivity
41	■				Dual Track on Pershing Lead	This project calls for 420 LF of track and two #8 turnouts.	0-5 yrs	0.1	RCRY	Additional capacity between the Classification Yard and Olympic Avenue is sought to safely handle new traffic in plastics and growing business in vegetable oils.	Line Capacity
42	■				Secure Hazmat Storage Yard	Construct two storage tracks with fencing and gates.	0-5 yrs	0.8	SRNJ	Southern Railroad has been storing empty freight cars on an out of service line. Due to the reconstruction of the Hospitality Creek Bridge, this line will be returning to service, and the empty cars, particularly those which have been carrying hazmats, should be stored in a secure location.	Other

Table A-1. Summary of Freight Rail Needs Compiled From Available Sources

Index	NJSRP	NJDP	MAROps	Other	Project Name/Location	Project Description	Time Frame	Cost ($ millions)	Railroad	Problem Solved/ Intended Function	Project Type
43	■				Reconstruct Port Branch W. Broadway	Reconstruct approximately 800 feet of track using 100 pound rail, replace one turnout, rehabilitate another turnout and improve drainage.	0-5 yrs	0.2	SRNJ	This project will serve a new tenant that has moved into the Port of Salem, creating 25 new jobs, but requiring rail service for delivery of raw materials and shipment of finished projects.	Line Rehabilitation
44	■				Anchor Lead Curve	Will reconstruct the existing track along Fifth Street and construct a new, broader curve. The old track will be removed and the area re-graded.	0-5 yrs	0.2	SRNJ	The SRNJ leases and maintains this section of track serving the Anchor Glass Container Corp. with 350 employees. Reducing the curvature on approximately 550 feet of track will permit longer rail cars to access the plant and reduce excessive wear on rail and cars.	Line Rehabilitation
45	■				Oldmans Creek Trestle	Replacing the timber pilings and other structural components with steel to accommodate 286,000 pound cars.	0-5 yrs	2.0	SRNJ	Upgrade to handle 286k railcars, thus increasing safety and efficiency for larger car loads. This bridge carries between 1500 and 2000 carloads annually. Recent work has included emergency repairs, and work on the approaches and deck.	Clearance/ Weight
46	■				Paulsboro Branch	Upgrade 4 turnouts, add 2 new turnouts, add 1575 feet of track, and upgrade 4500 feet of track to handle 286,000 pound cars.	0-5 yrs	1.0	SLRS	Upgrade the main line and yard tracks to support increasing traffic, including both new customers and heavier car weights. Over 600 additional carloads are expected on the Paulsboro Branch in 2006.	Clearance/ Weight
47	■				Bridgeport Branch	The project will include upgrading 1140 feet of track, extending the interchange and runaround siding by 2745 feet, extending a siding by 550 feet and building 1500 feet of new track to reach new customers.	0-5 yrs	0.9	SLRS	The need here is to upgrade the existing tracks to handle 286,000 pound car weights and lengthen interchange tracks to handle the 1800 additional carloads expected in 2006.	Line Capacity
48	■				Track Welding Southern Main Branch	Welding at 4 locations.	0-5 yrs	0.2	WW	This request will improve heavy car capacity on curved sections of the railroad's most heavily used track, serving eleven customers from the Bridgeton Yard.	Clearance/ Weight
49	■				Rail Replacement Seashore Branch	Upgrade 0.6 miles of track by replacing existing 100 pound rail with heavier rail.	0-5 yrs	0.2	WW	Replace existing 100 pound rail with heavier rail to accommodate heavier cars used by existing customers. Four customers are served on the line.	Clearance/ Weight
50	■				Bridgeton Junction Yard Track	Construct a 2000 foot siding track in the yard to facilitate the storage and assembly of trains.	0-5 yrs	0.4	WW	Train lengths are exceeding yard capacity, especially for unit grain and aggregate trains.	Facility Capacity
51	■				Millville Runaround Track	Construct a 3000 foot runaround to facilitate switching movements.	0-5 yrs	0.6	WW	New industrial development in Millville, as well as increased rail activity at existing industries, will increase rail usage requiring additional handling capability.	Line Capacity

Appendix B

Locations of Freight Rail System Needs

Appendix B: Locations of Freight Rail System Needs

Table B-1. Project Descriptions and Map Index Numbers (for Figures B-1 and B-2 following)

