INTERMODAL MANAGEMENT SYSTEM
NEW JERSEY REPORT

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

INTERMODAL MANAGEMENT SYSTEM

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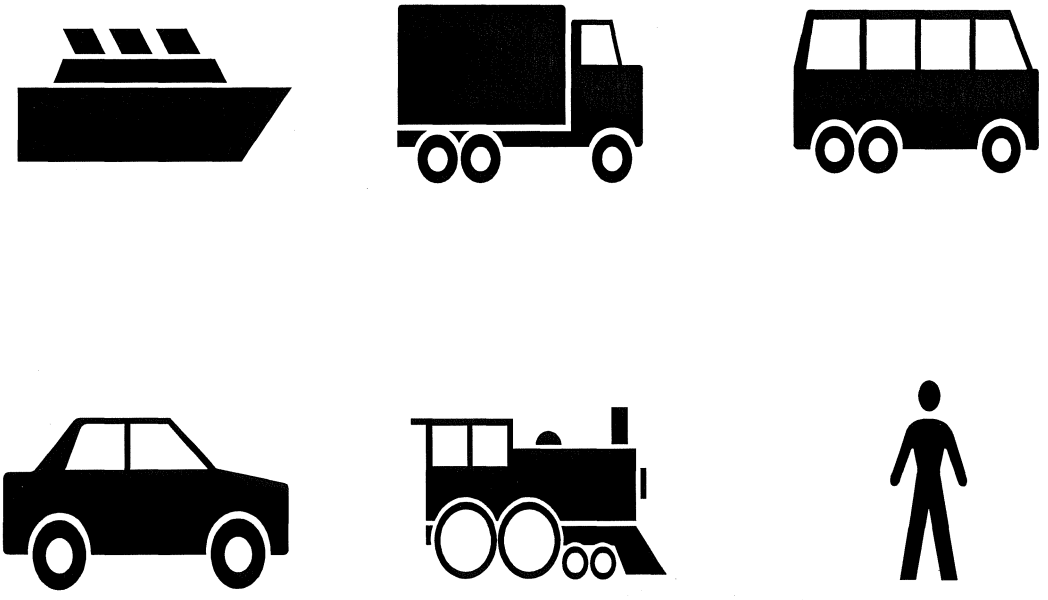

DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
NOVEMBER 1998

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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 Planning, 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: Intermodal Management System - *New Jersey Report*

Date Published: November 1998

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Geographic Area Covered: Mercer, Burlington, Camden and Gloucester counties, New Jersey

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ABSTRACT

The Intermodal Management System (IMS) is a systematic process for identifying and evaluating improvements which will expedite the transfer of people and goods between modes of travel. The IMS was one of the six management systems created by ISTEA. For the Delaware Valley Region, the performance of the IMS is carried on through the auspices of the region's long range plan (the Year 2020 Plan).

This report identifies 52 intermodal facilities, defines performance measures, conducts detailed performance evaluations, and identifies potential improvement strategies for a set of intermodal passenger stations and freight terminals in South Jersey.

The Intermodal Management System - *New Jersey Report* complements a similar effort, completed by DVRPC in November 1997, for the Commonwealth of Pennsylvania.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Intermodal facilities are components of the transportation network that expedite the transfer of people and goods between modes of travel.

The Intermodal Management System - *New Jersey Report* details a systematic process for evaluating and making recommendations to improve a total of 52 intermodal passenger and freight facilities (including 29 passenger stations, 16 freight terminals and 7 airports) in the New Jersey portion of the region.

The effort was undertaken by DVRPC staff — with the support of a multi-jurisdictional steering committee composed of representatives of Mercer, Burlington, Camden and Gloucester counties, NJ Transit, PATCO, the NJDOT and the Delaware Valley Goods Movement Task Force — to further the intermodal planning goals of the *Year 2020 Plan*. The work complements activities performed for the Pennsylvania Department of Transportation in 1997, and as such completes a regional perspective in the matter.

The inventory of intermodal facilities in New Jersey includes:

- regionally significant railroad and bus stations, park-and-ride lots and airports where passengers transfer between regional rail, subway and high speed rail, bus, automobile and/or airplane, and;
- regionally significant freight facilities where goods are exchanged between railroad, truck, pipeline and ship.

Descriptive and quantitative information are provided, where available, for the facilities to illustrate characteristics of and activity levels at the terminals.

Performance measures were used to evaluate how effectively the set of passenger and freight facilities operate in terms of key service and physical attributes. Emphasis in the performance evaluations of passenger stations is upon on-site attributes, whereas freight performance evaluations are focused exclusively on roadway connections between the facility's gate and the National Highway System (NHS).

