North Jersey
Transportation Planning Authority

FINAL SUMMARY REPORT

NJTPA *Freight System Performance Assessment*

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ACCESS & MOBILITY 2030 REGIONAL TRANSPORTATION PLAN

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1.0 Why is Freight Important?

The North Jersey Transportation Planning Authority region is one of the busiest freight handling centers in the nation. Goods from all over the world enter and leave the United States through its marine terminals; raw materials and finished products arrive and depart through major rail freight terminals; high-value, time-sensitive commodities are shipped via air cargo through the region's airports; and seemingly innumerable trucks carry goods within and through the region.

All metropolitan areas experience freight movement, but the NJTPA region – hosting a major international seaport, serving as the eastern terminus of the nation's east-west rail system, providing through routes for truck traffic moving between New York City/New England and the rest of the country, and being home to residents and businesses that consume and produce millions of tons of goods each year – experiences it far more intensely than most.

This situation – which has evolved from a combination of geographic, demographic, and economic forces over the last 150 years – has negative and positive aspects. On the negative side, we see decreased transportation system performance (from congestion and incidents associated with trucks, and from conflicts between rail freight traffic and other activity), as well as increased environmental impact (noise, vibration, air emissions, wetlands impacts, community and neighborhood quality of life, etc.) On the positive side, we see a huge boost to the regional economy. There are direct jobs associated with cargo handling by the region's marine terminals, airports, railroads, and truckers; there are indirect jobs associated with re-handling and value-added processing of that cargo through the region's warehouse/distribution and processing centers; and there are jobs created by the region's producers that are made possible because of excellent, cost-effective access to regional, national, and international markets. The region's status as a freight hub is a key advantage in retaining and attracting businesses, and in supporting its overall economy.

Regardless of whether one believes that we have too much freight movement, or not enough, one thing seems certain – freight is not going away anytime soon. Freight happens, and it will continue to happen as long as the region's residents and businesses consume, produce, and transport goods. Moreover, most forecasts call for a doubling or even tripling of freight demand over the next 25 years. If growth in freight movement cannot be reversed, it can – and must – be effectively planned and managed, so that its negative aspects are minimized and mitigated at the least public cost, while its positive aspects are promoted to achieve public benefits and public goals.

2.0 Overview of Regional Freight Movement

Freight movement studies tend to use their own descriptive terms, and there is some variability in how they use them. Here are some general definitions:

- Freight movement – This can be defined generally as the physical movement of commercial commodities – materials, products, and/or property – between two points. Waste products with commercial value – such as scrap metal, waste paper, and recyclables – are considered freight. Municipal waste is generally not considered "freight," and may not be represented in freight statistics.

- Freight modes – These are the ways that freight can be physically carried, and include air, water, truck, rail, and pipeline.

- Freight networks – These are point-to-point freight transportation systems that link specific geographic origins and destinations, and include waterways, highways, rail lines, and pipelines.

- Interchange points or nodes (not to be confused with modes) – These are specific locations where freight is exchanged between modes, or undergoes some sort of processing or handling activity, such as airports, seaports, rail terminals, and warehouse/distribution centers. These activities are often clustered due to zoning, transportation factors, and/or operational and marketing advantages.

- Intermodal freight – Most broadly, this is freight that moves from origin to destination using a combination of modes (truck-air-truck, truck-rail, seaport-rail, etc.). In a more limited definition, it is freight moved within an intermodal shipping container that can be easily transferred between vessels, trucks and railcars.

- Freight volume – U.S. freight movement is generally measured in terms of weight (metric tons, long tons, short tons, or pounds), value, units (number of containers, automobiles, etc.), value, vehicles moved (railcars, trucks, vessels, etc.), vehicle miles of travel (VMT), and ton-miles (tonnage times miles of travel). Container volumes are often measured in TEUs (twenty-foot equivalent units) because containers come in a variety of lengths. Liquid bulk may also be measured in barrels (42 gallons). **All tonnage quoted in this document represents short tons (2,000 lbs)**.

Within the NJTPA region, the key drivers of freight movement are:

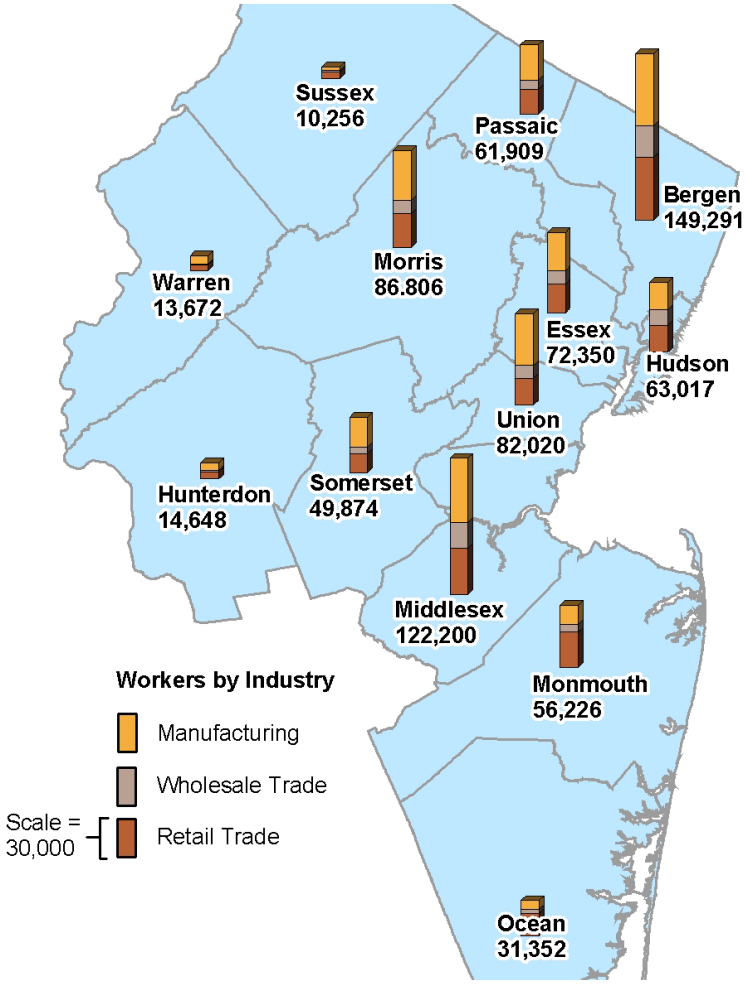
- Consumer demand in the NJTPA region. Freight movement is generated by the everyday economic activity of producing, processing, and consuming materials and goods. Millions of people buying millions of apples – and grapes, and everything else – generates a huge demand for freight movement.

- Producer demand in the NJTPA region. Production of raw materials, finished goods, and intermediate (partially completed) goods generates demand for freight movement, so that producer outputs can reach their markets.

- Interchanging, handling, and processing activities. Interchanging, processing, or other handling of goods and materials – through the region's airports, seaports, rail terminals, warehouse/distribution centers, and "value added" manufacturing facilities – is an important part of accommodating freight demand.

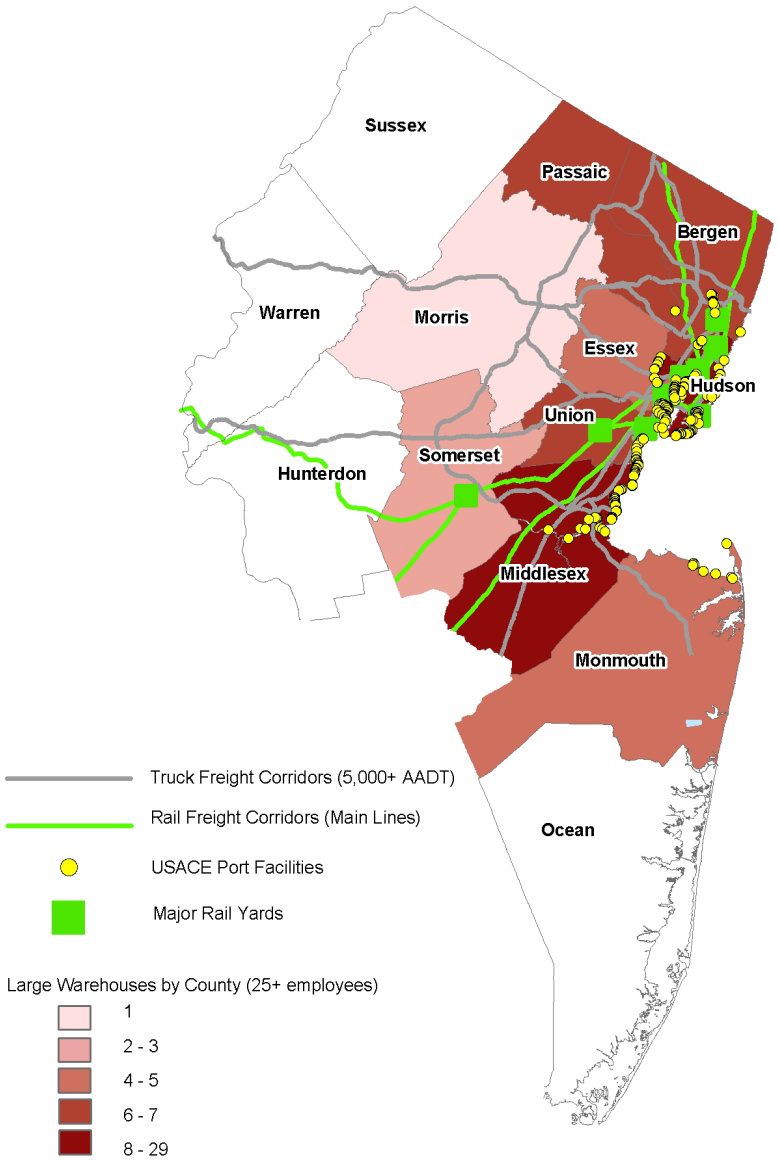
- Gateway functions. The region's geography and position within the nation's overall transportation system have created a 'gateway' role for the NJTPA counties. The NJTPA region's highways, rail lines, seaports, airports, and warehouse/distribution centers are critically important to serving the larger New Jersey/New York/Connecticut metropolitan area, as well as New England and the Mid-Atlantic states. This gateway function offers unique advantages for the region (highly-developed infrastructure and high job creation), but also imposes additional burdens (in the form of extra "through" traffic and related impacts).

Figure 1. NJTPA Region Employment in Manufacturing, Wholesale, and Retail Trades (2000)



Source: U.S. Census.

Figure 2. NJTPA Regional Gateway Transportation Facilities



Sources: Federal Highway Administration, Federal Railroad Administration, U.S. Army Corps of Engineers (USACE), Federal Aviation Administration, and InfoUSA business database.

There is no single source of data that provides a complete picture of freight movements for the NJTPA region. Table 1 on the following page is a summary of several different data sources, including TRANSEARCH (a commercial data product of Reebie Associates), the Port Authority of New York and New Jersey (PANYNJ), the U.S. Army Corps of Engineers (USACE), and the U.S. Department of Transportation (U.S. DOT). Much of the waterborne tonnage information has been approximated based on bi-state data.

Table 1. Approximate NJTPA Regional Freight Tonnage

	Truck (2003)	Rail (2001)	Water (Approx. 2003)	Air (2003)	Total
Originating in any NJTPA County	**164,458,387**	**8,365,016**	**32,444,828**	**430,051**	**205,698,282**
To International (est.)	**	**	7,836,359	69,800	7,906,159
To Outside Region	107,512,317	8,317,484	24,608,469	360,251	140,798,521
To another NJTPA County	56,946,070	47,532	**	**	56,993,602
Terminating in any NJTPA County	**144,778,511**	**16,327,506**	**58,042,572**	**477,545**	**219,626,134**
From International (est.)	**	**	45,281,031	121,442	45,402,473
From Outside Region	87,832,441	16,279,974	12,761,541	356,103	117,230,059
From another NJTPA County	56,946,070	47,532	**	**	56,993,602
Originating/Terminating, Other (est.)	**0**	**0**	**20,065,160**	**56,521**	**20,121,681**
Subtotal of Originating/Terminating	**309,236,898**	**24,692,522**	**110,552,560**	**964,117**	**445,446,097**
International (est.)	0	0	53,117,390	191,242	53,308,632
Domestic (est.)	309,236,898	24,692,522	57,435,170	772,875	392,137,465
Traffic 'passing through' any NJTPA county that is not generated by another NJTPA county; traffic through multiple counties is counted only once	**111,938,944**	**	**	**	**

Sources: TRANSEARCH 2003, TRANSEARCH 2001, PANYNJ 2003, USACE 2002; ** = no data available.

