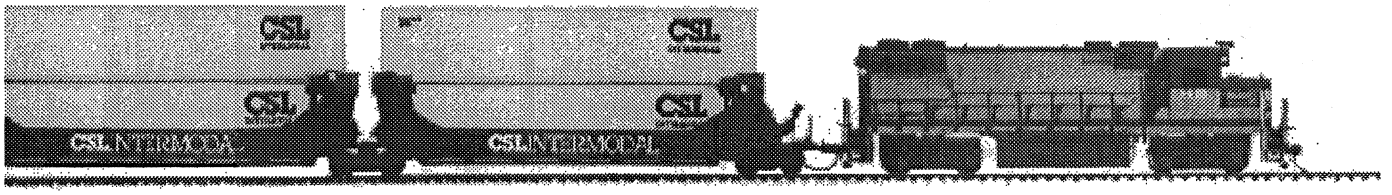
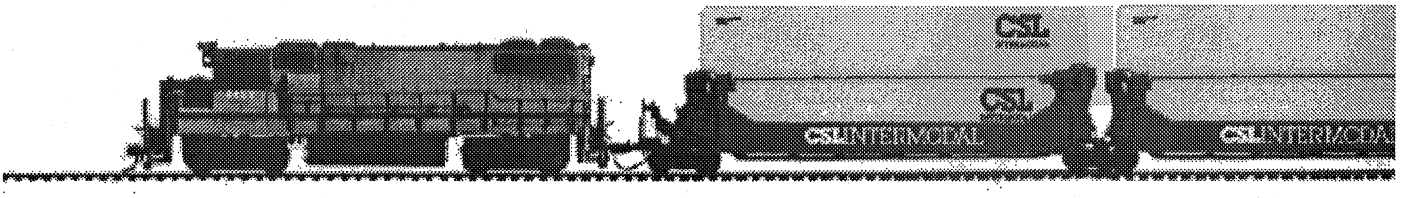


DRAYAGE COSTS
IN THE
PORTS OF THE DELAWARE RIVER



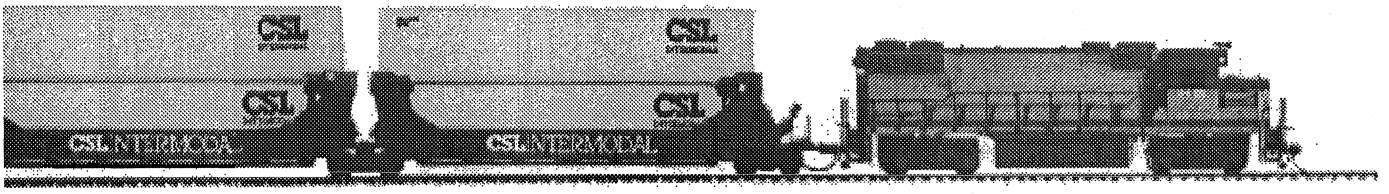
Prepared for the

Delaware River Port Authority

by the

Delaware Valley Regional Planning Commission

March 1991



AN ANALYSIS

OF DRAYAGE COSTS

IN THE

PORTS OF THE DELAWARE RIVER

Prepared by:

Delaware Valley Regional Planning Commission

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Philadelphia, Pennsylvania 19106

March 1991

This report, prepared by the Delaware Valley Regional Planning Commission, was financed by the Delaware River Port Authority. The authors, however, are solely responsible for the findings and conclusions, which may not represent the official views or policies of the funding agencies.

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency which provides continuing, comprehensive and coordinated planning for the orderly growth and development of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties as well as the City of Philadelphia in Pennsylvania and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. The Commission is an advisory agency which divides its planning and service functions between the Office of the Executive Director, the Office of Public Affairs, and three line Divisions: Transportation Planning, Regional Information Services Center, which includes Strategic Planning, and Finance and Administration. DVRPC's mission for the 1990s is to emphasize technical assistance and services and to conduct high priority studies for member state and local governments, while determining and meeting the needs of the private sector.

The DVRPC logo is adapted from the official seal of the Commission and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River flowing through it. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey. The logo combines these elements to depict the areas served by DVRPC.

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Publication Abstract

TITLE	Date Published: March, 1991
An Analysis of Drayage Costs In The Ports of the Delaware River	Publication No. 91013

Geographic Area Covered:

Port facilities along the Delaware River, including Bucks, Philadelphia and Delaware counties in Pennsylvania, Burlington, Camden and Gloucester counties in New Jersey, and Wilmington, Delaware.

Key Words:

Drayage, trucking, intermodalism, PDR (Ports of the Delaware River), RITF (Regional Intermodal Transfer Facility), DRPA (Delaware River Port Authority), containers, trailers, equalization, Conrail, CSX, Canadian Pacific Rail.

ABSTRACT

Port facilities and the regional rail network within the Ports of the Delaware River are identified and described. The Delaware River Port Authority's proposal to construct a Regional Intermodal Transfer Facility (RITF) in Philadelphia would provide centralized access for the three railroad lines which service the Port, but would create inequalities in drayage rates paid to transport shipping containers or trailers between marine terminals and rail facilities. Truckers and other port-related interests were surveyed and interviewed to determine drayage operations and cost structures. Alternatives to equalize drayage costs within the Ports of the Delaware River in association with the proposed RITF are presented.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

STUDY GOALS

The Delaware River Port Authority's (DRPA) proposal to construct a Regional Intermodal Transfer Facility (RITF) would consolidate, at one location, the operation of transferring containerized cargo to and from the rail carriers and the various marine terminals within the Ports of the Delaware River. The challenge in developing the RITF is to insure that all rail lines, marine operators and shippers who use the port have equal access to the facility. While the location selected for the RITF will provide access for the three rail lines which now service the Port, the *drayage* costs involved in transporting containers and trailers from the various marine terminals to the facility will vary significantly. Drayage costs within the Ports of the Delaware River are now much higher than at competing North Atlantic ports. In order to better understand existing drayage operations within the Port and predict how drayage costs and movements will affect the proposed RITF, the DRPA has contracted with the Delaware Valley Regional Planning Commission to undertake this study. The report presents alternative means to equalize the drayage cost among the individual shippers and terminal facilities which would use the RITF.

PORT FACILITIES AND DRAYAGE OPERATIONS

The Ports of the Delaware River include facilities in three states and are collectively, one of the major port centers in the country. Of the 11 major marine terminals in the Port, eight now handle containerized cargo and represent potential users of the RITF. Three major rail lines - Conrail, CSX, and Canadian Pacific Rail - now serve the Port, which connect the Delaware River Ports to almost every major market in North America. Two of these rail lines - Conrail and CSX - now operate intermodal yards within the Port region. The challenge for DRPA will be to attract these railroads to use the RITF by providing a more modern and efficient facility.

Over the past decade, intermodal transportation has emerged as the "second revolution" in shipping, particularly for double-stack rail cars which give a better ride than other rail container cars and can reduce costs by up to 40 percent. New York, Baltimore and Norfolk have already invested in intermodal terminals and double-stack clearance. The Delaware River Ports must now do the same.

The market studies for an intermodal facility in the Port indicate a strong potential demand, although the range of that demand varies from 606 loaded units per week to over 3000 loaded units per week (1987 base year) depending on the assumptions used in the analysis. The RITF should therefore proceed in a phased approach, starting small but prepared to grow as demand warrants.

The analysis of current drayage operations to the existing intermodal facilities in the Port indicate that drayage costs are determined based on time, rather than mileage charges. The greatest cost variations were between container-on-flat-car (COFC) and trailer-on-flat-car (TOFC) and to a lesser extent between Conrail and CSX. The average difference in drayage costs between New Jersey and Philadelphia facilities is negligible. The primary factor in reducing drayage costs in the Ports of the Delaware River is to reduce the turnaround time at the marine terminal and intermodal facilities.

DRAYAGE EQUALIZATION ALTERNATIVES

Current drayage charges within the Port range from $150 - $200 for TOFC loads and $200 - $250 for COFC loads. If the RITF is constructed and operated as proposed, the market drayage costs within the Port may be expected to drop to approximately half, or $75 for TOFC and $100 for COFC loads, based on the volume of traffic projected and the improved circulation and handling systems. If DRPA is seeking to equalize drayage costs throughout the Port, however, it must reduce drayage costs from all other marine terminals to the expected cost at Packer Avenue, or approximately $25 per container. Five alternative approaches to achieve this equalization are presented, which could be undertaken singly or in combination:

1. DRPA Contract with Trucking Company: DRPA would contract directly with trucking companies for all drayage services in the Port, and pay these companies the difference between the base cost (i.e. $25) and market costs.

2. DRPA Subsidy to Shippers: Market forces would control drayage costs, but DRPA would provide a subsidy payment to shippers or shipping lines, either as a flat fee or as the difference between base and market costs.

3. DRPA Regulates Drayage Rates: All truckers would be eligible for drayage work, but must comply with published rates. DRPA would pay truckers the difference between regulated rates and a defined market rate.

4. Long-distance subsidy only: A subsidy could be available for shippers only for an intermodal movement over a certain minimum distance, to avoid competition with trucks.

5. Cross-Subsidy Program: Place a surcharge on intermodal movements via Packer Avenue, and use this revenue to subsidize drayage movements from other marine terminals.

I. PURPOSE OF STUDY

INTRODUCTION

The Delaware River Port Authority (DRPA), in legislation signed by Pennsylvania Governor Casey on June 11, 1990, has proposed a number of significant improvements to the Ports of the Delaware River which, when completed, will improve the competitive position of the Port relative to other North Atlantic ports and serve as an important catalyst to the region's economic growth. The DRPA was established in 1951 under Compact between the Commonwealth of Pennsylvania and the State of New Jersey with the charge and responsibility to direct the improvement and development of the Port District for port purposes. Since its inception, the Authority has invested an average of over $25 million per year in transportation facilities and has completed and placed in operation projects at a cost of over $700 million. The DRPA operates four major bridges linking Pennsylvania and New Jersey, as well as one of the nation's most sophisticated rail systems, linking Philadelphia and Southern New Jersey. In addition, the DRPA has expended more than $50 million in port marketing and promotion both locally and throughout the world.

In November, 1988, the Governors of Pennsylvania and New Jersey called upon the Delaware River Port Authority to institute and carry out a program of projects to improve port facilities for the enhancement of commerce and the economic development of the Port District. A number of market, design, engineering and financial feasibility studies have been undertaken which resulted in the DRPA proposal for nearly $200 million of new port development projects. This is the proposal approved by the Pennsylvania legislature and signed by the Governor in June 1990.

REGIONAL INTERMODAL TRANSFER FACILITY PROPOSAL

A significant element of this package is the proposal to construct a Regional Intermodal Transfer Facility (RITF), which would consolidate, at one location, the operation of transferring containerized cargo to and from the rail carriers and the various marine terminals within the Port. Intermodalism - the movement of cargo by more than one mode of transportation such as ship and rail - is an important trend in the freight transportation industry. Convenient and efficient intermodal connections can decrease a shipper's time of delivery and overall costs and thus make

a port more attractive. Other East Coast ports have recognized this trend towards intermodalism and have responded by providing new or expanded intermodal port facility projects. **In order for the Ports of the Delaware River to retain its existing cargo and remain competitive with other North Atlantic ports for cargo, the development of a consolidated intermodal facility with easy access to and from rail lines in the Port is recommended.**

OBJECTIVES OF THE REGIONAL INTERMODAL TRANSFER FACILITY

The DRPA proposal for the Regional Intermodal Transfer Facility recognizes the following goals:

- Allow efficient transfer of containerized cargo to and from rail carriers in order to lower costs of these operations.

- Create the opportunity to increase rail-carried cargo volume to those levels which would encourage rail carriers to offer full, express train service to inland points served by the Ports of the Delaware River (PDR).

- Provide the capability of handling added volumes that will be required with the conversion of current break-bulk cargo to containerization and container cargo increases realized from an improved marketing position.

- Provide the PDR with the type of modern transfer facility that will provide double-stack capacity and match similar facilities at competing ports.

ISSUES FOR REGIONAL INTERMODAL TRANSFER FACILITY

In creating a centralized intermodal facility, the DRPA faces the challenge of providing equal access to and full utilization of the facility by all the rail lines that now service the Port. In addition, the facility must be operated in such a way that all terminal operators and all shippers who use the Port are encouraged to use the intermodal facility and that no operator within the Port District is disadvantaged or given an unfair advantage by virtue of the location, design or operation of the RITF. The Delaware River Port Authority's intent in creating the RITF is to establish a truly regional facility, which provides equal access and use by all marine operators within the Port.

The primary determinant in locating the RITF was to choose a location which is convenient to the container shipping traffic in the Port but is also accessible by all the rail lines which serve the Port, criteria met by the Greenwich Yard site near Packer Avenue in South Philadelphia. However, in selecting this location the RITF

will be closer to certain container shipping facilities and farther away from others. Container terminals within the Ports of the Delaware River are distributed over 35 miles along the river, from the Port of Wilmington to the south to Northern Shipping Terminal to the north. Those facilities which are farther from the RITF will thus have to transport containers a longer distance to the RITF than those located in close proximity to the RITF. A longer transfer distance translates directly into a greater expense, and therefore disadvantages those facilities located farther from the RITF.

DRAYAGE IN THE PORTS OF THE DELAWARE RIVER

The transfer of a shipping container from the terminal where it is unloaded from a ship to a rail yard where it may be placed on a rail car for inland transport is generally accomplished by truck and is referred to as *drayage.* Drayage serves the critical link in intermodal freight movement, by connecting shipping facilities with rail facilities. Drayage connections to or from a rail facility are either arranged for by the shipping facility as part of a comprehensive transportation package or are contracted for separately by a shipping line or a shipper's agent. In either case, drayage costs add, sometimes significantly, to the overall cost of delivering a container to its ultimate destination. Excessive drayage costs may lead a shipper to choose one port over another, threatening to reduce overall traffic at the Ports of the Delaware River, or may cause a shipper to avoid an intermodal connection to a rail car threatening the use and success of the RITF.

A recent economic analysis of the Ports of the Delaware River compared the average costs incurred in landing a vessel and unloading and transferring containers to a rail ramp for an intermodal connection at four North Atlantic ports. The study found that **Philadelphia area ports are competitive with New York, Baltimore and Norfolk at dockage, wharfage and stevedoring/terminal costs, but are significantly higher than these competing ports in drayage costs to or from a rail ramp.** The drayage element brings the PDR per container cost higher than these other ports.

STUDY GOALS

If the RITF is to be successful, it must provide a beneficial service to all container facilities within the Port. DRPA is seeking to provide equal access and equal cost for all area shippers to use the RITF, by exploring means to equalize the drayage cost among the various terminal facilities which would use the RITF. **In order to better understand existing drayage operations within the Port and predict how drayage costs and movements will affect the proposed RITF, the Delaware River Port Authority has contracted with the Delaware Valley Regional Planning Commission (DVRPC) to undertake this study.** The Resolution of the Board of Commissioners of the Delaware River Port Authority which authorized this study on September 19,

1990 recognizes that DVRPC is ideally suited to perform this analysis and confirms the study goals.

STUDY SCOPE OF WORK

The scope of this study will examine in detail the existing drayage operations within the Ports of the Delaware River, present the proposal for the new Regional Intermodal Transfer Facility and explore alternative means to increase the attractiveness and likelihood of success of the facility by equalizing drayage costs throughout the Port.

This chapter has provided background on the goals and intent of the study. Chapter II will provide an introduction to conditions in the Port, including existing facilities, cargos, railroads, and operating agencies. Chapter III will present the background on intermodal trends, including the conditions and needs at the Ports of the Delaware River, the proposal for the RITF and the critical issues surrounding the proposal. In Chapter IV, existing drayage operations within the Port are described based on a survey of regional trucking firms and interviews with drayage operators. Significant factors which influence drayage costs are also provided. Chapter V is a summary of the interviews which DVRPC conducted with a variety of individuals representing organizations involved in the Ports of the Delaware River, including port authorities, terminal operators, trucking and transportation services, railroads and maritime organizations. These interviews explored existing problems in the Port and potential opportunities for the future including the need for the Regional Intermodal Transfer Facility and other issues related to the size, location or operation of the facility. Finally, Chapter VI will present the conclusions and recommendations of the study, including:

- The recommended size, location and operation of the RITF;
- Access routes to and from the RITF;
- Changes to drayage operations to reduce overall costs in the Port;
- Cost equations to equalize drayage to the RITF;
- Alternatives to equalize drayage costs to the RITF. The relative advantages and disadvantages of each alternative are analyzed.

RESOLUTION
of the
Board of Commissioners
Delaware River Port Authority
September 19, 1990

WHEREAS: The Regional Intermodal Transfer Facility (RITF) is critical to the future competitiveness of the Ports of the Delaware River and,

WHEREAS: Equalization of the drayage cost among shippers is a key component to making the RITF a truly regional facility, serving the entire Port Community, and

WHEREAS: The Delaware Valley Regional Planning Commission (DVRPC) is ideally suited to perform this analysis and determine the most cost effective method to move the cargo from the various Terminal Facilities to the RITF, now therefore

BE IT RESOLVED: That the Board of Commissioners authorize the proper Officers to enter into a contract with the DVRPC, to complete an Analysis of Drayage Costs in the Ports of the Delaware River at a cost not to exceed $58,300.00 and said study to be completed within a five month period from the authorization to proceed.

II. PORTS OF THE DELAWARE RIVER

INTRODUCTION

The Ports of the Delaware River (PDR) are not just a single facility handling one type of cargo and operated by one authority, but are a conglomeration of facilities spread over three states handling almost all possible types of cargo, now operated by several different authorities. Strategically located in the center of the densely-populated Northeast corridor, the Delaware River Ports are halfway between New York and Baltimore and are served by one of the most efficient rail and highway transportation systems in the nation. Within a radius of 800 miles - generally one day delivery time - live nearly 70 million people, including the cities of Chicago, Detroit, Atlanta, Toronto, Montreal, Boston, New York and Washington, DC. Within a two-day delivery time lives almost half of the population of the United States.

The Delaware River Ports include facilities in Pennsylvania, New Jersey and Delaware. The Delaware River has always been a center of shipping and commerce: during colonial times, Philadelphia was the most important port and the largest manufacturing center in the colonies. Today, the Ports of the Delaware River include facilities in three states and remain as one of the major port centers in the country, ranking first among the United States North Atlantic Ports in total international waterborne commerce for the past four years (see Table I and Figure I).

The Delaware River Ports are in a position to capture an even larger share of the North Atlantic port market. Although the North Atlantic general cargo market lagged in the 1970's and appeared to be a declining market, the North Atlantic ports have stabilized since 1980 and have grown during the decade of the 1980's. North Atlantic ports as a whole handle about 20 percent of the total United States oceanborne foreign trade.

The importance of the Ports of the Delaware River to the regional economy of the Delaware Valley as a whole are reflected by the contribution that the port facilities make towards jobs, wages and taxes. In 1989, the Delaware River Port Authority reported that Delaware River port facilities and associated businesses provided for 53,500 jobs, paid almost $1.4 billion in wages and paid nearly $150 million in taxes.