#	Project Description	Railroad
1	Portside to E-Port Add 2nd Main & TCS	CR
2	Pike to Portside Add 2nd Main, TCS & Reconfigure PN	CR
3	Valley to Pike Add 2nd Main Track	CR
4	Stock to Valley Add 2nd Main Track	CR
5	Plank to Stock Add TCS-Both Mains	CR
6	Potter to Bound Brook Add 10.7 Miles 2nd Main Track	CR
7	Oak Island Raff Property-Phase I	CR
8	Preliminary Engineering & Property Acquisition	CR
9	Hack to Karny Double Track P&H Branch Segment, Extend 3 Yard Tracks & Add 1 Yard Track	CR
10	Connect Siding on Port Reading Sec to Trenton Line	CR
11	Marion (St. Paul's Ave) to Hack Add 2nd Main Track	CR
12	Waverly Build Loop Track	CR
13	Oak Island Raff Property-Phase II	CR
14	TCS & Upgrade Rail on Port Reading Sec	CR
15	Port Reading Secondary Extend Siding w/Spring Switches	CR
16	Bayway to PD Add 2nd Main & TCS	CR
17	Teaneck Add 2nd Main	CSX
18	Overpass New County Road, Croxton Yard	CR
19	Manville to Trenton - Add 2nd Main	CSX
20	Manville to Phillipsburg - 2nd Main, Sidings, Various Upgrades	NS
21	DS Clear Bergen & Waldo Tunnels	CR
22	Port Reading Junction (Bound Brook to Woodbridge) Add TCS & Durham Siding, Upgrade Rail	CR
23	Rail Safety Scale - Oak Island	CP
24	Concrete Pad To Facilitate Transloading of Solid Waste	CP
25	Robbinsville Secondary Track Rehabilitation - 5.5 Miles Between Bordentown and Yardville	CR
26	Tie Replacement on the Southern Secondary in Lakehurst Area	CR
27	Pemberton Industrial Track 1300 ft Runaround at Hainesport Industrial Park	CR
28	Station 1 Rehabilitation to Accommodate 315k Car Loads for Petrochemical Facility	EJR
29	Shook Track - Reconstruct 780 ft to Accommodate 315k Car Loads	EJR
30	Kenvil Sucasunna Branch Rehabilitation of 4 Miles of Track	ME

31	Cedar Knolls-Add New 1800 ft Siding, Add New Scale, Rehab 2500 ft Track	ME
32	Expand Truck Parking Area at Kenvil Transloading to Allow for Additional Rail Cars	ME
33	Add a 2500 ft & 3000 ft Siding at Sparta, Plus Four Turnouts	NYSW
34	Grading, Site Work, and Construction of 1300 ft of Track w/Two Switches for a Public Bulk	NYSW
35	Demolition of Sewage Facility for Expansion of Intermodal Facility at 43rd St & Secaucus Road	NYSW
36	Six Miles of Welded Rail Between Elmwood Park and Sparta to Handle Heavier Car Loadings	NYSW
37	Rehabilitation of Main Line, Rebuilding Clover Place Crossing	RCRY
38	Rehabilitation of HO-RO/Riviana Lead Serving US Gypsum/Ho-Ro Trucking	RCRY
39	Rehabilitation of Riviana/KTN Lead	RCRY
40	Rebuild Pershing Avenue Extension Tracks to Allow Transloading of Plastic and Food	RCRY
41	Add Capacity With a Dual Track on Pershing Lead to Accommodate Growing Plastic and	RCRY
42	Secure Hazmat Storage Yard with Fencing and Gate near Hospitality Creek Bridge	SRNJ
43	Reconstruct Port Branch Across West Broadway to Better Serve Port of Salem	SRNJ
44	Anchor Lead Curve - Reduce Curvature to Permit Longer Rail Cars to Access Anchor Glass	SRNJ
45	Replace Timber Pilings on Oldman's Trestle with Steel for 286k Loads	SRNJ
46	Paulsboro Branch Upgrade for Increased Traffic and 286k Loads	SLRS
47	Bridgeport Branch Upgrade for Increased Traffic and 286k Loads	SLRS
48	Track Welding For Heavy Car Capacity on Southern Main Branch	WW
49	Replace 100 lb Rail on Seashore Branch to Accommodate Heavier Car Loads	WW
50	Bridgeton Junction Yard Track 2000 ft Siding	WW
51	Millville Runaround Track 3000 ft to Facilitate Industrial Switching	WW