The tonnage originating and terminating entirely within the NJTPA region is estimated at over 445 million tons. Key highlights include the following:

- Modes – Trucks represented 69% of originating and terminating tonnage; water represented 25%; rail represented 6%; and air (which specializes in low-weight, high value commodities) represented less than 1%. Each is critical to the overall system.

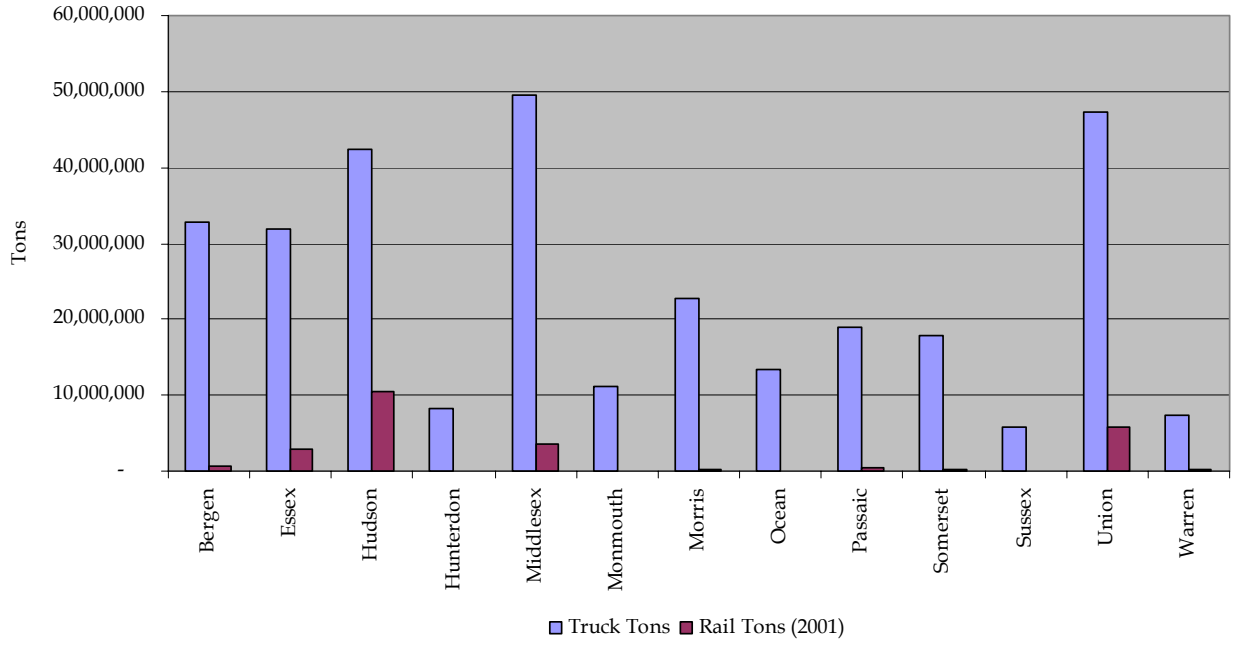
- International vs. domestic – Around 12% of originating and terminating tonnage is international, while 88% is domestic. Around half of waterborne tonnage is international and around 20% of airborne tonnage is international. For truck and rail, international tonnage data is not available, so all tonnage is classified as domestic.

- Directions – For international traffic, around 85% of tonnage was terminating. For domestic traffic, around 53% was originating; in part, this reflects the fact that terminated international traffic becomes originated domestic traffic when it passes through a port. Around one-third of domestic tonnage was between NJTPA counties.

- Through traffic – Around 309 million truck tons originate or terminate in NJTPA counties; another 111 million tons of 'pass through' truck traffic are generated by moves that have neither an neither an origin nor a destination in the NJTPA region. These through trucks represent around 25% of the region's truck tonnage, and primarily impact major regional through-corridors (I-95/NJ Turnpike, I-78, I-80, I-287).

Figures 1 and 2 previously showed that freight-related employment tends to cluster in certain NJTPA counties, and that regional gateway freight facilities also tend to cluster in certain counties. As a result, different counties experience different impacts.

Figure 3. Originating and Terminating Truck and Rail Tons by County



- For truck tonnage, the leading counties are Middlesex, Union, Hudson, Essex and Bergen. These are counties that host major gateway facilities (warehouse/distribution, marine terminal, rail terminal, and/or airport) which generate truck trips; these counties also tend to have high employment in freight-generating industries. But it is important to note that all NJTPA counties are impacted by originating and terminating truck traffic. Some of these lower-volume counties are disproportionately impacted by through truck trips, which are not shown on Figure 3.

- For rail tonnage, the leading counties are Hudson and Union, which host major rail terminals, followed by Middlesex, Essex and Bergen.

- Waterborne tonnage – Not shown on Figure 3 due to limitations of the source data –is associated with the counties that host PANYNJ marine terminals (Port Newark/Elizabeth in Essex and Union, Global/NEAT in Hudson) and private terminals (in Bergen, Hudson, Essex, Union, Middlesex and Monmouth).

- Air cargo tonnage – Not shown on Figure 3 due to limitations of the source data – is associated entirely with Newark Liberty Airport, which is in Essex and Union counties.

3.0 Freight Forecasts

To understand potential future freight impacts, NJTPA has developed year 2025 and 2030 forecasts for each component of the freight transportation system. The forecasts made use of the following information:

- The NY/NJ *Comprehensive Port Improvement Plan* (CPIP), U.S. Army Corps of Engineers *Harbor Navigation Study*, PANYNJ *Port Inland Distribution Network* (PIDN) study, and NYMTC *Regional Freight Plan* (for marine terminal throughput and marine terminal-generated truck and rail traffic);
- The NJTPA Portway Extensions Model;
- The Federal Highway Administration's *Freight Analysis Framework*; and
- Industry and facility trendlines.

Two forecast scenarios were developed. Scenario 1 is based generally on the CPIP assumptions (as previously modified for use in the NJDOT Portway Extensions Study, and applied to NJTPA traffic only). Scenario 2 is based generally on the Harbor Navigation Study assumptions (applied to NJTPA traffic only).

Working with different modes, base years, forecast sources, units, and analytical tools, we have worked to try and synthesize an overall multimodal forecast that coordinates the various elements, corresponds generally to current and anticipated conditions based on available information, and serves as a useful platform for "big picture" freight system evaluation. The forecasts are unconstrained – that is, they are not limited by actual or projected capacity – and should be confirmed and adjusted as more data is available.

Table 2. Unconstrained Freight Forecasts for NJTPA Region

Mode	Type	Annual Growth	Base Year Volume (NJTPA Region)	Year 2025 Forecast	Year 2030 Extrapolated
Marine (PANYNJ and private terminals)	Int'l Container, Scenario 1	3.5%	2,798,578 TEUs (2001)	6,398,107	7,600,933
	Int'l Container, Scenario 2	4.6%	2,798,578 TEUs (2001)	8,236,786	10,314,037
	Other Freight (approx.)	1.4%	93,107,904 tons (2003)	126,421,680	135,522,478
Rail (ExpressRail and private terminals)	All Container, Scenario 1	5.6%	1,827,734 TEUs (2003)	6,015,930	7,886,628
	All Container, Scenario 2	3.9%	1,827,734 TEUs (2003)	4,177,251	5,173,524
	Non-Container	2.4%	12,819,526 tons (2003)	21,826,764	24,632,927
Highway (AM peak over Portway Extension model network)	All Container, Scenario 1	3.0%	34,785 VMT (2000)	72,669	84,206
	All Container, Scenario 2	3.2%	34,785 VMT (2000)	76,344	89.341
	Other Trucks (average)	2.1%	328,864 VMT (2000)	551,409	611,456
	Non-Truck (average)	1.3%	10,545,579 VMT (2000)	14,678,449	15,682,023
Air	All Freight inc. air-truck	2.5%	964,117 tons (2003)	1,659,796	1,877,907
Warehouse	Warehouse Space	2.8%	671,218,968 s.f. (2004)	1,198,725,181	1,376,211,561

Sources: Comprehensive Port Improvement Plan, USACE Harbor Navigation Study, NJDOT Portway Extensions, U.S. DOT Freight Analysis Framework, NYMTC Regional Freight Plan, and Cambridge Systematics/Edwards and Kelcey/A. Strauss-Weider/Moffatt and Nichol.

The forecasts were initially developed for year 2025 due to the availability of previous forecasts using that horizon, and were linearly extrapolated to year 2030 for consistency with NJTPA planning requirements. Forecasts of container traffic by water and by rail are presented in TEUs, and can be converted to tons if desired using the rule of thumb of 7 tons per TEU. Forecasts of highway traffic are presented in vehicle miles of travel (VMT) rather than tons or TEUs, to allow for meaningful comparisons with auto traffic. Key findings can be summarized as follows:

- Marine Terminals. Container handling through the region's seaports will grow rapidly, and will triple (more or less) by the year 2030. Scenario 1 envisions less somewhat less container growth than Scenario 2, but the growth is substantial in both cases. Non-container growth will be modest by comparison.

- Rail. Intermodal rail traffic will grow three to four times by the year 2030, while non-container rail traffic will double in that period. Under Scenario 1, intermodal rail traffic is forecast to grow more rapidly than marine container traffic. This assumes that landbridge traffic (bringing Asian containers though West Coast ports and using rail to move them to East Coast) will continue to grow at historic rates. Under Scenario 2, intermodal rail grows less rapidly than marine containers, reflecting the idea that recent growth rates for landbridge are not sustainable. West coast ports and the national rail system are both showing signs of strain, and more shippers are using all-water routes (Panama Canal and Suez Canal) to move Asian containers to the U.S. East Coast.

- Highway. With higher volumes through the region's seaports, we will also see more container trucks. Container trucks are forecast to grow more slowly than marine containers, due to the PANYNJ's Port Inland Distribution Network (PIDN) strategy, which emphasizes rail and barge in lieu of truck. Modeled in the peak period, container truck VMT will grow around two and one-half times; non-container trucking will double; and auto traffic will grow by around 50%. Some reports suggest that trucks will represent more than 10% of New Jersey's vehicular traffic by year 2020; however, looking just at the peak period, trucks account for 3.3% of the region's VMT. This share is forecast to increase to 4.3% by 2030, unless it can be shifted to off-peak periods. Most of this truck VMT is associated with non-container trucks.

- Air cargo. Air cargo traffic will double by 2030. Air carriers are increasingly using trucking for domestic moves, so some of this growth may actually be on trucks.

- Warehouse/distribution. Warehouse space demand in the NJTPA region is expected to double by 2030, to more than 1.3 billion square feet.

This is great news from an economic perspective – freight will continue to be a key driver of the region's economy, creating jobs and value for businesses and residents of all NJTPA counties – provided that the region can handle it. This may not be such good news from a transportation perspective, since the region's transportation system is already showing signs of strain. Accommodating further growth will require significant action – in the form of physical improvements, operational improvements, changes in business practice, and/or changes in public policy and transportation financing.

4.0 Freight Transportation System Performance

4.1 Trucking

Trucks are the 'glue' that holds the entire freight transportation system together. They move goods to and from: shippers and receivers; warehouse/distribution facilities; airports; seaports; and rail terminals. Unless a shipper or receiver is located directly on an airport, seaport, or rail line, he/she is dependent on trucking for the shipment and receipt of goods. Safe, efficient trucking services are therefore imperative – not only to provide door-to-door freight transportation, but also to ensure the effective operation of other freight modes and facilities. The NJTPA region's highway system consists of:

- Major arterials (primarily interstate highways) accommodating longer-distance travel;
- Regional arterials (primarily state and county highways) accommodating shorter-distance travel, and linking local access roads with major arterials); and
- Last mile connectors (primarily county and local roads), which provide access to the front door of a shipper, receiver, or freight handling facility.

