VI. EXISTING CONDITIONS

Central to developing an understanding of the true nature of container movement to, from and through the region, it is necessary to first develop a comprehensive inventory of the variety of facilities that form the "nodes" of the container-handling network. For the purposes of this container movement study, the "nodes" consist of three primary classes:

- Marine Ports
- Intermodal Railyards
- Dense Warehouse/Distribution Center Clusters

The following sections identify and describe the variety of facilities incorporated into this study and major generators and attractors of container trips.

VI.1 SIGNIFICANT CONTAINER-HANDLING FACILITIES

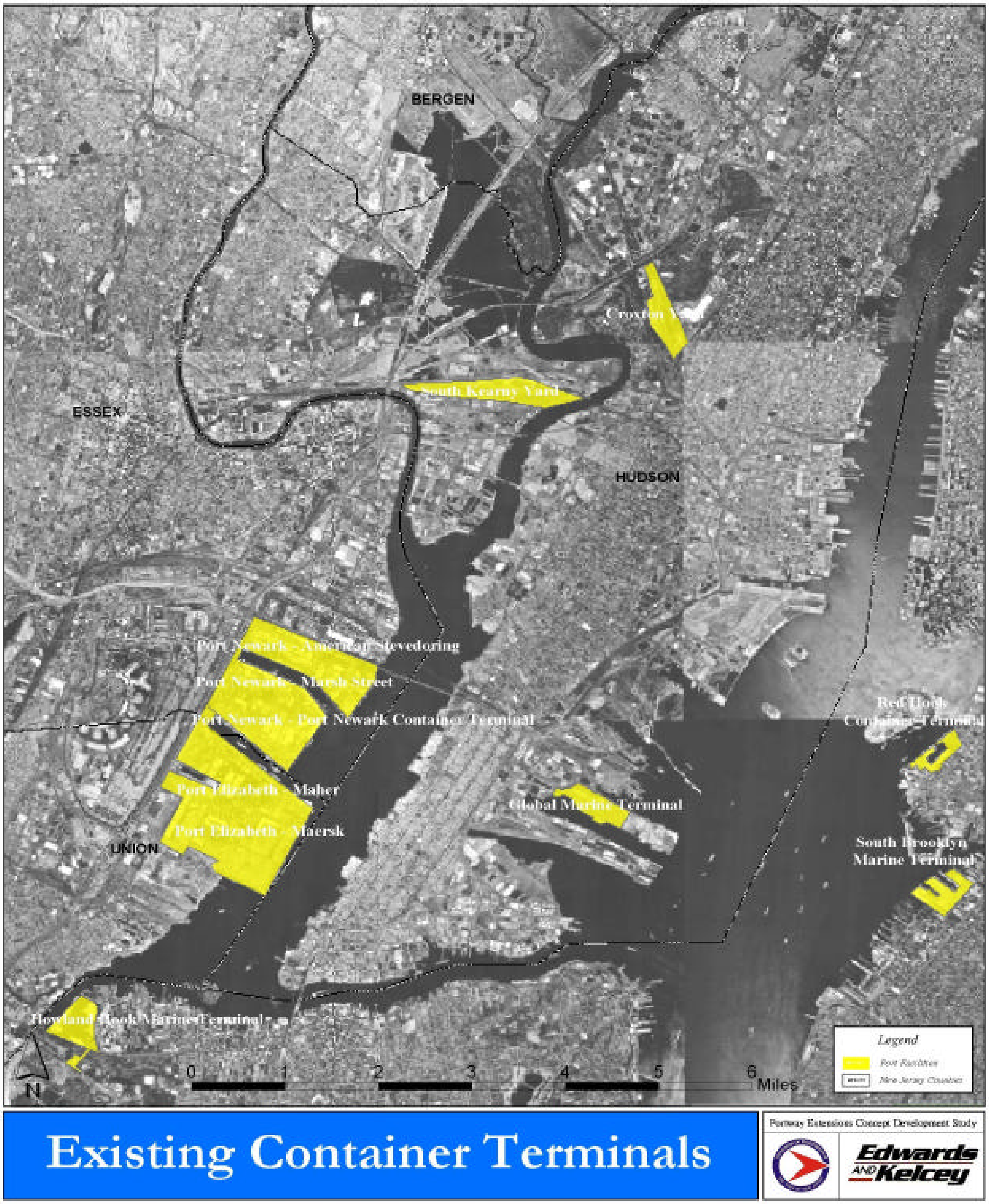
Marine Ports

As detailed in the CPIP studies, the US Army Corp of Engineers (USACE) database identifies a total of 559 docks, wharves and piers in the Ports of Newark, New York and Long Island. However, relatively few of these facilities are container terminals. Still fewer are located within or affect the Portway Extensions primary study area. A total of nine (9) existing marine port facilities incorporated into this study including:

- Port Elizabeth – Maher
- Port Elizabeth – Maersk
- Port Newark – Port Newark Container Terminal
- Port Newark -- Marsh St.
- Port Newark – American Stevedoring (estimated at 85% of Red Hook throughput)
- Port Jersey – Global
- Howland Hook
- Red Hook (excluding barge)
- South Brooklyn Marine Terminal

These marine ports are depicted on Figure VI.1.

Figure VI.1
Existing International Container Terminals



Intermodal Railyards

In addition to the container flows that enter and exit the region via the major marine terminals, a significant volume of containers enter and exit the region through intermodal railyards. The intermodal railyards serve as the local distribution nodes for containers shipped to and from the west coast ports (i.e.: LA / Long Beach) via the Landbridge. The Landbridge is effectively a series of major rail corridors spanning the United States accommodating demand for trans-continental shipping of containers and other commodity flows.

Within the Portway Extensions primary study area, a majority of the Landbridge traffic is handled at one of two intermodal railyards.

- Croxton Yard in Jersey City, New Jersey - Operated by Norfolk Southern, and
- South Kearny Yard in Kearny, New Jersey - Operated by CSX.

These intermodal railyards are both proximate to Interchange 15-W of the New Jersey Turnpike, and are depicted on Figure VI.1. While other smaller intermodal railyards are in operation within the region, the volume of containers handled at these other facilities is relatively small. Therefore, these facilities were not major considerations in the Portway Extensions study.

Warehouse/Distribution Centers

New Jersey has one of the leading concentrations of warehouses and distribution centers in North America. These facilities support businesses and consumers throughout the State of New Jersey, North America and the world. Warehouses and distribution centers add value to the freight moving through them and represent a substantial economic activity in New Jersey. According to the study ***The Value of Freight to the State of New Jersey***, an estimated 380,000 people work in New Jersey's warehouses and distribution center buildings, making this activity one of the leading employers in the State. Warehouses and distribution centers are integral to the domestic and international movement of goods and often represent the "first place of rest" after a container is unloaded from a vessel. In the global market place, research has shown that often the final assembly and customization of overseas products imported for North American use are generally done in the warehouses and distribution centers.

As shown in Table VI.1, over 764 million square feet of industrial space existed in northern and central New Jersey at the end of 2002. Warehouses and distribution centers represent a majority of this space.

Table VI.1
Industrial Space Development by County

County	3Q98 Existing Space	4Q02 Existing Space	1998-2002 Change	Percent Change
Bergen	115,631,718	120,322,432	4,690,714	4%
Essex	84,626,772	86,546,652	1,919,880	2%
Hudson	101,552,624	104,647,867	3,095,243	3%
Morris	37,138,230	40,720,537	3,582,307	10%
Passaic	55,013,403	57,060,888	2,047,485	4%
Hunterdon	2,423,105	2,621,145	198,040	8%
Mercer	19,230,677	19,699,887	469,210	2%
Middlesex	148,559,841	183,091,651	34,531,810	23%
Monmouth	22,603,108	22,965,267	362,159	2%
Somerset	36,175,788	37,916,939	1,741,151	5%
Union	85,585,275	88,869,788	3,284,513	4%
TOTAL	**708,540,541**	**764,463,053**	**55,922,512**	**8%**

Source: CB Richard Ellis

New Jersey has historically played a significant role in the distribution of goods. With the largest port on the East Coast and one of the largest consumer markets, the State's warehouse and distribution center activity has grown.

Given the key role of New Jersey's warehouses as often being the first place of rest in the container transportation chain, the Portway Extensions Concept Development project included an assessment of existing warehouse and distribution center trends and conditions. The assessment of existing conditions included three components:

- Trends in available industrial space;
- Trends in asking triple net lease rates; and
- Information provided during the outreach discussions with the counties and municipalities.

Trends in Available Industrial Space

As shown in Table VI.1 above, nearly 56 million square feet of industrial space was developed in New Jersey between 1998 and 2002. Middlesex County continued to be the epicenter of development, adding nearly 35 million square feet of space. The largest concentration of warehousing and distribution center space in Middlesex County is located in the New Jersey Turnpike Interchange 8A area. Other concentrations in the County include Edison and Carteret.

Morris County continued to develop its industrial base. Bergen, Hudson and Union Counties also saw increases in their inventory of industrial space, as new buildings were developed and existing space renovated. Warehouse and distribution center development also accelerated in Mercer County in the vicinity of New Jersey Turnpike Interchange 7A. While the total inventory of industrial space did not grow substantially in the County, older space was being removed while modern distribution facilities were being developed.

Trends in Asking Lease Rates

The development of properties for industrial uses in Bergen and Hudson Counties has become more difficult as the competition increased among land uses and the area has become more built up. The scarcity of available properties and competition among land uses was reflected in the increase in net asking lease rates between 1998 and 2002, as shown in Table VI.2 below. Bergen and Hudson Counties experienced among the highest increases in asking lease rates.