TABLE I

Total International Waterborne Commerce
North Atlantic Ports
(Tons, 000)

Port	1990*	1989	1988	1987
Delaware River	**79,446**	**71,759**	**71,840**	**68,477**
New York	50,796	61,872	64,047	59,710
Norfolk	68,666	64,547	58,300	49,492
Baltimore	28,152	30,988	28,847	24,753

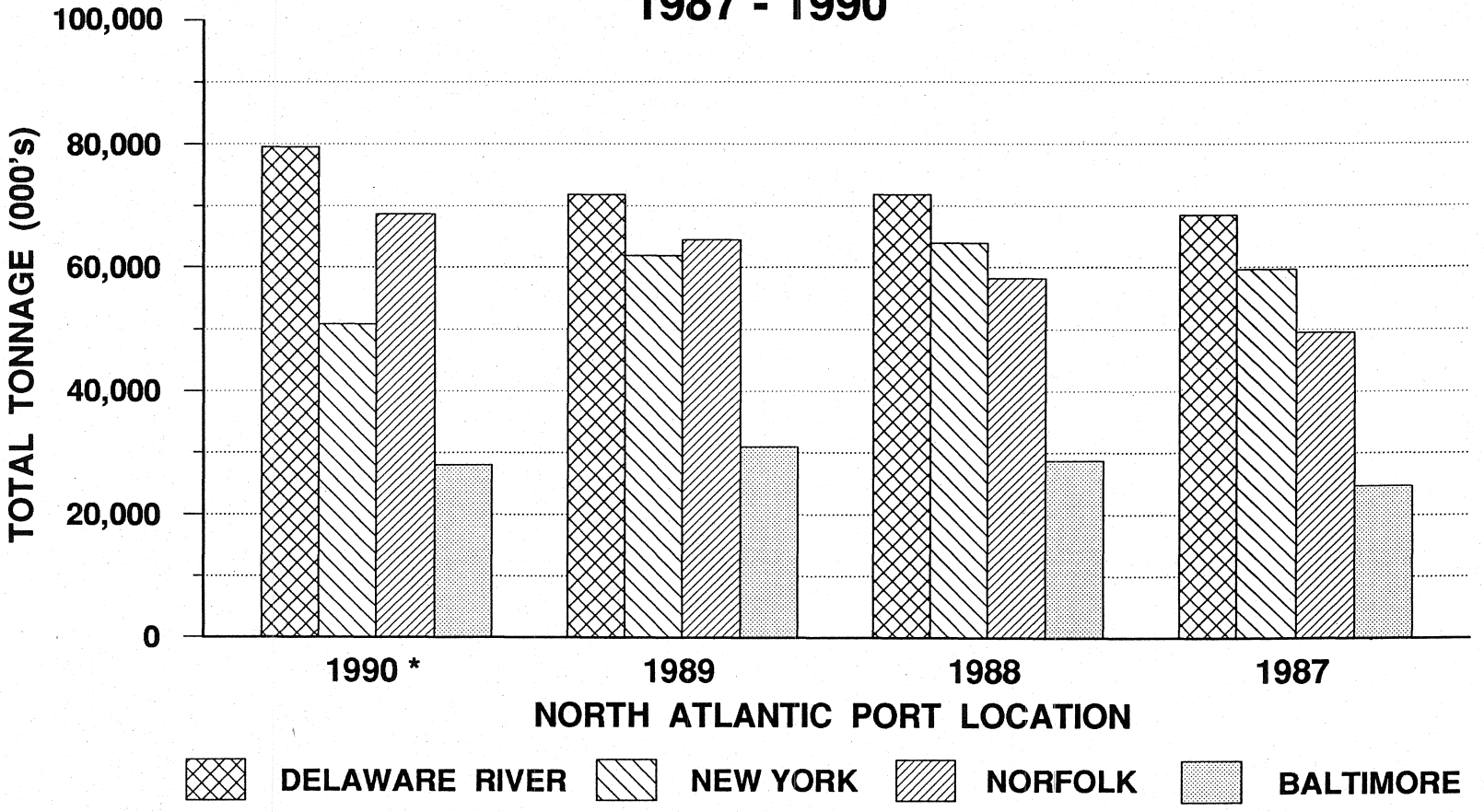
*Projections for the year based on data for first 6 months

Source: Delaware River Port Authority
U. S. Department of Commerce, Bureau of the Census,
Trade Information Planning System

Delaware Valley Regional Planning Commission, January 1991

FIGURE I

TOTAL INTERNATIONAL WATERBORNE COMMERCE
NORTH ATLANTIC PORTS
1987 - 1990



*Projected for year based on first 6 months data

Source: Delaware River Port Authority
January 1991

Delaware Valley Regional Planning Commission

PORT FACILITIES

Each year, over 3,000 ships from around the world visit the Ports of the Delaware River. Centered almost 100 miles from the Atlantic Ocean entrance to the Delaware Bay at Cape May, New Jersey and Cape Henlopen, Delaware, the Ports are served by a 40-foot deep channel and are the largest freshwater port complex in the world (see Figure II). Although located farther inland from the ocean shipping channels than other port facilities such as the Port of New York and New Jersey, the Delaware River Ports are advantaged by a wide variety of shipping terminal facilities and access to a system of rail and highway networks that serve the entire nation.

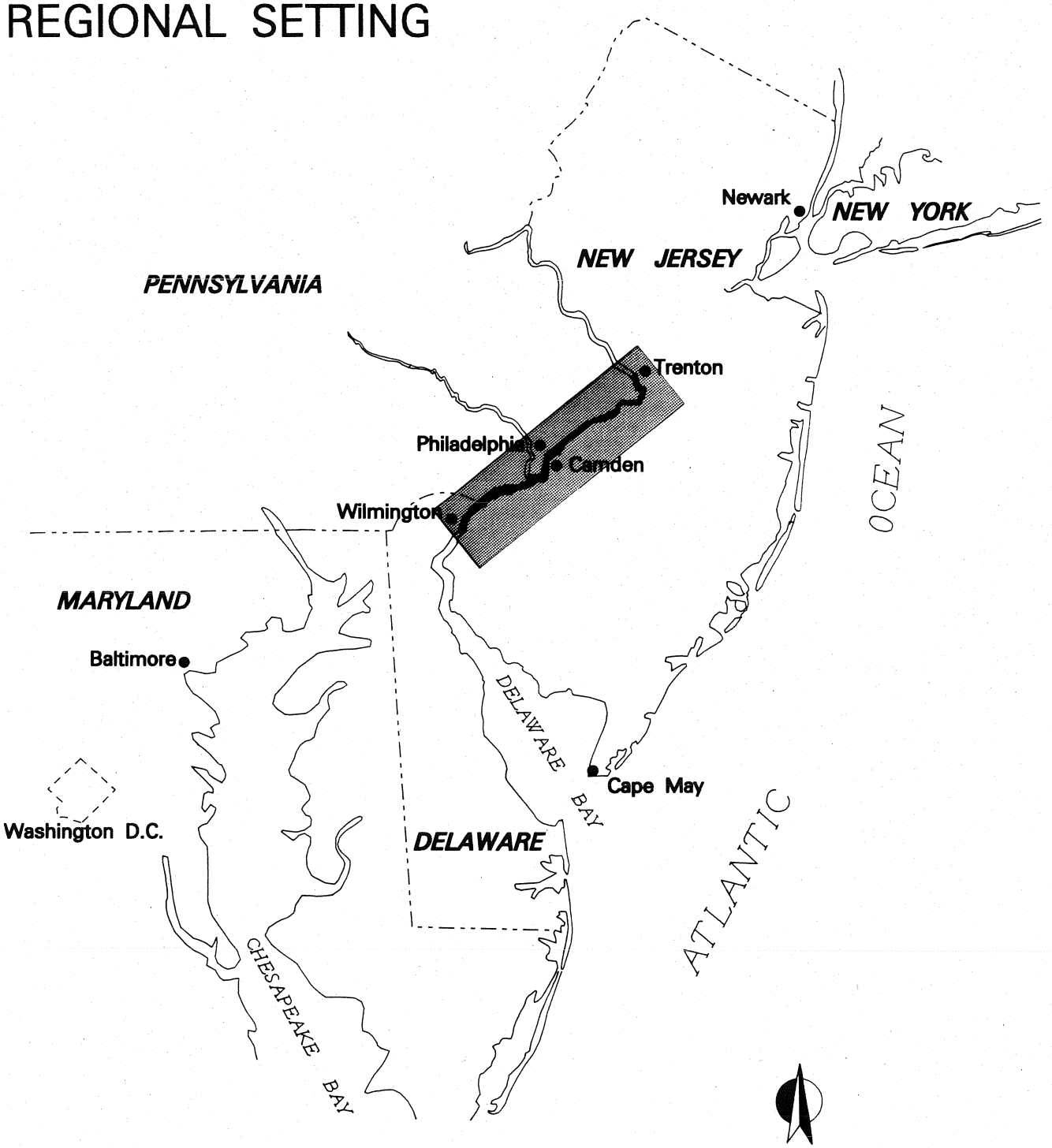
Collectively, the Delaware River Ports include eleven major marine terminals with 20 cranes, with lift capabilities up to 375 tons. There are grain elevators with a capacity of nearly 6 million bushels, coal terminals with capacity of 10 millions tons and ore terminals capable of handling 8 million tons. There is also over 32 million cubic feet of temperature-controlled storage. The Delaware River is also home to a number of fuel oil delivery and distribution facilities, centered in the area of Marcus Hook, Pennsylvania, south of Philadelphia. The Ports of the Delaware River are also a key center for the receipt of fruit, which is generally shipped as breakbulk cargo.

The purpose of this study is to examine those facilities in the Port which particularly handle container cargo, which may be served by an intermodal rail yard. The primary marine terminals within the Ports of the Delaware River which accommodate containers are as follows (see Figure III):

1. Northern Shipping Company : Located in the northeast section of Philadelphia, Northern Shipping is the northernmost marine terminal in the Port. The facility covers 114 acres and provides five berths along 3,700 linear feet of docking space. The entire terminal is also served by a dockside rail network with direct access to Conrail's train service. Northern Shipping's facilities include offices, an on-site machine shop and about 250,000 square feet of warehouse space. Northern's cargoes include containers, cocoa beans and cocoa products, steel, lumber, drum cargo, project cargo and vehicles.

2. Tioga Marine Terminal : The Tioga Marine Terminal is also located in Northeast Philadelphia, just south of the Betsy Ross Bridge. Set on 110 acres, Tioga has seven berths, including facilities for RoRo (roll-on/roll-off), a canopied truck platform 20 feet wide and a ten-lane truck gate house. Tioga is served directly by Conrail via two surface railroad tracks on the apron, plus one surface track inshore of the sheds. Tioga employs two 45-ton

Figure II
PORTS OF THE DELAWARE RIVER
REGIONAL SETTING



DELAWARE VALLEY REGIONAL PLANNING COMMISSION
FEBRUARY 1991

container cranes to handle predominately container traffic, but also handles break-bulk, reefer, Ro-Ro, bulk, steel, cocoa products and fruit. Tioga's warehouse facilities include heated and temperature controlled sheds.

3. Beckett Street Terminal: Set on 107 acres just south of the Benjamin Franklin Bridge in Camden, New Jersey, the Beckett Street Terminal provides three berths along its 2290 feet of docking space. The facility provides one 45-ton high capacity crane for both containers and bulk cargo and three 25-ton traveling Gantry cranes. Beckett Street handles containers, break-bulk, bulk and reefer cargo. Its 216,000 square foot transit shed and warehouse storage are served by surface railroad tracks, although there is currently no direct train service. Beckett Street is a leader in steel and scrap metal handling.

4. Broadway Terminal: Also in Camden, New Jersey, the Broadway Terminal is located south of Beckett Street near the Walt Whitman Bridge. The facility provides six berths at its piers set on 180 acres. Broadway handles containers with an 80-ton traveling crane and one 40-ton full-portal traveling crane. The Broadway Terminal is also the largest receiver of plywood in the United States and the second largest lumber port on the East Coast.

5. Holt Cargo Systems: At the New Jersey base of the Walt Whitman Bridge in Gloucester City is the 150 acre Holt Cargo Systems marine terminal. The facility provides 7 berths and over 5 million square feet of warehousing and storage. Holt handles containers by two 30-ton container cranes and also utilizes two 300-ton mobile cranes. In addition to containers, Holt handles meat, fruit and perishables, wood products, steel products and a variety of other cargoes. The Holt facility is served directly by Conrail, who loads and unloads containers from its trains on-site.

6. Independent Pier 80 North: Since 1876, the Independent Pier facilities have operated in South Philadelphia, just north of the Walt Whitman Bridge. The Pier has docking space along both its north and south sides and includes a double-deck 450,000 square foot shed. Almost nine acres of upland storage space is also available. The Independent Pier 80 facility is capable of handling bulk, break-bulk, containerized, unitized and roll-on/roll-off cargoes, but now specializes in paper and pulp products and handles few, if any containers. Railroad tracks are located on the facility, with two tracks on each apron and depressed tracks in the pier shed, with direct service by both Conrail and CSX lines.

7. Packer Avenue Terminal: Directly across from Holt Cargo, on the Philadelphia side of the Walt Whitman Bridge, is the Packer Avenue Terminal. With six berths along 3,820 linear feet of bulkhead and 115 acres of upland, Packer Avenue moves containers via three container cranes with a lift capacity of up to 375 tons. Break-bulk and other cargoes are also accommodated. The Packer Avenue facility provides two truck scales, an eight lane container gate for trucks and a separate break-bulk gate. The facility is served directly by both Conrail and CSX Railroad systems.

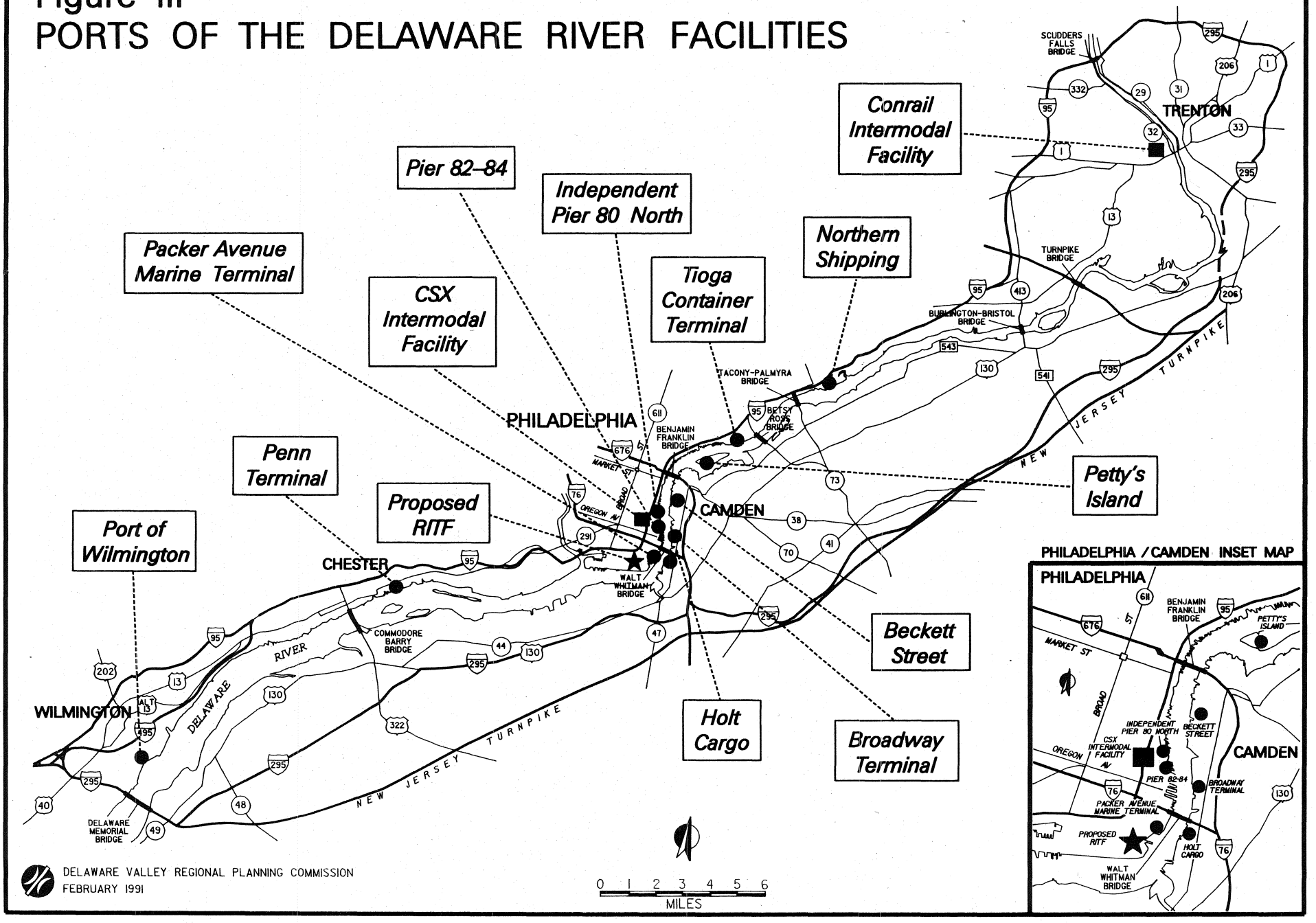
8. Petty's Island: Set in the center of the Delaware River north of the Benjamin Franklin Bridge and connected to Pennsauken, New Jersey by a single-lane bridge, the Petty's Island complex provides a triple-deck Ro-Ro ramp and 33 acres of upland area for handling containers and trailers. Two stick cranes plus top handling equipment provide lift-off service. Petty's Island specializes in Ro-Ro service via barge, but also handles heavy equipment and vehicles.

9. Pier 82-84 Terminal: The two piers of the Pier 82-84 Terminal, located adjacent to Pier 80 in Philadelphia, provide four berths for docking. Each pier incorporates direct railroad access via tracks on the pier apron. Pier 82 has a small transit shed, while Pier 84's transit shed is over one-half million square feet on two levels. This shed is heated for the handling of perishables in winter. The Pier 82-84 terminal now handles predominantly fruit and is not currently handling container traffic.

10. Penn Terminals: Located south of Philadelphia in Eddystone, Delaware County, Pennsylvania, the Penn Terminals facility provides service for containerized cargo, as well as steel products, lumber, paper and other bulk cargo. The 60-acre site features 260,000 square feet of warehouse space and 1150 linear feet of berthing space. Lifts are provided by 30-ton container cranes and a gantry crane capable of a 250-ton capacity. Railroad tracks are located on-site, although there is currently no direct rail service.

11. Port of Wilmington: The southernmost facility in the Ports of the Delaware River is located in Wilmington, Delaware, just north of the Delaware Memorial Bridge. This facility covers 300 acres, provides six docking berths and storage space for meat, juice, fruits and other produce. Wilmington is the primary center for the receipt of bananas on the East Coast. The Port of Wilmington also handles containers and has tracks for dockside rail car loading at three berths, although there is currently no on-site rail service.

Figure III
PORTS OF THE DELAWARE RIVER FACILITIES



DELAWARE VALLEY REGIONAL PLANNING COMMISSION
FEBRUARY 1991

Current Operations

Each of these facilities has the capability to handle containerized cargo, although not all do so. Certain facilities have focused on specialized cargo such as plywood, paper or fruit, while others have invested in container handling capabilities. The nature of the Port industry is a dynamic one, however, and conditions may often be expected to change.