Table 3. Highest Volume Truck Segments, Year 2000

AM Peak Volumes	Network Segment
> 180 trucks per hour, peak direction	New Jersey Turnpike (Bergen, Hudson, Essex, Union, Middlesex) I-78 west of the New Jersey Turnpike (Essex, Union, Somerset, Hunterdon, Warren) I-80 west of the George Washington Bridge (Bergen, Passaic, Morris, Warren) I-287 from I-80 to the New York state line (Somerset, Morris, Passaic, Bergen) NJ 3/NJ 495 (Hudson and Bergen) NJ 17 (Bergen) NJ 440 (Hudson)
> 90 trucks per hour, peak direction	I-280 (Hudson and Essex) U.S. 1+9 (Middlesex, Union, Essex, Hudson, Bergen) U.S. 46 (Bergen, Passaic, Morris) U.S. 202 (Passaic) NJ 3 (Bergen and Passaic) NJ 4 (Bergen) NJ 7 (Hudson) NJ 24 (Union) NJ 63 (Hudson) NJ 82 (Union) Doremus Avenue (Essex)

Source: NJDOT Portway Extensions Model.

Truck accident locations are highly clustered in the industrial areas of Hudson, Bergen, Essex and Union counties, and along major regional access roads (NJ Turnpike, I-78, I-80, I-287). They also appear on substantial numbers of local roads in each of the NJTPA region's counties. Accident locations are not limited to the high-volume truck routes identified in Table 3, which highlights the need to look beyond pure volume data and volume/capacity ratios when evaluating truck issues.

Referring back to the forecasts in Table 2, peak hour container truck VMT will grow around two and one-half times, non-container trucking will roughly double, and background traffic will grow by around 50%. The idea that truck VMT will grow substantially faster than non-truck VMT is very consistent with national forecasts. This is largely due to changing freight logistics and utilization patterns at the national level – per capita, we are moving more goods, through more facilities, over longer distances.

Even with this rapid growth, year 2030 truck VMT will still represent less than 5% of peak period VMT. However, the effects of truck traffic tend to be concentrated on selected network segments, rather than spread across the entire network, so trucks can have a significant effect on critical links. This is especially true for container trucks, which are less than 1% of peak period VMT, but are highly concentrated in the vicinity of the region's marine terminals and railyards, and on major interstate links.

Obviously, this growth has the potential for significant impacts. To identify critical locations, year 2030 projected traffic was assigned to the Portway Extensions highway model network without improvements, and without allowing traffic (freight or non-freight) to shift out of the peak periods or change modes. The year 2030 highway network included several highway improvements in the vicinity of Port Newark/Elizabeth (the NJDOT "Portway Phase I" program) but no other regional projects.

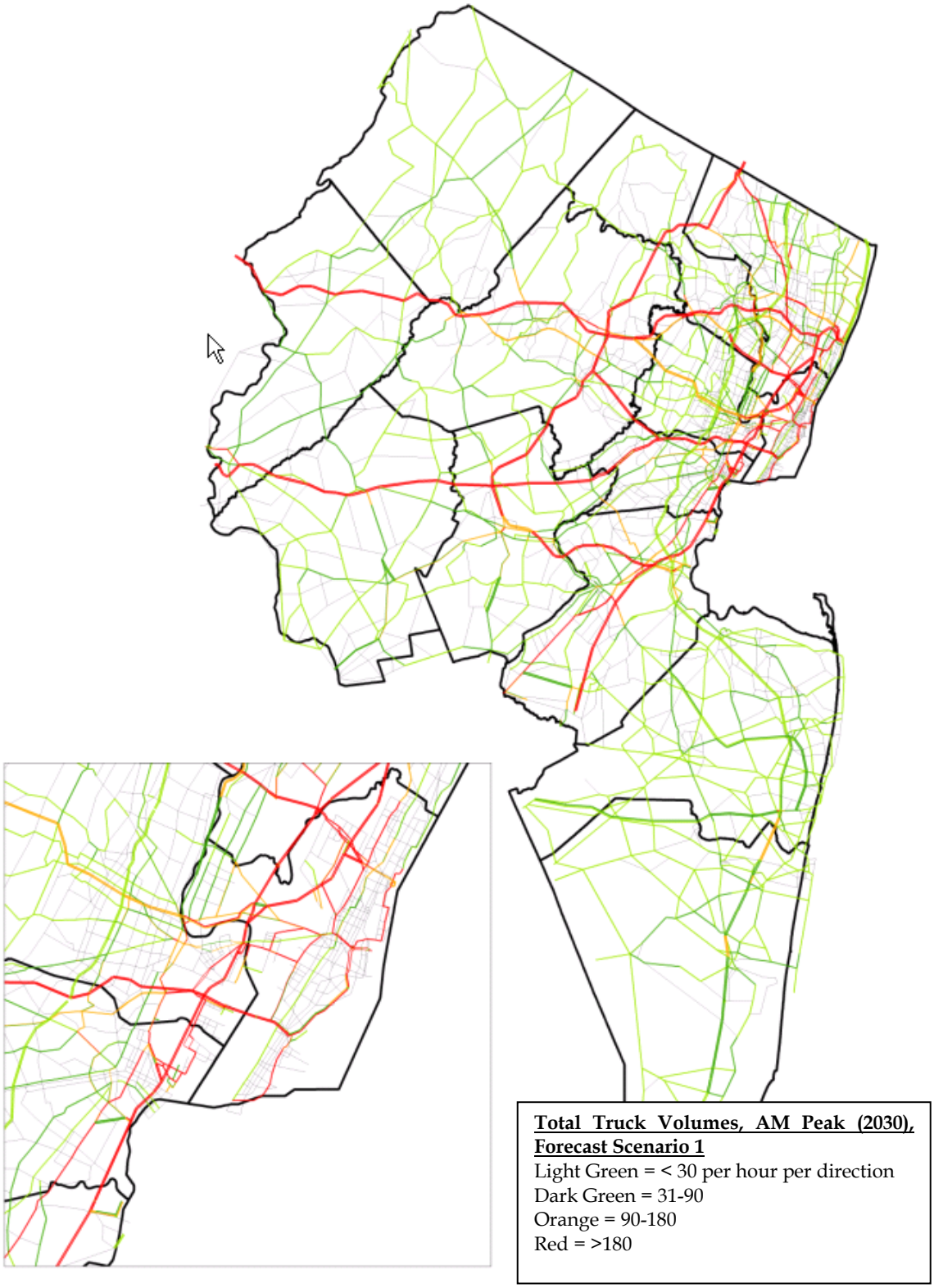
As shown on Figures 4 and 5 on the following pages, under both forecast scenarios there will be continued intensification of truck activity on existing high-volume truck segments (>180 per hour per direction), while most of the moderate-volume truck segments in year 2000 (>90 per hour per direction) will move into the high-volume category.

- Major corridors affected include: all of the New Jersey Turnpike, I-78, I-80, NJ 17, and NJ 24; most of I-287, U.S. 1 and 9, NJ 3/495, NJ 4, and NJ 440; and most of the waterfront industrial access roads in Hudson, Essex and Union counties.

- Other major segments of concern include I-280, U.S. 22, U.S. 46, U.S. 202, NJ 7, NJ 10, NJ 18, NJ 21, NJ 31, NJ 63, NJ 82, CR 503 and CR 505 through Bergen County, and some truck-carrying portions of the Garden State Parkway in Ocean County.

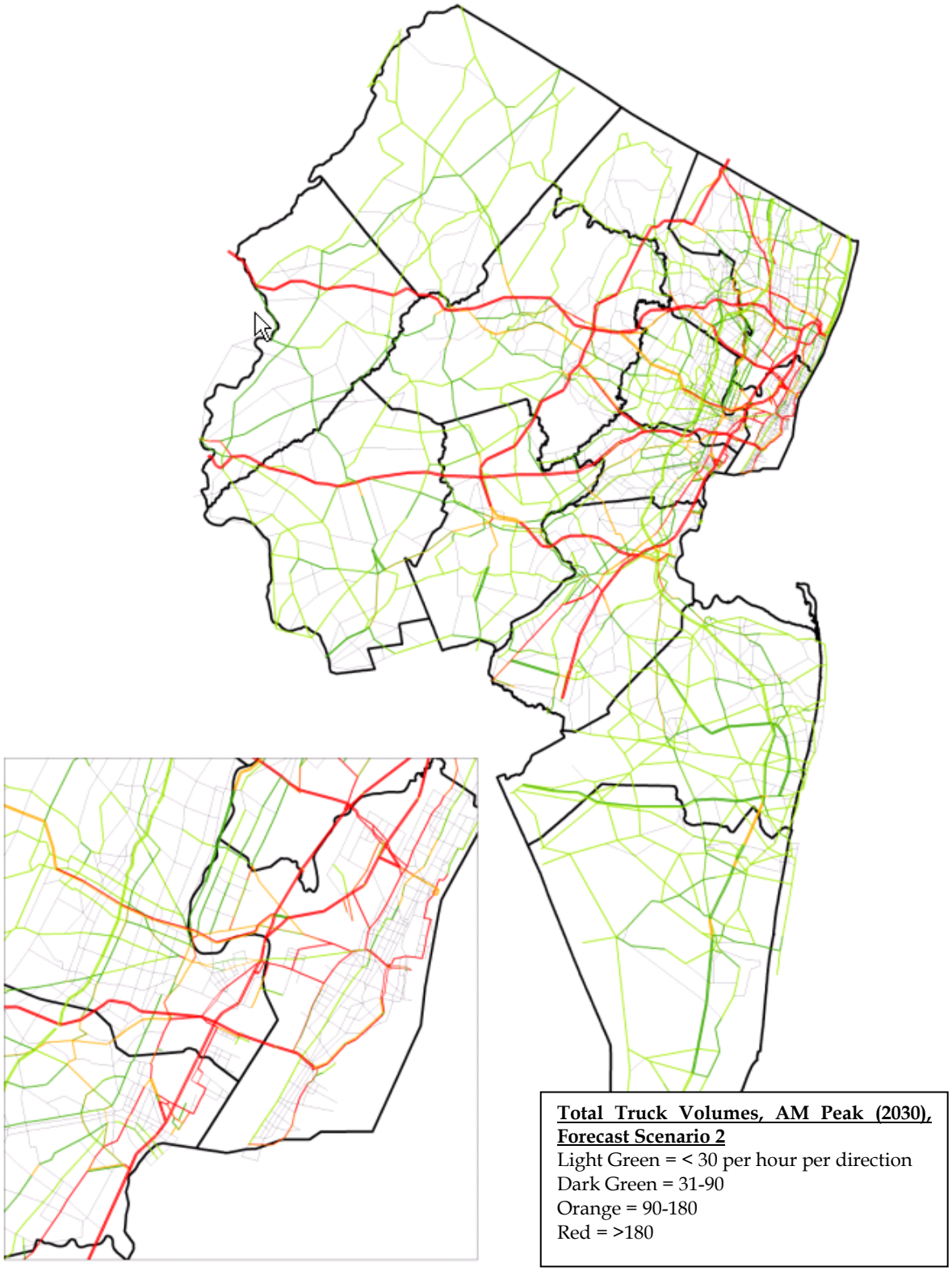
Table 3 summarizes some of the critical issues, needs, and potential NJTPA strategies associated with the region's trucking and highway system.

Figure 4. Modeled AM Peak Truck Volumes (2030), Scenario 1



Source: NJDOT Portway Extensions Model, Edwards and Kelcey/Cambridge Systematics.

Figure 5. Modeled AM Peak Truck Volumes (2030), Scenario 2



Source: NJDOT Portway Extensions Model, Edwards and Kelcey/Cambridge Systematics.