Evaluation of the intermodal facilities and their surroundings were conducted through field views performed during the Spring of 1998. As a result, of the

evaluation process, specific facility and systemwide deficiencies were identified. Key findings of the performance evaluation for the passenger system include:

- **Accessibility** - Trail blazer signage along the connector highways serving passenger rail stations is generally appropriate and those serving the Trenton Station are exemplary. Station identification signs for the PATCO system are lacking and the trailblazer signing network for the NJ DOT park-and-ride lot system needs to be revisited and updated.
- **Mobility / Connectivity** - The lack of integrated regionwide transit fares (between PATCO, SEPTA and NJ Transit) is a significant deficiency. Representatives of the three agencies are presently involved in a cooperative effort to coordinate fare collection technology and fare policy issues. Resolution in these matters will serve to foster regular and reverse transit ridership. Promoting more customer friendly means for station access, where interconnecting bus service is provided, can help counter parking constraints at the rail stations.
- **Station Amenities** - Amenity levels are lowest at bus stations. An enhanced standard of amenities (including: shelters, schedules, signs, benches, phones, parking and trailblazer signs) should be provided — particularly at all the regional malls (5). Expanding the intermodal role and presence of malls will extend the reach of fixed route public transit services, and will be important initiatives in easing the effects of impending federal welfare-to-work mandates.
- **Parking** - Land for parking expansions, adjacent to rail stations, is very limited. In its absence, greater reliance on passenger delivery to the stations is necessary through existing / expanded transit services. Opportunities for satellite parking facilities appear feasible in the vicinity of PATCO's Lindenwold, Ashland and Woodcrest stations and should be explored.
- **ADA Compliance** - The operators are complying with their contracts to be accessible to their mobility disadvantaged clients.

Some of the key findings of the freight system's evaluation are:

- **Highway Access** - Full access to the regional highway system is provided. The most serious deficiencies, however, involve long or indirect truck routings between the facility and the NHS (Petty's Island and facilities within the Port of Paulsboro freight cluster are two examples).

- **Roadway Geometrics / Conditions** - Almost all of the freight terminals have some form of pavement deficiency associated with the connector highways and roadways serving them.
- **Traffic Operations** - No dominant cause is attributable for deficient traffic operations in the vicinity of the ports. Low overall traffic volumes in the vicinity of these facilities generally means that normal or recurring congestion is not a widespread problem. One example of a unique cause for congestion within the system is at the Beckett Street Terminal. Inadequate sufficient storage for the property, necessitates that truck marshaling take place along the public street system. The resultant truck movements (i.e., backing away from the gate) interferes considerably with new truck arrivals to the facility's gate.
- **Signs** - The entire system is deficient and would best be served by comprehensive trailblazer signing networks along the connector highways (first priority), and improved destinational signing on interstates at the nearby interchanges (second priority). Limited improvement to facility entrance signing was also identified.
- **Safety and Security** - The connector highway system is generally safe and secure with respect to the delivery and movement of goods.

A comprehensive set of physical and operational improvement recommendations are identified to address facility specific and systemwide performance deficiencies. Table 8 and Table 10, in the main body of the report, present the complete set of recommendations for passenger and freight facilities, respectively. The following table quantifies the benefits conferred upon the intermodal passenger network, assuming the physical and operational improvement recommendations have been implemented.

SUMMARY of PASSENGER SYSTEM PERFORMANCE MEASURES

	EFFICIENCY RATING		
MEASURE	Existing	After Improvement	Change
Accessibility	41%	56%	15%
Mobility / Connectivity	72%	86%	14%
Amenities	66%	69%	3%
Parking	43%	72%	29%
ADA Compliance	75%	75%	0%
OVERALL	**59%**	**68%**	**9%**

The following table summarizes the benefits bestowed upon the intermodal freight network, assuming the physical and operational improvement recommendations have been implemented.

SUMMARY of FREIGHT SYSTEM PERFORMANCE MEASURES

	EFFICIENCY RATING		
MEASURE	Existing	After Improvement	Change
Highway Access	73%	75%	2%
Roadway Geometry / Condition	75%	95%	20%
Traffic Operations	67%	82%	15%
Directional Signs	65%	98%	33%
Highway Safety	92%	96%	4%
OVERALL	**74%**	**88%**	**14%**

Institutional actions — which involve the Delaware Valley Goods Movement Task Force or the DVRPC forum in order to advance the cited improvements — are also identified as recommendations. Such actions, include: adding selected highway links between the facilities and the NHS as designated connector routes.

Finally, the report identifies intermodal improvement projects which are included on the regional Transportation Improvement Program (TIP), and provides avenues toward implementing a majority of the remaining recommendations. These include:

- Adding the identified intermodal improvements into the scope of other projects which are in close proximity and are already on the TIP;
- Applying and competing for funds through established categorical capital and maintenance programs available through the TIP process, including traffic signal upgrades, signing enhancements, roadway resurfacing, pedestrian / bicycle extensions, etc.;
- Leveraging through the development application, review and approval process, and;
- Competing for project development / study funding available in the DVRPC planning work program.

A "next step" recommendation — is the formulation of candidate capital improvement programs (CIPs) for the intermodal passenger and freight components. The programs would provide priorities, cost estimates, likely funding sources and partnerships for implementing the report's recommendations. The proposed CIPs should also include the intermodal improvements which are being pursued through existing capital programs of the owners and operators.

Such a document will elevate the profile of intermodal issues, will support the voices of the various owners and operators through the implementation processes at the DVRPC, and will stand as a ready resource should new or dedicated funding be made available through the Transportation Equity Act for the 21st Century ("TEA 21"). □

1 INTRODUCTION

Intermodal facilities are components of the transportation network that expedite the transfer of people and goods between modes of travel.

The Intermodal Management System (IMS) was one of six transportation management systems established by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The management systems were enacted as systematic processes to assist decision makers' selection of cost effective transportation improvements.