Table II summarizes container movements at the various PDR facilities in 1990. These values reflect total movements for imports and exports, excluding empty container movements. **Container shipping through the Ports of the Delaware River has increased each year since 1986, as documented by the Delaware River Port Authority. Projections prepared by the DRPA and the Wharton Econometrics Forecasting Associates Group indicate a slight rise in containerized imports through the Ports of the Delaware River through 1998, with an uncertain picture of containerized exports, projecting either a slight increase or a slight decrease (see Figure IV).**

TABLE II

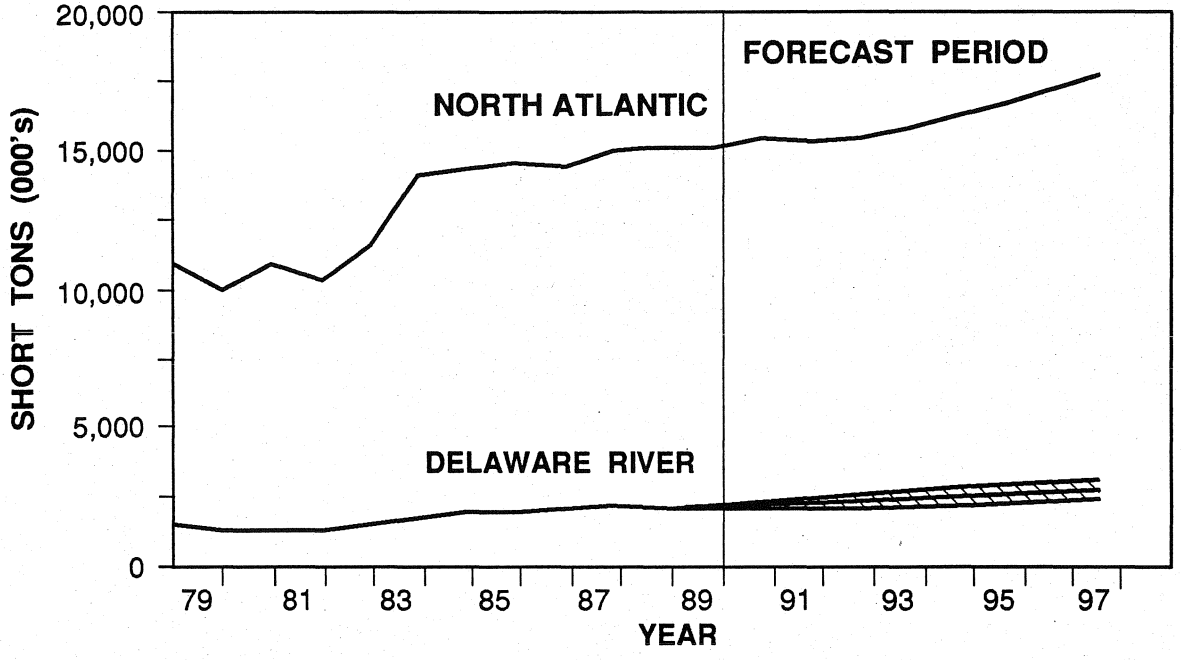
1990 Container Movements at the Ports of the Delaware River

Facility	1990 Total Loaded Containers
Tioga Marine Terminal	40,000
Packer Avenue	24,000
Petty's Island	37,000
Beckett Street/Broadway Terminal	8,000
Holt Cargo System	65,000
Northern Shipping	10,000
Penn Terminals	26,000
Port of Wilmington	8,500
TOTAL CONTAINERS	**218,500**

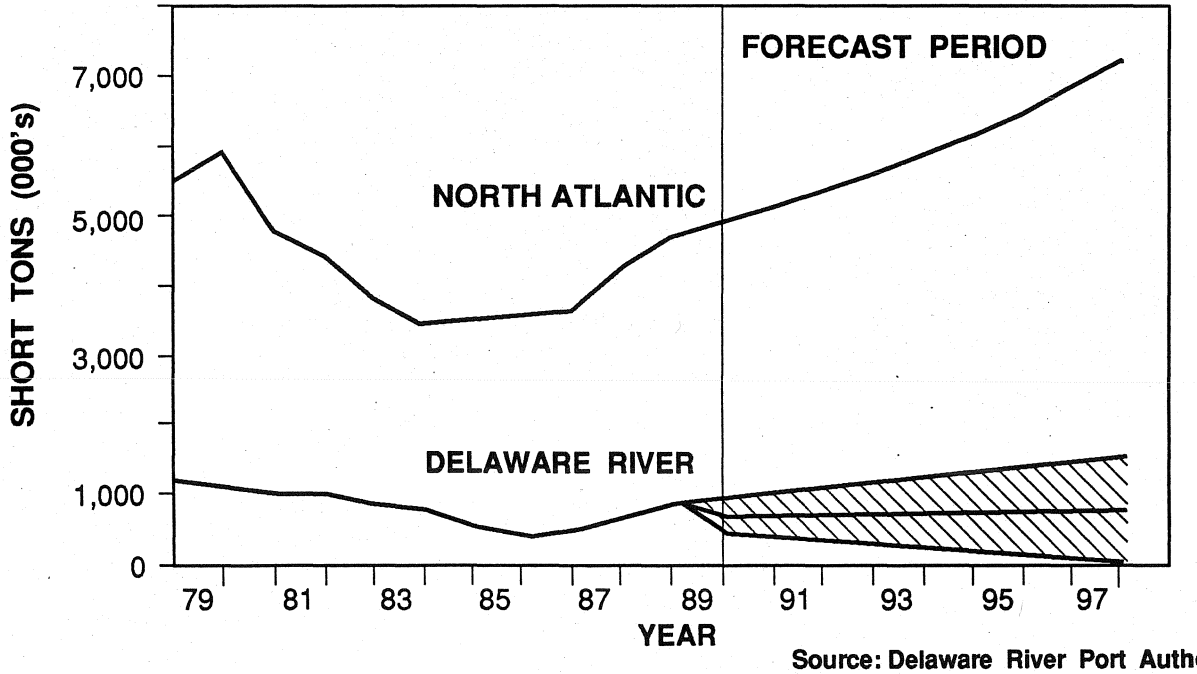
Source: Delaware Valley Regional Planning Commission, January 1991

FIGURE IV

CONTAINERIZED CARGO IMPORTS PORTS OF THE DELAWARE RIVER 1979 - 1989, FORECASTS THROUGH 1998



CONTAINERIZED CARGO EXPORTS PORTS OF THE DELAWARE RIVER 1979 - 1989, FORECASTS THROUGH 1998



Source: Delaware River Port Authority
WEFA Group
April 1990

Delaware Valley Regional Planning Commission

Proposed Port Facilities Changes

Reflecting the dynamic and uncertain nature of the Port industry, a number of the facilities in the Ports of the Delaware River have proposed changes to their operations. Some of these proposals involve expansion of capacities and capabilities, while others would yield a reduction or elimination in service. **While the final status of each of these proposals is currently undecided, they are presented here as an indication of potential future conditions within the Port.**

1. South Jersey Port Corporation: The South Jersey Port Corporation has developed plans for the expansion of both the Beckett Street Terminal and the Broadway Terminal. These plans, if completed, would more than double the land area of these facilities and increase available warehouse space by one million square feet.

	Beckett Street		Broadway	
	Existing	Proposed	Existing	Proposed
Berthing (linear ft.)	2,300	6,400	3,850	6,420
Land Area (Acres)	74	334	165	183
Transit Sheds (S.F.)	250,000	650,000	150,000	150,000
Warehouse Space (S.F.)	100,000	1,100,000	1,000,000	1,000,000
Open Storage (Acres)	40	180	30	40

2. Northern Shipping: The operator of this privately-owned facility has proposed closing the Northern Shipping facility and replacing it with 1300 housing units, 60,000 square feet of office and retail space, a 350 seat restaurant and two receational marinas with room for 500 pleasure boats. This proposal was denied by the Philadelphia City Planning Commission in December 1989, based on a policy to maintain industrial uses in this area, but may be resubmitted in the future.

3. Distributec: A privately-owned truck-terminal and storage company has proposed the construction of a container cargo facility at the site of the Kaiser Gypsum plant in Delanco, Burlington County, NJ. This facility, as proposed, could handle up to 10,000 containers per year.

4. South Jersey Food Distribution Center: A state-sponsored Authority, created in 1985, has been charged with developing plans to build piers, terminals and refrigerated warehouses on 120 acres of a 660-acre site in

Burlington Township, Burlington County, NJ. While the State Authority has recently been disbanded, planning for the facility still continues.

5. Packer Avenue: A new lease signed between the Philadelphia Regional Port Authority (owner of the facility) and Holt Cargo Systems (current stevedore at the facility) encourages Holt to transfer container cargo from Holt's facility in New Jersey to the Packer Avenue facility. This lease can be expected to result in the consolidation of most of Holt's container traffic at the Packer Avenue facility.

6. Holt Cargo Systems: While the PRPA lease with Holt at Packer Avenue can be expected to reduce container traffic at this New Jersey facility, break-bulk and other non-containerized cargoes may actually increase here. For example, Holt may seek to transfer certain cargoes from Packer Avenue to the New Jersey facility.

RAILROAD SYSTEMS

The Ports of the Delaware River have an unusual advantage, in that three major freight lines now serve the Port. One or more of these rail lines traverse adjacent to, or provide direct access into, each of the eleven port facilities identified above (see Figure V). **Collectively, these three rail lines connect the Delaware River Ports to almost every major market in North America, both the United States and Canada.**

The region has historically provided access to a number of competing rail lines in order to provide a diversity of service and lower prices. In 1899, the Philadelphia Belt Line Railroad was chartered to construct and operate a railroad within the city. In 1914, three railroad companies including the Philadelphia Belt Line and the City of Philadelphia signed the "South Philadelphia Agreement", stating that:

> *"Railroad companies now or hereafter entering the city should have free access on equal terms to all public and private wharfs, and recognizes that the Belt Line was created and exists in the public interest."*

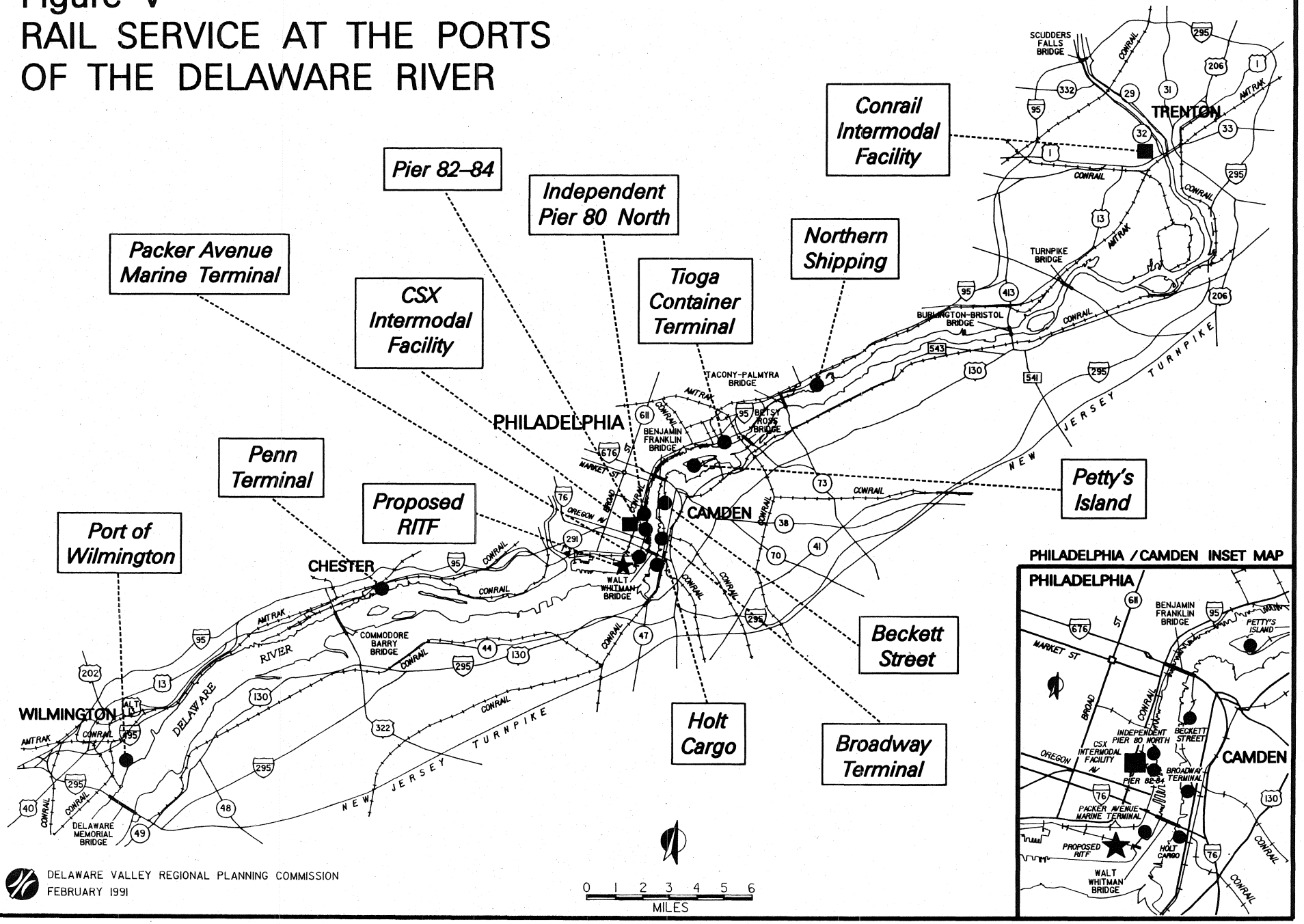
The principle of equal access to the port facilities by all railroad companies should continue as the underlying principle for railroad and port operations in the Port of the Delaware River. This principle and practice is also central to the ultimate success of the Regional Intermodal Transfer Facility.

Conrail

Today Conrail, headquartered in Philadelphia, provides service over 13,500 miles of track. From Philadelphia, Conrail provides direct connections throughout the midwest (see Figure VI), including Chicago, Cincinnati, Detroit and St. Louis. Through connections with the major western railroads, service can be provided throughout the west, including Seattle, San Francisco, Los Angeles and Phoenix (see Figure VII).

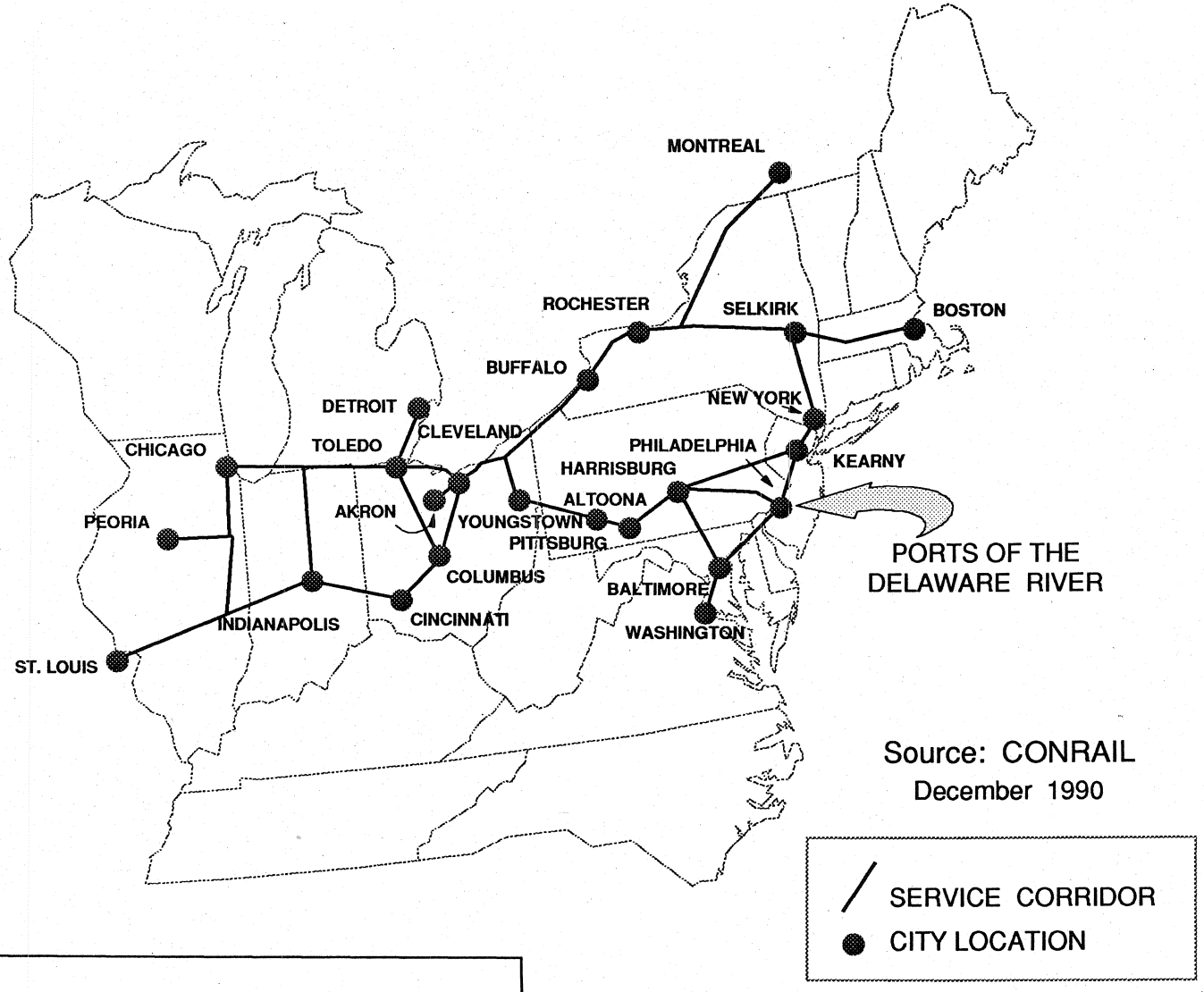
Conrail's intermodal service for the Ports of the Delaware River is centered in Morrisville, Pennsylvania, located in Bucks County approximately 30 miles north of the Port's geographical center. For container shipping via rail, most shippers or their agents arrange for the drayage movement of containers from the point of unloading at the marine terminal to the Morrisville facility. For the year 1990, Conrail loaded or unloaded 918 containers at the Morrisville facility (see Table III) which were bound to, or originated from, the PDR facilities as Atlantic container traffic. Of these, 632 were imported and 286 were for export. In addition, Conrail now provides direct container loading to rail cars at four area facilities in addition to Morrisville

Figure V
RAIL SERVICE AT THE PORTS OF THE DELAWARE RIVER



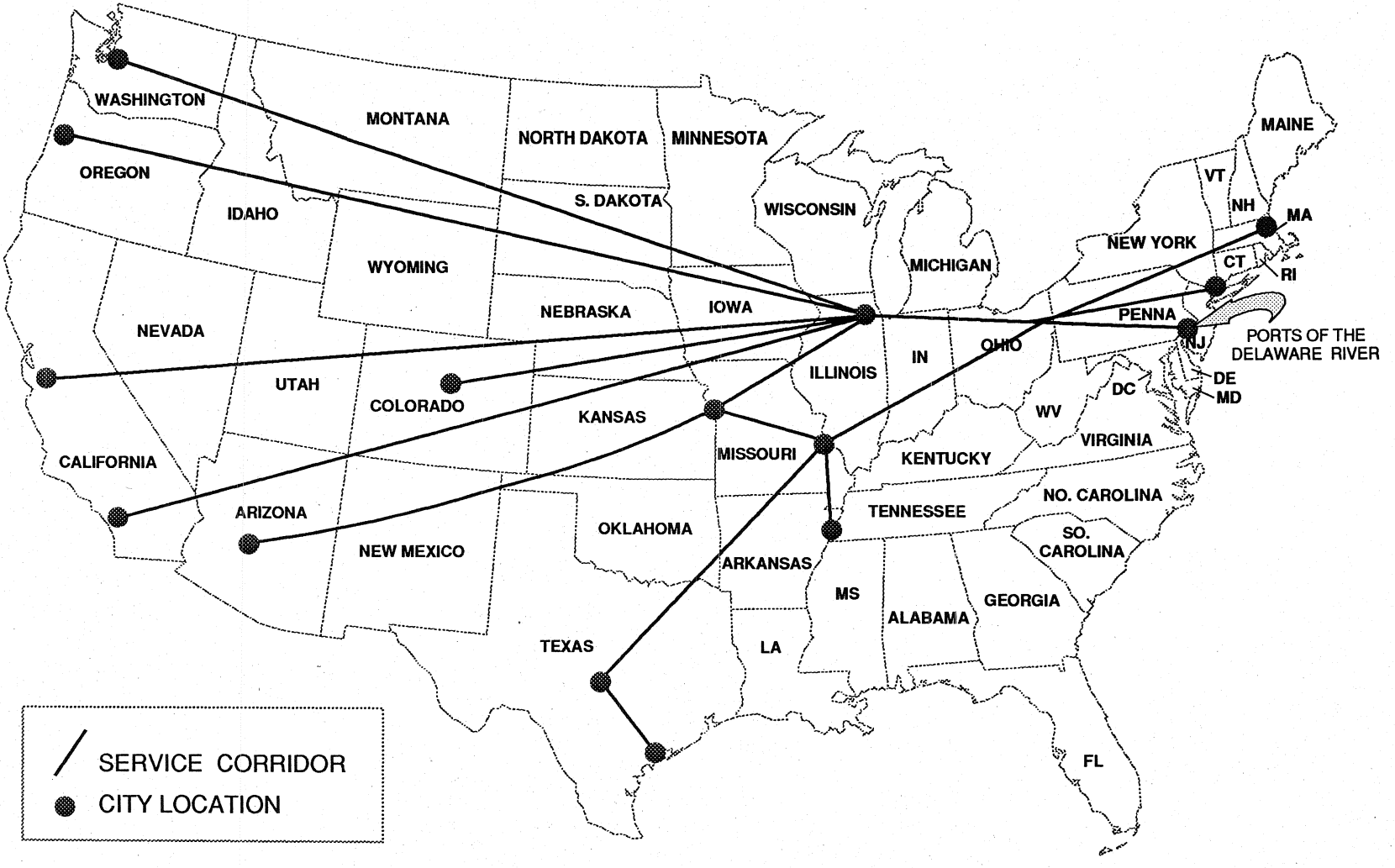
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
FEBRUARY 1991

FIGURE VI
CONRAIL'S NORTHEAST AND MIDWEST SERVICE



Delaware Valley Regional Planning Commission

FIGURE VII
CONRAIL'S WESTERN SERVICE CONNECTIONS



Delaware Valley Regional Planning Commission

Source: CONRAIL
December 1990

TABLE III

Conrail Intermodal Service at Morrisville
Containers originating or bound for PDR facilities
Containers loaded in 1990

MONTH	EASTBOUND	WESTBOUND	TOTAL
January	13	44	57
February	14	80	94
March	23	92	115
April	15	37	52
May	24	77	101
June	15	55	70
July	14	83	97
August	23	69	92
September	37	29	66
October	46	32	78
November	43	18	61
December	19	16	35
TOTAL	**286**	**632**	**918**

Source: Conrail

Delaware Valley Regional Planning Commission, January 1991

TABLE IV

Conrail Service at the Ports of the Delaware River
Containers loaded on-site in 1990

Port Facility	Containers Loaded on site by Conrail
Tioga Marine Terminal	1570
Packer Avenue	160
Petty's Island	0
Beckett Street/Broadway	0
Holt Cargo Systems	1663
Northern Shipping	1396
Penn Terminals	0
Port of Wilmington	0
TOTAL Containers loaded on -site	**4789**

Source: Conrail

Delaware Valley Regional Planning Commission, January 1991

(see Table IV). These are the Tioga Marine Terminal, Packer Avenue Terminal, Northern Shipping and Holt Cargo in Gloucester City, New Jersey.