Mercer County displayed the largest increase. However, the increase in net asking lease rates for industrial properties in Mercer County reflected the removal of older, less marketable properties and the construction of state-of-the-art distribution facilities. The 2002 average asking lease rate in Mercer is consistent with the prices sought for modern warehouses.

Table VI.2
Industrial Space Net Lease Rate Trends by County

County	3Q98 Existing Space	4Q02 Existing Space	1998-2002 Change	Percent Change
Bergen	$ 5.56	$ 6.96	$ 1.40	25%
Essex	$ 5.16	$ 5.88	$ 0.72	14%
Hudson	$ 4.61	$ 5.90	$ 1.29	28%
Morris	$ 5.76	$ 6.82	$ 1.06	18%
Passaic	$ 5.07	$ 5.95	$ 0.88	17%
Hunterdon	Not Available	$ 3.31	Not Available	Not Available
Mercer	$ 3.30	$ 4.98	$ 1.68	51%
Middlesex	$ 4.36	$ 4.66	$ 0.30	7%
Monmouth	$ 5.23	$ 5.98	$ 0.75	14%
Somerset	$ 4.35	$ 4.83	$ 0.48	11%
Union	$ 4.51	$ 4.86	$ 0.35	8%

Source: CB Richard Ellis

Information from the Outreach Discussions

The outreach discussions with the counties and municipalities confirmed these trends, as well as identified additional considerations regarding warehousing and distribution center development. The information from the outreach discussions included:

- Bergen County was reaching full development. Prices for available properties are increasing. With some exceptions (e.g., the Meadowlands area), the development of warehousing space is discouraged; development of office and retail space is preferred because of the higher tax ratables and jobs generated.
- The Tremley Point area in Linden, which includes several hundred acres of brownfield properties, is likely to be redeveloped into distribution facilities. The attractiveness of this location has increased substantially with the announced redevelopment of New Jersey Turnpike Interchange 12 and the construction of a new direct access road into Tremley Point.
- The Carteret section of Middlesex County will also benefit from redevelopment of Interchange 12 and the reuse of the extensive brownfield properties in the area.
- Properties in Raritan Center have been identified as having the potential for an additional 5 million square feet of distribution facilities.
- The City of Newark, Kearney and Jersey City have available industrial property in the vicinity of the Port that could be used for warehouse development. These properties are currently storing empty and disused containers.

VI.2 EXISTING CONTAINER TRANSPORTATION MARKETS

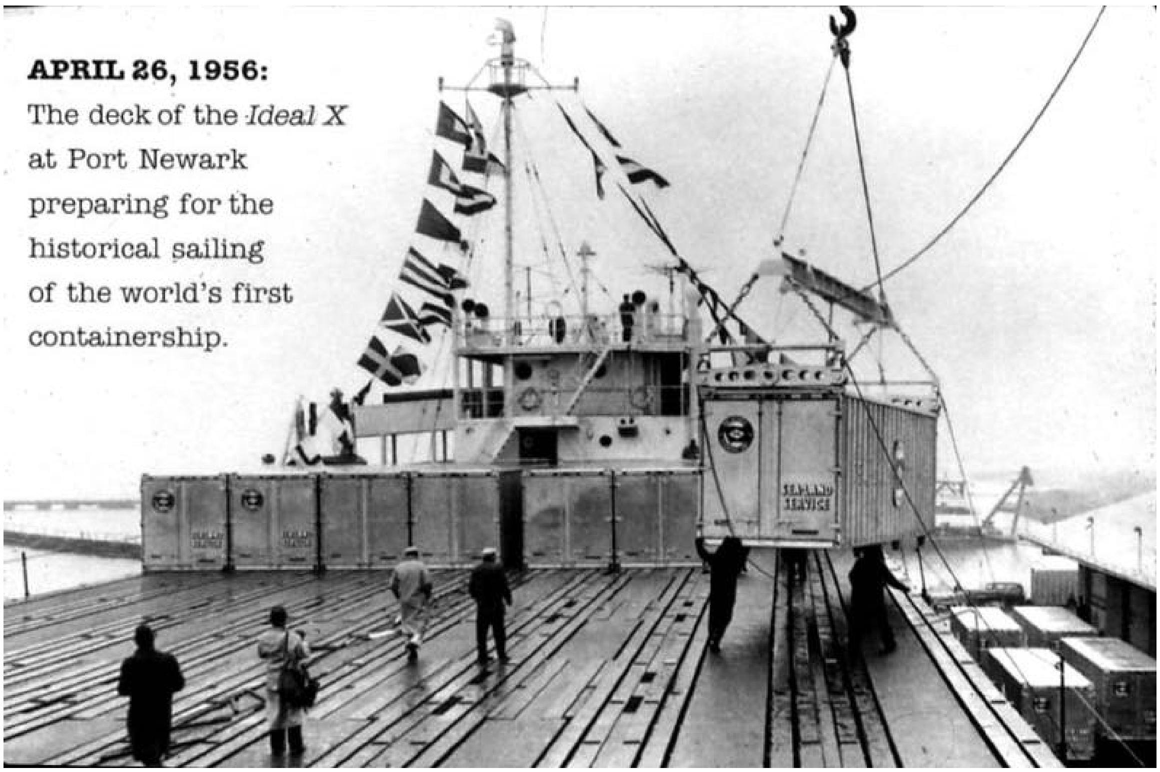
VI.2.A OVERVIEW OF CONTAINER LOGISTICS

The transportation of containers into, out of, within and through the North Jersey region involves a variety of modes and trip purposes. Fundamentally, this is because a container is a highly flexible tool for meeting a variety of freight transportation needs. They come in a variety of sizes; they can be handled by and quickly interchanged among a variety of modes (marine, rail, truck); and they can be used to carry almost any commodity that will physically fit in the box.

The first intermodal shipping container was developed in the late 1950's by Malcolm McLean of Sea-Land services with a trucking background. The first container carried domestic cargo and was loaded using ship's gear (a vessel-mounted crane) at Port Newark.

Since its introduction, the container has revolutionized international waterborne commerce. Containerized shipping has been the fastest-growing segment of U.S. marine trade. It has also fueled the development of cross-country intermodal rail services featuring container on flatcar (COFC, where a box rests on a rail flatcar), trailer on flatcar (TOFC, where a box and accompanying over-the-road trailer rests on a rail flatcar), and "double stack" trains (DST, where two boxes are stacked on a specialized rail flatcar). Finally, it has supported the growth of trucking services that typically handle the short and intermediate range pickup and delivery of containers on over-the-road trailers, either as a point-to-point move between shipper and receiver, or as part of a larger "trip chain" involving multiple modes.

Figure VI.2
Loading of the First Containership



Intermodal shipping containers come in a variety of sizes. The most common lengths are 20 feet, 40 feet, 45 feet (the maximum size for standard ship loading), 48 feet (truck or rail), and 53 feet (truck or rail). To report container traffic volumes, the industry uses several standard measures:

- TEUs (twenty-foot equivalent units)
- FEUs (forty-foot equivalent units)
- Boxes (a single container of any size)

The weights associated with containers will vary based on the commodities they carry. For lighter commodities, a box may "cube out" (its volume will be filled) before it "weighs out" (reaches its weight limit, based on over-the-road restrictions or other applicable limits). For heavier commodities, the reverse may be true.

A container that carries no cargo is known as an "empty." In an ideal case, a container that carries cargo on its "headhaul" (the outbound leg of its trip) can be re-filled at its destination and carry cargo on its "backhaul" (the return leg of its trip), to maximize the revenue generated from the move. In cases where the backhaul cannot be filled, containers may be returned empty to their origin (known as an "empty backhaul"), or they may be exchanged between different users or services. In cases where there is no user for a container, it may be parked at a storage depot, sometimes for long periods. This is a significant issue in regions like New York/New Jersey, which import more containerized commodities than they export.

The choice of modes used to carry containers will depend on the distance and type of move. Rail and barge services generally incur a fixed "lift cost" (the cost of transferring a container between modes) plus a low per-mile cost; all-truck services do not incur a lift cost, but have higher per-mile costs. Beyond a certain distance, rail and barge become cost-competitive with trucking, because their lower per-mile costs eventually offset their higher lift costs. For containers moving between the study area and the "hinterland" region (generally defined as anything more than 400 miles away) it is generally preferred to use rail. Containers moving between 75 to 400 miles are generally transported by truck, but may also use rail or barge. For containers moving locally (within 75 miles) it is typically preferred to transport them by truck.

These are general guidelines based on economic considerations, and in some cases, service requirements – speed, reliability, visibility, security and/or special handling – will outweigh cost considerations. As a matter of public policy, many states are actively encouraging alternatives to trucking at medium and short distances. The Port Inland Distribution Network (PIDN) is designed to encourage the development of rail and barge services to "dense trade clusters" at a radius between 75 and 400 miles. This study examines options and requirements to make rail more competitive at even shorter distances, as described in Section X of this report.

Within the Portway Extensions study area, containers generate four general types of movements:

- "Over-the-wharf" traffic – loaded and empty containers handled at Port of New York and New Jersey (PONYNJ) marine terminals, which generate landside traffic that is handled by truck, intermodal rail, and barge.
- "Landbridge" traffic – loaded and empty containers moving between the study area and to and other U.S. ports (primarily Los Angeles and Long Beach) by intermodal rail.
- Cross-Border and Domestic traffic – loaded and empty containers moving within the study area, between the study area and other U.S. locations, and between

the study area and Canada and Mexico, other than over-the-wharf or landbridge traffic.