4.2 Rail

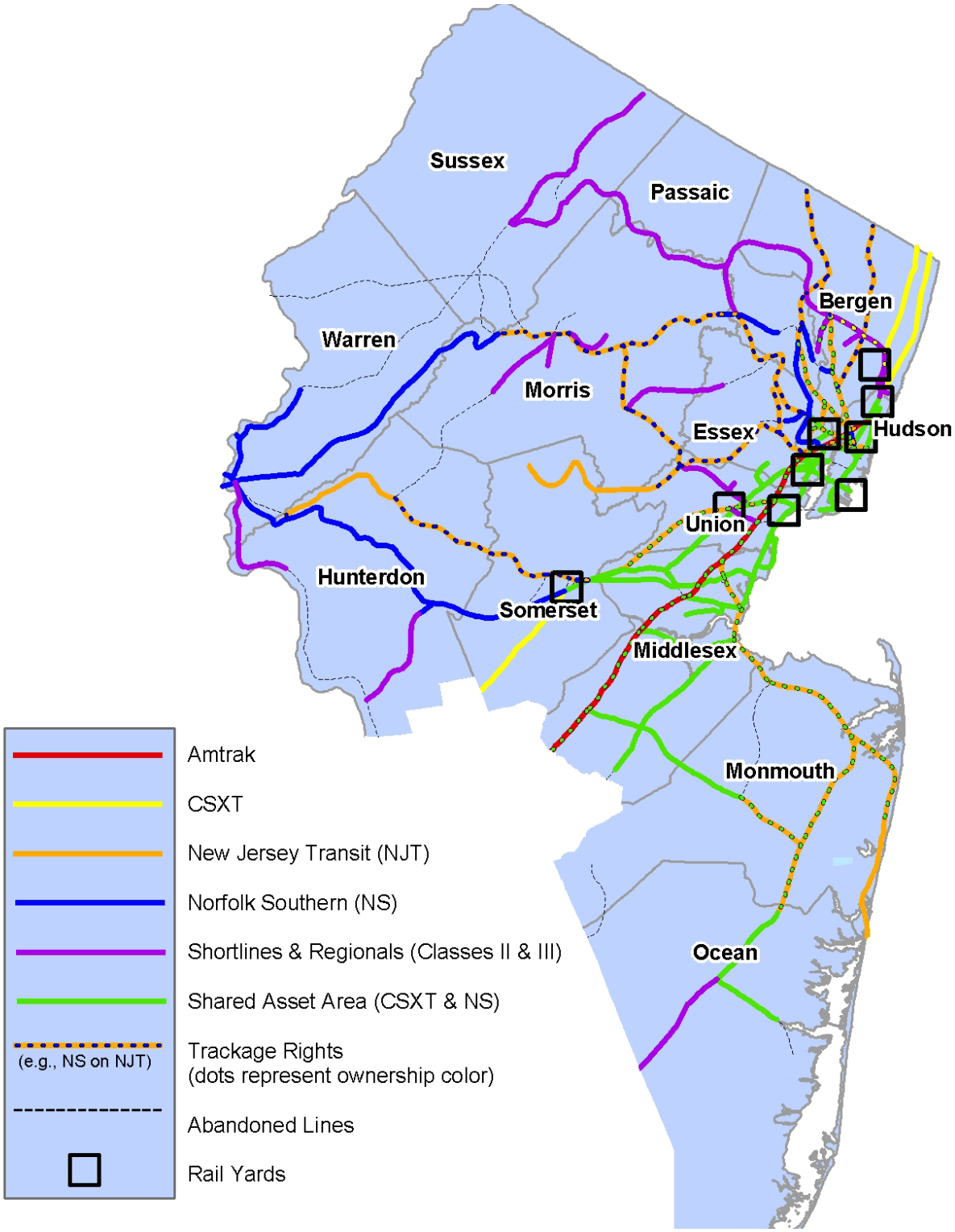
While rail is not as flexible a mode as truck – roads go everywhere, and rails do not – rail excels at many different types of freight moves. By its nature, rail offers a lower per-unit cost for longer-distance and/or lower-value freight moves. Within the NJTPA region, the freight railroads are critically important for a number of reasons: they provide needed services to the region's shippers and receivers; they provide critical connections to the region's marine terminals; and they provide an alternative to trucking, reducing pressure on the region's highways. The NJTPA region's 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 for the exchange of shipping containers between rail and trucks, or between rail and marine terminals
- "Transload" or "transflow" yards for the exchange of non-containerized commodities between rail and trucks, or between rail and marine terminals
- Classification yards for breaking longer trains into shorter trains, and vice-versa

Construction of the NJTPA region's rail system began before the Civil War, and has undergone substantial evolution – growth, contraction, and consolidation – since then. As shown on Figure 6 on the following page, the system is currently operated by:

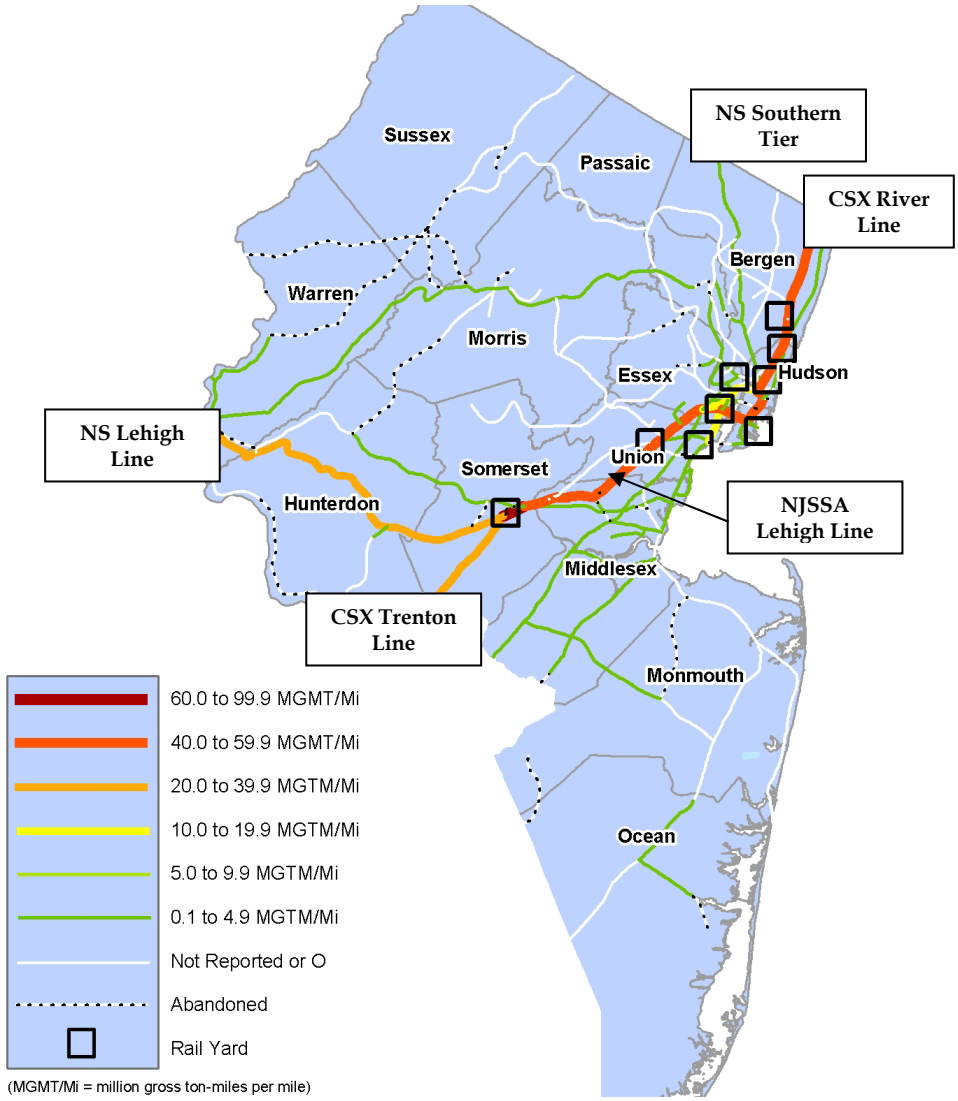
- Two national Class I railroads – Norfolk Southern (NS) and CSX – which operate major systems in the region. A third Class I – the Canadian Pacific (CP) – also offers limited service, but does not own track.
- Conrail, a subsidiary of NS and CSX, which serves as a terminal railroad for NS and CSX within the North Jersey Shared Assets Area (NJSSA). The NJSSA was formed as a result of the 1999 acquisition by and division of Conrail assets between NS and CSX. The NJSSA includes main lines of NS and CSX that link the region with the national rail system, secondary freight and passenger lines (including Amtrak's Northeast Corridor), and lines owned and operated by shortline railroad companies.
- Eight shortlines, including the: Black River and Western RR (BRW&BDRV); East Jersey Railroad (EJR); Morristown and Erie Railway (ME); New York Cross Harbor RR (NYCH); New York and Greenwood Lake Railway (NYGL); New York Susquehanna and Western RR (NYS&W); Port Jersey Railroad (PJRR); and Raritan Central Railway.
- New Jersey Transit, which permits freight railroads to operate over many of its segments, and which operates passenger traffic over the NJSSA Lehigh Line.
- Amtrak, which shares some of its Northeast Corridor with the freight railroads.

Figure 6. The NJTPA Region's Major Rail Lines and Railyards



Source: Federal Railroad Administration.

Figure 7. Rail Traffic Density by Line, Year 2000



Source: Federal Railroad Administration.

The highest-tonnage lines in the region are the CSX River Line and the shared asset portion of the Lehigh Line. The NS portion of the Lehigh Line and the CSX Trenton Line, which join the shared asset portion of the Lehigh Line at Manville, are the next highest tonnage lines. These volumes result primarily from two kinds of traffic – intermodal (containers and, to a more limited extent, automobiles in railcars) and carload (trains consisting of a mix of different types of railcars, such as flatcars, liquid bulk tank cars, dry bulk hopper cars, and boxcars) – that flow to and from the NJTPA region via the national rail network. Each handling type – intermodal and carload – carries around 12 million tons annually; around 16 million tons are terminated in the region, while around 8 million tons are originated from the region.

Analyses of rail system capacity for the NJSSA performed by R.L. Banks Associates Inc. have found that year 2003 peak day demand slightly exceeds capacity on the P&H Line and the Chemical Coast Line, and matches capacity on the double-tracked NJSSA Lehigh Line (over which NJ Transit operates). These lines can be considered to be operating at their peak, with little capacity for additional traffic unless improvements are made.

The forecasts presented earlier in Table 2 suggest that intermodal rail traffic will grow three to four times by the year 2030, while non-container rail traffic will double in that period. This level of growth will place severe demands on rail line capacity both within and beyond the borders of the NJSSA. A program of rail improvements has been developed by NJDOT in cooperation with the region's railroads, and the PANYNJ is also making significant investments, and these infrastructure investments will address some of the needs – but there are additional needs that may be unmet under year 2030 conditions. This is true for both Forecast Scenario 1 and Forecast Scenario 2, although capacity shortfalls are somewhat greater under Forecast Scenario 1, which assumes a higher number of intermodal landbridge trains.

Table 4. Projected Rail Capacity Needs Within the NJSSA, Year 2030

Peak Day Train Capacity	Network Segment
Adequate for Year 2030 Without Improvements	CSX Trenton Line National Docks Branch Port Reading Secondary
Adequate for Year 2030 Following Planned Improvements	Chemical Coast Line P & H Line Northern Running Track
Potentially Inadequate for Year 2030	NJSSA portion of Lehigh Line (even after planned improvements) NS portion of Lehigh Line (not currently planned for improvement) CSX River Line (not currently planned for improvement)

Source: R.L. Banks Associates, Inc.

Estimates of railyard volumes were not developed as part of this study. This information 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 Intermodal facility has recently been expanded to accommodate increasing levels of international container traffic, and volumes are forecast to grow at other major intermodal terminals, particularly at the NS Croxton and CSX Kearny yards. Capacity constraints have also been recognized at Oak Island Yard, the region's major bulk classification yard, and expansion plans are being considered. Finally, given that rail handles substantial volumes of hazardous materials, operates in proximity to non-freight land uses, and crosses many NJTPA roads at grade, the issues of rail safety and rail security are increasingly important to address.

4.3 Marine System

Marine terminals in Northern New Jersey and downstate New York are part of the U.S. Army Corps of Engineers Port of New York and New Jersey (**PONYNJ**) district. Within the PONYNJ, there are publicly-owned terminals operated by the Port Authority of New York and New Jersey (**PANYNJ**), as well as privately-owned terminals. We refer to the PONYNJ and PANYNJ throughout this document, so it is helpful to know the difference.

Marine transportation has been enormously important in the region's history – from the founding of New York as a colonial port, to the emergence of New York and New Jersey as a center of industrial production, to its evolution as a focus of world trade and commerce – and continues to play a leading role in the region's freight transportation system. The PONYNJ is one of the nation's leading centers of maritime trade based on overall tonnage; it trails only the Los Angeles/Long Beach port complex in container handling. The region's marine terminals handle a wide range of commodities.