CSX

The second major railroad which serves the Delaware River Ports is the CSX Corporation, which provides service from Philadelphia throughout the Midwest and South, including Chicago, Baltimore, Atlanta and New Orleans (see Figure VIII). CSX operates a central intermodal rail yard in South Philadelphia, just north of the Walt Whitman Bridge. Containers to be shipped via CSX rail are generally drayed by truck to this facility. Table V illustrates total container and trailer movements at CSX's facility. Accounting practices at CSX do not permit any indication of how many of these containers or trailers originated in, or were bound for, the Ports of the Delaware River. Discussions with the yard operator, however, indicate that up to 90% were of domestic origin, rather than port related.

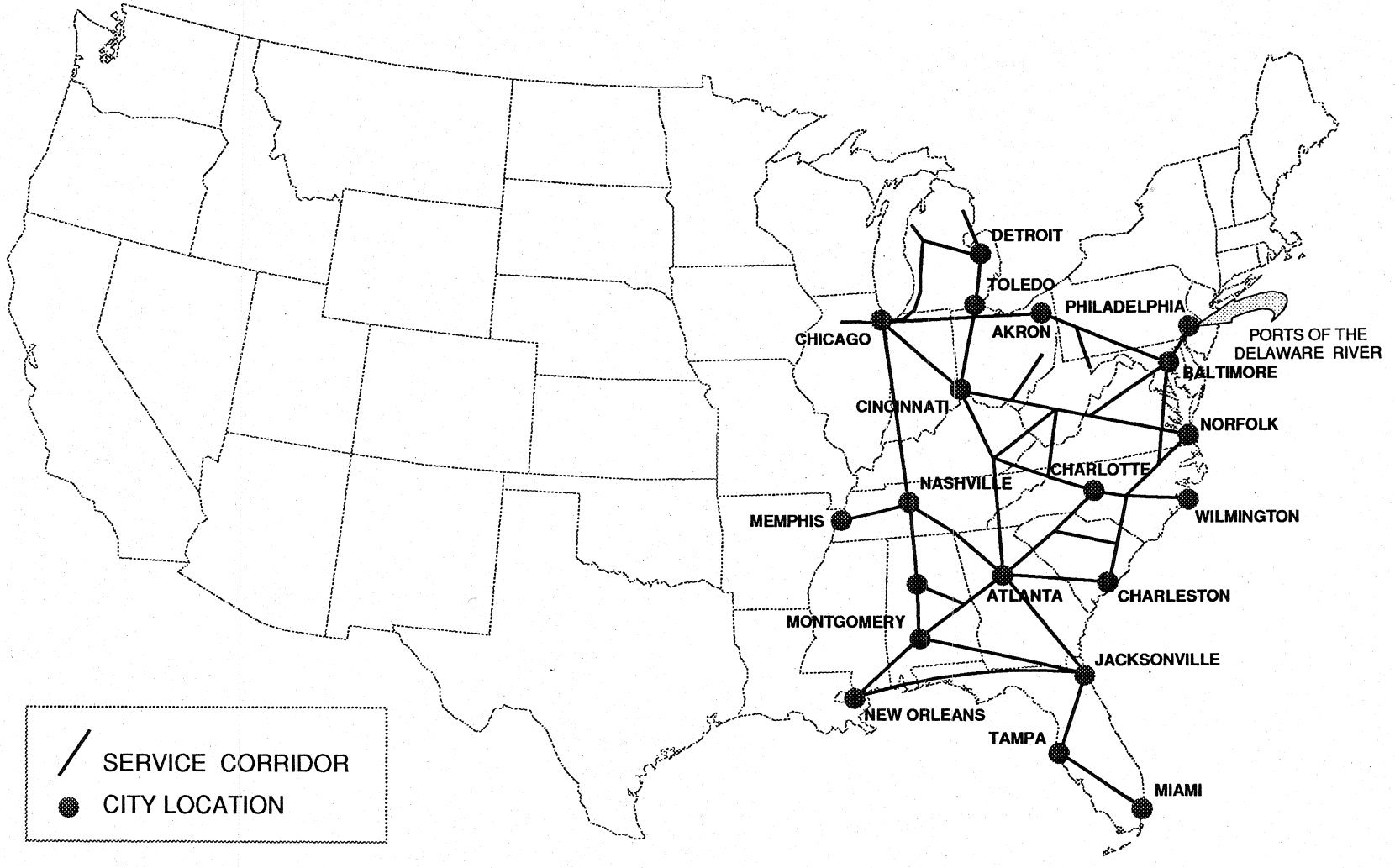
Canadian Pacific

The third railroad which provides service to the Delaware River Ports is the newest addition to the region. Canadian Pacific Railway (or CP Rail) has recently purchased the bankrupt Delaware & Hudson Railway. The Delaware & Hudson traces its history to 1823, when it was originally founded as a canal system and then operated a rail system over 1,600 miles of track. Using a combination of its own tracks and operating rights over certain Conrail tracks, the Delaware & Hudson connects Philadelphia to Montreal, Buffalo, New York and Washington (see Figure IX). Despite this market, the Delaware & Hudson did not offer competitive service and was sold in 1985 for only $500,000 to Guilford Transportation Industries. In 1988, the Delaware & Hudson was declared bankrupt.

Canadian Pacific's interest in the Delaware & Hudson is an opportunity to link CP Rail's 21,000 mile North American system with the Ports of the Delaware River and the Port of New York and New Jersey via the Delaware & Hudson connection at Buffalo and Niagara Falls. Although the $25 million CP Rail offer for the Delaware & Hudson was approved by the Interstate Commerce Commission and the U.S. Bankruptcy Court in the fall of 1990, there were two additional impediments which were only recently overcome.

First was the commitment of the Pennsylvania legislature and the Governor to appropriate up to $5.5 million to rebuild parts of the dilapidated Delaware & Hudson system in Pennsylvania. That funding has now been committed. The second impediment for CP Rail to close on the Delaware & Hudson acquisition was the

FIGURE VIII
CSX RAIL SERVICE



Source: CSX TRANSPORTATION
December 1990

Delaware Valley Regional Planning Commission

TABLE V

CSX Intermodal Service in Philadelphia

Trailers and Containers loaded in 1990

Month	Loaded Trailers	Loaded Containers
January	5646	1082
February	7878	838
March	7089	950
April	6588	711
May	6620	890
June	6470	789
July	5484	900
August	6357	874
September	6674	892
October	6855	1173
November	6291	1092
December	6370	947
TOTAL	78,322	11,138

Source: CSX, CSL Intermodal

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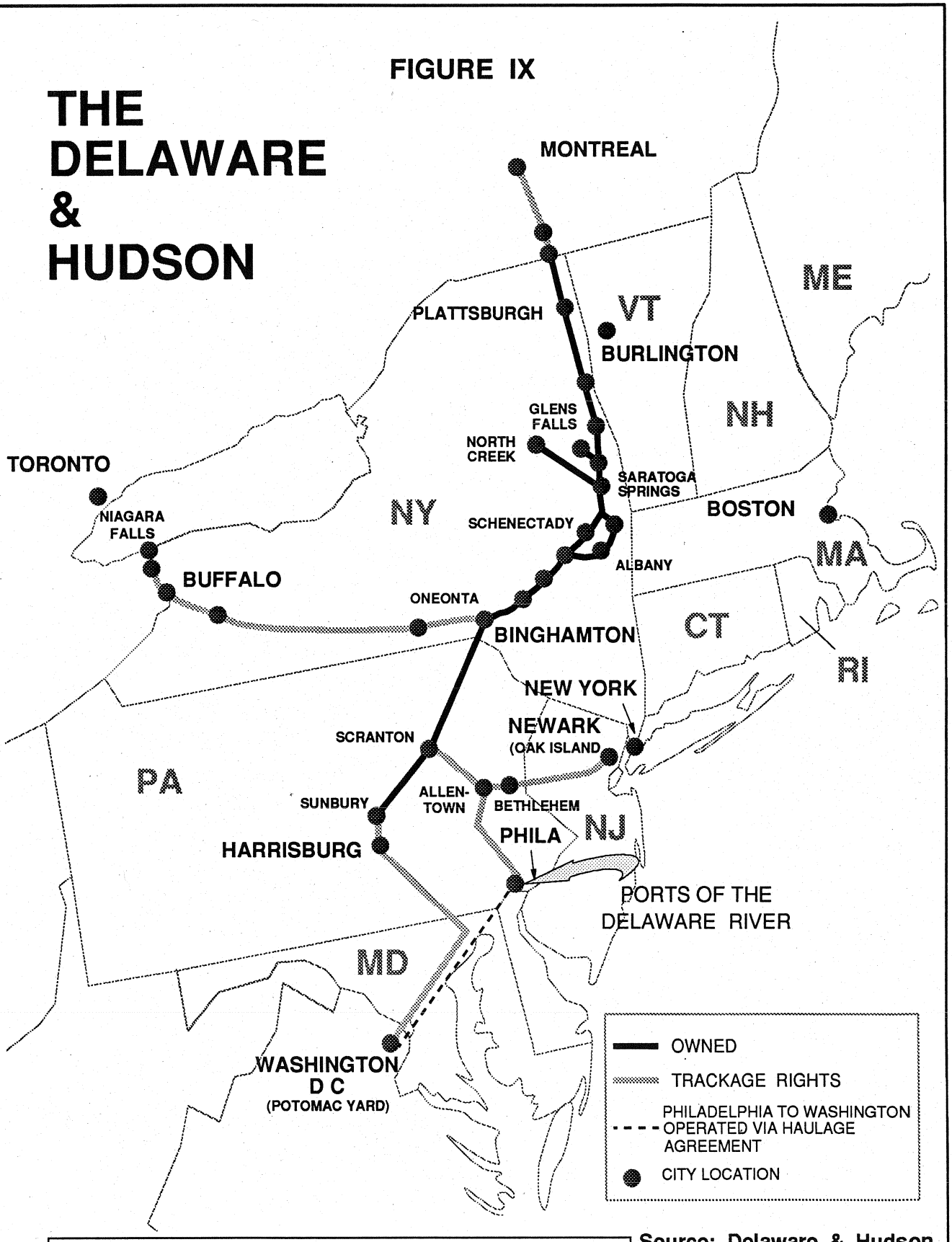
FIGURE IX

THE DELAWARE & HUDSON



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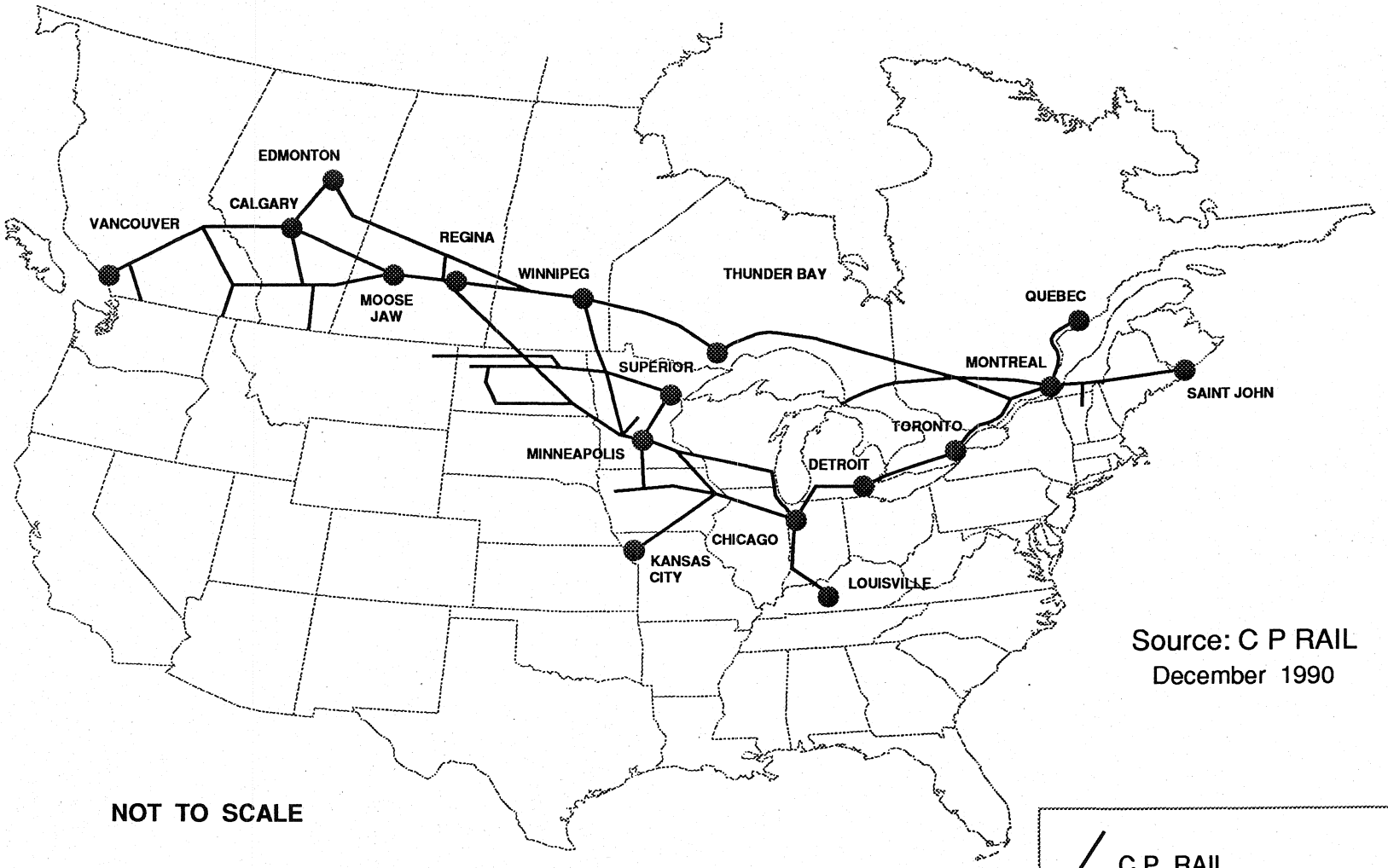
Source: Delaware & Hudson December 1990

FIGURE X
CANADIAN PACIFIC RAIL SYSTEM



Delaware Valley Regional Planning Commission

initial opposition of Conrail, who owns a key bridge over the Niagara River and tracks between Niagara Falls and Buffalo which CP would need to link its Canadian system with the Delaware & Hudson system. In December, 1990, Conrail finalized an agreement with CP Rail which would permit CP Rail access across the Niagara River and from Niagara Falls to Buffalo, as well as access across a section of Conrail tracks in South Philadelphia. This agreement will provide CP Rail with direct access into the Ports of the Delaware River and the site of the proposed Regional Intermodal Transfer Facility.

With this access, the Ports of the Delaware River will be linked to the entire North American market via CP Rail's lines (see Figure X) including direct service to Montreal and Toronto. CP Rail believes that the Ports of the Delaware River may be a more attractive destination for unloading cargo headed for Canada than Halifax, Nova Scotia, which CP does not serve.

PORT OPERATING AUTHORITIES

The Ports of the Delaware River possess certain advantages which should keep the Port as one of the leaders among North Atlantic ports. These advantages include a diversity of marine terminal facilities capable of handling almost any type of cargo, three major railroad lines which provide service to almost any part of the North American continent, and central access via highway to the population centers of the East Coast.

The Port is disadvantaged, however, by the lack of central control in the management of the various facilities within the Port. Three different governmental agencies now operate port facilities in the three-state region. In addition, a number of private organizations own and control other marine facilities within the Port district. While each of these public and private entities is professionally run and is working to increase traffic at their particular facility, this fragmentation of management responsibility will ultimately result in duplication of efforts, competition for a limited market, and a net decline rather than a net increase in the attractiveness and utilization of the PDR as a whole.

In Pennsylvania, the Philadelphia Regional Port Authority is the State agency responsible for managing the Packer Avenue Marine Terminal and the Tioga Marine Terminal, including negotiating leases for operators and planning capital investments. The Philadelphia Regional Port Authority was formed and assumed control of these facilities when the City of Philadelphia sold the port facilities owned by the City to the State in 1990. In addition to the two major marine terminals, the PRPA controls and manages 11 finger piers in the City of Philadelphia, including Independent Pier 80 and Piers 82-84.

In New Jersey, the South Jersey Port Corporation manages the Broadway and Beckett Street Terminals in Camden. The South Jersey Port Corporation is also a State agency, chartered by New Jersey to manage these two marine terminals. The South Jersey Port Corporation is also operating, marketing and planning for investments and expansion at their facilities.

In Delaware, a third government agency operates the Port of Wilmington. This city-owned facility is managed by the municipality as a city agency. Profits from the Port of Wilmington contribute to the revenues of the City of Wilmington.

A number of other facilities within the Ports of the Delaware River are privately owned and operated. Holt Cargo Systems, Petty's Island, Northern Shipping and Penn Terminals are each individually owned and operated. Holt Cargo also leases and operates the Packer Avenue facility and Crowley Maritime (operators of Petty's Island) leases and operates the Tioga Marine Terminal.

With so many individual operators seeking to increase revenue at their respective facility, it is difficult for the Ports of the Delaware River to present a unified front to compete across the North Atlantic. The Port is a regional resource and will only be successful in the global marketplace if it competes as a regional entity.

For this reason, the Delaware River Port Authority is seeking to unify the Ports of the Delaware River for the purpose of port planning. The DRPA, by its charter, already has the responsibility to promote the Port and to sponsor port-related capital projects. As operators of the Benjamin Franklin, Walt Whitman, Betsy Ross and Commodore Barry bridges, the DRPA also has the revenue to do so. The DRPA already enjoys the sponsorship of both Pennsylvania and New Jersey through the bi-state representation on its Board, and has promoted discussions between these two states towards port unification.

The legislation passed by Pennsylvania sets the DRPA on the first step towards port unification, by authorizing the Authority to spend funds on certain port enhancement projects, including construction of the Regional Intermodal Transfer Facility. The Authority will not act, however, without companion authorization from the New Jersey legislature and Governor, whose approval is still pending. When endorsed by New Jersey, the Ports of the Delaware River will begin to gather strength as a unified force. Perhaps in the near future the unification will encompass the Port of Wilmington and the privately operated facilities as well.

III. INTERMODAL TRANSPORTATION and the PDR

INTRODUCTION

Intermodal transportation can provide the basis for better integrating the transportation network through smoother, quicker and less frequent transfers of goods and cargo. The principle of intermodalism is to increase efficiency by reducing time delays between changes of transport mode, thus providing a nearly seamless movement of goods from their point of origin to their final destination. By providing greater efficiency, intermodalism can reduce transportation costs, which result in greater utilization of those transportation resources and the stimulation of local and regional economic growth.

In 1987, the National Council on Public Works Improvement submitted a report to the President and Congress addressing the state of the nation's infrastructure. In the report, the Council notes that intermodal transportation has emerged over the past decade as an important element offering a range of economic opportunities for reducing costs and improving the marketing and distribution of goods on both a domestic and international basis.