- "Non-Freight" container traffic – a special case of empty containers that are moving between different facilities (maintenance, short and long-term storage, railyards, marine terminals, etc.) within the study area, rather than being returned to their origins as "empty backhaul."

The functional relationships between modes, types of traffic, and distance factors are illustrated in Figures VI.3 through VI.6 below.

Figure VI.3
Functional Flow Diagram, "Over the Wharf" Container Traffic

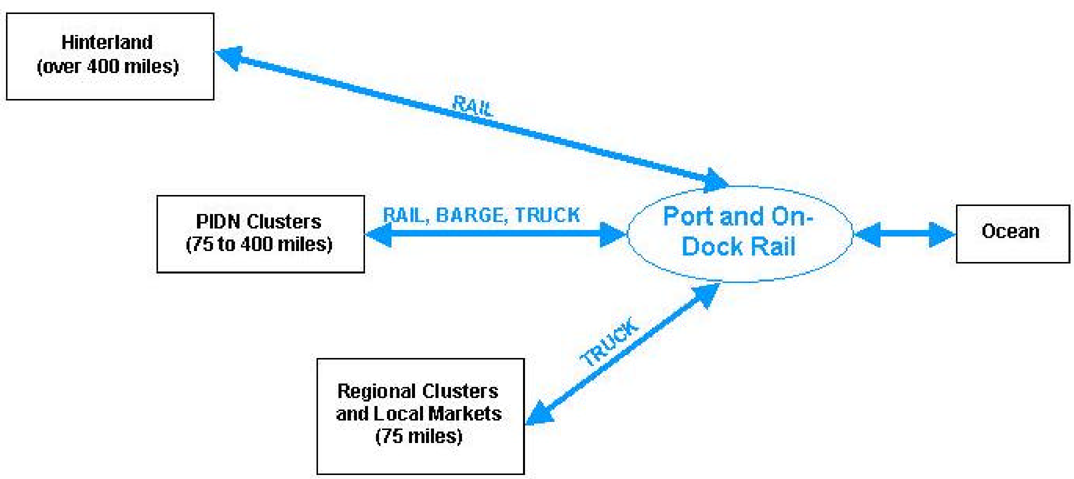


Figure VI.4
Functional Flow Diagram, "Landbridge" Traffic

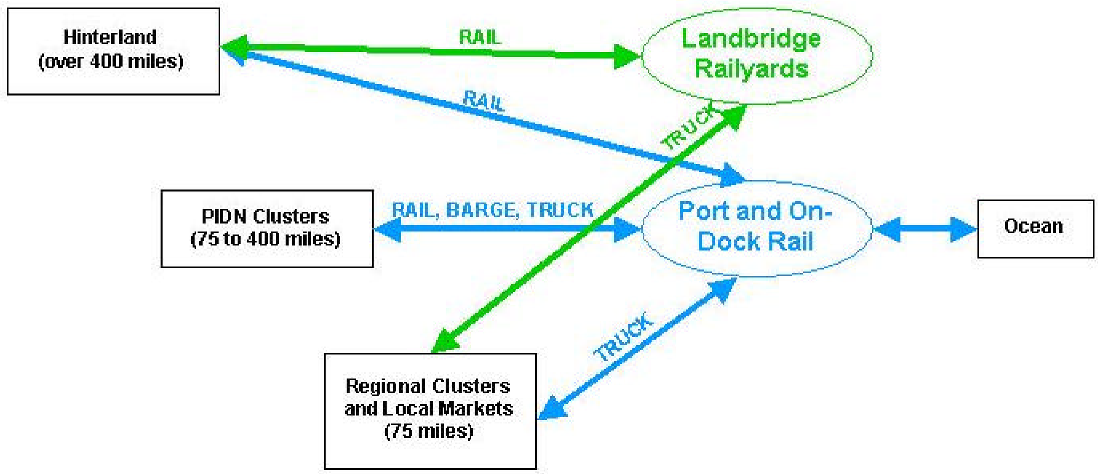


Figure VI.5
Functional Flow Diagram, Cross-Border and Domestic Container Traffic

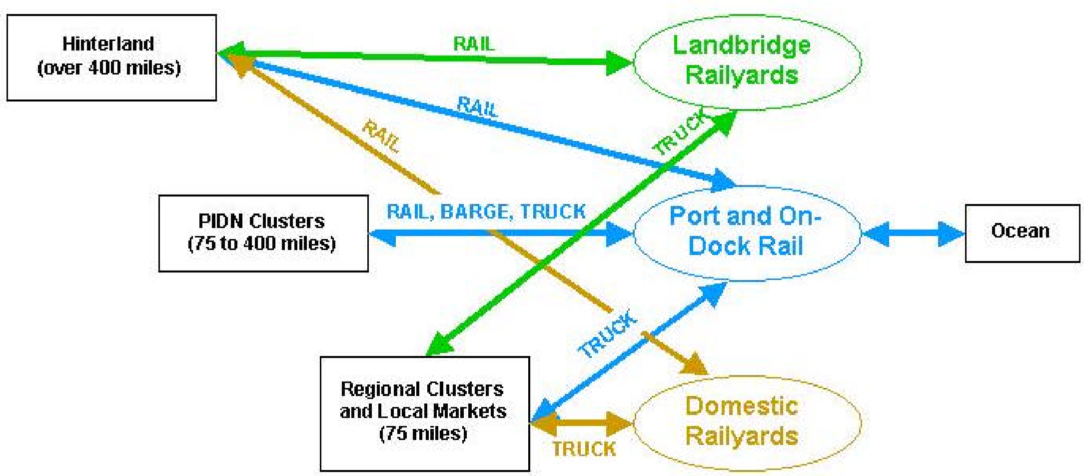
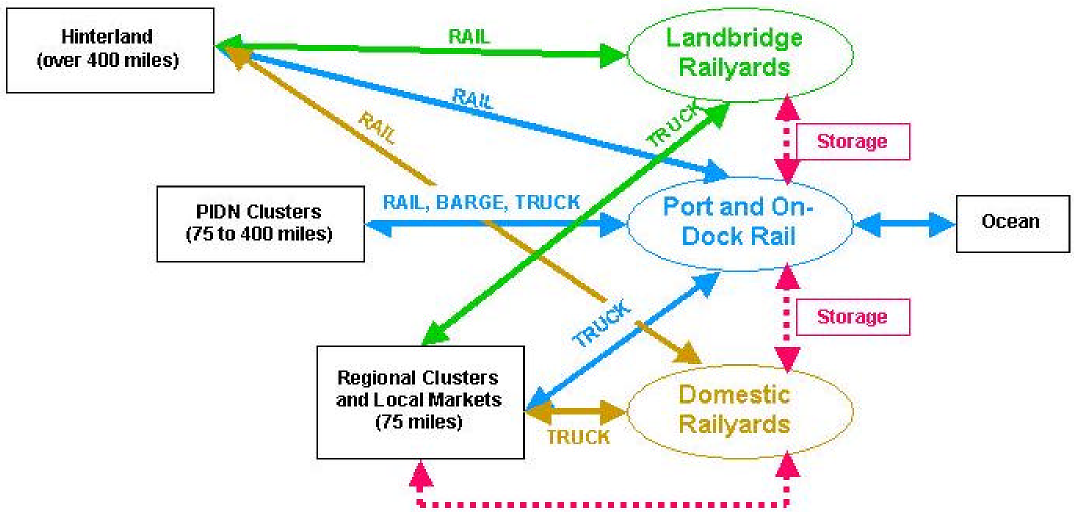


Figure VI.6
Functional Flow Diagram, "Non-Freight" Container Traffic



VI.2.B EXISTING "OVER THE WHARF" CONTAINER TRAFFIC

Marine terminal container traffic volumes were derived from the draft Comprehensive Port Improvement Plan (CPIP) and are reported in TEUs. Since each marine terminal complex represents a unique generator of marine, truck and rail traffic, separate volumes are reported by terminal. Year 2001 is used as a baseline. For Red Hook, where an estimated 85% of the terminal's import containers are barged from Brooklyn and New Jersey, container volumes are assigned to the facility where they are ultimately transferred to truck or rail.

As indicated in Table VI.3 below, the Port of New York and New Jersey handled a total of 3,307,321 TEUs in 2001. Around 2.5 million TEUs were transferred to/from landside distribution modes at he Port Newark/Elizabeth complex; around 500,000 TEUs were transferred at Howland Hook; around 300,000 TEUs were transferred on the Bayonne Peninsula; and around 10,000 TEUs were transferred in Brooklyn.