Acknowledging the sound planning practices inherent in ISTEA's requirement, the Delaware Valley Regional Planning Commission (DVRPC) adopted improved intermodal planning as a goal within its *Year 2020 Plan* in 1993. In 1995, as part of the adoption of the National Highway System (NHS), Congress relaxed management system requirements — remanding them to the discretion of each state and its department of transportation.

In response to directives received from PADOT, DVRPC prepared a report entitled *Intermodal Management System - Phase II Report* (November 1997). That effort identified performance measures for evaluating intermodal freight and passenger facility operations. The work also included systematic evaluations of, and recommendations for improving the intermodal transportation network for the Pennsylvania portion of the region.

Receiving no such request from the New Jersey Department of Transportation, therefore, the Intermodal Management System - *New Jersey Report* summarizes the systematic process to provide comparable information for an inventory of intermodal facilities within Mercer, Burlington, Camden and Gloucester counties in the New Jersey portion of the region — to fulfill the goals of the *Year 2020 Plan*.

Goals and Objectives

Listed below are the goals and objectives of the region's IMS planning effort:

Goal 1: Promote Coordination and Integration of all Transportation Systems

Objectives:

- *establish opportunities for connections among transportation modes;*
- *improve scheduling and operations to accommodate intermodal movements;*
- *insure participation of the goods movement industry in the regional and state planning processes.*

Goal 2: Create Efficient Intermodal Facilities Throughout the Region

Objectives:

- *reduce transfer time to move persons and goods between different transportation modes;*
- *improve data and technology sharing between public and private interests;*
- *identify impediments and recommend improvements for the efficient and safe movement of passengers and freight.*

The Report

The Intermodal Management System - *New Jersey Report* identifies significant passenger and freight intermodal facilities located in the New Jersey portion of the Delaware Valley region (Chapter 2). It includes an evaluation of selected performance characteristics at the intermodal facilities and along roadway connections to the National Highway System (Chapters 3 and 4). Finally, the report identifies strategies to rectify identified deficiencies (Chapter 5), and suggests approaches for implementing the improvements (Chapter 6).

Steering Committee

Representatives from the following agencies participated in the development of this study.

- the Data Subcommittee of the Delaware Valley Goods Movement Task Force (DVGMTF);
- New Jersey Department of Transportation (NJDOT);
- New Jersey Transit (NJ Transit);
- Port Authority Transit Corporation (PATCO);
- The four New Jersey counties: Mercer, Burlington, Camden and Gloucester. □

2 INVENTORY

The inventory of New Jersey's intermodal network is comprised of three types of facilities: passenger, freight, and airport. In all, a total of 52 intermodal facilities were considered in this work (29 passenger stations - including one due to open in the Fall 1998, 16 freight terminals, and 7 airports). An explanation of each group follows.

Passenger Facilities

The inventory of passenger facilities includes regionally significant facilities where passenger transfer, between any of the following modes of transportation, takes place: regional rail, subway and high speed rail, bus, automobile, and airplane.

There are substantial differences in how passenger terminals operate depending upon their market (whether a commuter origin or destination station), their function (rail-bus transfer or rail-rail transfer), and their location (urban or suburban area). As an example, hub facilities — such as Trenton Station — offer many amenities. Subway stations, like the City Hall PATCO station in Camden, have less need for amenities because the higher frequency of service results in shorter waiting times at the station.

Because of the differences between stations, the report divides the inventory of passenger facilities into five categories for evaluation purposes. Airports are addressed in a subsequent section of this chapter.

Hub Station:

- high passenger volumes;
- variety of different modes;
- emphasis on amenities and mobility;
- permits transfers among modes that have wide geographic coverage.

Regional / High Speed Rail Station:

- accessibility and parking critical;
- many amenities offered;
- bus access secondary.

Subway Station:
- bus transfers critical;
- high pedestrian volumes;
- less emphasis on amenities and parking.

Bus Station:
- bus transfers critical;
- more emphasis on amenities.

Park-and-Ride Lot:[1]
- more emphasis on amenities;
- parking critical.

Figure 1 illustrates the distribution of New Jersey's intermodal passenger facilities within the region. Table 1 provides an inventory of the passenger facilities along with the following descriptive information:
- type of transit service and operator(s);
- location (county);
- status as a transportation center[2] (existing, emerging, or potential transportation center);
- parking information (supply, demand, percent utilization, proposed expansion);
- daily boardings;
- number of intersecting transit routes;
- location relative to the National Highway System (is the station located on the NHS, or along a designated connector route to the NHS).

Freight Facilities

The inventory of freight facilities includes regionally significant goods movement facilities where goods are exchanged between at least two of the following modes: railroad, truck, pipeline, and ship[3].