The Port Modal Network

For the Port industry, intermodalism is a way of life. Goods which are manufactured or assembled at one location must be moved, via truck or rail, to a dock where they are loaded onto a ship. When this ship docks at its import location, the goods are unloaded and again shifted to another mode of transportation, generally truck or rail, for delivery to their final destination. Each change of mode, however, can result in delays as goods must be packed or repacked, or additional documentation forms must be prepared.

The objective of intermodalism is to reduce delays during modal changes. The increased use of containers to pack cargo has made the transfer of cargo between different modes of transportation a much smoother process than in the past due to the relative standardization of container size. Containers were initially attractive to exporters because of the better protection, security and shelter from the weather for cargo that they provided, but their advantage for shippers and railroad companies soon became apparent.

For shippers, containers can be stacked on larger ships and handled via large cranes. Break-bulk cargo which previously took several days to load or unload could be moved via containers and cranes in just a few hours. The railroads also quickly saw the advantages of containerized cargo, as these containers could be loaded directly onto rail cars for shipment. As more containers began to be loaded faster onto trains, the railroad industry could compete on a stronger basis with trucks for goods movement.

Railroad Intermodal Facilities

The National Council on Public Works Improvement report noted that in the past decade, railroads have been closing unprofitable routes in an effort to redistribute traffic flow and create high density corridors designed to maximize their earning capability. Rail intermodal services have been restructured to service higher volume hub centers, from which trucks are used to make the local delivery. A 1985 study estimated that the 600 rail intermodal facilities operating at that time would decrease to less than 400 by 1988, and eventually be reduced to only 200 highly productive terminals.

This prediction was borne out by a 1990 study by the U.S. Department of Transportation, which documented about 215 high-volume rail transfer facilities operating in 1989. This trend reflects the advantages of hub centers that improve services while reducing costs. Fewer intermodal terminals concentrate available services into corridors that have sufficient density to operate dedicated intermodal trains.

While the number of terminals has decreased over the past decade, the number of intermodal loadings has increased greatly. In 1980, just over 3 million ocean-going trailers or containers were hauled by rail in the United States, as compared to more than 6 million in 1990. Recognizing the trend towards centralized railroad terminal facilities which provide intermodal access, a number of public and private port operators have sought to consolidate rail intermodal facilities into fewer, but larger facilities where the movement of containerized cargo via rail could be concentrated.

In Baltimore, the Maryland Port Administration has completed the $250 million Seagirt Marine Terminal, a 262 acre facility with seven container cranes capable of handling 150,000 containers a year. Next to Seagirt is the new Intermodal Container Transfer Facility, with separate gates for domestic and international cargo and capability to stack containers two high on trains.

In California, the Southern Pacific Transportation Company has completed construction of the Los Angeles/Long Beach Intermodal Container Transfer Facility. This state of the art facility, located four miles from the primary container terminals of the Port of Los Angeles and Long Beach, is capable of servicing four one-mile long trains

simultaneously. With five cranes loading trains two containers high, this facility can lift 1500 containers a day, or over 250,000 containers per year. The company even has plans for expansion, to eventually provide 12 additional tracks and container capacity of up to 750,000 loads per year.

The Los Angeles facility also provides an advanced electronic information transfer system which reduces the normal time of documentation and paper handling and helps to speed cargo in and out of the facility. While still off-shore, ship's captains can relay manifest information to the intermodal facility for those containers making a rail connection. By the time the container is unloaded at the port and drayed by truck to the intermodal facility, the documentation for the rail transfer is in place. The driver checks in by phone at the entry gate, an operator relays the information by computer to an inspector who checks the cargo and directs the driver to the loading ramp, where even the crane operators have a computer link to track the cargo. The entire sequence of check-in at the gate, inspection, transfer and loading to the rail car, may take as little as 15 minutes.

Intermodal rail facilities may even be established away from the port. For the port of Hampton Roads, Virginia, the Virginia Port Authority has built an inland port at Front Royal, 200 miles from the Atlantic Ocean. Here, freight is loaded or unloaded to rail cars for a high-speed connection to the Port, avoiding truck congestion and delays on roads near the Port.

INTERMODAL RAIL FACILITIES AT THE PORTS OF THE DELAWARE RIVER

In 1986, the Pennsylvania Department of Transportation (PADOT) completed a technical study of "Intermodal Issues and Needs in Pennsylvania", as part of a larger "Comprehensive Freight Rail Study for Pennsylvania". These studies were undertaken in response to concerns about the future of a freight rail network in the state. From 1970 to 1986 Pennsylvania saw in-service route miles decline from 10,000 to just 6,000 miles. The report further noted that an additional 2,000 miles of the remaining network was at risk of being abandoned or downgraded in the very near future.

The report examined every aspect of rail operations, including issues of maintenance, funding, insurance, service improvements and rail banking for the future. In terms of intermodal operations, the primary issues considered were the location and operation of intermodal terminals, the competitiveness of the Port of Philadelphia, double stack trains and containerization, and adequate railroad clearances necessary to support intermodal services.

Double Stack Trains and Rail Clearance

The PADOT study viewed rail-line and bridge clearance as key problem areas for intermodal movements in Pennsylvania noting that insufficient bridge clearances were limiting intermodal activity because double stack trains could not pass through. This 1986 report was particularly prescient in its recognition of the importance of double stack container trains.

In early 1984, major double stack services were provided only between the Port of Los Angeles/Long Beach and Chicago, with a total of 2000 container spaces available on double stack rail cars. This represented a significant increase over the previous year, when double stack service was virtually unheard of and only 400 double stack container spaces were available nationwide. By 1989, 30,000 double stack container spaces were available and the double stack network served most areas of the country (see Figure XI).

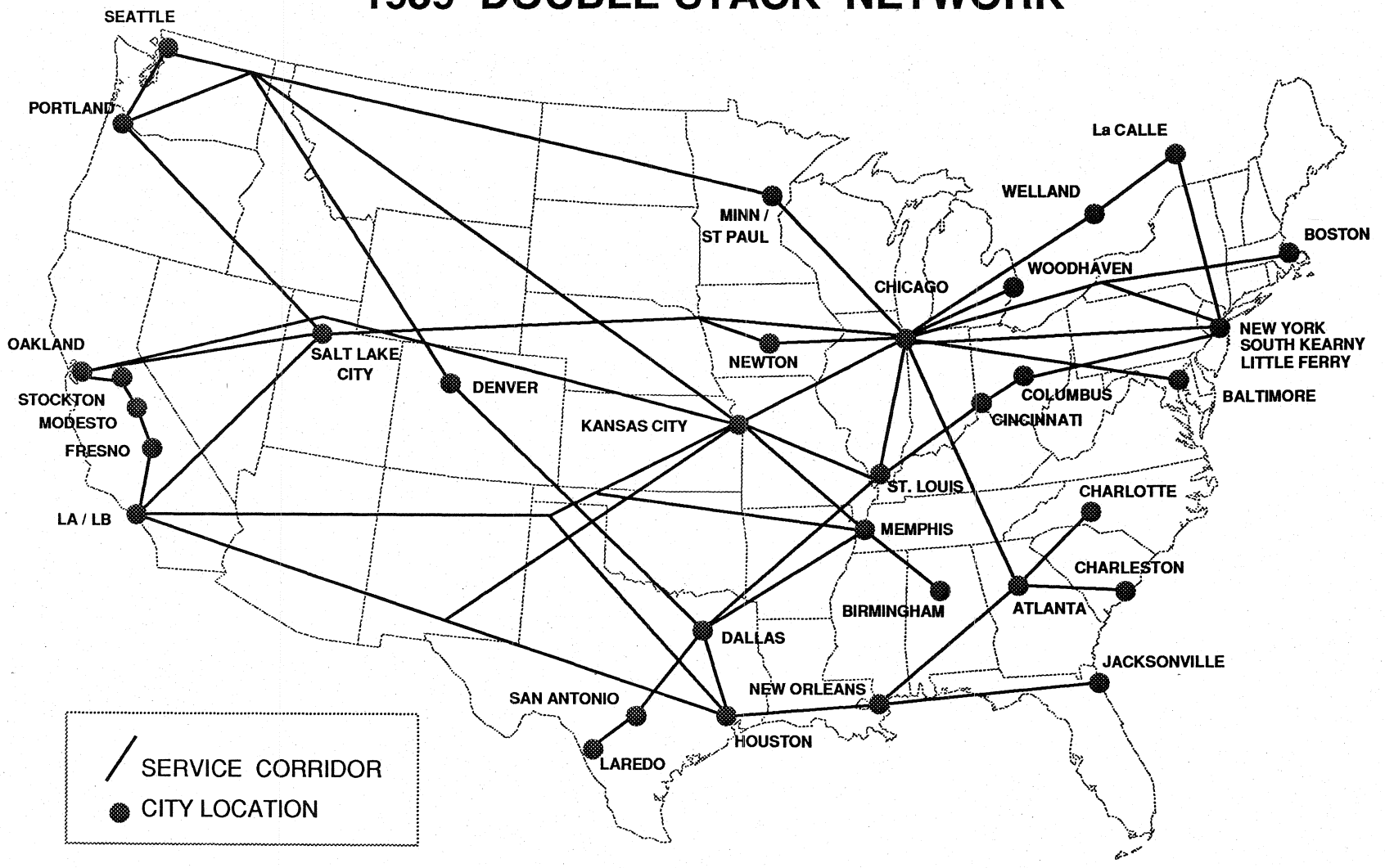
Other East Coast ports recognized the importance of the emerging double stack technology and provided the necessary investments to accomodate double stack trains. In Baltimore, the new Intermodal Container Transfer Facility serves double stack trains which boast a direct cleared route to Chicago. For the Port of New York and New Jersey, Conrail has recently completed a three-year, $33 million program to increase the vertical clearance on its tracks to Chicago. And in Virginia, the Norfolk Southern Corporation is widening tunnels and raising bridges from Hampton Roads to its intermodal facility at Front Royal, 200 miles away, to provide double stack service.

Advantages of double stack container service are clear. The cars are lighter, shorter, more aerodynamic, and give a better ride than other rail container cars. By allowing twice as many units to be hauled by the same train crew and proportionally fewer locomotives, labor and fuel costs per unit are reduced, resulting in railroad linehaul cost reductions of up to 40 percent.

For the Ports of the Delaware River, providing double stack service is an important, if not essential, component of the overall intermodal strategy. A 1988 study by Conrail calculated that a $38.7 million investment in bridge and tunnel clearance to enable double stack service across the state would yield up to $176.9 million in a variety of direct and indirect benefits over a period of 20 years.

A January 1991 draft report of the Double Stack Subcommittee of the Pennsylvania State Rail Freight Advisory Committee has also endorsed the need to provide double stack train service across Pennsylvania to the Ports of the Delaware River, noting that:

FIGURE XI
1989 DOUBLE-STACK NETWORK



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Source: U.S. Dept. of Transportation
June 1990

. . . the potential to open up intermodal clearance routes can have enormous implications for Pennsylvania's economy and especially for the Port of Philadelphia . . . For the Port of Philadelphia, it would become the major Port of Choice for cargo bound to and from Western Canada and to and from the Pacific Rim and Northern Europe . . . (and) help position Philadelphia as the Port of Choice for heavy lift moves.

Location of Intermodal Terminals and the Competitiveness of the Port

The PADOT report recognized the trends of railroad companies both nationwide and within the state to consolidate their operations by discontinuing unprofitable routes and services and establishing hub centers at locations with sufficient volume to support the facility. The report recommended that the state examine existing and potential locations for regional intermodal facilities, including a location to service the Ports of the Delaware River. **Lack of an intermodal rail facility in close proximity to the facilities of the Delaware River Ports was identified as a handicap for the Port to compete with other North Atlantic ports.** With the primary intermodal rail yard located 30 miles away from the Port (the Conrail facility in Morrisville) transit times for deliveries tended to be longer than at competing port locations. The report recommended that a detailed feasibility study be undertaken to examine the Port's existing rail facilities and the Port's general needs with respect to intermodal transportation. The concept of a State Port Authority was promoted to serve as an economic development arm of the state which could undertake port improvement projects, including the development of a new intermodal facility.

DRPA's PROPOSED REGIONAL INTERMODAL TRANSFER FACILITY

Following the 1986 Pennsylvania Department of Transportation report which recommended that the Ports of the Delaware River establish a central intermodal facility to serve the shippers and railroads now operating in the Port, the Delaware River Port Authority (DRPA) undertook a series of marketing and feasibility studies to determine the potential users and traffic which could be attracted to a new Regional Intermodal Transfer Facility (RITF), and the best location for such a facility in the Port.

RITF Location

The RITF is envisioned to serve as the center for the transfer of rail-borne freight within the Port of the Delaware River facilities. Several alternative sites in the vicinity of the Packer Avenue Marine Terminal were evaluated to determine a location which was in proximity to a major container terminal, had existing track access to serve multiple rail lines, and was large enough to create the proposed facility and maintain sufficient area for possible future expansion.

A proposed location for the RITF was selected on a site of approximately 106 acres in south Philadelphia, between Broad Street and the Packer Avenue Terminal. The site is south, and generally parallel to, Interstate Highway 95 and the Philadelphia Beltline right-of-way (see Figure XII). The proposed site would include the existing rights-of-way of both Conrail and CSX railroads. In addition, the facility would occupy the northern edge of the Greenwich rail yard which is owned and operated by Conrail. Property for the facility, including additional private property, public streets, and property controlled by the Philadelphia Regional Port Authority, would be acquired either through lease or purchase from current owners.

The proposed location for the RITF would provide truck access to Interstate 95 and the Walt Whitman Bridge systems, thus serving marine terminals in both Pennsylvania and New Jersey. The existing Conrail and CSX rail lines on-site provide direct access to the networks of these two rail lines plus the recently completed agreement between Canadian Pacific and Conrail will provide access for Canadian Pacific Rail in and out of the facility and service to their extensive network. Creating the facility adjacent to the Packer Avenue Marine Terminal will also insure an on-going volume of container traffic.

MARKET DEMAND FOR THE RITF

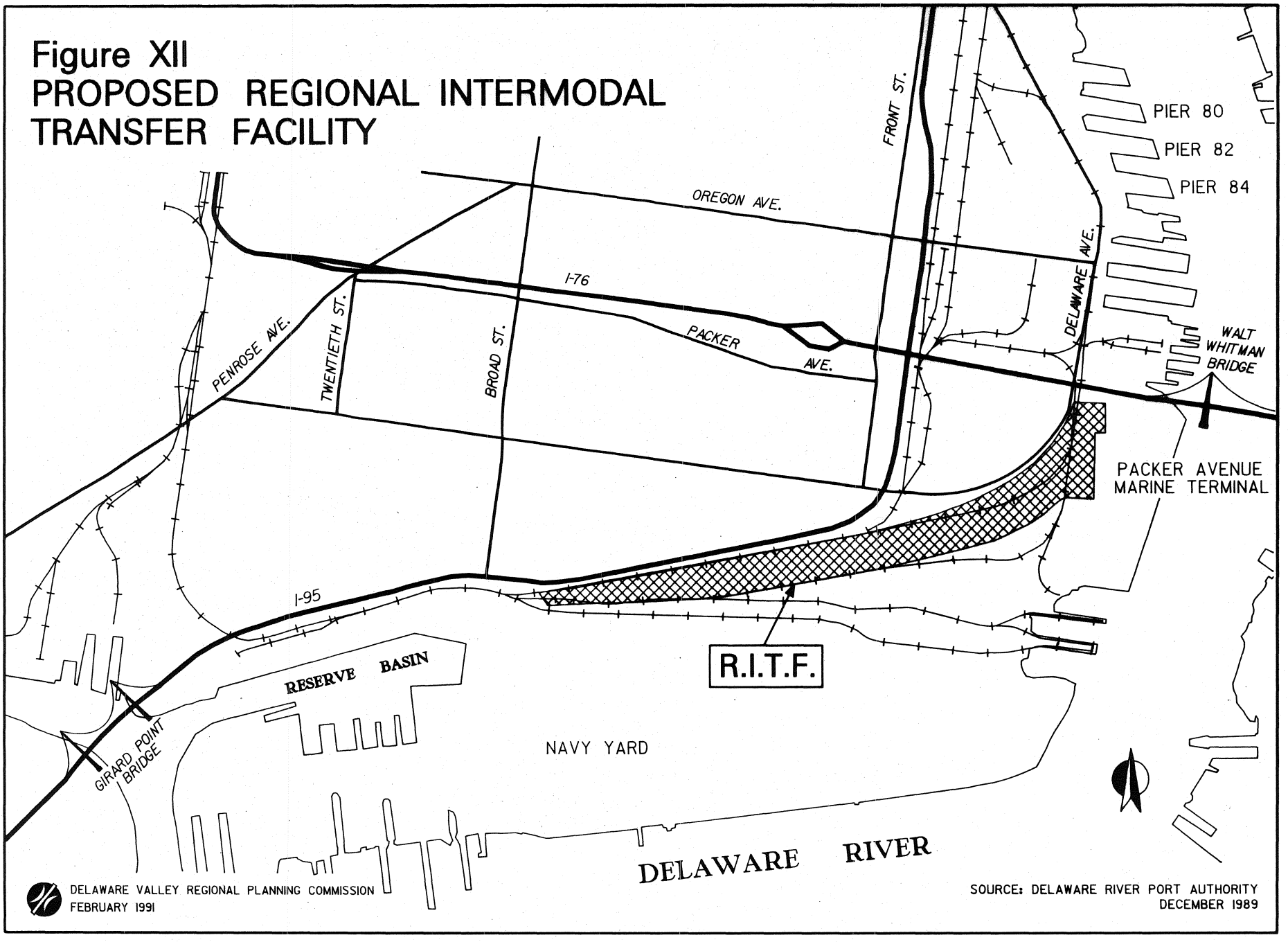
A Regional Intermodal Transfer Facility at the proposed location is projected to serve both containers moving in international trade and domestic intermodal traffic. Demand analysis for the RITF has been prepared by Booz-Allen & Hamilton consultants, plus supplemental analysis prepared by Vickerman-Zachary-Miller and Temple, Barker & Sloane, Inc.

The use of the facility by international container movements will primarily be a function of the degree to which inland markets are served via the Ports of the Delaware River, and the degree to which the Port can compete for the traffic from other North Atlantic Ports. For the domestic cargo market, the RITF will serve existing business, plus an incremental increase in intermodal traffic from diversion of cargo from other modes. The RITF must also successfully attract the domestic intermodal traffic now handled at Conrail's Morrisville Yard and CSX's Snyder Avenue Yard.

Baseline Demand Analysis

A baseline demand estimate prepared by Booz-Allen & Hamilton (BAH) using 1987 data indicated six market segments with potential demand for the RITF. These segments and the demand assumptions are as follows:

Figure XII
PROPOSED REGIONAL INTERMODAL TRANSFER FACILITY



1. International containers moving through Packer Avenue: 100 percent of containers now moving to or from targeted Midwest areas are assumed to use the RITF.

2. International containers moving through other PDR terminals: 50 percent of containers moving to or from targeted Midwest areas are assumed to use the RITF.

3. Diversion of international containers from other Ports: 10-20 percent of containers moving to or from targeted Midwest areas now moving through New York, Baltimore, or Hampton Roads.

4. Attraction of new international container line to the PDR: Having an RITF may attract a new container line to the PDR, which could bring 20-40 percent of its intermodal traffic moving to or from targeted Midwest areas.

5. Present intermodal domestic traffic: 20 percent of the domestic TOFC traffic would be attracted to the RITF.

6. Long haul domestic truck diversion: Certain cargoes of medium to high density and medium to low value are considered susceptible to diversion from truck traffic to intermodal carriers at the RITF.

The total baseline demand estimates prepared by Booz-Allen & Hamilton are presented in Table VI.

Supplemental Demand Analysis

The DRPA staff has considered these baseline demand estimates and then reviewed the assumptions. DRPA has projected a scenario whereby the Packer Avenue Marine Terminal is upgraded to a point where it will be able to receive up to four new container lines. Given the recently signed lease for the Packer Avenue facility between Holt Cargo Systems and the Philadelphia Regional Port Authority, it appears likely that container traffic at Packer Avenue will be increasing significantly over the estimates prepared in 1987.