Table VI.3
Year 2001 Marine Container Terminal Throughput

Terminal	Year 2001 Throughput (TEUs)
Port Elizabeth – Maher	1,383,191
Port Elizabeth – Maersk	650,065
Port Newark – Port Newark Container Terminal	390,017
Port Newark -- Marsh St	18,137
Port Newark – American Stevedoring	58,613
Subtotal, Port Newark/Elizabeth	***2,500,024***
Port Jersey – Global	298,554
Bayonne – MOTBY	--
Subtotal, Bayonne Peninsula	***298,554***
Howland Hook	***498,399***
Red Hook (excluding barge)	***10,344***
South Brooklyn Marine Terminal	--
TOTAL, ALL MARINE CONTAINER TERMINALS (TEU's)	**3,307,321**

Source: CPIP Draft Comprehensive Port Improvement Plan, Task Memorandum E

Container movements "over the wharf" (to and from vessels) generate corresponding landside traffic by truck, rail and barge. Each marine terminal has slightly different trip generation characteristics, depending on its carrier mix and operations. Detailed terminal-by-terminal information is not available, so the following process is used to estimate these mode split characteristics:

- About 10.3% of each terminal's "over the wharf" containers are assigned to intermodal rail (to be handled at existing / proposed on-dock railyards). This represents the ratio of ExpressRail containers to the total containers handled through all PONYNJ facilities. It is recognized that a small number of over-the-wharf containers are moved through railyards other than ExpressRail, which are not reflected in this assignment. It is also recognized that some terminals are heavier users of intermodal rail than others, but in the absence of good terminal-level data, the mean was applied to all terminals for purposes of system-level assessment.
- The remaining 89.7% of each terminal's over-the-wharf containers are assigned to truck.
- The effect of the Red Hook barge in repositioning containers between Brooklyn and Newark is accounted for by assigning Red Hook traffic to two different

terminals. Barges were not used for other types of local container distribution in year 2001.

The numbers of truck and rail containers associated with each terminal, as summarized in Table VI.4 were calculated based on these assumptions, and were translated into vehicle equivalents as follows:

- For an average day, the equivalent number of rail boxes was calculated assuming 365 operating days per year and 1.7 TEUs per box moved (or “lifted”). A variety of railcar equipment can be used to move containers, from 90’ single-stack flatcars (4 TEUs) to 270’ double-stack well cars (20 TEUs).
- For an average day, the equivalent number of truck moves was calculated, assuming 260 operating days per year (five days per week), an average of 1.7 TEUs per container truck, and an inflation factor of 2. The inflation factor means that for every truck carrying a container, there is a corresponding truck move that is not actively involved in a headhaul or backhaul move. These types of moves include: trucks exchanging containers between users or facilities; trucks moving containers to/from storage or repair yards; bare-chassis trucks not carrying containers; and “bobtail” trucks not hauling a chassis. This factor is consistent with PANYNJ truck counts and forecasts, and yields reasonable levels of container traffic on the Portway Extensions model network.

In practice there are seasonal and day-of-week variations in container movements, but the assumptions detailed above and incorporated into the study are considered reasonable and appropriate for planning purposes.

Table VI.4
Year 2001 Truck and Rail Trips Generated by Marine Container Terminals

	Average Truck Trips (one way) Per Day, Year 2001	Average Intermodal Rail Box Moves (one way) Per Day, Year 2001
Port Elizabeth – Maher	5,613	230
Port Elizabeth – Maersk	2,638	108
Port Newark – PNCT	1,583	65
Port Newark – Marsh St	74	3
Port Newark – American Stevedoring	238	10
Subtotal, Port Newark/Elizabeth	***10,145***	**416**
Port Jersey – Global	1,212	50
Bayonne – MOTBY	--	0
Subtotal, Bayonne Peninsula	***1,212***	**50**
Howland Hook	***2,022***	**83**
Red Hook (excluding barge)	***42***	**2**
South Brooklyn Marine Terminal	0	0
Average Daily Traffic, All Marine Container Terminals	**13,421**	**550**
Annual Traffic, All Marine Container Terminals	**3,489,345**	**200,854**

The next step was to determine the distribution of these trips:

- All intermodal rail traffic was assigned to the ExpressRail facility.
- Trucks were assigned based on data developed previously by Moffatt and Nichol for the Port Inland Distribution Network (PIDN) initiative. The PIDN produced estimates of the number of PONYNJ containers moving to and from different zip codes within a 17-state region in year 1998/9. The shares of traffic associated with each zip code were applied to the estimate of total truck traffic in 2001.

Figure VI.7
Distribution of Containers Moving Through the PONYNJ, 17 State Level

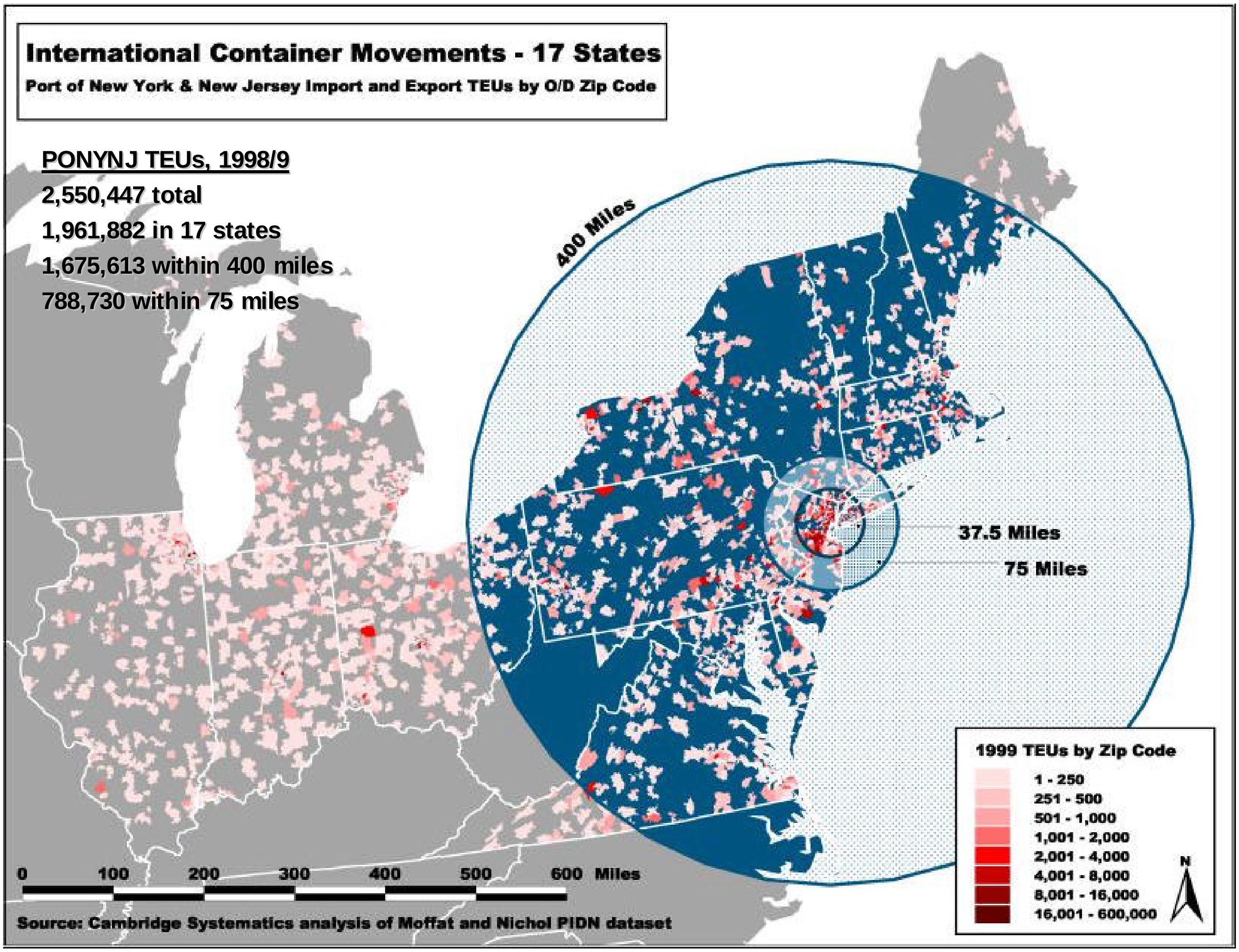
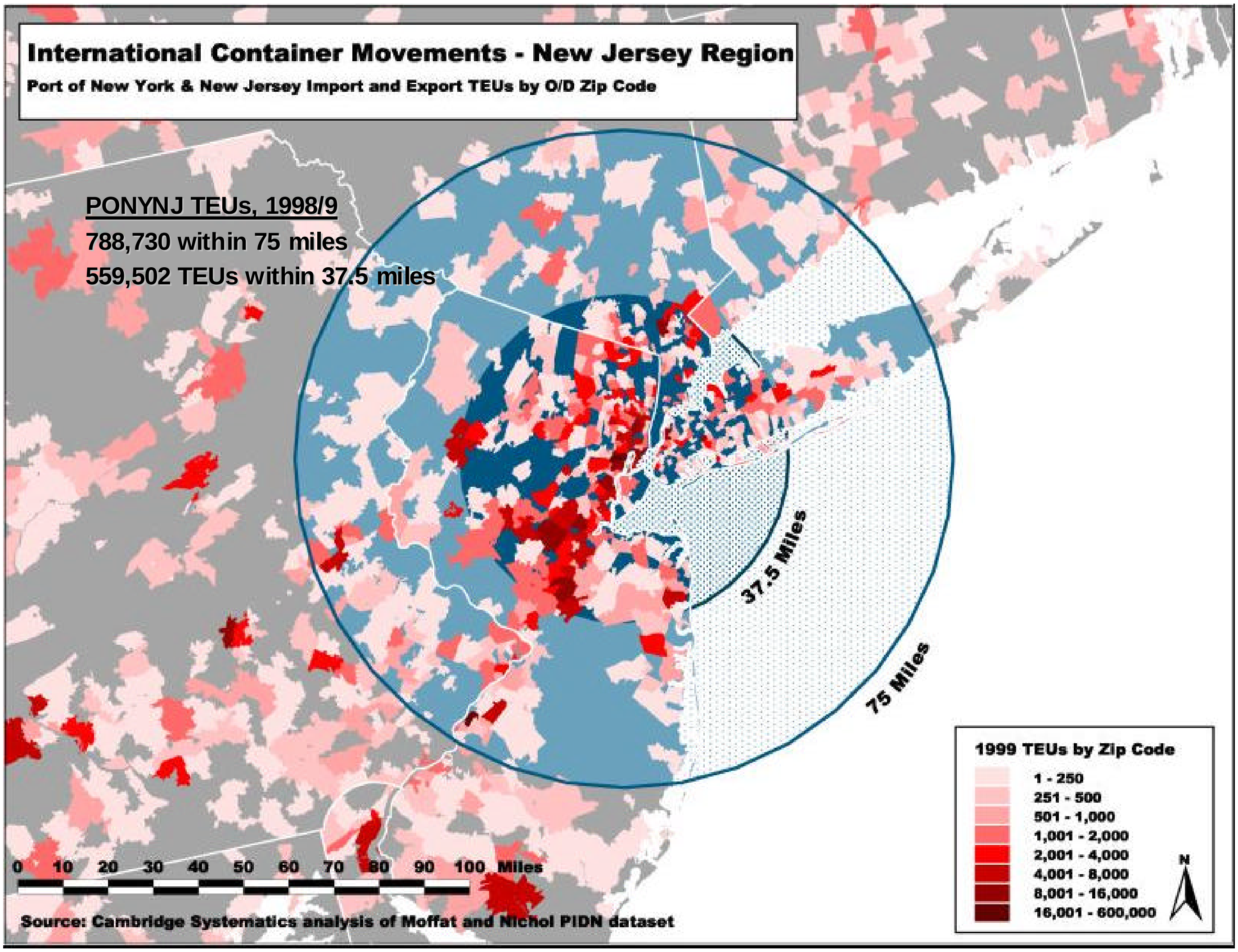