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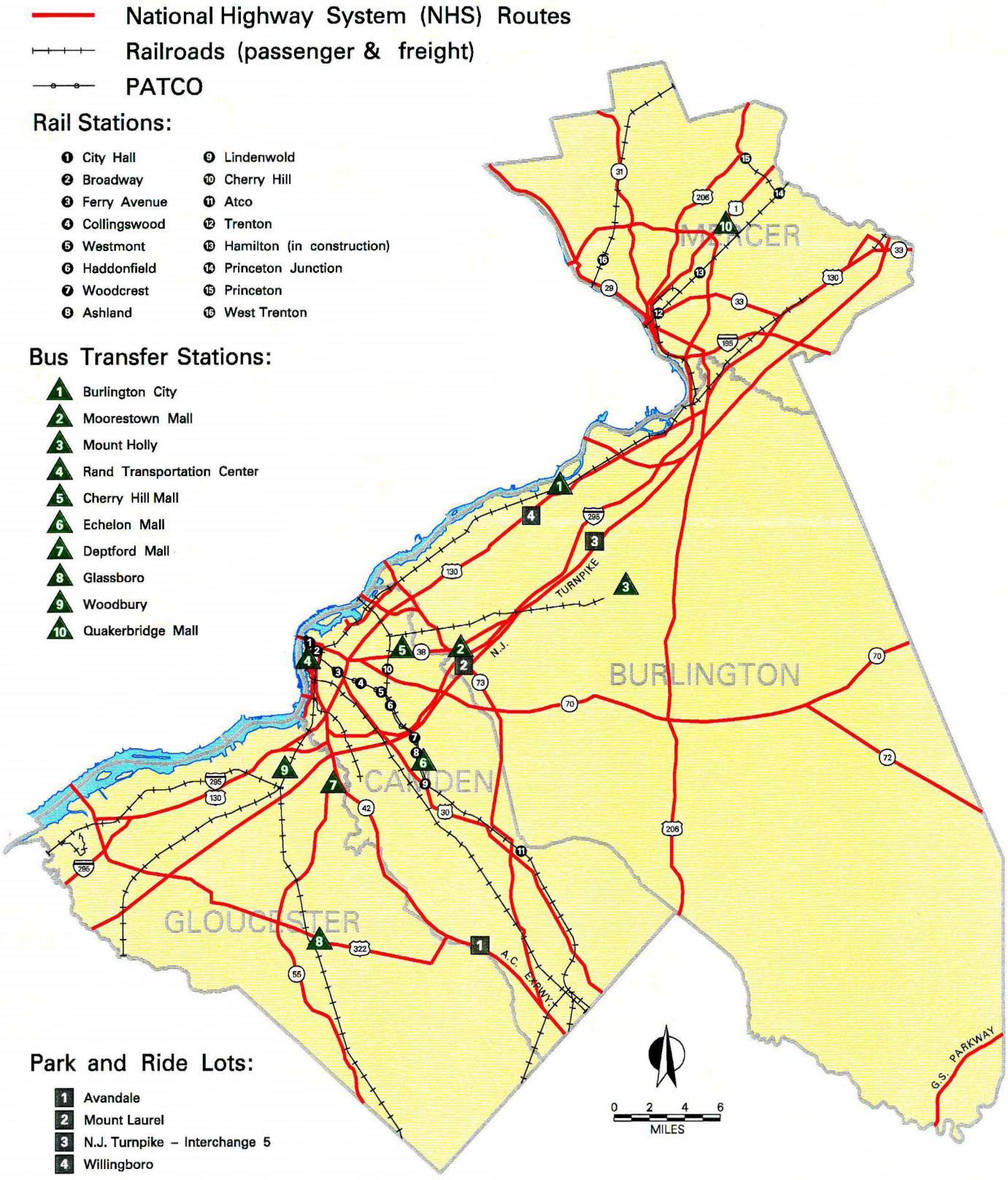
[1] Officially designated facilities served by transit.

[2] Locations as listed in *Direction 2020 Report #10 - Transportation Centers: Concept and Evaluation* (DVRPC, October 1993).

[3] Note that freight does pass through airports in the region, Trenton-Mercer included. The vast majority of operations at the New Jersey facilities, however, respond to passenger demands.

Passenger Facilities:
Intermodal Management System – *New Jersey Report*

Figure 1



DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
NOVEMBER 1998

TABLE 1 PASSENGER FACILITIES INVENTORY

FACILITY	SERVICE	COUNTY	TRANSP. CENTER	PARKING			UNLINKED DAILY BOARDINGS			INTERSECTING ROUTES			NATIONAL HIGHWAY SYSTEM (NHS)	
				Supply	Use (%)	Expansion Proposed	Rail	Bus	Total	Rail	Bus	Total	Located on NHS	Connecting Routes
HUB STATION														
Broadway *Rand Trans. Ctr*	PATCO NJTransit Greyhound	Camden	existing	480	83%	no	1,933 --- NA	10,374	12,307	1	25	26	yes	Broadway, Cooper St, 7th St to I-676
Trenton	NJTransit Amtrak SEPTA	Mercer	existing	4,452	62%	no	4,898 1,047 948	NA	6,893	3	8	11	yes	S. Clinton Av, Barlow St to US 1
SUBWAY STATION														
City Hall	PATCO NJTransit	Camden	no	---	---	no	949 ---	NA	949	1	6	7	no	none
REGIONAL / HIGH SPEED RAIL STATION														
Princeton Junction	NJTransit Amtrak	Mercer	emerging	3,741	86%	no	4,960 1,124	NA	6,084	2	2	4	yes	Vaughn Dr, Alexander Rd to US 1
Lindenwold	PATCO NJTransit	Camden	emerging	3,337	93%	no	5,167 390	NA	5,557	2	4	6	yes	CR 673, CR 544 to NJ 73
Atco	NJTransit	Camden	potential	216	28%	no	157	---	157	1	0	1	yes	US 30 and NJ 73
Ferry Avenue	PATCO NJTransit	Camden	no	1,928	87%	no	2,702 ---	NA	2,702	1	3	4	yes	CR 606, CR 603, CR 561 to US 30/130
Haddonfield	PATCO NJTransit	Camden	emerging	1,033	95%	no	2,055 ---	NA	2,055	1	4	5	yes	CR 573 to I-295, CR 644 to NJ 70
Westmont	PATCO NJTransit	Camden	no	1,144	87%	no	1,536 ---	NA	1,536	1	2	3	yes	CR 561, CR 643 to NJ 70, CR 551 to US 30
Woodcrest	PATCO	Camden	no	2,673	94%	no	2,987	---	2,987	1	0	1	yes	CR 667, CR 670, CR 561 to I-295