The DRPA estimate also assumes that the RITF will be available to all regional rail services and thus will attract a larger share of the intermodal traffic now operating at Morrisville (Conrail) or Snyder Avenue (CSX), rather than just the 20% diversion predicted by the baseline demand analysis. Maintaining cooperative relationships with

the rail lines and competitive pricing schedules will assure that the rail lines consolidate their services at the RITF, rather than existing facilities. This estimate did not consider, however, potential traffic from Canadian Pacific, which was not yet foreseen at that time. DRPA's total supplemental demand estimates are also presented in Table VI.

Additional Supplemental Demand Analysis

DRPA has retained the consultant team of Vickerman-Zachary-Miller and Temple, Barker & Sloane to review both the preliminary demand analysis and the supplemental demand analysis to determine if the initial assumptions were correct and valid, and to determine if there are any additional markets which might be attracted to use the RITF.

This analysis found general agreement with the previous studies, but determined the overall potential market for the RITF to be even higher than previous estimates, due to additional markets analyzed and higher estimates in certain cases of the identified markets. Market segments and demand assumptions of this analysis are as follows:

1. International containers moving through the PDR: Generally agreed with previous analysis.

2. Increased intermodal traffic of international containers now moving through the PDR: Generally agreed with previous analysis.

3. Attraction of new container lines to the PDR: Established a broader possible range than previous studies, based on either the possibility that no new lines are attracted, or a more detailed analysis of the actual traffic brought by the two most likely carriers.

4. Asia - U.S. East Coast landbridge: This market was not previously considered, but interviews with seven carriers now involved in Asia - U.S. landbridge traffic indicates that two carriers are significantly interested in potentially using the RITF and the PDR as hub center. Potential traffic generated by these lines is added to the estimate.

5. Europe - U.S. West Coast landbridge: An analysis of carriers involved in this movement did not indicate any interest in the PDR.

6. Canadian diversion via Halifax: Two carriers which now serve the PDR may be induced to divert Canadian traffic through the PDR, particularly now that Canadian Pacific Rail will be servicing the RITF. The potential traffic generated by these two lines has also been added to the demand estimate.

7. Present intermodal domestic traffic: Assuming that there are no restrictions to handling domestic trailer traffic at the RITF and that the cost to the railroads to use the RITF is less than their own facilities, this analysis concludes that the RITF can attract an even larger share of this market than the previous studies indicated.

8. Longhaul domestic truck diversion: Generally agreed with previous analysis.

The total additional supplemental demand analysis is compared to both the supplemental demand analysis and the baseline demand analysis in Table VI. **The results of these various analyses range from an initial low baseline demand estimate of 606 loaded units per week to a high supplemental analysis of 3006 loaded units per week for the base year 1987. Applying the DRPA's projections through the year 2005, the weekly demand for the RITF ranges from a low of 1389 (low baseline) to a potential high estimate of over 4500 loaded units per week (high additional supplemental).**

TABLE VI

Demand Analysis for the RITF
Total Weekly Loaded Units, Combined Eastbound and Westbound
(1987 Base)

Market Segment		Estimate 1	Supplemental Estimate 2	Additional Supplemental Estimate 3
International Containers now moving through the PDR		154	154	123
Increased intermodal traffic of international container lines now calling at the PDR		79 - 159	79 - 159	71 - 141
New Container line induces to the PDR and RITF		24 - 48	158 - 222	0 - 350
Asia - U. S. East Coast landbridge		____	____	90 - 124
Europe - U. S. West Coast landbridge		____	____	____
Canadian traffic via Halifax		____	____	0 - 221
Present domestic intermodal rail traffic		321	1371	1850
Long-haul domestic truck diversion		28 - 197	28 - 197	28 - 197
TOTAL WEEKLY UNITS	**Low**	**606**	**1790**	**2162**
	High	**879**	**2103**	**3006**

Source: 1. Booz-Allen & Hamilton
2. DRPA
3. Temple Barker & Sloane

Delaware Valley Regional Planning Commission, January 1991

IV. SURVEY OF MOTOR CARRIERS

INTRODUCTION

A list of 21 trucking companies involved in drayage work within the PDR (excluding Wilmington) was compiled from the Philadelphia Regional Port Authority (PRPA), the Pennsylvania Motor Carriers Association, the Maritime Exchange and individual trucking companies. Wilmington was excluded because discussions with Port operators there indicate that few, if any, intermodal traffic now comes to the north. Each of these companies were sent a questionnaire (see Appendix A) concerning their operations and were interviewed in person or by phone. The purpose of this survey was to determine the number of containers transported between the PDR piers and the Conrail intermodal facility in Morrisville and the CSX intermodal facility in Philadelphia and the drayage costs of these movements. Respondents were also asked questions about their overall container movements, problems they have encountered at the marine and rail terminals and their opinions about the RITF (the opinions are summarized in Chapter V).

After all 21 companies were contacted, six were eliminated from the survey because they no longer work at the PDR or the companies were out of business, reducing the survey sample size to 15. Responses were received from 10 companies, resulting in a response rate of 67% with five firms not participating. The ten trucking companies which participated in the survey are believed to be a representative sample of trucking companies servicing the PDR. The remainder of this chapter summarizes the responses from the 10 companies.

CONTAINER MOVEMENTS

As Table VII shows, the survey respondents reported that they pick up or deliver approximately 15,000 containers/trailers annually at the PDR piers. This represents approximately 7% of all containers at the PDR (excluding Wilmington). The number of containers[1] handled by the individual survey respondents ranged from 90 to 4,648 with a median of 1,200 container movements per year. Five companies averaged 1,000 or more containers per year, representing 83% of all container moves but only 50% of all survey respondents.

[1] Most companies did not differentiate between containers or trailers, therefore this analysis will use "containers" to include both containers and trailers.

Approximately 13,000 (87%) containers are trucked directly to the consignee, leaving 13% (approximately 2,000) containers to be drayed to the Conrail or CSX rail facilities. These results match closely with information received from the railroads, which report approximately 900 intermodal containers at Conrail and approximately 1,100 containers at CSX. Of the 10 trucking companies, two do no local drayage work. Only four companies conducted 100 or more drays annually to the intermodal facilities, yet they represented 90% of all containers moved intermodally. Additionally, the five companies which handle 1,000 or more containers annually account for only 39% of the total drays. **This means that a greater percentage of the smaller companies' port work is devoted to drayage.**

The truckers reported that seventy-two percent (1,442) of the containers making intermodal connections are drayed to the CSX rail facility as compared to 28% (554) to the Conrail-Morrisville facility[2]. This distribution depends on the final destination of the containers and the fact that four marine terminals loaded 4,800 containers on-site onto Conrail tracks in 1990, thus eliminating the need to dray the containers to Morrisville (see Table VIII).

Four of the 10 respondents use only the CSX rail yard and two companies use both rail facilities. The annual number of containers per company drayed to CSX ranged from 90 to 676 with a median of 338; for Conrail, the range was 52 to 300 containers with a median of 60 containers.

DRAYAGE COSTS

The range of drayage costs varied moderately among the survey respondents. The greatest cost variations were between container-on-flat-car (COFC) and trailer-on-flat-car (TOFC) and to a lesser extent between Conrail and CSX. Table IX shows the average drayage costs between PDR piers (excluding Wilmington) and Conrail-Morrisville and CSX.

Although most trucking companies vary their charges based on the type of dray involved, some survey respondents did not break their costs down by pier or COFC vs. TOFC. Additionally, **most respondents stated they do not charge a substantial difference in drayage costs at Philadelphia piers vs. New Jersey piers. As table IX shows, the average difference in drayage costs between New Jersey and Philadelphia is negligible. Apparently bridge tolls are an insignificant factor in drayage costs.**

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[2] Although the total number of containers drayed to the rail facilities matches information supplied by the railroads, the breakdown of containers by rail company does not match. Conrail states 918 containers were drayed to Morrisville from the PDR in 1990. Apparently the motor carriers have underestimated their usage of Conrail's Morrisville facility.

TABLE VII

MOTOR CARRIERS SURVEY
Annual Container/Trailer Movements from the PDR

TOTAL Movements By Truck	TOTAL Rail Connections	TOTAL No Rail Connections	PERCENT Rail	PERCENT No Rail
15,034	1,996	13,038	13.3%	86.7%

Source: Delaware Valley Regional Planning Commission Survey of Motor Carriers, January 1991

Delaware Valley Regional Planning Commission, February 1991

TABLE VIII

MOTOR CARRIERS SURVEY
Annual Intermodal Container/Trailer Movements from the PDR

TOTAL RAIL CONNECTIONS: 1,996

NUMBER		PERCENT	
Conrail	**CSX**	**Conrail**	**CSX**
554	1,442	27.8%	72.2%

Source: Delaware Valley Regional Planning Commission Survey of Motor Carriers, January 1991

Delaware Valley Regional Planning Commission, February 1991

Drayage Costs at Philadelphia Piers

As Table IX shows, average drayage costs at Philadelphia piers ranged from $185 to $215 for a TOFC to Conrail and $200 to $315 for COFC to Conrail. A drayage move to the CSX facility from the Philadelphia piers ranged from $120 to $175 for TOFC and $150 to $275 for COFC. Overall, the average difference in drayage costs between Conrail and CSX was approximately $49.

The greatest difference in drayage costs occurs between TOFC and COFC which averages approximately $62 higher for COFC. This cost differential is due primarily to the time involved. A driver with a TOFC dray can proceed to a storage area where he can unhitch his trailer with container and leave the rail facility. However, a driver with a COFC dray must wait for the container to be lifted off his trailer before he can leave the rail facility or must leave the chassis and return later to pick it up thus incurring more time than a TOFC dray.

Drayage Costs at New Jersey Piers

Most survey respondents did not provide separate information on drayage costs at New Jersey piers. This is due to the fact that many companies use a range of costs which cover all Philadelphia and New Jersey piers. Additionally, only a few survey respondents service the New Jersey piers.

Based on the information received, average drayage costs at New Jersey piers to Conrail range from $150 to $205 for TOFC and $150 to $305 for COFC. Drayage costs to the CSX rail facility range from $129 to $165 for TOFC and $150 to $265 for COFC. **As with the Philadelphia piers, drayage costs for COFC are higher than TOFC, averaging $55 more. The average difference in drayage costs between NJ piers and the Conrail and CSX rail facilities is $26, lower than the $49 difference between the two rail ramps and the Philadelphia piers.** This difference is due to the lower drayage costs to the Conrail facility for the New Jersey marine terminals. Drayage costs to CSX from New Jersey is the same as from the Philadelphia terminals.

TABLE IX

MOTOR CARRIERS SURVEY
Average Drayage Costs at the PDR

	RANGE	AVERAGE
PHILADELPHIA PIERS		
Conrail - TOFC	$ 185 - $ 215	$ 200
Conrail - COFC	$ 200 - $ 315	$ 258
CSX - TOFC	$ 120 - $ 175	$ 148
CSX - COFC	$ 150 - $ 275	$ 213
NEW JERSEY PIERS		
Conrail - TOFC	$ 150 - $ 205	$ 178
Conrail - COFC	$ 150 - $ 305	$ 228
CSX - TOFC	$ 129 - $ 165	$ 147
CSX - COFC	$ 150 - $ 265	$ 208

Source: Delaware Valley Regional Planning Commission, Survey of Motor Carriers, January 1991

Delaware Valley Regional Planning Commission, February 1991

DRAYAGE COSTS STRUCTURE

Unlike most truck movements, short-haul drayage movements are based on time rather than mileage. For this reason, all of the survey respondents charge a flat fee to dray a container. This flat fee is based on competition, time, and number of moves, rather than mileage.

Most motor carriers charge a flat fee which allows a limited number of hours to load and unload the container plus an additional charge for drays over the allowable time. The additional charges range from $30 to $35 an hour. Since the flat fee is based on the typical amount of time a driver spends at a marine terminal and rail yard, the extra charges are only incurred if unusual delays occur at the terminals. These charges are passed on to the shipper.

Motor carriers do adjust their single container rates for steady customers and multiple moves. However, these discounts are negotiated directly with the shipper and could vary with each customer. Only one survey respondent was willing to state his discount for multiple moves: $25 per container.

Drayage costs also vary with competition and economic conditions. As noted earlier, only 39% of all drayage movements were completed by the motor carriers who handle 1,000 or more container movements annually. The drayage rates of these companies are higher than their smaller competitors. **It therefore appears that the smaller motor carriers (in terms of total container moves) are more willing to keep drayage costs low to attract drayage work.**

Since the motor carrier industry is labor-intensive and drivers are paid on an hourly basis, some of the larger motor carriers feel that the time delays at the marine and rail terminals limit the attractiveness of drayage work. Some of these companies make little profit on drayage work and provide drayage moves only as a service to their steady customers who may need sporadic drays to prevent them from hiring other motor carriers.

Factors Influencing Drayage Costs

There are several factors which the motor carriers have little control over that influence drayage costs. All of the carriers agreed that labor costs accounted for the largest percentage of drayage costs, ranging from 44% to 60% of total costs. Most also felt that insurance costs were the second highest factor which influence drayage costs. Other factors include fuel, tolls and equipment problems. Rising fuel costs,

due to the Middle East crisis, have forced motor carriers to charge their customers fuel surcharges.

Most of the motor carriers surveyed use independent owner-operators as opposed to organized union teamsters. The teamster drivers are paid on an hourly basis as opposed to owner-operators who can accept flat fees. **The teamster motor carriers stated that they do little or no drayage work at the PDR piers, because the time delays at the piers prevent the teamster operations from offering drayage costs competitive with owner-operator motor carriers.**

Tolls were mentioned as another factor which influence drayage costs, although this did not appear to make a significant difference in drayage charges between New Jersey and Philadelphia piers. Most motor carriers reimburse their owner-operators for bridge tolls. One-way tolls on the four DRPA bridges (Betsy Ross, Ben Franklin, Walt Whitman, Commodore Barry) are $6.00 for a five-axle truck (cab plus chassis) and $3.60 for a bobtail (cab without chassis). Truckers can receive a 10% discount on DRPA tolls if they purchase a book of 25 tickets.

One-way tolls on the two Bridge Commission bridges (Burlington-Bristol and Tacony-Palmyra) are $4.50 for a five-axle truck and $2.00 for a bobtail. No discount tolls are available on these bridges.

A dray between the PDR piers and the Conrail-Morrisville and CSX-Philadelphia rail facilities does not require using the PA or NJ Turnpikes. However, one survey respondent stated it was typical for motor carriers not to reimburse owner-operators for turnpike tolls since the drivers choose their own routes. The Philadelphia Regional Port Authority recently completed a study of turnpike tolls and found that they were not a significant factor in determining trucking costs to the PDR.

All of the motor carriers who conduct business at the PDR cited long waits at marine terminals to load and unload their cargo as a severe problem. Since the motor carrier industry is labor-intensive and the costs of short hauls are based on time rather than mileage, these long delays may be the reason drayage costs at the PDR are high.

Most carriers claim they have a minimum two hour wait to load and unload cargo; others claim three to four hours depending upon the pier and time of day. Since the delays are long, most owner-operators do not like to do drayage work.

Drivers attribute these delays in part, to a lack of computerization at the terminals. When drivers check-in at the gate their paperwork must be processed before they can

pick-up or drop-off their container. Drivers have complained of incomplete paperwork or missing containers which leads to further delays. Three of the motor carriers surveyed also do drayage work at the New York and Baltimore ports which are computerized. These ports have a much higher volume of traffic, including containers, yet the turnaround time at each port is one to two hours.

The motor carriers expressed similar concerns with the operation of rail facilities. The few that use both the Conrail-Morrisville and CSX yards prefer CSX for several reasons. First, Conrail-Morrisville is one hour from the PDR as compared to approximately 20 minutes travel time to CSX. Secondly, Conrail requires the driver to leave the chassis for COFC drays which takes a minimum of 24 hours to get back. The operational system at Conrail-Morrisville thus prevents a driver from making two trips in one day. Although the motor carriers felt CSX was more efficient and faster, they all felt the turnaround time at both rail years could be improved.

SUMMARY

In summary, the survey of motor carriers found approximately 13% of all container traffic at the PDR handled by these carriers makes intermodal connections at the Conrail-Morrisville facility or Philadelphia's CSX rail yard. The range of drayage costs varied with the type of dray involved. Overall, a COFC dray costs approximately $60 more than a TOFC dray. Additionally, a dray to Conrail is approximately $49 more expensive than a dray to CSX from the Philadelphia piers and $26 more expensive from the New Jersey piers. The overall difference between a dray from the Philadelphia piers as compared to the New Jersey piers was approximately $13.

Drayage costs, unlike other truck trip costs, are based on time rather than mileage. All of the motor carriers stated the drayage costs could be reduced if the turnaround time at the marine terminals and rail yards were reduced. All of the motor carriers felt this problem must be eliminated to increase the competitiveness of the PDR. The physical configuration of the proposed RITF will be expected to reduce turnaround times and drayage costs. It is also recommended that an electronic information exchange system be established to speed the flow and processing of documentation, both at the RITF and between the various marine terminals in the Port.

V. INTERVIEWS WITH PORT-RELATED GROUPS

INTRODUCTION

During the course of this study interviews were conducted with various individuals representing groups who have an interest in and are knowledgeable of the drayage business. These individuals were asked their opinion of the RITF; how it would impact the PDR, its design and operations. The individuals surveyed represent marine terminals, rail facilities, motor carriers and port-related associations.

MARINE TERMINAL OPERATORS

Public and private operators of the major marine terminals which handle container traffic were interviewed to obtain their perspective on the RITF and port operations in general.

Most of the operators foresee an increase in container traffic within the near future. As evidence of this, one operator recently took delivery of a second container crane. Additionally, several shipping lines have increased their business at the PDR and one shipping line has expressed interest in an on-site rail spur in anticipation of an increase in intermodal business.

Those marine operators with on-site rail connections do not see the RITF as helping their operations, particularly if Conrail discontinues their on-site service in favor of the RITF. These operators view the RITF as competition although all stated that they doubted Conrail would discontinue on-site service. Those with on-site rail feel they would lose the control they currently have over rail connections if forced to use the RITF. At some facilities, Conrail contracts with the operators for rail loadings and actually pays a fee per container which would be lost if the on-site rail service was discontinued. **Current on-site service provides same day ship-to-train departure with second morning delivery to mid-west destinations. The RITF would have to provide comparable service, or better, to compete with on-site operations.**

Most marine operators felt the RITF should be operated by an independent company rather than the DRPA. One operator claimed the steamship lines resent public

authorities telling them what to do and all felt a private company would be easier to remove if problems arose rather than a public agency.

All marine terminal operators felt the type of operation at the RITF was crucial to its success. For example, the RITF should have computerized check-in and separate gates for containers leading to a turnaround time of as little as 30 minutes. The operators also felt DRPA should subsidize drayage costs and the New Jersey operators felt bridge tolls should be abated for trucks using the RITF which are carrying containers from the New Jersey piers.

The marine operators felt that although the RITF had the potential to improve the competitiveness of the PDR, it would not singlehandedly boost the port's position. The operators stressed that proper operation of the RITF is critical to its success as well as locating it closest to those terminals which handle the largest volume of containers. Additionally, one operator mentioned the need to eliminate congestion on roads leading to and from the piers and the bridges during the morning and evening peak hours.

Additionally, all of the marine operators felt that double-stack capability combined with the RITF would make the PDR more attractive. One operator, however, stated that it may be less expensive to double-stack containers by train into New York and then truck them to Philadelphia rather than diverting the train to Philadelphia.

CONRAIL

Although Conrail recognizes the need for the RITF it does not feel it will necessarily attract more container traffic to the PDR. Conrail feels the primary benefit of the RITF will be to consolidate current operations. The current system is inefficient since containers are drawn from multiple marine terminals.

Conrail believes that the Delaware River Port market is now regional rather than national. Approximately 80% of the PDR cargo is trucked to local markets (Harrisburg & Scranton for example), 10% is trucked to other markets along the East Coast and only 10% of the cargo actually make a rail connection once leaving a ship.

Conrail does not see this regional trend changing and feels it is therefore unlikely that the PDR can capture New York container traffic. Since New York is the largest consumer market in the United States, shippers must have a presence there. Therefore, it is unlikely that shippers will split their business between New York and Philadelphia. Additionally, Conrail stated that the PDR's physical location requires

an extra half-day trip through the Delaware River which costs the shipper more money than going to a New York port. Conrail feels the PDR market should be the smaller shipping lines from South America and Africa rather than Europe. European traffic generally is more attracted to the New York market. Conrail did not discuss the possibility of Canadian traffic diverted to the PDR due to the new presence of Canadian Pacific Rail.