Figure VI.8
Distribution of Containers Moving Through the PONYNJ, Study Area Level



The PIDN data indicate that PONYNJ containers are widely distributed throughout the country. Around four-fifths are within a 17-state "primary service area." Around two-thirds are within a 400-mile radius of Port Newark/Elizabeth, and around one-third are within a 75-mile radius.

The distributions of these containers tend to cluster in two important ways: as regional clusters, generally corresponding to the location of major warehouse and distribution centers, located along the New Jersey Turnpike and Interstates 80 , 78 and 287; and as "dense trade clusters" located between 75 miles and 400 miles of Port Newark/ Elizabeth. Activity in the regional clusters is discussed in Section VIII, and is the basis for many of the recommendations of this study. Activity in the dense trade clusters was documented as part of the PIDN, and is noted in Table VI.5. Container traffic in these corridors currently moves by truck, but under the PIDN proposals, some share would be shifted to alternative modes (truck or barge). The first PIDN service – a barge to Albany – was initiated in 2003.

Table VI.5
Distribution of Containers Moving Between PONYNJ and Dense Trade Clusters

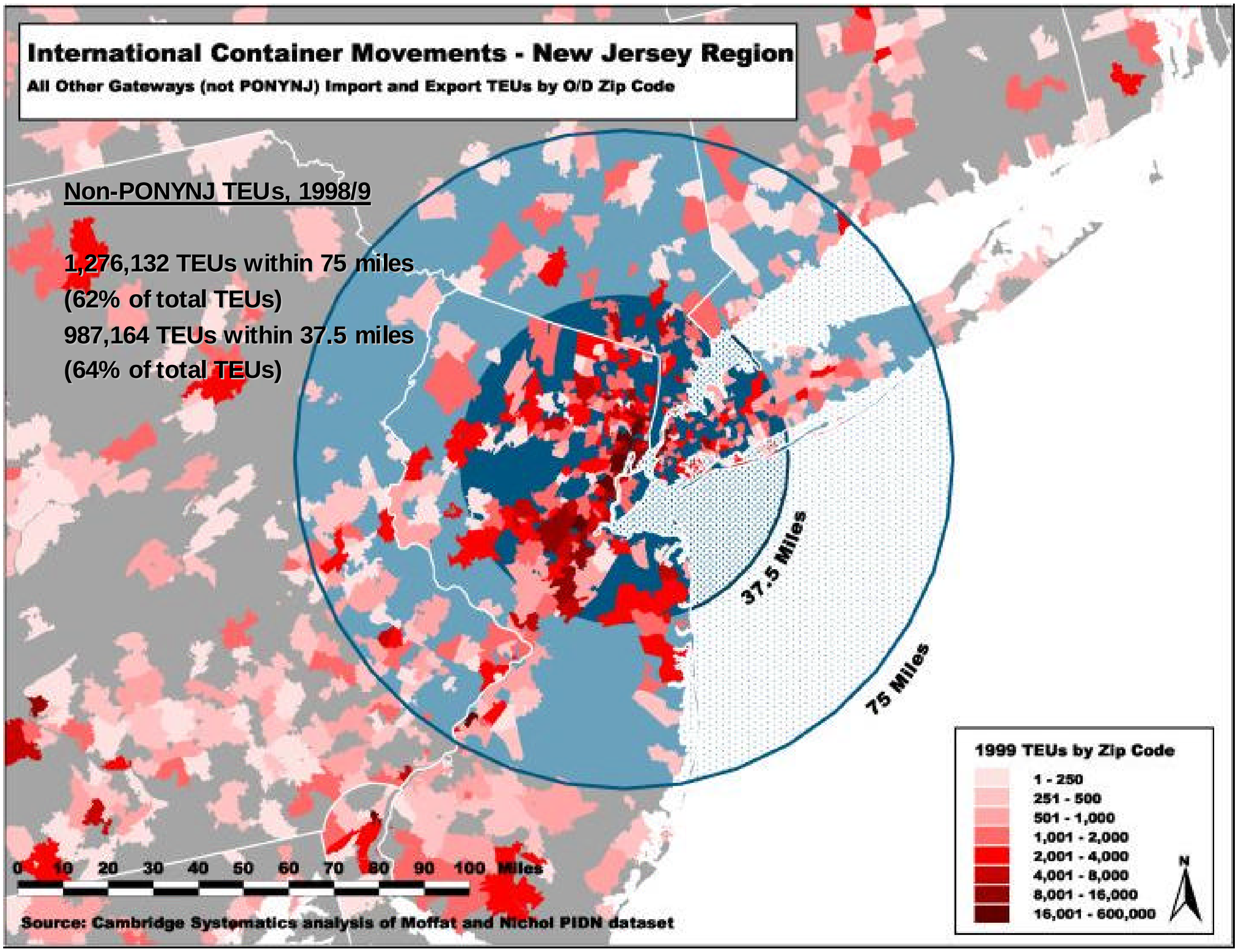
PIDN Trade Cluster	State	1998/9 TEUs
Worcester and Framingham	MA	294,938
Hanover	PA/MD	257,122
Reading and Camden	PA/NJ	286,586
Pittsburg	PA	48,890
Hartford and Springfield	CT/MA	47,914
Rochester	NY	47,394
Albany	NY	24,574
Buffalo	NY	33,012
Syracuse	NY	28,115
Total - Dense Trade Clusters		**1,068,545**

Source: Moffatt and Nichol, Port Inland Distribution Network

VI.2.C EXISTING "LANDBRIDGE" TRAFFIC

Another important finding from the PIDN work was that a large percentage (over 60%) of the international marine containers moving into and out of the North Jersey region do not actually move through the region's marine terminals – they actually come through other U.S. ports. This is depicted in Figure VI.9.

Figure VI.9
DISTRIBUTION OF CONTAINERS TO/FROM NORTH JERSEY VIA NON-PONYNJ PORTS



While some of these non-PONYNJ containers are trucked to and from the region, most can be accounted for as "landbridge" traffic. In a landbridge (or more properly, mini-landbridge) service, containers are imported and exported via west coast ports (principally Los Angeles/Long Beach and Seattle/Tacoma), and moved to/from North Jersey via intermodal rail double-stack trains.

Landbridge traffic is handled primarily at two intermodal railyards: Norfolk Southern's Croxton Yard, and CSX's South Kearny Yard. The two yards are located next to each other, just east of Turnpike Exit 15W. Other NS and CSX yards also handle limited amounts of landbridge traffic, but their volumes are less significant. There is no single dataset for determining the volume of landbridge traffic, but a comparison of different data sources paints a generally consistent picture.

Table VI.6
Estimates of Landbridge Container Traffic

Year	Total Non-PONYNJ International TEUs	Total TEUs at NS Croxton and CSX South Kearny	Total Landbridge TEUs to/from New York and New Jersey
1998/1999	1,276,132 within 75 miles 987,164 within 37.5 miles	Approximately 850,000 *	
2000	Not available		681,000 import only up to 1,362,000 import plus export
Source	PIDN data	NYMTC Regional Freight Facilities Inventory	Draft CPIP

* Includes PACER Stacktrain

VI.2.D EXISTING CROSS-BORDER AND DOMESTIC CONTAINER TRAFFIC

Over-the-wharf and landbridge services were developed to handle international containers, although they also handle some domestic containers as well. A third source of international containers moving into and out of the region is cross-border surface (truck and rail) traffic with Canada and Mexico. Table VI.7 provides a summary of transborder trade by weight, value and leading commodities.