TABLE 1 PASSENGER FACILITIES INVENTORY

FACILITY	SERVICE	COUNTY	TRANSP. CENTER	PARKING			UNLINKED DAILY BOARDINGS			INTERSECTING ROUTES			NATIONAL HIGHWAY SYSTEM (NHS)	
				Supply	Use (%)	Expansion Proposed	Rail	Bus	Total	Rail	Bus	Total	Located on NHS	Connecting Routes
Ashland	PATCO Echelon-Shuttle Bus	Camden	no	1,867	89%	no	2,405 60	NA	2,465	1	1	2	yes	CR 678 to US 30, CR 670, CR 544
Collingswood	PATCO NJTransit	Camden	no	710	98%	no	1,650 ---	NA	1,650	1	1	2	yes	CR 636, Atlantic Av, CR 561 to NJ 70 and US 30
Cherry Hill	NJTransit	Camden	potential	307	19%	yes	114	---	114	1	0	1	yes	NJ 70
West Trenton	SEPTA NJTransit	Mercer	no	100	96%	yes	186 ---	NA	186	1	1	2	no	none
Hamilton - (open in Fall 1998)	NJTransit	Mercer	no	1,600	---	no	---	---	---	1	1	2	no	none
Princeton	NJTransit	Mercer	no	---	---	no	NA	NA	NA	1	1	2	no	none
BUS STATION														
Woodbury	NJTransit	Glouc.	potential	---	---	no	---	199	199	0	6	6	no	none
Cherry Hill Mall	NJTransit	Camden	emerging	---	---	no	---	425	425	0	4	4	yes	NJ 38
Moorestown Mall	NJTransit	Burling.	potential	---	---	no	---	169	169	0	3	3	yes	NJ 38
Echelon Mall	NJTransit Echelon-Shuttle Bus	Camden	potential	---	---	no	--- ---	117 10	127	0	4	4	no	none
Quakerbridge Mall	NJTransit	Mercer	potential	---	---	no	---	109	109	0	4	4	yes	US 1
Glassboro	NJTransit	Glouc.	potential	---	---	no	---	92	92	0	3	3	no	none
Deptford Mall	NJTransit	Glouc.	potential	---	---	no	---	89	89	0	3	3	no	none

TABLE 1 PASSENGER FACILITIES INVENTORY

FACILITY	SERVICE	COUNTY	TRANSP. CENTER	PARKING			UNLINKED DAILY BOARDINGS			INTERSECTING ROUTES			NATIONAL HIGHWAY SYSTEM (NHS)	
				Supply	Use (%)	Expansion Proposed	Rail	Bus	Total	Rail	Bus	Total	Located on NHS	Connecting Routes
Burlington City	NJTransit	Burling.	potential	---	---	no	---	184	184	0	2	2	no	none
Mount Holly	NJTransit	Burling.	potential	---	---	no	---	NA	---	0	3	3	no	none
PARK-N-RIDE LOT														
NJ Turnpike Interchange #5	Academy	Burling.	no	204	88%	no	---	NA	---	0	2	2	no	none
Willingboro	NJTransit Academy	Burling.	no	234	68%	no	--- ---	NA	---	0	2	2	yes	US 130
Mount Laurel	Greyhound	Burling.	no	500	70%	no	---	NA	---	0	2	2	no	none
Avandale	NJTransit	Camden	no	400	45%	no	---	NA	---	0	5	5	no	none

Sources:

Most recent schedules of all operators - 1997 (PATCO Winter/Spring 1998)

PATCO: ridership - average weekday from accounting periods 1 through 13, 1997, parking - average from accounting period 4 - week 4, 1998

SEPTA ridership - 1997

SEPTA parking - July 1993

Amtrak ridership - 1997

NJ Transit parking - November 1996

NJ Transit rail ridership - 1995

NJ Transit bus ridership - Direction 2020 Report 10 - Transportation Centers (October 1993)

Echelon Shuttle Bus - June 1998

Transportation Center information: per Direction 2020 Report #10 - *Transportation Centers: Concept and Evaluation* (DVRPC, October 1993)

Park-and-ride information: NJ DOT report 12/6/96

Notes:

Underlined connecting routes are considered congested per the findings of the *New Jersey Congestion Management System Report* (DVRPC, December 1997).