If the RITF is to be successful, Conrail feels it must be a facility that can be built quickly and one that is small to keep debt service low. The design of the RITF should allow easy expansion of the facility if it becomes successful. Additionally, better cooperation between labor and government will be necessary; it was suggested that labor relations be fully negotiated and contracts in place before the RITF is built.

If the RITF is built, Conrail will continue operations at Morrisville because it handles other cargo in addition to that from the PDR. Conrail hopes the RITF will enable them to concentrate container cargo from all marine terminals at the RITF rather than collecting the containers at individual terminals, as they do now. Conrail claims rates would be adjusted to make the RITF work by concentrating on differential rail fees to attract containers to the new facility. In addition to the PDR containers now drayed to Morrisville, Conrail has estimated the number of domestic trailers which could be diverted to the RITF once it is operational. Conrails' estimate of the annual domestic traffic that is divertible from Morrisville to the RITF is as follows:

- Domestic trailers - 13,600 export
  4,000 import

- Reefer trailers - 2,400 export
  3,500 import

Conrail feels the RITF must offer shippers highly efficient and frequent service if it is to be successful. For example, shippers will be expecting their cargo to arrive in Chicago on the second morning after arriving at the port. This means the cargo must be loaded onto the rail the evening of port arrival. Ideally, the RITF would be able to provide this level of service for all three railroads simultaneously. The design of the RITF must also eliminate current queues at the gates which seriously delay turnaround time.

Although the RITF should be designed to handle TOFC and COFC, Conrail feels trailer service may not exist 10 years from now. Shippers prefer containers because they are moved on equipment that provides a better ride thus reducing damage to cargo. Conrail does not believe roadrailer (trucks that ride on rails) moves will be demanded because the equipment necessary is extremely costly. Conrail foresees no other new technology in the near future which might impact the design of the RITF.

MOTOR CARRIERS

The motor carriers seemed evenly divided on whether or not the Port would benefit from a RITF. Those who supported the RITF felt it would enable the Port to compete more effectively with the ports in Baltimore and New York. They felt the RITF would enable the PDR to capture container business from competing ports. These motor carriers also agreed that the RITF would only work if the problems encountered at the marine terminals such as long waits at the gates and labor disputes were resolved.

Those who do not favor the RITF feel there is no demand for the facility. Many expressed the opinion that marine terminals with on-site rail had sufficient capacity to handle intermodal containers. These motor carriers did not feel a RITF would draw container traffic from competing ports. These carriers felt shippers have been given little incentive to call on Philadelphia and that other ports more aggressively sought port contracts. These companies felt the money which would be spent on the RITF would be better spent on existing facilities, such as improving the efficiency of marine terminals. The motor carriers also believe New York customers would not leave New York and that the labor disputes at the PDR piers discourage new customers.

PORT-RELATED ASSOCIATIONS

The Philadelphia Regional Port Authority (PRPA) and the Ports of Philadelphia Maritime Exchange were interviewed to obtain their views towards the RITF.

The PRPA feels approximately 75% of the RITF traffic will be domestic. No substantial increase in container traffic is expected at the PDR since the East Coast terminals are now over-capacity for containerized cargo. However, the RITF may have the potential to capture Canadian traffic if rates and service are competitive with New York. New York charges high assessment fees, if these fees can be avoided by going to the PDR, shippers will do so. However, there is always the possibility that New York will modify these fees if it loses traffic to the Delaware River Ports.

The RITF could attract containers from the West Coast, provided that double-stack capability was in place. However, the PRPA noted that if the clearance problem was resolved, New York, rather than Philadelphia may be the benefactor.

It is the belief of PRPA that DRPA must subsidize drayage costs. If they do not, the RITF will become an extension of the Packer Avenue Marine Terminal. Additionally, DRPA must remove bridge tolls to and from the RITF. However, the problem arises as to whether or not the toll abatement is granted to all truckers using the RITF or does it apply only to those making an intermodal connection.

The Philadelphia Maritime Exchange supports unification of the Port and development of an intermodal facility and prefers that DRPA operate the facility. The Maritime Exchange feels Turnpike toll abatements will stimulate exports at the Port. The Maritime Exchange has not addressed the issue of toll abatements or subsidies on the Delaware River bridges. **The Maritime Exchange also supports equal access and equal drayage costs for all to the RITF.**

SUMMARY

The marine terminal operators and half of the motor carriers felt the RITF would generate a substantial increase in container traffic to the PDR. Those who do not foresee an increase in container traffic feel the PDR market is too regional in nature and that shippers require a presence in New York because it has immediate access to the largest group of consumers. Many of these individuals feel shippers will not split their business between New York and Philadelphia. However, the unknown factor here is Canadian Pacific (CP). The PDR could see an increase in traffic if cargo from Canada is diverted to the PDR.

Although some of those interviewed felt the RITF would improve the ability of the PDR to compete with other East Coast ports, they did not feel it was the only solution. Double-stack capability, more aggressive marketing of the Port and an end to labor disputes were cited as other components which must be in place before the PDR can compete more effectively.

Most of those interviewed felt the RITF should be operated by an independent entity. Additionally, if the RITF is to be successful, it must have computerized check-in to avoid delays at the gates, separate gates for containers and a turnaround time of 30 minutes or less. Shippers will expect their cargo to arrive at mid-west destinations by the second morning after arriving at the Port. This means the containers must be loaded onto the rail car by the evening of port arrival.

While the RITF may not directly increase traffic at the PDR, it could make the Port more competitive by improving the efficiency of port operations.

VI. CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The Ports of the Delaware River should be able to expand its market and standing among the competing ports of the East Coast, provided that certain necessary capital improvements are made and that existing administrative arrangements are improved. In particular, the Port could benefit significantly by the creation of a modern Regional Intermodal Transfer Facility, but these benefits will only be realized if the facility is properly run and relations among the Port Operating Authorities, the railroads and the labor unions are working cooperatively for the mutual benefit of the Port.

This chapter presents the conclusions and recommendations of the study, following research into the conditions of the Port, a survey of regional motor carriers and interviews with involved Port interests. For the RITF, recommendations are presented on the location and operation of the facility, including the issues of truck and railroad access, circulation and construction phasing. Expected drayage costs to the proposed RITF are presented based on an analysis of the factors which influence those costs. In order to further lower drayage costs throughout the Port and to equalize drayage costs among the different marine terminals, five alternative subsidy programs are presented for consideration with an analysis of the relative advantages and disadvantages of each.

RITF LOCATION AND OPERATION

The Ports of the Delaware River need a modern, convenient and efficiently run Regional Intermodal Transfer Facility in order to provide lower costs and better service and to attract additional business to the Port. The trend towards increased intermodal shipment of cargo is already clear, having doubled nationwide over the past decade. In much the same way that containerization brought about a "revolution" in the shipping industry, intermodalism, particularly in concert with double-stack trains, has the potential to carry that revolution forward.

Ports throughout the country have recognized these trends by clearing track routes to permit double-stack trains and by building new centralized intermodal facilities. In order to maintain its position and compete with these ports to increase its shipping volumes, the PDR will need this new RITF.

Location

As a truly regional facility, the RITF must be centrally located within the Port with easy access from all container handling terminals. Ideally, an RITF would be sited directly on a dock to permit one-step ship to train transfers; but at the PDR it must be sited to accommodate a number of different container terminals. **The proposed location adjacent to the Packer Avenue Marine Terminal meets these objectives by being centrally located within the Port area, as close to the dock as possible, but with excellent highway access, and adjacent to a steady supply of containerized cargo.**

Railroad Access

The RITF must also provide direct and convenient access for the three rail lines that provide intermodal service. **The Ports of the Delaware River are fortunate to be served by three major rail lines and the proposed location of the RITF will be at the convergence of these three lines.** For Canadian Pacific Rail, the RITF will be the new designated point of transfer within the Port and can be expected to be heavily used. **The challenge for DRPA will be to attract both Conrail and CSX away from their existing intermodal yards and to the RITF by creating a more modern and efficient facility.**

Truck Access

The Delaware Valley Regional Planning Commission has recently completed a study of tractor-trailer access in the vicinity of the proposed RITF, including a survey of 130 truck drivers at the Packer Avenue Marine Terminal (PAMT). The results of this survey are directly applicable to the planning, design and operation of the RITF.

Based on the driver's responses, most trucks were making local trips within the Philadelphia area. Forty-five percent of the drivers arrived at the PAMT via westbound I-76 and 32% exited via eastbound I-76. An additional 23% arrived via southbound I-95 and 29% exited via northbound I-95. The high percentage of drivers arriving at the PAMT via westbound I-76 indicates a large volume of container traffic travelling over the Walt Whitman Bridge from New Jersey. Additionally, the heavy use of southbound I-95 results in part from the fact that many trucking companies

are located north of the PAMT in Northeast Philadelphia and southern Bucks County.

Most of the drivers cited no major problems with access to and from the PAMT. **The primary concern noted was highway congestion, particularly during the morning and evening peak periods. Congestion on the Walt Whitman Bridge and delays at the toll booths were also mentioned by several drivers. Other comments included the lack of a second access road to the PAMT other than Delaware Avenue and a lack of directional signs to the PAMT.**

Phasing

The various market studies undertaken in the past few years clearly indicate that there is an existing demand within the Port for the RITF and that, if constructed, additional traffic can be attracted here. An unresolved question, however, is exactly how deep that demand will be. Demand estimates completed to date reflect a market ranging from a low of 606 loaded units per week to a high of 3006 loaded units per week for the base year 1987. Projections through the year 2005 both increase these figures and widen the possible range. Recognizing the uncertainty inherent in these projections and the dynamic nature of the port industry, it is recommended that the RITF be constructed in phases and designed in such a way to accommodate growth when needed. **Thus, while the recent proposal to construct a small, privately-financed intermodal facility near Packer Avenue may initially seem an attractive prospect, this facility should only proceed if it can later be integrated into the larger yard. If DRPA proceeds with their proposal at Packer Avenue, it should also follow a phased approach.**

Circulation

The primary operational goal of the RITF is to load and unload containers and trailers onto rail cars as fast and inexpensively as possible. This can only be achieved by maximizing efficiency in the circulation and processing of information and the circulation and processing of the containers and trailers through the yard. The RITF can have a tremendous advantage over the two existing intermodal facilities now operating in the Port if it can avoid the gate and loading delays now found at those facilities. **It is the time delays at the intermodal facility itself, rather than the transportation distance, which is primarily responsible for the high drayage costs within the PDR. By reducing turnaround time at the facility through the use of electronic information exchange, sufficient and efficient gate lanes, and quick loading and unloading systems, drayage costs can be significantly reduced. Computerized information exchange between the various marine terminals and the RITF will also speed transfer time and reduce drayage costs.**

Operations

In addition to the processing of containers and trailers through the facility, the RITF's fundamental purpose is the throughput of trains. As difficult as it is for a single rail line to schedule its trains for runs throughout the country, the DRPA must face the challenge of providing access and coordinating schedules for three competing rail lines from a single facility. Coordination, cooperation and compromise will all be necessary. **Therefore, no single railroad should have primary operating authority for the facility. Rather, an independent operator - either DRPA or its subcontractor - should run the facility and work closely with all three rail lines.**

Double-Stack

One of the most important determinants of the ultimate success of the RITF is neither the site design nor the operational system of the facility, but the rail network to which the facility is connected and the ability to bring double-stack container trains into and out of the facility. **Based on the explosive growth of the double-stack network across the country in just the past five years, it is clear that any intermodal facility will not be fully successful unless it can accommodate double-stack rail cars.**

DRAYAGE COSTS TO THE RITF

Current Drayage Costs

The results of the trucker's survey and interviews with those involved in drayage within the Ports of the Delaware River clearly indicate that the single most important factor which influences drayage costs is time. Drayage costs from container terminals to intermodal rail terminals differs from typical trucking charges, in that drayage costs are typically based on time, rather than mileage charges. Therefore, in order to reduce drayage costs within the PDR, it will be necessary to reduce the total time involved in the transaction.

Table VIII reflects current drayage costs from the Philadelphia and New Jersey piers to the Conrail intermodal facility in Morrisville and the CSX Philadelphia yard. Neither the range of costs or the average cost differs significantly between the Philadelphia piers and the New Jersey piers for comparable drays. Nor does drayage cost vary significantly among the various marine terminals on each side of the river. Instead, trucking companies were more likely to quote a single price for all Philadelphia or all New Jersey piers, with price differences based on whether the load was COFC or TOFC and where it was headed - Morrisville or CSX.

Typically, TOFC drays were approximately $65 cheaper than COFC drays, to either Morrisville or CSX from either Philadelphia or New Jersey. Drayage to the CSX Philadelphia yard was cheaper than comparable loads to Morrisville from either Philadelphia or New Jersey.

Interviews with truckers and intermodal managers indicate a preference for the CSX facility, which provides a quicker turnaround time for loading or unloading, which is reflected by the lower drayage costs. This quicker turnaround at the gate and at the yard is the main factor which yields the lower costs, although the shorter mileage to CSX as compared to Morrisville is also a factor.

TOFC drayage charges are lower than COFC charges because for TOFC loads truckers are able to deliver, unhitch and leave the trailer chassis for shipment. For COFC loads, the trucker must either wait for a crane to pick the container off the chassis so that they can leave or, more typically, unhitch the chassis and leave it at the yard. After the container is picked off and loaded on the train the trucker will return, either later that day or the next, to retrieve the chassis.

The results of the survey, interviews and analysis yields several conclusions regarding drayage operations in the Ports of the Delaware River:

- **The Closer the Better: The nearer that an intermodal facility is to a marine terminal, the less time it will generally take to dray a load to or from that facility, which will be reflected in lower drayage costs.**

- **Time is Money: Drayage charges within the Port are based on the time it takes to deliver a load, rather than the mileage the load is transported. Reducing the time of that delivery on the highway or bridges, at the entrance gate, during inspection or while transferring to rail cars will reduce drayage charges.**

- **Tolls are Money, but not Much: The difference in drayage costs between Philadelphia and New Jersey is negligible, indicating that time delays crossing the bridges or the tolls paid on those bridges are not significant factors. It may be possible that less congestion in New Jersey speeds travel time, and thus accommodates for the toll charges.**

- **Pay less for more: The drayage costs indicated here generally reflect charges for an individual container or trailer. Most trucking companies did note, however, that volume discounts would be available for multiple loads or for a guaranteed amount of ongoing volume. While each contract is negotiated independently, volume discounts typically average about $25 per box.**

Projected Drayage Costs

Given the picture of current drayage operations and costs within the Ports of the Delaware River, projections can be made as to the expected drayage costs to serve the proposed RITF at the Packer Avenue site. While actual costs can not be determined until the facility is constructed and operational, certain assumptions about the design, market demand and circulation systems of the facility can be made. If these assumptions hold true, then total drayage costs to the RITF should be significantly cheaper than existing drayage costs in the Port.

The assumptions for drayage costs to the RITF are as follows:

1. Less travel time to reach the facility: The RITF would be closer to all of the PDR container terminals than the Morrisville facility, with easy bridge and highway access. The proposed location is very close to the CSX intermodal facility, which should be considered as the initial base cost.

Base Cost = $ 150 TOFC ; $ 220 COFC

2. Improved gate operations and turnaround time: Truckers report gate delays and turnaround times of approximately two hours at the Morrisville yard and one hour at the CSX yard. With expanded gate lanes, electronic information transfer, improved handling capability and expanded storage area, the RITF should be able to virtually eliminate these delays and provide turnaround within 15-20 minutes, as the Los Angeles-Long Beach facility now provides. Reducing gate delays and turnaround time will reduce the base cost by approximately one-third.

Improved turnaround time = $ 100 TOFC ; $ 150 COFC

3. Improved COFC handling: There is now a wide variation in costs between TOFC and COFC drays because of the different handling systems for each and the time delays at the intermodal yard. COFC loads must either wait for a crane to unload the container or must leave the chassis and return later to pick it up. The RITF would have the capability for direct loading and unloading of container loads from the truck to the train via rubber-tired gantry cranes spanning the truck lanes and the rail tracks. This system will reduce the drayage surcharge for COFC loads at the intermodal yard. However, COFC loads will still be more expensive due to the longer time involved for loading or unloading at the marine terminal.

Improved COFC handling = $ 100 TOFC ; $125 COFC

4. Greater volumes will reduce costs: Market demand scenarios for the RITF indicate a marked increase in intermodal traffic and drayage movements associated with the new facility. While these market analyses vary in range, all agree that the increased traffic will be significant, and possibly spectacular. Almost all trucking companies involved in drayage movements in the Port have indicated that if there were larger and consistent volumes of drayage movements the overall costs could be reduced. While actual volume discounts would be negotiated individually with each shipper, a conservative estimate of $25 per load reduction is appropriate.

Volume discount = $75 TOFC ; $ 100 COFC

These projected costs for drayage to the RITF - $75 for TOFC loads, $100 for COFC loads - represents a total expected trucking time of two to three hours round trip, from any container facility in the Port, including a discount for volume traffic. These costs appear to be reasonable, assuming the final design and operation of the RITF is as predicted.

ALTERNATIVE APPROACHES TO LOWER DRAYAGE COSTS

Introduction

At a projected drayage cost of $75 for TOFC loads and $100 for COFC loads, drayage costs to the RITF would be approximately half of what they now are in the Ports of the Delaware River. This reduction is reasonable based on the nature of the design, operation and volume of the traffic expected from the RITF and resultant market forces. No additional support from the DRPA would be needed to achieve this reduction in drayage costs, other than the investment in construction and the continued operation of the RITF in an efficient manner.

Drayage at this rate would bring the drayage component of total shipping costs at the PDR in line with the Port of New York, where off-site drayage charges average $85. However, in this market driven scenario, the PDR would still not be competitive with Baltimore, Norfolk or the New York facilities which are on-dock, where drayage costs have been virtually eliminated.

Nor would a market driven scenario equalize the drayage costs within the Port itself. While no significant drayage cost differences are expected between the New Jersey and Philadelphia marine terminals, all facilities will face a disadvantage when compared to the Packer Avenue Marine Terminal. As envisioned, the RITF will be immediately adjacent to Packer Avenue. While the proposed design does not permit direct ship to train loading, it would only require the transfer of containers perhaps several hundred yards from the Packer Avenue dock to the rail loading ramp. This transfer would likely pass through a separate "express" gate, avoiding any queuing at the regular entrance gate. This minimal dray might be expected to cost on the order of $20-$25 per box.

If the DRPA is seeking to equalize drayage costs within the Port itself, it must reduce drayage costs from all other marine terminals to Packer Avenue's expected $25 cost. However, if it seeks to make the PDR truly competitive with the other North Atlantic ports, it must reduce drayage costs from all marine terminals to $0. This may be a larger objective and larger financial commitment than the DRPA is prepared to make at this time.

Assuming the first objective - to equalize drayage costs within the Port - there are five different approaches which the DRPA might consider. Each approach presents certain advantages and disadvantages, as discussed below, yet each could be effective in meeting DRPA's objective. Certain approaches could also be combined in joint configurations.

Alternative No. 1: DRPA Contract with Trucking Company

This approach would be similar to the program that was operated for several years in the Port of New York, at first by the Port Authority of New York and New Jersey, then by New York State and the City of New York. In this program, a request for proposals was issued to trucking companies soliciting cost estimates to provide drayage services from port facilities in New York City to the intermodal rail yard in New Jersey. Based on the proposals submitted, several trucking companies were selected and contracted with to provide all drayage service between these locations at an agreed-upon contract price. Shippers and terminal operators at these facilities were notified of the approved trucking companies and the maximum drayage price they should pay. The base price the truckers could charge was the equivalent price of drayage from a New Jersey marine terminal to the intermodal yard. Upon completing the dray, the trucking company would submit documentation of proof to the Port Authority or the City and be reimbursed for the difference between the base cost charged to the shipper and the contracted drayage cost. The subsidy paid to the truckers by the Port Authority represented the equalization of drayage costs between the New York marine terminals and the New Jersey terminals. Contracts with the trucking companies were renegotiated on a yearly basis to determine the contract price, which varied each year depending on expected volume and trucking costs. For the PDR, the DRPA would pay the trucking companies the difference between the base price (i.e. Packer Avenue - $25) and the market cost ($75 - $ 100).