Table VI.7
New Jersey Transborder Surface Trade with Canada and Mexico, Year 2000

	Canada to New Jersey	New Jersey to Canada	Mexico to New Jersey	New Jersey to Mexico
Truck				
Value	$3.7 billion	$3.2 billion	$1.2 billion	$0.7 billion
Tons	2.1 million	not available	0.4 million	not available
Leading Commodities	Paper, Wood, Plastics	Plastics, Nuclear Reactor Parts, Vehicles	Plastics, Iron and Steel, Electrical Machinery	Electrical Machinery, Plastics, Nuclear Reactor Parts
Rail				
Value	$1.0 billion	$0.2 billion	< $0.1 billion	< $0.1 billion
Tons	1.4 million	not available	0.1 million	not available
Leading Commodities	Paper, Wood, Chemicals	Vehicles, Plastics, Chemicals	Iron and Steel, Plastics, Fruits and Vegetables	Plastics, Chemical Products, Vehicles

Source: USDOT Transborder Surface Trade Database

The Transborder Surface Data do not provide tonnages for exports, and they do not distinguish between containerized and non-containerized shipments. Therefore, these data cannot be used to generate estimates of container trips by truck or rail. To estimate the number of containers, another database – know as TRANSEARCH – was used. TRANSEARCH is a commercial database product developed and maintained by the firm Reebie Associates. It provides data on the volume of freight moving between U.S. origins and destinations at the county (and in some cases zip code) level, by commodity type, and by mode. It is based on a combination of public data, proprietary data, and modeled traffic assignments. TRANSEARCH distinguishes between container and non-container moves on the rail system, and can also be used to estimate container versus non-container moves on the highway system by defining different commodity types as “containerizable” (typically moved in containers) and “non-containerizable.”

The TRANSEARCH data cover, in aggregate form, all of the non-waterborne container moves shown in Table VI.8 through Table VI.9. The data include truck and rail traffic associated with over the wharf containers, as well as rail traffic associated with landbridge operations. Also included are:

- Intermodal trains carrying international containers (cross-border) and domestic containers (between U.S. origins and destinations). These trains are handled at a number of regional rail terminals, including the Norfolk Southern E-Rail and CSX North Bergen and Little Ferry yards. NS-Croxton and CSX–South Kearny yards also handle a limited share of this traffic.
- Trucks carrying international containers, either cross-border or to/from other U.S. ports (Miami, Philadelphia, etc.) to and from the region.
- Trucks carrying domestic containers between shippers and receivers, to and from warehouse and distribution facilities, and to and from intermodal railyards. This includes "secondary" or post-warehouse moves of containerized international cargo. When a container arrives at a marine terminal, it generates a truck or rail move to its first point of rest in the U.S. As previously noted, the first point of rest is often a warehouse and distribution facility, where the contents of the container are unpacked, processed or stored, and ultimately redistributed by truck or rail. Redistribution moves tend to be handled in non-containerized "less than truckload" lot sizes; a container may bring a single commodity into a distribution center, but a redistribution truck may carry dozens of different commodities back out again and may go to multiple locations. TRANSEARCH treats the redistribution trip as a completely separate domestic move, which may be container or non-container.

TRANSEARCH data were used primarily to "fill in the gaps" in the study datasets. It was used to perform origin-destination assignments of traffic flows and to estimate link volumes where this information was not available from other sources (such as the PONYNJ terminal estimates, PIDN distributions, and field counts). Movements of non-container trucks – which are also important to the study, since they represent an estimated 80% of truck tonnage on the region's highway network – were estimated primarily from traffic count data rather than TRANSEARCH.

TRANSEARCH reports the following totals for freight moving into, out of, and through the counties of Hudson, Bergen, Essex and Union in year 2001. Tables VI.8 and VI.9 on the following page show these totals in the context of other data to derive estimates of cross-border and domestic moves.

Table VI.8
TRANSEARCH Data on Freight Flows, Hudson/Bergen/Essex/Union, Year 2001

	Loaded Units	Equivalent TEUs
Intermodal Rail, All Types (TRANSEARCH)	**963,320**	**1,637,644**
Trucking, All Types (TRANSEARCH) *	**115,158,611**	**n.a.**
Less than Truckload and Private Truck	59,902,183	n.a.
Truckload		
Non-Containerizable	44,756,750	n.a.
Containerizable (“Dry Van”) Commodities		
Through Traffic	7,608,391	up to 12,934,265
Inbound/Outbound/Local		
Warehouse/Distribution Goods	1,180,169	up to 2,006,287
Intermodal Rail Drayage	966,458	up to 1,642,979
Remainder (other commodities)	744,661	up to 1,265,924

Source: TRANSEARCH Database

* Includes single-unit and combination trucks.

Table VI.9
Combined Data on Freight Flows, Year 2001

	Loaded Units	Equivalent TEUs
Intermodal Rail, All Types (TRANSEARCH)	**963,320**	**1,637,644**
Port-related (ExpressRail volume)	200,854	341,452
Landbridge (estimated from NYMTC data)	500,000	850,000
Cross-Border and Domestic (remainder)	242,466	446,192
Trucking, Containerizable, In/Out/Through (TRANSEARCH)	**2,891,288**	`
Port-related (from PONYNJ trip estimates)	1,744,672	
Warehouse and Shipper/Receiver Intermodal Drayage	116,800	
Landbridge-related (from NYMTC estimates) Intermodal Drayage	500,000	
Cross-Border and Domestic (remainder)	180,158	
Warehouse and Shipper/Receiver Intermodal Rail Drayage	349,658	

Source: Cambridge Systematics analysis of Draft CPIP, NYMTC data, and TRANSEARCH Database

Analyses such as these that combine and compare datasets from different sources must always be interpreted with caution – especially when the datasets themselves are based on significant assumptions -- and do not support strong conclusions. However, this is considered the best available information, and the datasets appear to tell a consistent and plausible story about container freight movement in the North Jersey region. The numbers suggest the following:

- Landbridge accounts for about half of the region's intermodal rail activity, ExpressRail for about one-quarter, and domestic and cross-border traffic for about one-quarter. NYMTC data indicate approximately 225,000 lifts at the region's domestic railyards (E-Rail, North Bergen, Little Ferry) in 1999, which is very close to the 242,000 containers estimated from the TRANSEARCH data.
- Of the total amount of trucks moving into, out of, within and through the study area's core counties, slightly less than half is truckload – the majority is less-than-truckload or private trucking (of undetermined size). This implies a roughly 50%/50% split between large and small trucks on the region's highways.

- Only about 20% of truckload moves are handling "containerizable commodities." Since truckload moves represent half of all truck moves, this means that container moves account for only about 10% of all truck moves. Truckload and container moves tend to be made over longer distances, and represent substantially more than 10% of system wide truck vehicle miles of travel. For many residents, the "trucking problem" occurs on local roadways along which container truck movements are substantially less frequent or non-existent.
- With respect to container trucks, around three-quarters of these moves represent through traffic, which does not have an origin or destination in the four-county core of the study area. This means it is not associated with the Port, or with the region's intermodal rail terminals, or with close-in warehouse and distribution centers. Much of this through traffic is on the Turnpike, I-78 and I-80 -- moving to and from New York City, New York State, and New England -- and is clearly a major contributor to New Jersey's "container truck problem" on these roads.
- The remaining container trucks that have origins or destinations (or both) within the four-county area account for around 2.8 million truckload moves.
- Approximately two-thirds of the 2.8 million truckload moves appear to be accounted for by the PONYNJ, which generates an estimated 1,744,672 truckload moves and 116,800 rail dray moves. The remaining one-third is a combination of landbridge and domestic intermodal rail drayage and trucking, with intermodal drayage comprising the largest share. While the PONYNJ is the biggest single contributor to local origin-destination container truck moves, through trucking accounts for more than four times as many container truck moves as the PONYNJ.

It should be noted that the study highway model was based on actual field counts and facility-specific traffic estimates wherever possible. Where these differed from TRANSEARCH origin-destination volume flows, the counts and facility estimates were allowed to govern. However, the TRANSEARCH origin-destination volume flows are enormously useful in giving a sense of the "big picture" of regional container movements. Figures VI.10 through VI.15 on the following pages provide a geographic context for some of the most important container flows.

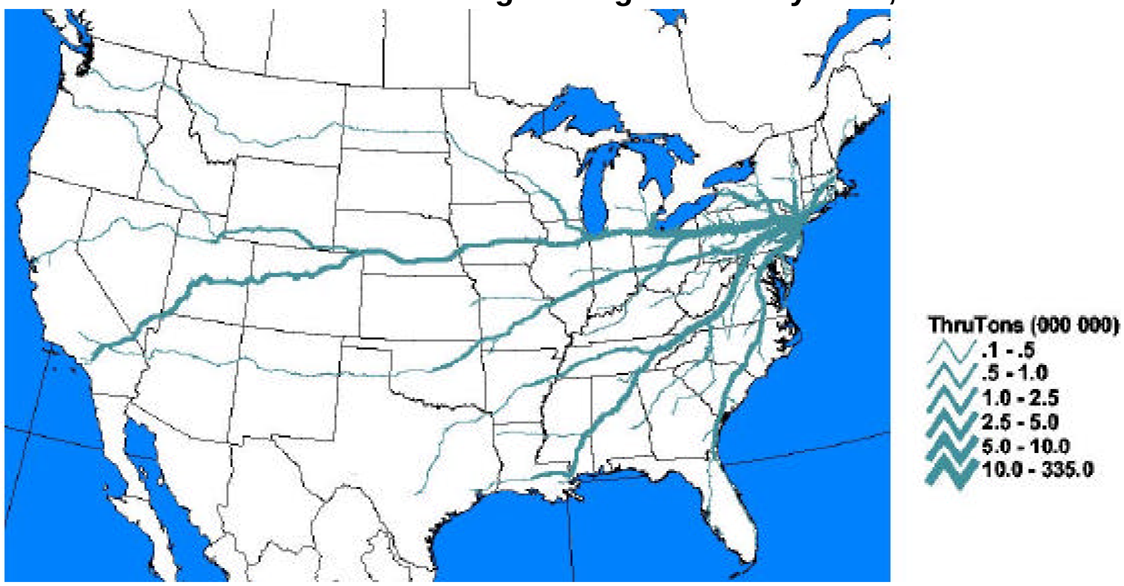
Figure VI.10
Intermodal Rail Traffic to/from the Study Area, 2001