Table 5. Types of Marine Cargo

Category	Cargo Type
General Cargo	Containers. Intermodal shipping containers can contain basically anything, but typically are used for high-value goods that need to be transferred to/from truck or rail with maximum speed, security, and visibility. Containers come in a variety of lengths – 20', 40', 45', and even up to 53' (for domestic over-the-road containers only). The volume of containerized traffic can be measured in terms of boxes or lifts (the number of containers handled), TEUs (twenty-foot equivalent units), or cargo tonnage. Automobiles and Motor Vehicles. The modern automobile terminal is an integrated facility for shipping/receiving, storing, and value-added processing (dealer prep, installation of options, etc.) of motor vehicles. Break-Bulk and Neo-Bulk. These are non-containerized cargos that move in packaged units. Break-bulk usually refers to cargo (boxes of fruit, pallets of lumber, bags of cocoa, etc.) that can be handled by traditional stevedoring equipment. Neo-bulk usually refers to cargo moving in larger, heavier units that require specialized handling equipment, such as rolled steel or paper, "super sacks" of clay, or large machines.
Bulk Cargo	Dry Bulk. These are dry commodities that are shipped loose in a vessel hold, without packaging. Typical dry bulk commodities include coal, sand, salt, cement, grain, etc. Liquid Bulk. These are liquid commodities that are shipped loose in vessel tankage. Typical liquid bulk commodities include crude petroleum, petroleum products such as gasoline and diesel fuel, chemicals, molasses, and oils.

The New York and New Jersey waterfronts have evolved substantially over the last several hundred years. The first ports were break-bulk ports, where cargo was passed hand-to-hand. With time, the relative importance of break-bulk shipping has declined. Specialized terminals for handling of liquid bulk, dry bulk, autos, and containers have been developed.

Perhaps the most significant step in this evolutionary process has been the rise of containerization. From the shipment of the first container in 1956 (from Port Newark), the container has become the dominant means of transporting high-value goods across international and domestic waterways. Today, millions of containers are shipped each year to and from the U.S. west coast, Gulf coast, and east coast.

The PONYNJ is by far the leading container port on the U.S. east coast, and nearly 85% of PONYNJ containers are shipped through marine terminals in the NJTPA region:

- Port Newark – Port Newark Container Terminal and American Stevedoring (which moves containers on barges to and from the Red Hook Container Terminal in Brooklyn)
- Port Elizabeth – APM (comprising the former Maersk and SeaLand operations) and Maher Terminals
- Bayonne Peninsula – Global Marine Terminal

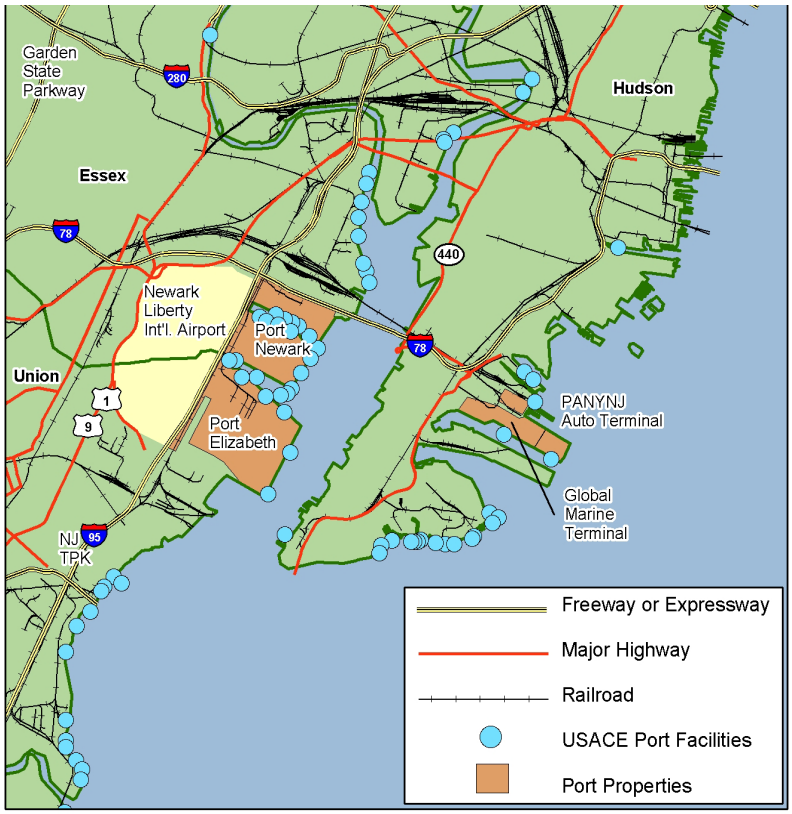
The PONYNJ is also one of the nation's leading automobile handling ports. All of its major auto handling facilities are located in the NJTPA region:

- Port Newark – FAPS (originally known as Foreign Auto Preparation Services), Toyota Motor Logistics Center
- Port Elizabeth – DAS (Distribution and Auto Storage)
- Bayonne Peninsula – NEAT (Northeast Auto Terminal) and BMW

These facilities are located in Essex, Union, and Hudson counties, as shown in Figure 8 on the following page. In addition to these facilities, the NJTPA region hosts other marine terminal facilities in Bergen, Hudson, Essex, Union, Middlesex, and Monmouth counties. Excluding inactive facilities and active mooring facilities for passenger boats, fishing boats, and service craft, the USACE database identifies more than 180 freight-handling marine terminals in the entire PONYNJ, of which 75 are located within the NJTPA region. Other important public facilities in the NY/NJ region (not shown) include the Howland Hook Marine Terminal on Staten Island, the Red Hook Marine Terminal in Brooklyn, and the South Brooklyn Marine Terminal.

Historic and current data on marine freight traffic for the PONYNJ as a whole is readily available from a number of sources, including the American Association of Port Authorities (AAPA), USACE, and PANYNJ. However, the data for individual subregions is not readily available. Overall, the PONYNJ as a whole handled over 134 million tons of traffic in year 2002, and 4,067,811 TEUs of container traffic (around 30 million tons) in year 2003. Table 6 on the following page presents an approximate estimate (from combining limited datasets) of NJTPA's share of 2003 traffic.

Figure 8. Location of PANYNJ Marine Terminals in NJTPA Region



Source: U.S. Army Corps of Engineers and PANYNJ.

Table 6. Estimated NJTPA Waterborne Traffic, Year 2003 (Tons and Units)

	International		Domestic Coastwise		Internal	Total
Tons	Originating	Terminating	Originating	Terminating		
International Containerized	5,601,026	11,843,630				17,444,656
International Autos	70,757	984,758				1,055,515
Crude Petroleum	70,000	12,068,000				12,138,000
Other (mostly Petrochemical), approximated only	2,094,576	20,384,643				22,479,219
Petroleum Products			22,270,749	7,635,800		29,906,549
Chemicals			158,914	1,540,611		1,699,525
Waste Paper/Scrap Metal (not trash or municipal waste)			2,140,909	3,250,621		5,391,530
Other/Unknown			37,897	334,509	20,065,160	20,437,566
Total	**7,836,359**	**45,281,031**	**24,608,469**	**12,761,541**	**20,065,160**	**110,552,560**
Units	Originating	Terminating				
Containers (TEUs)	1,788,090	1,511,327				3,299,417
Autos (Vehicles)	42,883	596,823				639,706

Sources: TRANSEARCH 2003, PANYNJ 2003, USACE, 2002.

Some key observations can be made:

- First, as previously noted, terminals in the NJTPA region handle nearly 85% of PONYNJ containers. Import container tonnage (terminating in the region) is twice as high as export (originating in the region) container tonnage; however, in 2003, export container units through NJTPA terminals were higher than import units, apparently reflecting a high share of empty export containers.

- Second, much of the total NJTPA tonnage is in bulk commodities – crude petroleum, petrochemical, and chemical – highlighting the importance of marine transportation in handling these commodities.

- Third, much of the total NJTPA tonnage – nearly half – is actually associated with domestic traffic, along the Atlantic coast and between different facilities within the NY/NJ region. Water is a very important means of domestic freight distribution, and helps reduce dependence on other modes.

The two most important recent studies of regionwide container capacity were done under the *PONYNJ Comprehensive Port Improvement Plan* (CPIP) and the U.S. Army Corps of Engineers' *Harbor Navigation Study and Limited Re-evaluation Report.* Overall, the consensus is that the PONYNJ has sufficient container capacity currently and well into the future, assuming completion of improvements underway and currently planned by PANYNJ (including channel deepening, terminal reconfiguration, wharf extension, rail improvements, and highway access improvements). Under the most aggressive scenario, capacity constraints would not be reached until around 2025.

Table 7. Container Terminal Capacity and Demand in the PONYNJ Region

Baseline Study	CPIP-Based Assessment	Harbor Navigation Study-Based Assessment
Current Capacity	8.0 million TEUs	7.9 million TEUs (2010 with improvements)
Current Demand	4.1 million TEUs	4.1 million TEUs
2030 Capacity	8.0 million TEUs	10.5 million TEUs
2030 Demand	5.6 to 6.2 million TEUs (with 50' channels)	11.5 million TEUs (with 50' channels)

Source: Moffatt and Nichol/Cambridge Systematics.

Automobile terminal capacity has also been studied, but to a lesser extent. Generally, studies have indicated the need to add auto terminal acreage and/or improve facility throughput to accommodate future volumes, but have found existing capacity adequate to current levels of demand. Capacity for other types of cargo has not been comprehensively studied. Many, if not most, of the non-container/non-auto terminals are privately owned and operated. Growth rates for non-container/non-auto terminals have been relatively low – in the 1% to 2% per year range – so there has been less stress on terminal infrastructure, compared to containers, which have grown at 7.5% per year since 1993.

4.4 Air Cargo

Air cargo is primarily focused on the movement of high-value, light-weight, time-sensitive commodities – perishables, equipment and instruments, high-end consumer goods, and printed information. Air cargo relies almost exclusively on trucking for its last-mile connections, and in some cases trucking can be used for longer segments of an "air cargo" trip. Air cargo is vital in providing the NJTPA region's shippers with access to domestic and international markets, and in providing its consumers with access to a wide range of goods and services.

Air cargo is typically handled in several ways:

- All-cargo airlines;
- Integrated carriers, who manage and coordinate both air and truck fleets; and
- Passenger carriers, who carry cargo in the aircraft hold (also known as "belly cargo").

Newark Liberty International Airport (EWR) is the hub of air cargo activity for the NJTPA region and the overnight/small package center for the larger bi-state area. Operated by the Port Authority of New York and New Jersey, EWR is also one of the largest hubs of air cargo activity in the world. The airport focuses primarily on domestic cargo movement through integrated carriers, such as FedEx, UPS and the U.S. Postal Service. With the increasing amount of international aircraft activity at EWR, international cargo activity has also developed. However, John F. Kennedy International Airport (JFK) in New York remains the leading international cargo facility in the bi-state region.

The air cargo-related facilities in the NJTPA region consist of:

- On-airport facilities. EWR has 290 acres and nearly 1.4 million square feet of space devoted to cargo activity on the north (Essex County) and south (Union County) sides of the airport,
- Air cargo facilities in the immediate vicinity of the airport (also known as "through the fence" operations). Additional air cargo related operations exist in the area immediately adjacent to the airport on the south side in Elizabeth, New Jersey. This location balances easy access to the airport with far less expensive lease rates. With on-airport space increasingly constrained, the Elizabeth area provides needed capacity to allow the continued growth of cargo activity at the airport.
- Air cargo forwarder facilities, which are generally located within a 30-minute drive time to the airport.

EWR handled over 960,000 tons of freight in 2003. Facilities are generally considered adequate for current traffic, although further study may identify appropriate physical/operational improvements to accommodate future growth.

4.5 Warehouse/Distribution

Warehouses and distribution centers are an often overlooked element of the freight transportation system. Nevertheless, these facilities play a key role in goods distribution and the NJTPA region. It is estimated that nearly 422,000 people work in New Jersey warehouses and distribution centers, making this activity one of the leading job generators in the state.