NA not available

- - - not applicable

The inventory of freight facilities is shown on Figure 2 and listed in Table 2. All are port facilities. For analytical purposes, some of the port facilities listed in Table 2 have been grouped into clusters where connecting routes to the NHS are shared. The following descriptive information (where available) is provided in the table.

- location (county);
- activity indicators (daily truck moves - in and out, and/or other indicators);
- cargo (type and modal split - i.e., how the cargo arrives / departs);
- location relative to the NHS - is the facility located on the NHS, or along a designated connector route to the NHS.

Airport Facilities

As previously mentioned, airports can simultaneously serve passenger and freight intermodal needs. In the case of the New Jersey locations, airports are decidedly oriented to serving passenger travel demands. The New Jersey airports vary in size, ownership and function. At Trenton-Mercer scheduled service and supporting amenities lend an air of importance and activity to the facility. At some of the private facilities a relaxed country club atmosphere exists.

The inventory of New Jersey airport facilities includes the seven airports listed in the Regional Air System Plan (RASP) for the Delaware Valley. Their locations are shown on Figure 3. Selected characteristics of the airport inventory are listed below and detailed in Table 3.

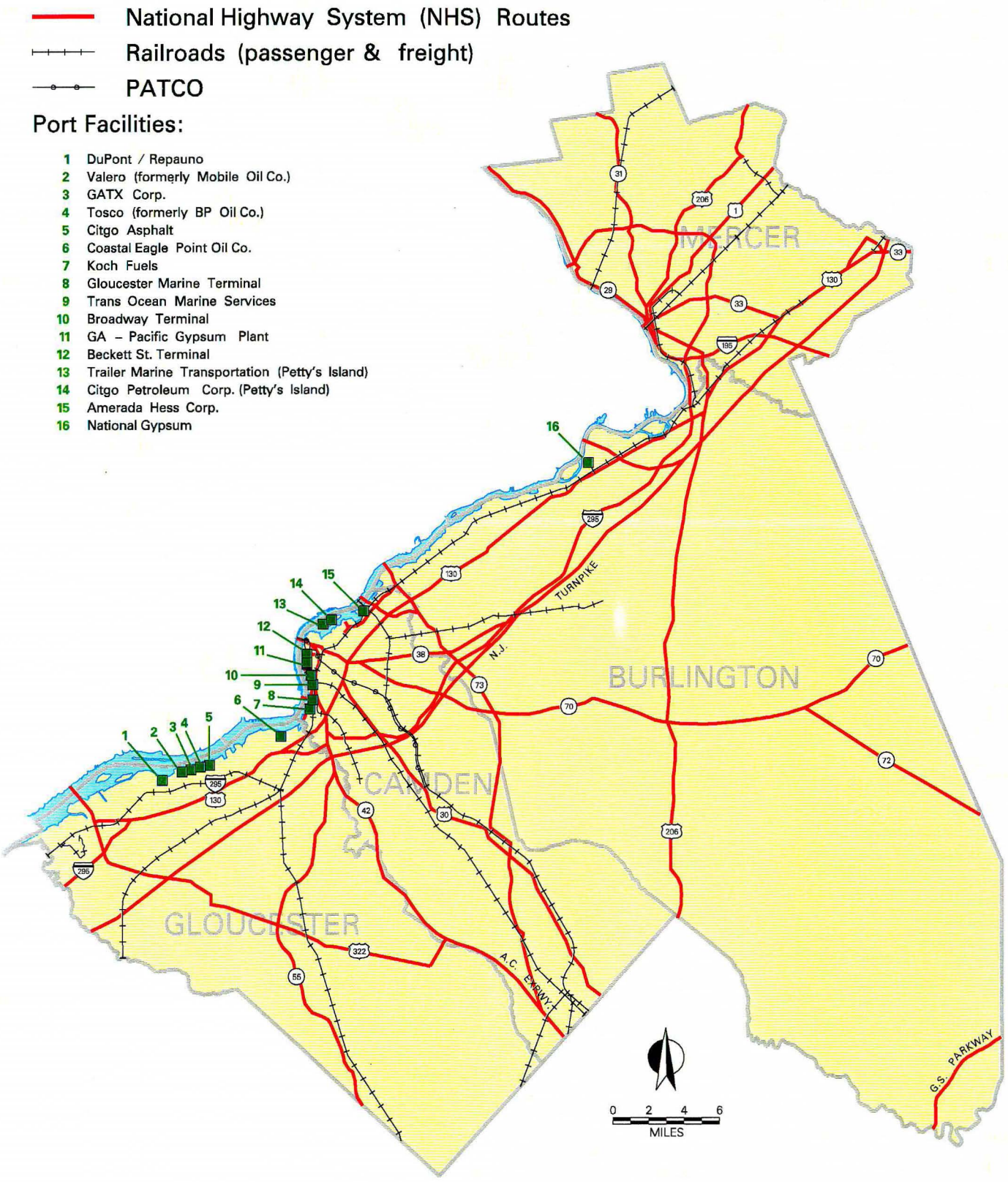
- location (county);
- owner / operator (public or private);
- whether it is an existing, emerging, or potential transportation center;
- commercial and noncommercial operations (takeoffs and landings) during the course of a year
- functional classification according to the RASP (general aviation, reliever, or commercial);
- location relative to the NHS - is the facility located on the NHS, or along a designated connector route to the NHS.