Source: TRANSEARCH Database

Figure VI.11
Container Truck Traffic to/from/within the Study Area, 2001

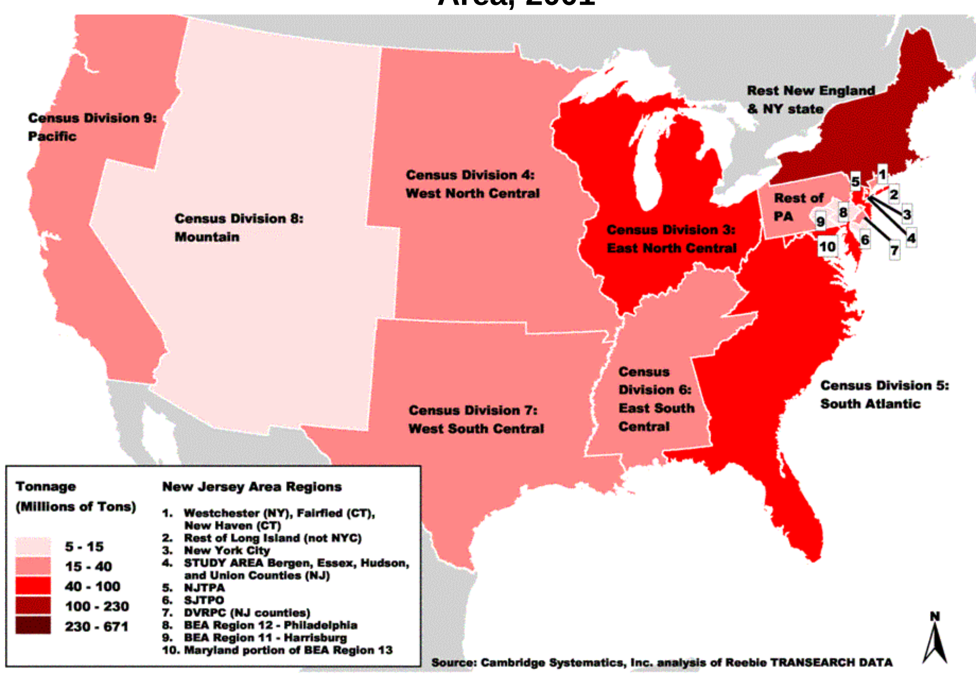
Source: TRANSEARCH Database

Figure VI.12
Container Truck Traffic Moving Through the Study Area, 2001



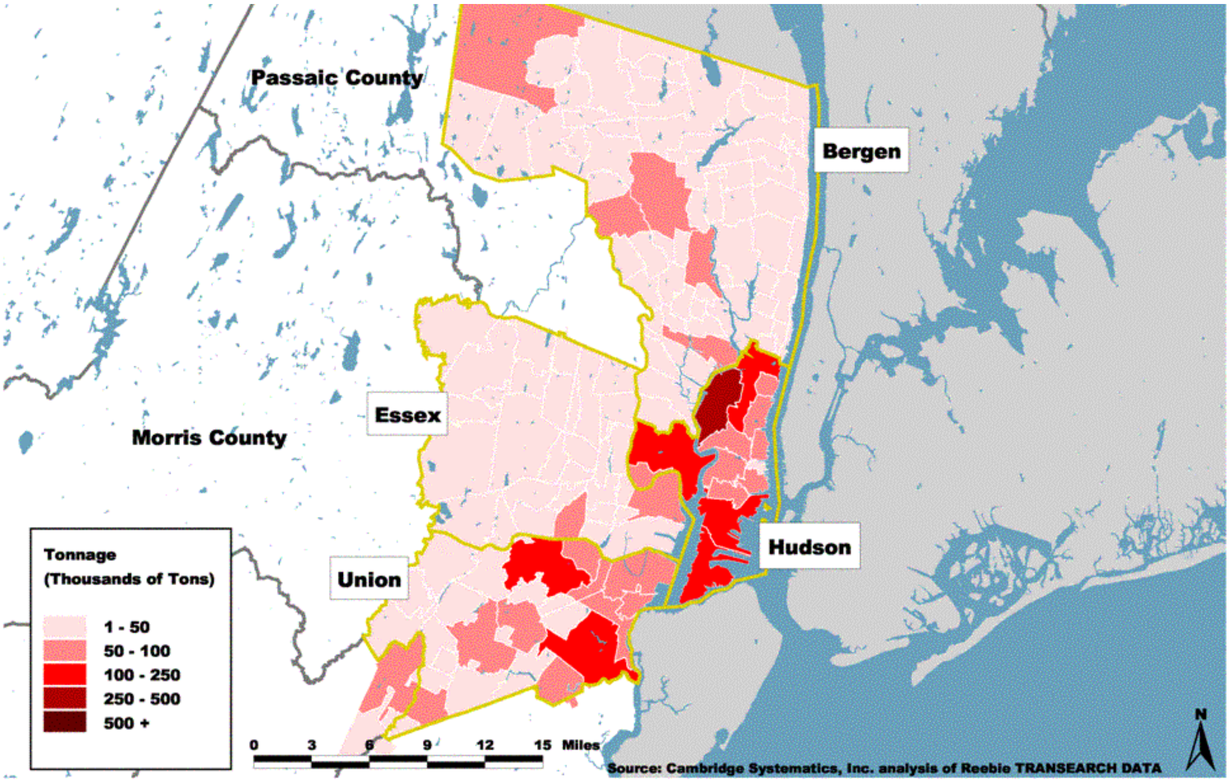
Source: TRANSEARCH Database

Figure VI.13
Origins/Destinations for Container Trucks Moving to and From the Study Area, 2001



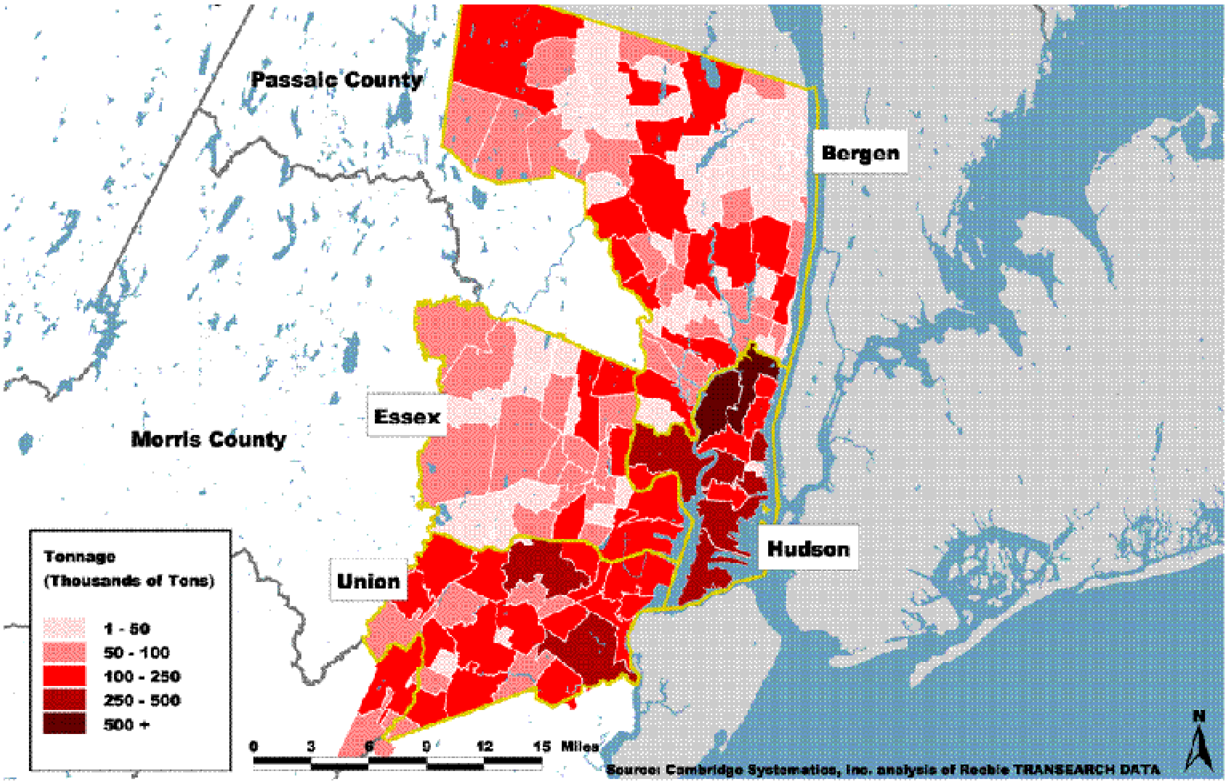
Source: TRANSEARCH Database

Figure VI.14
Origins/Destinations for Container Trucks, Warehouse and Distribution, 2001



Source: TRANSEARCH Database

Figure VI.15
Origins/Destinations for All Trucks, Warehouse and Distribution, 2001



Source: TRANSEARCH Database

VI.2.E EXISTING "NON-FREIGHT" CONTAINER TRAFFIC

An important part of container freight logistics involves the repositioning of truck cabs and chassis, and the repositioning and exchange of empty containers between shippers, receivers, marine terminals, intermodal railyards, maintenance and repair facilities, and storage depots. These trips are different from an empty backhaul, where a container is returned to its point of origin.