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

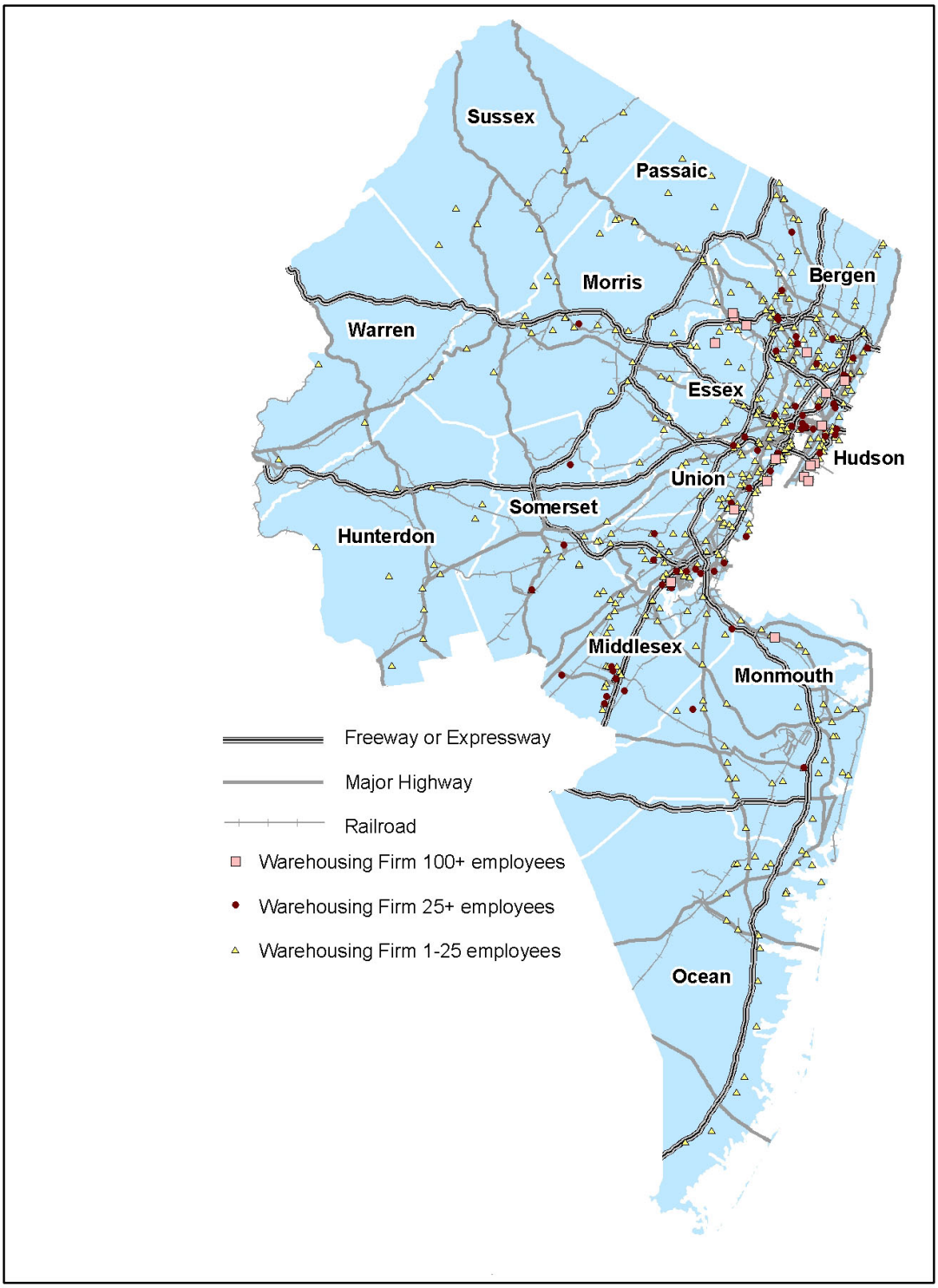
Warehousing operations vary considerably in size, ranging from just a few thousand square feet to buildings that are over one million square feet. Warehouses may contain temperature-controlled space, which is essential for maintaining perishable food. Warehouses and DCs can be located at or adjacent to airports and ports to support cargo operations. Warehouses may also have rail sidings for the receipt or shipping of products. However, the vast majority of the freight moving from warehouses and distribution centers tends to be handled by trucks.

Warehouses and distribution centers in the NJTPA region serve the area, the surrounding states and North America. The northern/central New Jersey area contains over 778 million square feet of industrial property, with an additional 5 million square feet currently under construction. The majority of this space consists of consists of warehouse and distribution centers, with over 670 million square feet in the NJTPA counties. By comparison, Laredo Texas, another key distribution location, has 65 million square feet.

Since the third quarter of 1998, the NJTPA region has added 70 million square feet of space, primarily consisting of warehouses and distribution centers. The availability rate has decreased, dropping from over 10 percent to less than 7 percent despite all of the new construction. The average asking lease rate has generally increased throughout the region. Older industrial structures are being demolished or converted to other uses. The new construction, increasingly oriented towards warehousing and distribution, has provided the region with state-of-the-art capacity.

Figure 9 on the following page shows the location of the largest warehouse and distribution facilities in the region, as reported by the InfoUSA database. The largest warehouse concentrations are located in Bergen, Hudson, Essex, Union, and Middlesex counties. However, other counties also host substantial warehouse and distribution center activity. This data does not include private warehouses operated by wholesalers and retailers (Barnes and Noble, etc.), which have a substantial presence in the region. The prevailing trend has been for newer, larger warehouses to be built in outlying "greenfield" areas (NJ Turnpike Exits 8A and 7A, as well as eastern Pennsylvania), which generates more VMT than warehousing located closer to the markets it serves.

Figure 9. Location of Major Warehouse and Distribution Facilities



Source: InfoUSA.

5.0 Interregional and Institutional Factors

Beyond NJTPA's freight transportation infrastructure and operations, there are several important issues related to interregional and institutional relationships and actions. We believe the most critical of these issues can be summarized as follows.

Planning Across Boundaries

Most freight trips are hundreds or thousands of miles in length, cross multiple jurisdictional boundaries (local, county, region, state, and/or nation), and involve both public and private assets and infrastructure. Given these conditions, no single entity in the trip chain "owns the problem" and no single entity can "fix the problem" acting alone. To borrow an analogy, we can think of the intermodal freight transportation system as a series of interconnected pipes connecting every part of the U.S. to every part of the world. If NJTPA builds a 12-inch pipe connected to a 6-inch pipe coming out of Pennsylvania, it's a waste – at least until the pipes get fixed in Pennsylvania. Conversely, a 12-inch pipe from Pennsylvania feeding into a 6-inch pipe in New Jersey can create a major chokepoint.

There are a variety of multi-state planning initiatives underway that could impact the NJTPA region. For some of these initiatives, NJDOT and/or NJTPA have been active participants; for others, they have served a review and oversight role; and for others, participation would be a future opportunity. These include:

- The Comprehensive Port Improvement Plan (CPIP). As previously discussed, the CPIP is a multi-state (NY and NJ), multi-agency effort to document the NY/NJ region's container terminal capacity and future demand, impacts, and other issues.

- The Port Inland Distribution Network (PIDN). The PIDN initiative – which aims to substitute rail and/or barge in lieu of trucks for the landside collection and distribution of PANYNJ containers within a 75 mile to 400 mile radius – was developed by PANYNJ. But the "other end" of these PIDN trips will be in New Jersey, New York, Pennsylvania, Connecticut, and possibly other states as well, so it becomes a multi-state effort. For example, the Port of Bridgeport is taking the initiative to implement a Bridgeport to PANYNJ container barge service.

- The Mid-Atlantic Rail Operations Study (MAROPs). MAROPs is a joint effort of the states of New Jersey, Pennsylvania, Delaware, Maryland, and Virginia, plus the I-95 Northeast Corridor Coalition (of which New Jersey is a member), plus three major railroads (Norfolk Southern, CSX, and Amtrak). Together, this MAROPs working group developed a consensus recommendation for a 20-year, $6.2 billion dollar freight/passenger rail investment strategy to upgrade aging infrastructure and substantially improve rail system capacity and performance throughout the Mid-Atlantic corridor. The hoped-for benefit is reduced stress on highway systems from freight and passenger travel. The projects identified for New Jersey supplement other rail improvements planned by the railroads and the State, and reflect additional needs due to increased rail traffic attracted by coordinated multi-state improvements.

- The Virginia I-81 Rail Corridor Study. The State of Virginia has undertaken several studies to test the impact of improving rail capacity along one or both of the NS lines paralleling I-81 through Virginia. The goal is to divert trucks from I-81 and possibly I-95, reducing or delaying the need for highway system investments. In Virginia, I-95 carries a mix of local-serving and long-haul trucks, but I-81 carries predominantly long-haul trucks that are serving markets in Pennsylvania, New Jersey, New York, and New England. If Virginia builds infrastructure to improve rail flows, the issue becomes: what must the "upstream" states (Maryland, Pennsylvania, New Jersey, New York) do?

- The New York Cross Harbor Freight Movement Draft EIS. This ongoing study and its preceding Major Investment Study examine opportunities to increase the percentage of freight moving from the "west of Hudson" to the "east of Hudson" via rail. The EIS looks to provide rail improvements that would: 1) allow a higher percentage of rail traffic that currently terminates in the NJTPA region (becoming a cross-harbor truck trip) to continue on to the east of Hudson; and 2) allow a percentage of existing truck trips (predominantly long-haul) to/from the east of Hudson to shift to rail. NJTPA and others have reviewed the project and provided substantial comment.

Planning across boundaries is not just an interstate problem – We can just as easily talk about discontinuities in pipelines between Ocean and Bergen counties, for example. Cooperation and coordination at the intraregional level – with the State of New Jersey, with the two other MPOs representing central and southern New Jersey, with the counties, and with local governments – is essential to getting the most benefit from freight improvements.

- The Kapkowski Road Transportation Planning Study in Union County eliminates the intersection of North Avenue and Kapkowski Road with a flyover, separates port and non-port traffic at NJ Turnpike Exit 13A, and improves the Dowd/Division/North Avenue intersection. These improvements will substantially reduce conflicts between Port Newark/Elizabeth traffic and non-freight traffic to the Jersey Gardens Mall, IKEA, several hotels, and other land uses.

- The Liberty International Transportation Corridor (formerly the International Intermodal Transportation Corridor) is envisioned as a multi-county economic zone of interlinked businesses, served by an efficient goods movement infrastructure, and providing the institutional framework for implementing comprehensive land use and transportation planning in the port district. Substantial work to define and advance this concept was performed by NJIT as part of its Freight Planning Support System.

- The NJDOT Portway Phase I project is a coordinated program of 11 independent-utility freight-oriented highway improvement projects in several counties. The projects – currently in various stages of implementation – are designed to strengthen highway access to and between regional marine terminals, intermodal rail facilities, warehouse/distribution centers, and future development sites identified as freight opportunities.

- The NJDOT Portway Extensions project built on the objectives of Portway Phase I with an additional series of recommended improvements, covering a larger geographic portion of the NJTPA planning region, addressing multiple modes, and dealing with operational as well as physical improvements.

Guiding Private Commerce to Achieve Public Benefit

Transportation services are products, which are offered by private sector providers, to public and private customers looking for the best available deal that meets their needs. Logistics decisions – what to ship, where, and by what modes – are made by the private sector, not dictated by the public sector. The public sector in many cases has built the infrastructure that they operate over (roads, seaports, airports), but other parts of the infrastructure remain largely in private ownership (railroads, warehouse and distribution centers, vehicles, equipment, information systems, etc.).

Regardless of what the public sector does, freight happens – but the public sector has a lot to do with how, where, and when it happens, and can act to guide the private sector to make freight transportation and freight logistics decisions that are consistent with public objectives. The public sector is most effecting in achieving public benefits (congestion reduction, economic development, etc.) from freight initiatives when it acts with the input and cooperation of the freight shippers, carriers, and intermediaries who actually use the system. Private stakeholders can help identify needs, projects, and policies that support their facilities and operations while also meeting public purposes. NJTPA has established a Freight Initiatives Committee which meets regularly.

Achieving Equity of Benefits and Impacts

The public benefits of freight improvements – economic benefit, improved systemwide mobility, etc. – tend to accrue over larger areas, while the negative impacts – changes in highway or rail traffic through neighborhoods, development of new freight facilities, loss of tax revenues associated with other potential uses – tend to accrue over smaller areas.

This can create perceptions that benefit and cost are not equitably distributed, and make it difficult to implement needed freight improvements. Neighborhoods feel they are being burdened with impacts so that cities can benefit, cities feel burdened so counties can benefit, etc. Conversely, cities blame neighborhoods for holding freight projects hostage without legitimate cause, counties blame cities, etc.

A thorough, fair understanding of the benefits and impacts of freight projects is enormously helpful in crafting projects and programs that appropriately balance benefit and impact. The Alameda Consolidated Transportation Corridor project in Southern California was an excellent example of an ultimately successful (albeit litigious) process to identify both regional benefits and local community impacts, and to ensure that local communities received appropriate impact mitigation and benefit.