Of the full inventory, only Trenton-Mercer Airport contains enough activity and intermodal variety for consideration in this effort (i.e., many amenities offered, parking critical, and transfers among modes which have wide geographic coverage). As such, no further attention will be directed to the other airports in the remainder of this report. □

Freight Facilities:

Intermodal Management System – *New Jersey Report*

Figure 2



DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
NOVEMBER 1998

TABLE 2 FREIGHT FACILITIES INVENTORY

FACILITY	COUNTY	ACTIVITY INDICATORS		CARGO		NATIONAL HIGHWAY SYSTEM (NHS)	
		Daily Truck Moves	Other	Type	Modal Split	Located on NHS	Connecting Routes
Citgo Asphalt	Glouc.	NA	NA	asphalt	ship pipeline truck	no	none
Coastal Eagle Point Oil Company	Glouc.	NA	86 ships/yr	crude oil	ship pipeline truck	yes	I-295, US 130
National Gypsum	Burlington	NA	12 ships/yr	drywall	ship pipeline truck	no	see recommendations
Port of Camden North							
- Amerada Hess Corp.	Camden	NA	27 ships/yr	fuel oil	ship	yes	River Rd to NJ 73
- Citgo Petroleum Corp. (Petty's Island)	Camden	NA	65 ships/yr 2 mil gal/mo	fuel oil, diesel	ship pipeline truck	yes	36th St, River Rd to NJ 73
- Trailer Marine Transportation (Petty's Island)	Camden	170	63 ships & barges/yr	general	ship truck	yes	36th St, River Rd to NJ 73
Port of Camden Central							
- Beckett Street Terminal	Camden	150	156 ships/yr 4000 rail crs/y	bulk, break-bulk	truck rail ship	yes	2nd St, Atlantic Av to I-676. 2nd St, Clinton St, 3rd St, Mickle Blvd to I-676
- GA Pacific Gypsum	Camden	NA	8 ships/yr	general	ship truck	yes	Chestnut St, 2nd St, Atlantic Av to I-295