There are dozens of facilities in North Jersey that provide container services (see Table VI.10), and the truck movement patterns associated with these facilities – number of trips, origin-destination patterns, and time-of-day tendencies -- are not well-understood. These movements are not part of any national freight database, and can only be determined by facility-specific studies and field counts.

This study accounts for non-freight truck moves by introducing an inflation factor, where each identifiable container move generates a corresponding non-freight move. The non-freight truck moves are assigned based on observed link traffic volumes and regional container origin-destination patterns, which yields reasonable results within the context of the study model. Greater accuracy could be obtained by more detailed study of these movements, which was beyond the scope of this study.

Table VI.10
Container Leasing, Rental, and Storage Businesses in Northern New Jersey

CONTAINERIZED TRANSPORT & STORAGE	25 RTE. 22 EAST SPRINGFIELD, NJ 07081-1725
PORTABLE COLD STORAGE, INC.	860 U.S. RTE. 1 EDISON, NJ 08817
ROGERS RENTALS	139 RTE. 46 HACKETTSTOWN, NJ 07840-0388
SEA BOX, INC.	76 CENTRAL AVENUE SOUTH KEARNY, NJ 07032-4603
CAMBRIDGE INTERMODAL TRANSPORTATION	1250 W. ELIZABETH AVENUE, P.O. BOX 4220 LINDEN, NJ 07036
CAPITAL TRUCKING CO	316 COLFAX AV. CLIFTON, NJ 07013
AMSTAR TRUCKING CO.	550 DUNCAN AVENUE JERSEY CITY, NJ 07306
KESSLER TRUCKING CO.	52 BERKSHIRE AVENUE PATERSON, NJ 07502
MAIN TRUCKING & RIGGING CO., INC	WALLACE ST. ELMWOOD PARK, NJ 07407
ABC CRATING & RIGGING CO	121 ERIE ST., P.O. BOX 506 PATERSON, NJ 07544-0506
AIM CARIBBEAN EXPRESS, INC.	330 MANHATTAN AVENUE JERSEY CITY, NJ 07307
MCCARTHY, DAVID P., INC	HACKENSACK AVENUE, BUILDING 104 SOUTH KEARNY, NJ 07032
REFRIGERATION CONTAINER SERVICE, INC	635 DELANCY ST. ELIZABETH, NJ 07105

Table VI.10 (continued)
Container Leasing, Rental, and Storage Businesses in Northern New Jersey

SEA AIR CARGO FORWARDERS OF NEW JERSEY, INC.	500 LAWLINS PARK S., P.O. BOX 371 WYCKOFF, NJ 07481
CRATING & CONTAINER INTL	1200 FULLER RD LINDEN, NJ 07036-5774
TABY AMERICA INC	1150 RARITAN RD. CRANFORD, NJ 07016-3369
COMTROL INTERNATIONAL LTD	35 WALNUT AVE CLARK, NJ 07066-1600
CRUISE INTERMODAL	398 ADAMS ST NEWARK, NJ 07114-2802
IRONBOUND INTERMODAL IND	65 JABEZ ST NEWARK, NJ 07105-3047
MARITIME CONTAINERS EXCHANGE	20 TROY RD WHIPPANY, NJ 07981-1623
REFRIGERATED CONTAINER NJ INC	635 DELANCEY ST NEWARK, NJ 07105-3811
UNICON INTERNATIONAL INC	1201 CORBIN ST ELIZABETH, NJ 07201-2952
INTERPORT MAINTENANCE CO., INC.	635 DELANCY STREET NEWARK, NEW JERSEY 07105

SOURCE: Logistics-Source.com, Questdex White Pages, Verizon Superpages, Company websites

VI.3 EXISTING CONTAINER MOVEMENT CORRIDORS

VI.3.A DEFINITION OF CORRIDORS

Within the Portway Extensions study area, the container flow corridors closely follow the primary, non-parkway traffic corridors. Principal routes utilized for truck container movements were found to include:

- the New Jersey Turnpike;
- the US Route 1/9 corridor;
- Interstate Routes 78, 80, 278 and 287;
- the West Shore Expressway in Staten Island;
- New Jersey Routes 3, 4, 17, 24, and 440;
- and US Route 22.

A further, key element of the container corridors is the access between the port and rail facilities and the regional highways. Designated connector roadways as well as local streets share the latter role.

VI.3.B QUANTIFICATION OF CONTAINER FLOW VOLUMES

The heaviest container traffic can be found on the highways listed in the previous section. The calibrated Portway Extensions Model shows existing container flows exceeding 350 trips (both directions combined) on the New Jersey Turnpike between Interchanges 13 and 10 during the morning peak hour. As expected, during the PM peak hour the container volumes on the above turnpike link are slightly less, with two-way container truck volumes of approximately 250 per hour. Since the existing AM trip table volumes for containers (trip purpose 2) exceed the PM volumes by about 30 percent, the following locations discussed will refer to AM container volumes. Also, it should be noted that the container volumes are highest near the port facilities and rail yards and diminish with outbound distance.

The I-78 corridor carries approximately 140 AM containers of which about 40 divert to NJ Route 24. The NJ Route 17 container volumes approach 100 as do I-78 volumes west of Springfield. US Route 1 south of New Brunswick also carries AM container volumes exceeding 100.

VI.3.C OTHER FLOWS ON CONTAINER MOVEMENT CORRIDORS

The container traffic must share the roadways with other traffic. As a matter of fact, the container volumes are a very small part of the total traffic volume. The existing AM peak hour model trip table contains 1,404 container trips out of total of 2,790,704 total trips or about 5 hundredth of one percent. The PM peak hour trip table has fewer container and more total traffic resulting in an even lesser proportion of container trips.

However, on the corridors described above, the proportion of container traffic is higher. On the New Jersey Turnpike south of Interchange 13 the existing total AM model volumes is 17,772 of which 360 are containers or a proportion of 2 percent. On the paralleling US Route 1 / 9 corridor there are 98 containers out of a total of 6,292 vehicles or 1.6 percent. Further south on US Route 1 there are 107 containers out of 8,325 total vehicles (1.3 percent). On Interstate Route 78 between Elizabeth and Springfield there are 143 container trips out of 15,612 total trips; on I-78 west of Springfield there are 99 container trips out a total of 8,679 trips; and close by on Route 24 Expressway, there are 46 container trips out of a total of 9,746 total trips. On NJ Route 17 in Paramus there are 97 container trips out 7,029 or 1.4 percent.

While the proportion of peak hour container flows vary from corridor to corridor and location to location, they are generally in the 1 to 1.5 percent range.

VI.3.D SYSTEM-WIDE TRAVEL CHARACTERISTICS AND PERFORMANCE MEASURES

A regional transportation planning network model is evaluated in terms of the number of vehicle miles and vehicle hours of travel and how these statistics can be improved with recommended system enhancements. The objective is to reduce both, however, it is generally acceptable to reduce the vehicle hours of travel at the expense of slight increase in vehicle miles. The existing AM peak hour vehicle miles for the Portway Model is 24,937,786 of which 66,022 are attributable to container trips. During the PM peak hour the respective statistics are 26,432,914 and 51,221.

The total vehicle hours of travel during the AM peak hour are 960,548 (1,716 for containers) and during the PM peak hour are 994,353 (1,312 for containers). The above statistics result in an average system travel speed of 26.0 mph during the morning and 26.6 mph during the evening peak hour.

Volume to Capacity Ratios

As the name implies, the volumes to capacity ratio (v/c) is an indication of how much of the roadways ability to carry traffic is being used. A v/c of 1.0 means, theoretically, that the roadway capacity is used up and additional vehicles cannot be accommodated. In actuality, capacity is dependent on numerous parameters and has some flexibility where v/c ratios in excess of 1.0 have been observed in field. However, when the demand volumes exceed capacity, for any length of time, queues are likely to form until the volumes drop below capacity.

Figures VI.16 and VI.17 depict the volume of container trucks on the roadway network during the a.m. and p.m. peak hours. Figures VI.18 and VI.19 depict the roadways which carry five (5) or more container trucks per hour, and experience a peak hour volume to capacity ratio in excess of 1.25. As shown on Figures VI.18 and VI.19, there are very few location in the study area where the capacity is exceeded and there are significant container flows.

Figure VI-16


PORTWAY EXTENSIONS
AM PEAK HOUR CONTAINER TRAFFIC - EXISTING CONDITIONS
Container Traffic >= 10
J:\2003 Projects\030011.078\Documents\Model\6_20_2003\2003Existing\AM\6_05_03\PORTAM00.LOD
cube
Licensed to Edwards & Kelcey, Inc.

Figure VI.17


PORTWAY EXTENSIONS
PM PEAK HOUR CONTAINER TRAFFIC - EXISTING CONDITIONS
Container Traffic >= 10
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cube
Licensed to Edwards & Kelcey, Inc.

Figure VI.18

PORTWAY EXTENSIONS

AM PEAK HOUR CONTAINER TRAFFIC AND VC RATIO - EXISTING CONDITIONS

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Figure VI.19

PORTWAY EXTENSIONS
PM PEAK HOUR CONTAINER TRAFFIC AND VC RATIO - EXISTING CONDITIONS

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