Funding Freight Improvements

Freight funding is a long-recognized problem. Federal transportation funding – which is allocated by MPOs in their designated regions through the Regional Transportation Plan and Transportation Improvement Plan process – is mostly geared toward highways, and makes few special provisions for freight-related projects. Consequently, truck-oriented projects must compete with auto-oriented projects for available funds. Federal assistance for railroads is very limited and devoted primarily to safety, rather than capacity. New Jersey allocates around $10 million annually to its state rail program, and is also partnering with the PANYNJ and private railroads to fund more than $100 million in planned improvements. Funding for publicly-owned marine terminals comes mostly from agency operating revenues and Harbor Maintenance Tax (currently levied on imports, domestic freight, and passenger traffic) proceeds. Funding for publicly-owned airports comes mostly from operating revenues, passenger facilities charges, and other assistance. Some additional finance opportunities include:

- Expanded Federal program eligibility for freight projects would provide more flexibility in the use of available Federal funds, if sufficient funds are forthcoming.

- Dedicated freight funding pools. Some states, like Florida, have established a statewide fund for freight-related improvements.

- User-based financing. Having the private sector pay a greater share of transportation improvements is an idea that many states are pursuing with increasing vigor.

- Public-private partnerships. The public sector generally has better access to capital than the private sector – it can borrow more, for less cost, for a longer period. Public sector "freight loans" can be repaid by freight carriers out of operating revenues.

- Tax credits and incentives. Tax rebates, payments in lieu of taxes, and other strategies are being used or considered in many states as inducements for the private development of freight facilities and infrastructure deemed in the public interest.

Providing Regional Leadership

Many have argued that freight planning is made substantially more difficult in the New York-New Jersey region because no one seems to be "in charge." Transportation and land use leadership, authority, governance, and funding powers are divided among a broad range of local, regional, state, and multi-state entities. This division of powers makes for a less efficient and more confrontational planning process, consumes more time and effort than strictly necessary, and can produce less than optimal solutions. Hopefully, new and innovative structures will emerge to more effectively address the region's compelling freight needs. But whether they do or not, there are still opportunities for NJTPA to provide meaningful, effective leadership – by formulating a compelling regional vision, identifying issues and opportunities, developing the information needed to evaluate potential actions and strategies, and guiding diverse public and private stakeholders to agreements on mutually beneficial solutions.

6.0 Freight Issues, Needs, and Strategies

For each of the freight transportation system elements, freight transportation issues tend to cluster around a few key categories:

- System capacity, performance, safety, and reliability. The NJTPA freight transportation system must provide for and balance each of these elements.

- Land use and economic development. Freight transportation capacity influences the region's ability to retain and attract freight-related businesses and maximize economic benefit; conversely, land use strategies can help focus and cluster freight development where it can be best accommodated by the transportation system, and discourage development where it poses a burden to the transportation system. Freight transportation issues are closely linked with land use policies and strategies.

- Industry competitiveness and performance. There is a compelling public interest in ensuring the competitiveness and performance of freight shippers and receivers, freight carriers, and freight-handling facilities, through efficient and smoothly-functioning freight transportation facilities. By doing so, we minimize costs to producers and consumers, maximize job creation and economic benefits, and improve accessibility to national and world markets.

- Environmental, community, and security issues. Freight movement has the potential to create significant environmental impacts – congestion, emissions, noise and vibration, land use conflict, etc. – if not properly planned, mitigated, and managed. Impacts can be especially significant for communities that host freight -generating activities, as well as communities located on major "through" corridors. Finally, as much of the region's cargo is international in nature, there is an overlaid concern regarding cargo safety and security, on top of established need to regulate hazardous materials and other types of high-risk shipments.

- Implementation and delivery. Freight projects do not fall in the mainstream of public planning or funding. For one thing, much of the freight system is privately-owned. For another, freight projects must compete with other legitimate investment needs, which typically have a higher profile. There are few established mechanisms for the dedicated funding for freight improvements, or for structuring shared freight investments between public and private sector partners.

Each of these issue areas implies a specific need, to be addressed with a set of appropriate NJTPA policies, strategies, and/or actions. The needs, issues, and strategies recommended to address each element of the freight transportation system are summarized in Tables 8 through 12 on the following pages. Additional strategies recommended to address interregional and institutional issues are presented in Table 13.

Table 8. Highway System Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Optimize highway system capacity, performance, safety and reliability.	Overall system performance is declining due to increasing truck and auto traffic. Interchanges and "last-mile" connectors are particularly impacted. Local-serving trucks will continue to impact communities. Through truck traffic will continue to impact the region. Container and non-container trucks will affect different areas. Bridges and tunnels face capacity, design, age constraints. Urban congestion means declining passenger and freight mobility.	Pursue modal diversion strategies using alternative modes (long-haul rail, short-haul rail, water) to relieve congested highways. Pursue temporal diversion strategies (off-hours operation of terminals and warehouse/ distribution centers,, truck rest/staging areas, congestion pricing) to minimize peak travel. Explore spatial diversion strategies (truck-only lanes, passenger transit, high occupancy/toll or "HOT" lanes) to reduce conflicts between trucks and cars on critical corridors. Pursue Intelligent Transportation Systems (ITS) strategies (Advanced Traveler Information Systems, Advanced Traveler Monitoring Systems) to manage capacity and demand. Identify and designate "Priority Freight Projects" for study and investment.
#2: Identify and implement "smart growth" land use and economic development strategies.	"Freight sprawl" (trend to locate freight facilities outside the region where land is cheap) is producing increased truck VMT and reducing economic benefit. Truck rest areas are needed to accommodate layovers.	Where possible, locate major truck generators to minimize in-region VMT. Encourage clustered freight development in the region, particularly on Freight Opportunity Sites previously identified by NJTPA. Explore strategies for improving the location and function of truck rest and service areas.
#3: Promote the competitiveness and performance of NJTPA's trucking and truck-served businesses.	Trucks provide critical intermodal access and connectivity. Business and economic vitality depends on trucking availability, performance, and cost; driver availability becoming an issue. Enforcement and regulation remain critical issues.	Support projects that specifically promote intermodal access and connectivity. Support projects and regulatory approaches that improve trucking availability, performance, and cost. Continue supporting Freight Initiatives Committee and working with stakeholders.
#4: Ensure that environmental, community and security issues are fully addressed.	Environmental and community concerns over truck traffic and accidents are increasing. Hazardous materials handling, overweight shipments, and cargo security have heightened importance.	Continue and expand efforts to engage the public in freight issues and project discussions. Continue to coordinate closely with other agencies (local, regional, state, and Federal) on safety and security issues. Pursue additional study of critical issues (hazardous materials movement, overweight containers, major accident locations, etc.).
#5: Develop transportation programming and funding processes that take full account of freight project opportunities and benefits.	Freight needs to be higher on the investment agenda, but there are already too many legitimate transportation needs and too little available public money.	Develop mechanisms for the special consideration of freight-oriented projects within the NJTPA programming process; research and evaluate alternative financing strategies for highway improvements.

Table 9. Rail System Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Optimize rail system capacity, performance, safety and reliability.	There are current and projected future rail capacity and performance shortfalls in the NJTPA region. Rail capacity and performance at the national level has been inconsistent and future performance is open to question. There is uncertainty about whether rail will gain or lose market share relative to trucking, and how this can be impacted by public policy and public investment.	Support implementation of rail improvements jointly identified to date by New Jersey and its railroads. Evaluate the long-term need for other major rail improvements. Support Class I and shortline projects as part of NJ and multi-state initiatives. Continue to monitor and understand national rail system conditions.
#2: Identify and implement "smart growth" land use and economic development strategies.	Consistent with the "freight sprawl" trend, we have seen the development of new out-of-region railyard capacity to serve the NJTPA region, which increased truck VMT.	Seek to maximize the capacity and operational efficiency of close-in railyards; identify opportunities for new in-region rail facility development. Promote the Portway Extensions program to improve railyard accessibility.
#3: Promote the competitiveness and performance of NJTPA's railroads and rail-served industries.	Class I's operate as for-profit businesses, not as public benefit providers. Some of their emerging strategies – broader services and greater partnership with trucking and ports – are clearly positive. Others – system rationalization, cutbacks in "last mile" service, and perceived 'demarketing' of less critical customers and services – are sometimes seen as counter to the public interest. Shortline railroads need improvements to handle 286,000 lb railcars and closer integration with larger railroads. There may be opportunities to offer rail services over shorter distances in highly-congested corridors.	Support projects that specifically promote intermodal access and connectivity. Cooperate with the railroads to develop marketing incentives, preservation initiatives, and improvements to increase rail availability, performance, and cost, particularly in the NJSSA. Identify opportunities to expand rail markets with innovative services such as short-haul rail and resuscitation of historic services such as railcar floats. Continue to support the Freight Initiatives Committee and work with industry.
#4: Ensure that environmental, community and security issues are fully addressed.	There are environmental and community concerns over growth in rail traffic, particularly associated with reactivation of historic rail lines. Grade crossing safety remains an important issue, and becomes even more critical with projected growth. Cargo security has a heightened focus, due to rail's role in handling hazardous materials and international containers.	Continue and expand efforts to engage the public in freight issues and project discussions. Continue to coordinate investments with other agencies (local, regional, state, and Federal) on safety and security issues. Pursue additional study of potential grade crossing elimination projects in cooperation with other regional and state agencies.
#5: Develop transportation programming and funding processes that take full account of freight project opportunities and benefits.	There is a potential need for substantially increased public investment in rail capacity to meet future needs and secure public benefits from the rail system.	As a matter of policy, endorse the potential need for and appropriateness of substantial public investment in the region's rail system to achieve public benefits.

Table 10. Marine System Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Optimize marine system capacity, performance, safety and reliability.	Container terminal capacity and demand are still being debated; the consensus is that major expansion is not needed, but physical and operational improvements to get the most of existing facilities will definitely be required. Improvements to vessel navigation, market access, and intermodal connectivity are clearly needed – work is underway, but needs remain.	Support implementation of planned physical and operational improvements for the region's container terminals and navigation channels. Support implementation of needed landside access improvements – including highway projects, rail improvements, and the Port Inland Distribution Network initiative. Support continued evaluation of other current and future marine system needs, including: air drafts; long-range container needs; non-container capacity; and private marine terminal operations.
#2: Identify and implement "smart growth" land use and economic development strategies.	Marine terminals are huge economic engines – from the terminals themselves, from port-serving warehouse and distribution facilities, and from regional businesses that receive cost/logistics benefits. Substitution of other ports and/or more landbridge rail for PONYNJ terminals would increase truck VMT and decrease economic benefit. Empty containers are undesirable.	Maximize economic benefits from port activity through development of related warehouse/ distribution center capacity, potentially utilizing Freight Opportunity Sites. Investigate the potential for Inland Port operations, where containers are hauled between the waterfront and an inland facility by rail or off-peak trucking, reducing terminal 'dwell time' and improving terminal efficiency, and also reducing peak period truck impacts. Identify empty container management strategies.
#3: Promote the competitiveness and performance of NJTPA's ports and port-served industries.	Customer needs are changing to include: larger ships, integrated warehouse/ distribution capacity, better landside access, and greater reliability. The PONYNJ needs to be responsive to these needs to remain competitive. If so, it could possibly capture a substantial increase in all-water services from Asia via the Suez and Panama canals.	Work with the PANYNJ and state of NJ to ensure that NJTPA's marine terminals offer the capacity, performance, landside access, and warehouse/ distribution facilities to serve the region and state, and to compete for growing world trade. Identify opportunities to expand port markets with innovative services such as short-haul rail, short-sea shipping, coastwise and in-region barges, and truck ferry.
#4: Ensure that environmental, community and security issues are fully addressed.	Cargo security remains a critical issue. In the face of increased attention to environmental impacts, many ports are exploring "Green Port" initiatives such as: off-peak operations, scheduled truck delivery, off-terminal equipment exchanges, chassis pooling, and emissions management.	Cooperate in the development of cargo security measures that safeguard the public without compromising freight system performance. Promote alternative mode strategies for landside distribution – rail and barge. Pursue "green port" strategies where feasible and applicable.
#5: Develop transportation programming and funding processes that take full account of freight project opportunities and benefits.	To meet multimodal investment needs for marine terminals, innovative approaches are needed.	Explore new institutional structures to finance and deliver multimodal investments.