Analysis: This approach provides a very high degree of control, since only a few trucking companies are providing all drayage services and all costs are known and contracted for up front. With a designated number of trucking companies providing all drayage services, service and price will be more certain.

The disadvantage of this approach is that it eliminates competition among trucking companies once the RFP process is completed, and denies the non-contracted trucking companies access to drayage work. This approach would also place the DRPA in a position of selecting one or more trucking companies over the dozens in the Port area and entering into and enforcing contracts.

Alternative No. 2: DRPA Subsidy Available to Shippers

Utilizing this approach, DRPA would provide a drayage subsidy available to individual shippers or shipping lines, rather than trucking companies. Similar in form

to the drayage subsidy program developed in Baltimore, this approach would permit and encourage each individual shipper or shipping line to find the most competitive drayage rate available within the Port and to contract directly with the trucking firm of their choice for drayage services. Based on our analysis, the market rate for drayage to the new RITF should be in the range of $75 - $100. DRPA would then provide a subsidy payment to the individual shipper or shipping line, upon receipt of documentation of proof of drayage and intermodal rail connection. The subsidy payment would reflect the difference between the market price paid and the base price (i.e. Packer Avenue - $25). Alternatively, the subsidy available to shippers could be a fixed fee (i.e. $50 per box). Payments would be made on either a weekly or monthly basis.

Analysis: This approach presents some advantages over Alternative No. 1, in that it permits full and open competition among trucking companies and would not place the DRPA in a position of selecting only a few trucking companies to do all drayage work at the exclusion of all others. DRPA would also not have to be in the position of administering any contracts for services, but could make the subsidy program available to any shipper utilizing the intermodal facility. In this way the subsidy program would be a more visible attraction to shippers and steamship lines and could be administered and promoted by DRPA through its existing port promotion programs.

The disadvantage of this approach is that DRPA would not be in a position to control the drayage rates charged by truckers, which would be negotiated directly with shippers. This approach would also require a greater administrative burden, as the DRPA would potentially be dealing with a dozen or more shipping lines and many more individual shippers. The time and paperwork to process subsidy payments to each of these would be time-consuming. It may also be difficult to accurately document the actual drayage charges paid, therefore a flat rate would be recommended.

Alternative No. 3: DRPA Regulates Drayage Rates

Under this scenario, DRPA would equalize and control drayage costs within the Port by defining and publishing the maximum drayage rate which could be charged for any movement within the Port. These rates, set following public hearings and review, would be distributed to all trucking companies involved in drayage services in the Port and all shippers and steamship lines which visit the Port. In much the same way that taxicab rates are regulated, drayage rates from anywhere within the Port would be set at the base rate (i.e. Packer Avenue equivalent = $25). The DRPA would then provide subsidy payments (up to a maximum defined rate) to any trucking

company which completes a dray and provides documentation of that movement. Shippers or shipping lines would be free to select any trucking company they choose, but all truckers would charge the shippers the same base fee for drayage. Subsidies paid to truckers would either be a flat fee within the Port, based on published rates, or could be fine-tuned from each marine terminal.

Analysis: This alternative provides the predictability of Alternative No. 1, in that all drayage costs to the shipper are clearly defined and known, while avoiding the problem of limiting truckers accessibility to drayage work. Any trucking company would be free to participate in the subsidy program, provided that they comply with the published drayage rates. Shippers would also benefit from a low initial drayage charge.

The difficulty of this approach lies in DRPA's ability to regulate and enforce drayage rates throughout the Port. Such an action goes beyond DRPA's current activities and may require additional enabling legislation. This approach will also be difficult to administer, as DRPA would be faced with regulating a large number of trucking firms. It may also be difficult to determine compliance with the published drayage rates.

Alternative No. 4: Subsidy Limited to Long Distance Moves Only

A number of different studies have analyzed the minimum distance which a container or trailer must be carried by rail before it is competitive in terms of cost or time with overland transport by truck. The trade-off distance judged by these studies ranges from 500 to 1000 miles. Truckers are very sensitive to this issue, as they view rail service as competition which reduces trucking business.

While the DRPA will seek to attract the maximum volume of business to the RITF in order for it to be successful, they may also wish to respond to the fears of the trucking industry in the Port. If so, a drayage subsidy program could be established which provides the subsidies only for those intermodal loads which travel over a certain minimum distance. In this way, the drayage subsidy would not be provided to those shorter distance hauls (i.e. those under 750 miles) which are now serviced by trucks. Instead, the subsidy would only be available for the longer distance movements which would already be likely to move by rail.

If selected, this approach should probably be applied in combination with Alternative No. 2, where the subsidy is paid to the shipper or the shipping line upon receipt of documentation. The trucking company providing drayage to the intermodal facility would have no way of knowing the final destination.

Analysis: This approach would help the DRPA to assuage the concern of the trucking industry that the RITF poses a threat to their business. While a strong argument could be made that the RITF will increase total business in the Port and provide more work for truckers - both drayage and short haul - some still believe that an increase in rail will translate into a decrease in trucking. This approach would also require a smaller funding commitment for the DRPA relative to the other approaches, as only a percentage of drayage moves would be eligible for the subsidy.

The disadvantages of this approach are that by limiting the subsidy to only certain movements, it would decrease the attractiveness of the program. It will also be very difficult to determine the appropriate cut-off distance (i.e. 500, 750, 1000 miles, etc.) and to determine which locations fall above or below the cut-off figure. For example, should distance be calculated as map miles, roadway miles, or rail miles?

Alternative No. 5: Cross-Subsidy Program

Operators of the Packer Avenue yard will be provided with a significant advantage if the RITF is constructed, as proposed, directly adjacent to their location. While intermodal shipments through Packer Avenue must now pay drayage charges comparable to other facilities in the Port, their drayage charges would be reduced to only approximately $25 when the RITF is completed.

An alternative approach to equalize drayage costs within the Port would be for DRPA to levy a surcharge for those intermodal movements to the RITF via the Packer Avenue marine terminal. This surcharge could be collected as part of the gate fee and would be designated for a special drayage subsidy fund. The fund, with additional contributions from the DRPA, would reimburse shippers from all other marine terminals in the Port which are utilizing the RITF.

For example, if a surcharge of $25 per box were applied to each intermodal move via Packer Avenue, this $25 would be available for a subsidy payment to a shipper who is moving via another terminal such as Tioga or Petty's Island and paying up to $75 per dray. In this way, both drays would be equalized at $50.

Analysis: The primary advantage of this approach is that it would provide an equalization of drayage costs within the Port with only a minimum commitment of funds from the DRPA. Most of the funding needed for the subsidy program would be generated by the surcharge levied on intermodal movements via Packer Avenue. This approach would also "level the playing

field", by removing some of the cost advantage of Packer Avenue and making the other facilities equally attractive.

The obvious disadvantage of this approach is the opposition which could be expected at Packer Avenue. Either the operator of the facility: Holt Cargo Systems, or the owner: The Philadelphia Regional Port Authority, would be required to pay the surcharge. Either would likely view this as an unwarranted penalty on their business. One way to ameliorate such opposition would be to levy the surcharge only on additional intermodal traffic above their current levels, which would be attributable to the RITF. For example, the number of intermodal movements via Packer Avenue in 1990 could be used as a base figure, and the surcharge would only apply to intermodal movements above this base figure.

SUMMARY

The proposed Regional Intermodal Transfer Facility, if convenient and efficiently run, could provide lower costs and better service and help attract additional business to the Port. The proposed location adjacent to the Packer Avenue marine terminal is centrally located within the Port, has excellent highway and bridge access, can accommodate all three rail lines and is adjacent to a steady supply of containerized cargo. The Port is fortunate to be served by three major rail lines. While Canadian Pacific can be expected to use the RITF, the challenge for DRPA will be to attract both Conrail and CSX away from their existing intermodal facilities and to the RITF by creating a more modern and cost-effective facility.

The RITF must greatly reduce the time delays now found at these other intermodal facilities, through the use of electronic information exchange, sufficient and efficient gate lanes, and quick loading and unloading systems. Reductions in trucker's time spent at the RITF will translate directly into reduced drayage costs. It is recommended that an independent operator run the facility, rather than one of the railroad companies. It is also recommended that the RITF - or any new intermodal facility - proceed in a phased manner to start small and grow as demand warrants. Finally, it is essential that a program of increasing clearances along train routes be undertaken to provide access for double stack trains to the RITF.

The survey of motor carriers, interviews with representative port interests and analysis of current drayage costs yields several conclusions regarding drayage operations within the Port:

•The Closer the Better: Drayage charges will generally be less to or from intermodal facilities which are closest to the marine terminals.

•Time is Money: Drayage charges are based on the time it takes to deliver a load, rather than the mileage the load is transported.

•Tolls are Money, but not Much: The difference in drayage costs between Philadelphia and New Jersey facilities is negligible, indicating that bridge tolls are not a significant factor.

•Pay less for More: Drayage costs are reduced as volume increases, particularly for a guaranteed amount of ongoing volume.

Projected drayage costs to the RITF can be expected to be approximately $75 for trailer loads and $100 for container loads from any marine terminal other than Packer Avenue, or nearly half of what they now are. These cost reductions will come about based on the design, operation and volume of traffic expected at the RITF and resultant market forces. No additonal support from the DRPA would be needed to achieve this level of reduction in drayage costs, other than the investment in construction and operation of the facility in a fair and efficient manner.

However, if the DRPA wishes to equalize drayage costs throughout the Port, it must reduce drayage costs from all other marine terminals to the projected $25 cost at Packer Avenue. There are five alternative approaches to achieve this equalization, each with relative advantages and disadvantages. Each of these approaches could be modified slightly or be applied in combination to create additional permutations but the five primary alternatives are as follows:

1. DRPA Contract with Trucking Company: In this approach, a Request for Proposals would be used to solicit one or more trucking companies to provide all drayage services within the Port at a contracted price. The truckers would only charge shippers the Packer Avenue base cost for drayage (i.e. $25) and DRPA would pay the trucking company the difference between this base cost and the contracted market cost ($75 - $100).

2. DRPA Subsidy available to Shippers: Rather than contracting with the truckers, DRPA could allow the market to define drayage costs and encourage shippers to find and negotiate their best drayage rate. DRPA would then provide a subsidy payment directly to shippers or shipping lines, either as a flat rate (i.e. $50) or as a difference bvetween the base price and the market price paid.

3. DRPA Regulates Drayage Rates: The third approach would let DRPA equalize and control drayage costs within the Port by setting and enforcing the maximum drayage rate which could be charged for any movement within the Port. All trucking companies would be subject to these rates, but DRPA would provide a subsidy payment up to a maximum defined rate for any trucking company which completes a dray in accordance with the regulated rate.

4. Subsidy for Long Distance Moves Only: DRPA may wish to only subsidize drayage costs for those intermodal moves which travel by rail over a certain minimum distance, whereby the rail movement is not competing directly with trucks. In this way, the subsidy program would not be available to those shorter distance moves which are now serviced by trucks.

5. Cross-subsidy Program: Finally, DRPA could establish a cross-subsidy program whereby the reductions in drayage costs at Packer Avenue could be used to off-set drayage costs from other marine terminals. A surcharge on intermodal movements via Packer Avenue of $25 per box could be placed in a fund and used to subsidize drayage movements from other marine terminals.

APPENDIX A

Truckers Survey Questionnaire Form

QUESTIONNAIRE

CONTAINER MOVEMENTS AND DRAYAGE COSTS AT DELAWARE RIVER PORTS

PURPOSE OF QUESTIONNAIRE: To determine: (1) the number of containers transported between the Ports of the Delaware River and the Conrail and CSX rail facilities; and (2) the drayage costs of these container movements.

TRUCKING COMPANY NAME: _____

NAME AND POSITION OF PERSON FILLING OUT QUESTIONNAIRE:

_____

ADDRESS: _____

PHONE: _____

CONTAINER MOVEMENTS

1. Total Number of containers and trailers picked up at Delaware River ports _____
(Circle one: daily, weekly, monthly, annually)

2. Total number of containers and trailers picked up at Delaware River ports and transported to rail facility at:

Conrail (Morrisville) _____ (Circle one: daily, weekly, monthly, annually)

CSX (Philadelphia) _____ (Circle one: daily, weekly, monthly, annually)

Other (Specify) _____ (Circle one: daily, weekly, monthly, annually)

3. Total number of containers and trailers dropped off at Delaware River ports _____
(Circle one: daily, weekly, monthly, annually)

4. Total number of containers and trailers dropped off at Delaware River ports and picked up at:

Conrail (Morrisville) _____

CSX (Philadelphia) _____

Other (Specify) _____

DRAYAGE COSTS

5. Please list your drayage charges from the Delaware River Ports to/from the following:

Marine Terminal Name	Conrail Morrisville TOFC	Conrail Morrisville COFC	CSX Philadelphia TOFC	CSX Philadelphia COFC
	(FILL IN COST)			
1.	$	$	$	$
2.				
3.				
4.				
5.				

6. Do you charge a base cost per container/trailer to transport from marine terminal to rail facility?

Yes ____ No ____
If yes, what is charge: Conrail $_____ CSX $_____

7. What are costs based on? (Circle one: time, mileage, both or other)

Time Charge Conrail $_____/hour

CSX $_____/hour

Mileage Charge Conrail $_____/mile

CSX $_____/mile

Other charge (Specify) _____

8. Please list top five factors which influence drayage costs (ie: cost of labor, insurance, fuel, taxes, tolls, etc.) and the estimated percentage of total drayage costs attributed to each factor.

Factor	% of Total Cost
1.	
2.	
3.	
4.	
5.	

PORT OPERATIONS

9. Please list three ports you transport to and from most frequently. List the port you do the most volume with as No. 1.

1.
2.
3.

10. What is average length of time it takes to load and unload a container at the marine terminal listed as No. 1 above? (Include average length of time waiting at gate.)

Load _____ (Minutes or Hours)

Unload _____ (Minutes or Hours)

11. Once you leave the marine terminal you do the most volume with how long does it take to reach:

Conrail (Morrisville) _____ Minutes

CSX (Philadelphia) _____ Minutes

RAIL OPERATIONS

12. Please list average length of time it takes to unload and load a container at the following (including waiting at gate):

Conrail (Morrisville)	Unload _____	(Minutes or Hours)
	Load _____	(Minutes or Hours)
CSX (Philadelphia)	Unload _____	(Minutes or Hours)
	Load _____	(Minutes or Hours)
Other (Specify)	Unload _____	(Minutes or Hours)
	Load _____	(Minutes or Hours)

13. If you leave a chassie at Conrail Morrisville facility, what is average length of time it takes to get it back?

_____

_____

Please answer the following questions based on your professional experience. Please be as specific as possible. Your responses to these questions will be kept confidential.

14. Do you expect an increase in the number of containers going in and out of the Delaware River Ports which are shipped by rail over the next ten years? If yes, will these containers be captured from competing ports or will they represent new cargo coming into the Ports of the Delaware River?

15. Please list major problems encountered at marine terminals which impact the Ports of the Delaware River's ability to compete with other East Coast ports.

16. Please list major problems encountered at Contrail-Morrisville facility which prevents or slows down the movement of containers to and from the Ports of the Delaware River.

17. Please list major problems encountered at CSX Philadelphia facility which prevents or slows down the movement of containers to and from the Ports of the Delaware River.

18. Do you think the Ports of the Delaware River will benefit from a Regional Intermodal Transfer Facility located near the Packer Avenue Terminal? Please explain your answer.

Please return questionnaire to the Delaware Valley Regional Planning Commission at 21 South 5th Street, Philadelphia, Pennsylvania 19106 or by FAX: 215-592-9125.

THANK YOU FOR YOUR ASSISTANCE

APPENDIX B

Personal Interview Questionnaire Form

Drayage Costs at Delaware River Ports

Delaware River Port Authority
Delaware Valley Regional Planning Commission

Date:_____

Name:_____
Title:_____
Facility:_____
Address:_____
Function:_____
(Port Authority, Terminal operator, Trucking Company, Rail operator, Port organizations, etc.)

I. FACILITY OPERATIONS

1. Monthly number of containers import:_____; export:_____

1a. Annual number of containers import:_____; export:_____

2. Monthly/annual number of trailers:_____

3. Percentage and/or number of each incoming by rail:_____

3a. Percentage and/or number of each outgoing by rail:_____

4. Location of railshed connection: Morrisville:_____ ;
Snyder Ave:_____; On-site:_____; Other:_____

5. Expected growth or change in container shipping at facility:

6. Expected growth in rail connections:

7. Problems or issues of intermodalism:

II. DRAYAGE ADMINISTRATION

1. Trucking companies serving facility: Limited access:_____;
   Open access:_____

2. Direct contract with shipping line:

3. Facility contract with drayage companies:

4. Other arrangements:

III. DRAYAGE OPERATIONS

1. Describe system and responsibilities for truck pick-up or drop-off:

1a. Average time for each truck at facility: Pick-up:_____; Drop-off:____

2. Number of trucks in _____ and out _____ of facility daily (average)

3. Number of containers moved:
   Per day:_____
   Per truck:_____
   Per truck/day:_____

4. Primary route to/from railshed:

5. Secondary route to/from railshed:

6. Projected route to RITF:

IV. DRAYAGE COSTS

1. Base charge per container:_____

2. Distance charge per container:_____

3. Time charge per container ($):

   Travel time from point of origin to facility:_____
   Travel time from facility to railshed:_____
   Waiting time:_____
   Pick-up/drop-off time:_____

4. Administrative costs: (ie. Regulations, licenses, bills of lading, manifests,

5. Operating costs: (ie. Insurance, taxes, tolls, fuel, maintenance, back-up fle

6. Labor costs:

7. Cost changes due to volume or economies of scale:

8. Other cost factors:

V. DRAYAGE PROBLEMS

1. Limited access roads
2. Road conditions (physical)
3. Road conditions (congestion)
4. Low clearance under bridges
5. Tolls (cost)
6. Tolls (time)
7. Weight limits
8. Poor signage
9. Waiting time at shipping facility
10. Waiting time at railshed
11. Inspection/Customs
12. Administrative (describe)
13. Scheduling
14. Regulations
15. Other

VI. POTENTIAL IMPROVEMENTS

1. Express tolls
2. Express lanes
3. Improved scheduling and timing
4. Use of longer or double trucks
5. More spur rail lines
6. Float bridge connections
7. Electronic information exchange
8. Roadway improvements
9. Improved signage
10. Improved signalization
11. New roads or off-ramps
12. Improved inspection or transfer procedures
13. Other improvements:

APPENDIX C

ORGANIZATIONS INTERVIEWED

Baird, Bob, Port Authority of New York and New Jersey, New York, NY.

Balzano, Joe, South Jersey Port Corporation, Camden, NJ.

Castagnola, Kevin, South Jersey Port Corportion, Camden, NJ.

Curran, Walter, Holt Cargo Terminal and Packer Avenue Marine Terminal, Gloucester City, NJ and Philadelphia, PA.

De Gennaro, Richard, Conrail, Philadelphia, PA.

Fox, Charles, Coastal Transportation Company (Northern Shipping), Philadelphia, PA.

Gault, Patrick, Pennsylvania Motor Truck Association, Philadelphia, PA.

Hansen, Mark, CSX Transportation, Jacksonville, FL.

Harrison, William, Ports of Philadelphia Maritime Exchange, Philadelphia, PA.

Howland, Susan, Ports of Philadelphia Maritime Exchange, Philadelphia, PA.

Janis, Michael, Port of San Francisco, San Francisco, CA.

La Rue, John, Philadelphia Regional Port Authority, Philadelphia, PA.

Marshall, Charles, Conrail, Philadelphia, PA.

Metheny, Scott, Tioga Marine Terminal, Philadelphia, PA.

Murphy, Elizabeth, Philadelphia Regional Port Authority, Philadelphia, PA.

Neilson, Claire, Pennsylvania Motor Truck Association, Philadelphia, PA.

Sullivan, Mark, Port of Seattle, Seattle, WA.

Testa, Lou, Crowley Maritime Corporation (Petty's Island Marine Terminal), Cherry Hill, NJ.

Trovato, Carl, Philadelphia, Regional Port Authority, Philadelphia, PA.

Wallace, Ralph, New York City Department of Ports and Trade, New York, NY.

APPENDIX D

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