Figure B-1. Location of Freight Rail Needs Outside the NJSAA

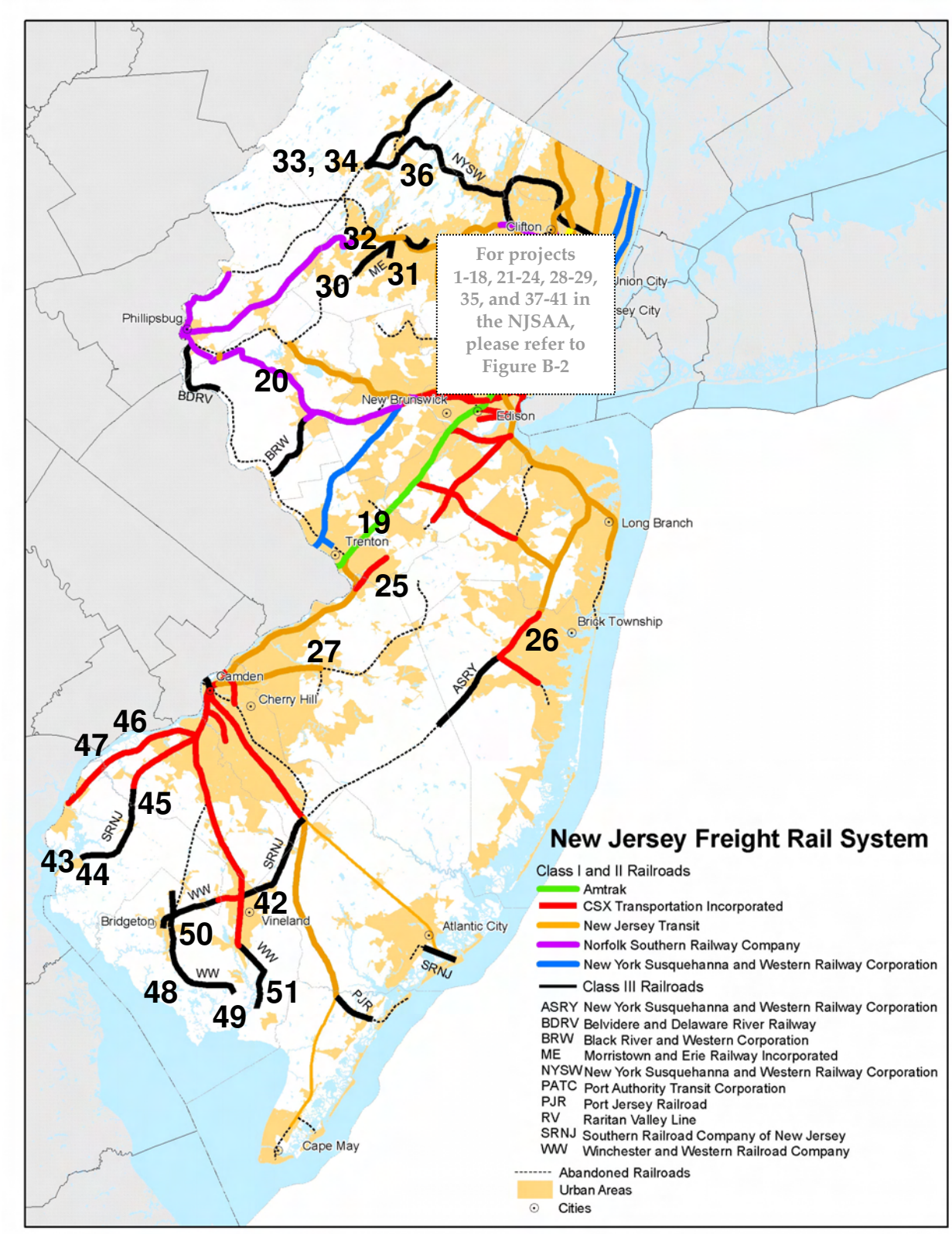


Figure B-2. Location of Freight Rail Needs Within the NJSAA