Table 11. Air Cargo System Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Optimize air cargo system capacity, performance, safety and reliability	EWR capacity appears sufficient for the present, but future needs remain to be assessed. EWR international cargo often is trucked to JFK to clear customs, creating additional truck trips. Truck substitution - – the use of trucking to handle segments of an "air cargo" trip – is an important trend. Water substitution may also be an emerging trend.	In cooperation with PANYNJ, continue to explore a range of issues for EWR air cargo, including future demand, adequacy of current and future cargo capacity, need for airside improvements, need for landside access improvements, and relationship between EWR and JFK customs operations. Explore opportunities to reduce inefficiencies and truck traffic associated with use of JFK Customs facilities to clear EWR cargo. Explore opportunities to increase use of off-peal periods for "truck substitution" moves.
#2: Identify and implement "smart growth" land use and economic development strategies	Air cargo provides an economic benefit opportunity for warehouse and distribution development.	Maximize economic benefits from port activity through development of related warehouse/distribution center capacity in the NJTPA region, potentially using Freight Opportunity Sites near the airport.
#3: Promote the competitiveness and performance of NJTPA's airports and air-cargo served businesses	Several trends suggest an upswing in air cargo – an improving economy, "open skies" initiatives, growth in E-commerce, and service disruptions in other modes.	Ensure that EWR offers the throughput capacity, landside accessibility, and warehouse/distribution facilities necessary to serve the NJTPA region and compete effectively for growing air container trade.
#4: Ensure that environmental, community and security issues are fully addressed	New security requirements are evolving and impacts on cargo are highly uncertain, and may encourage truck substitution.	Cooperate in the development of cargo security measures that safeguard the public without compromising freight system performance.
#5: Develop transportation programming and funding processes that take full account of freight project opportunities and benefits	Adequacy and availability of funding for needed improvements is not yet known.	Review the adequacy and availability of funding pending further study of needed improvements.

Table 12. Warehouse and Distribution Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Optimize warehouse / distribution system capacity, performance, safety and reliability	Builders have a choice of locations: close-in, or in outlying areas. For larger facilities, outlying areas are being preferred.	As a matter of policy, formally endorse the goal of supporting warehouse/distribution space in the NJTPA region, in appropriate areas with suitable transportation, land use, and community conditions. Encourage off-peak operations to minimize peak-period generation of truck trips.
#2: Identify and implement "smart growth" land use and economic development strategies	Warehouse/distribution activity is a major economic opportunity. Growth in outlying areas means more VMT to serve the NJTPA region, along with lost jobs and revenues to the region.	Where possible, locate warehouse/distribution facilities to minimize VMT and maximize benefit to the region; encourage "intermodal logistic center" development. Primary consideration should be given to underutilized "freight opportunity sites" identified by NJTPA.
#3: Promote the competitiveness and performance of NJTPA's warehouse/distribution facilities and customers	International trade and overseas production are key drivers of demand. Operations are sensitive to disruptions in the overall freight transportation system.	Seek to maximize the efficiency and reliability of other freight system elements – highway, rail, port, and airport – that affect the viability and performance of warehouse/distribution facilities in the region. Continue to support the Freight Initiatives Committee and work with industry stakeholders.
#4: Ensure that environmental, community and security issues are fully addressed	Development can have local impacts, in the form of increased traffic and potential conflicts with other uses. Site development of Freight Opportunity Sites may pose environmental challenges.	Provide assistance in identifying and addressing site development issues. Continue and expand efforts to engage the public in freight issues and project discussions.
#5: Develop transportation programming and funding processes that take full account of freight project opportunities and benefits	There may be opportunities for increased public-sector involvement to achieve public purpose objectives.	Explore public-private partnership development and funding opportunities within the overall structure of NJTPA's planning and programming responsibilities.

Table 13. Interregional and Institutional Needs, Issues, and Strategies

Needs	Issues	Strategies
#1: Strategy for NJTPA participation in multi-state freight initiatives and coordination/ facilitation of in-state and in-region initiatives	Multi-state planning initiatives underway or upcoming In-state and in-region initiatives underway or upcoming	Continue to take active role in interagency coordination, emphasizing NJTPA initiatives. Establish formal working structures with out-of-state partner agencies to identify and coordinate multi-state corridor projects; this would be an extension of current practices, where partner agencies meet on an as-needed or informational basis. Establish formal working structures with in-state partner agencies to identify and coordinate in-region/in-state freight projects; in other states, these structures have been most successful when they are responsible for allocating funding, even in limited amounts.
#2: Strategy to guide the private sector to invest and operate consistent with public benefit and public purpose, and to leverage private investment with public participation as warranted	Role of the public sector Need for public/private cooperation	Coordinate transportation and economic development activities, including reuse of Freight Opportunity Sites, with interested private sector parties; this can be accomplished through the continued efforts of NJTPA's Freight Initiatives Committee; and through expanded outreach efforts to key industry sectors.
#3: Policies and procedures to promote equitable balance of benefit and cost among freight stakeholders	Perceptions of equity Practical challenges of reconciling interests	Seek to maximize public knowledge and awareness regarding freight issues, real benefits, and real impacts; focus on identifying shared interests in transportation system safety/security/ performance, equity of impact and benefit, need for funding, etc. Seek to maximize transparency, openness, inclusiveness, and respect for divergent points of view in the freight planning process; but recognize that the ultimate goal is to make progress in meeting critical challenges, not to 'talk the problem to death'.
#4: Opportunities for the creative financing and implementation of freight improvements	Overall freight funding deficiencies	Maximize Federal assistance for regional freight projects through legislation. Maximize other non-Federal (state, PANYNJ, private industry, etc.) assistance for regional freight projects, possibly through a dedicated freight funding pool associated with a statewide freight partnership. Aggressively pursue innovative funding opportunities such as expanded Federal program eligibility, user-based financing, public-private partnerships, and tax credits/incentives.
#5: Provide regional leadership to promote the exploration and implementation of needed freight improvements, possibly within new institutional structures.	Division of powers Need for effective regional leadership	As noted in #1 and #4, establish a formal working structure – a New Jersey Freight Partnership – to identify and coordinate freight projects, and consider a dedicated freight funding pool to be directed by same; the goal is not to usurp existing jurisdictional responsibilities and prerogatives, but to set an overall vision and to coordinate mutual efforts.

7.0 Critical Path Action Items

Freight planning is a cross-cutting issue – it covers all modes, involves both transportation and economic components, and it addresses the overlapping roles and responsibilities of the public and private sectors. From the menu of potential strategies identified in this RTP update, several key opportunities have been identified as "critical path" items for near-term action.

NJTPA's Freight Vision

To guide and support ongoing freight planning efforts, NJTPA has developed the following vision statement:

> *NJTPA recognizes that freight movement is critical to the economy of its member counties and the state of New Jersey, but also generates significant transportation and environmental challenges that become more critical each day. It is the policy of NJTPA to promote a safe, secure, efficient multimodal freight transportation system that minimizes the negative impacts of freight transportation and distributes them equitably, while maximizing the positive economic benefits accruing to the region. Furthermore, it is the policy of NJTPA to take a proactive role in identifying and facilitating multimodal freight improvements and strategies, particularly in the area of innovative approaches, and to coordinate effectively with public sector and private sector partners to achieve real and lasting benefit for the region's residents and businesses.*

Land Use and Economic Development Initiatives

- Utilization of Freight Opportunity Sites. NJTPA and NJIT have identified currently underutilized properties throughout the region that are highly suitable for freight-related land uses, by virtue of their size, location, and transportation accessibility. NJTPA should continue to lead efforts to return these underutilized properties to productive use, as a means of generating economic benefits, and as a means of concentrating freight activity closer to the region's production, consumption, and transportation core.

- Smart growth. Building on the Freight Opportunities initiative, NJTPA should work closely with the NJ Office of Smart Growth to formulate goals and strategies to improve the coordination between land use and transportation components of freight movement. The goal is to maximize economic benefit while minimizing transportation investment needs and environmental impacts.

- Empty containers. NJTPA should assist the state in further exploration of empty container management issues.

- Truck rest areas. NJTPA should take a lead or co-lead role in examining emerging issues related to truck rest areas and support facilities.

Highways and Bridges

- Critical corridors. NJTPA should identify and designate 'critical corridors' for in-region and through-trucking, and take a lead or co-lead role in further examination of improvement strategies. Candidates include, but are not limited to, the routes identified previously in this document.

- Time-shift, space-shift, and mode-shift strategies. NJTPA should take a lead or co-lead role in exploring the potential to reduce highway impacts and infrastructure needs associated with truck operations by promoting off-peak operations, separation of trucks and autos, and the use of alternative modes in lieu of trucking where practical.

- Goethals Bridge. The Goethals is a critical link between the NJTPA region and Staten Island, and carries a substantial percentage of truck traffic, but with six narrow lanes it is substandard for truck operations. NJTPA should inform and support the PANYNJ-led study now underway.

Rail Initiatives

- NJSSA operations. Efforts to improve rail service, accessibility, and marketing to current and potential future rail customers should be jointly undertaken by NJTPA, the state of New Jersey, and the railroads.

- Regional rail improvements. NJTPA should coordinate with the various Class I and shortline system rail improvements developed by the PANYNJ, NJDOT, and others, and should identify gaps or further recommendations.

- Multi-state rail corridors. NJTPA should monitor and coordinate planning with the MAROPs and I-81 Corridor initiatives.

- Short-haul opportunities. NJTPA may take a lead or co-lead role in further exploration of the potential for short-haul rail service.

- Cross-harbor rail issues. NJTPA should continue to play an active role in review and comment on the ongoing Cross Harbor Freight Movement EIS, as well as the Access to the Region's Core passenger rail project, to identify appropriate options to accommodate increasing freight and passenger flows between the west of Hudson and east of Hudson regions.

Ports and Port Access Initiatives

- PANYNJ expansion program for marine terminals, highway and rail access, and channel deepening. NJTPA should monitor, inform, and support these ongoing efforts as needed.

- Kapkowski Road, Portway Phase I Projects, Portway Extensions Program, and Liberty International Transportation Corridor program. NJTPA should facilitate implementation of these needed projects and initiatives.

- Innovative maritime strategies. NJTPA should take a lead or co-lead role in exploring the potential for:

    - Inland Port development;

    - Use of marine transportation in coastwise/short-sea shipping, in-region barge, and in-region ferry services; and

    - "Green Port" initiatives.

- Air draft improvements. The Bayonne Bridge presents an "air draft" limitation for vessels navigating in the Kill van Kull, which needs to be addressed to accommodate the changing needs of the world shipping fleet. NJTPA should work with its bi-state partners on the appropriate next steps.

Air Cargo Initiatives

- Air cargo related warehouse/distribution facilities. NJTPA should participate in planning for the expansion of these facilities, encouraging the use of Freight Opportunity Sites in the vicinity of EWR.

"Freight Impact Concept Area" Studies

As part of the Freight System Performance Assessment Study, NJTPA explored how these freight initiatives might be applied in practice. Five Freight Impact Concept Areas were studied:

- NJ 17 Corridor (Bergen County);

- NJ Turnpike Interchange 12/Tremley Point (Union County);

- Interstate 78/NJ 31 (Hunterdon County);

- Manville Yard and former Veterans Administration Supply Depot (Somerset County); and

- Newark Liberty Airport and Port Newark/Elizabeth (Essex County).

These initial concept-level investigations identified opportunities for multimodal physical and operational improvements to enhance economic benefits and address transportation and community impacts. NJTPA should pursue more detailed follow-on study of these opportunities.

Institutional Initiatives

- Prioritization, evaluation, and funding of freight projects. NJTPA should work with its partner agencies to identify appropriate criteria and strategies for prioritizing freight projects within a multimodal investment framework, for evaluating the benefits and costs of such projects on a consistent and repeatable basis, and for identifying and securing non-traditional funding to fill the gaps in currently available sources. The possibility of a state-level funding set-aside for freight should be explored.

- Leadership. NJTPA should work with its partner agencies to establish an overall freight vision for the region, and to identify structures and mechanisms to streamline the planning, review, funding, and implementation of freight projects across public agency and private sector boundaries.

Outcomes

The results of these various freight initiatives, it is hoped, will include:

- The ability to handle projected increases in freight handling, and to secure the economic benefits associated with those increases, with reduced transportation system impacts and investments and reduced environmental and community impacts.

- A more effective and pro-active partnership among the diverse public and private stakeholders involved in freight movement in the NJTPA region.

- A stable platform for the implementation of projects currently on the drawing board, and for the effective planning of future projects to serve the region's growing freight needs, today and through the year 2030.