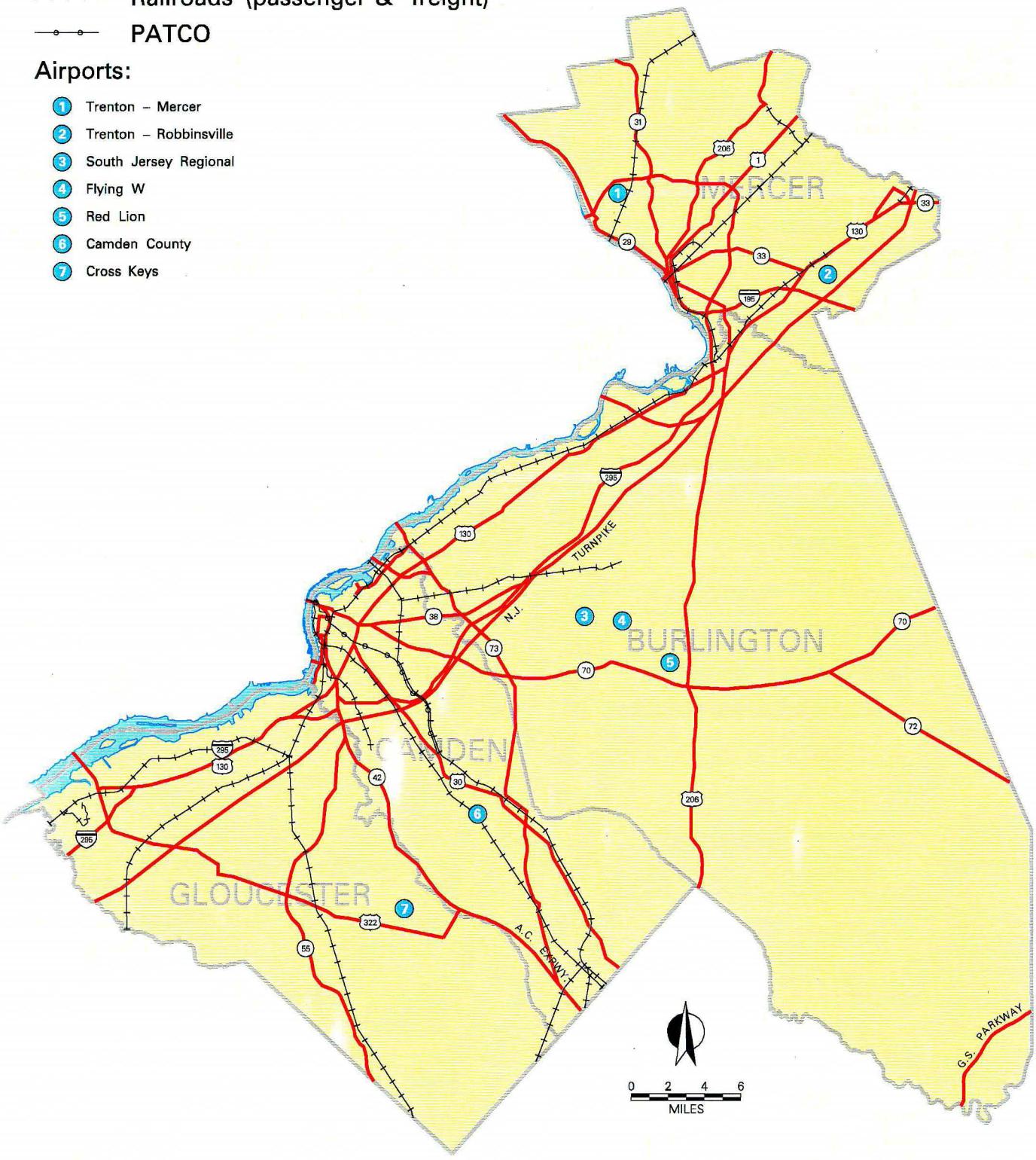
TABLE 2 FREIGHT FACILITIES INVENTORY

FACILITY	COUNTY	ACTIVITY INDICATORS		CARGO		NATIONAL HIGHWAY SYSTEM (NHS)	
		Daily Truck Moves	Other	Type	Modal Split	Located on NHS	Connecting Routes
Port of Camden South							
- Broadway Terminal	Camden	100	103 ships/yr 2000 rail crs/yr	break-bulk	truck rail ship	yes	Broadway, Morgan Blvd to I-676
- Trans Ocean Marine Services	Camden	NA	60 ships/yr	general	ship truck	yes	Broadway, Morgan Blvd to I-676
- Gloucester Marine Terminal	Camden	NA	213 ships/yr	general	ship pipeline truck	yes	Broadway, Morgan Blvd to I-676
- Koch Fuels	Camden	100	1 ship/yr	heavy/light oil	ship truck	yes	Broadway, Morgan Blvd to I-676
Port of Paulsboro							
- Valero (formerly Mobile Oil Co)	Glouc.	NA	120 ships/yr	petroleum	ship pipeline truck rail	no	see recommendations
- Tosco (formerly BP)	Glouc.	NA	NA	petroleum	ship	no	see recommendations
- GATX Terminal Corp.	Glouc.	45	11 ships/yr 336,000 gl/day	petroleum	ship truck	no	see recommendations
- Dupont Repauno	Glouc.	NA	NA	NA	ship truck	no	see recommendations

Sources:
Annual truck moves and modal split are estimations obtained from each terminal via phone conversations.
Source for ships/yr: 1997 Maritime Exchange for the Delaware River and Bay.
NA: data Not Available

Airport Facilities:
Intermodal Management System – *New Jersey Report*

Figure 3



DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
NOVEMBER 1998

TABLE 3 AIRPORT FACILITIES INVENTORY

FACILITY	COUNTY	OWNER/ OPERATOR	TRANSPORTATION CENTER	ANNUAL OPERATIONS		FUNCTIONAL CLASSIFICATION	NATIONAL HIGHWAY SYSTEM (NHS)	
				Commerc.	Non-commerc.		Located on NHS	Connecting Routes
Camden County	Camden	private	no	0	20,328	General Aviation	no	none
Cross Keys	Gloucester	private	no	0	40,363	Reliever	no	none
Flying W	Burlington	private	no	0	55,020	General Aviation	no	none
Red Lion	Burlington	private	no	0	15,187	General Aviation	no	none
South Jersey Regional	Burlington	private	no	0	58,159	Reliever	no	none
Trenton - Mercer	Mercer	public	no	4,000	146,101	Commercial	no	none
Trenton - Robbinsville	Mercer	private	no	0	72,833	Reliever	no	none

Source: Direction 2020 Report #31 - 2020 Regional Airport System Plan for the Delaware Valley (DVRPC, August 1995)

3 PERFORMANCE MEASURES

Performance measures have been used to evaluate how effectively the inventories of passenger and freight facilities operate in terms of key service and physical attributes at the facilities. In this manner, specific facility deficiencies, as well as system wide deficiencies are identified.

The intent of the IMS effort is to conduct performance evaluations on a periodic basis to not only identify corrective actions but to also measure how effective previously implemented improvements have been. Additionally, performance measures are an evolving concept that may change over time based upon experiences encountered.

The performance measures used in the evaluation were developed in part through research prepared for the New Jersey Congestion Management Systems planning effort, IMS planning guidelines of PennDOT, and national literature among other materials. Additionally, the evaluation process, which uses equally weighted performance measures, was first applied in DVRPC's *Intermodal Management System - Phase II Report* prepared for PennDOT in November 1997. A few changes, suggested by the New Jersey Study Steering Committee, were incorporated into the evaluation process. Still enough similarity remains for a regional assessment of intermodal facilities.

The performance measures are qualitative in nature and the evaluation procedure can be applied based upon on-site visual inspections and simple analysis of readily obtainable data. DVRPC staff visited each facility and recorded its observations on a facility survey form. The survey form is a simple instrument as well, and awards each performance characteristic between 0 and 2 points. A score of 2 points is awarded if the performance condition is fulfilled, 1 point if partially fulfilled or 0 if the condition does not exist.

After all of the facilities were surveyed, staff revisited the initial survey ratings to better reflect actual field conditions and to make the ratings less subjective.

Passenger Performance Measures

There are 25 performance measures for intermodal passenger facilities which are distributed within five general categories. Table 4 lists and defines each of the performance measures used in assessing passenger facilities.

TABLE 4 PASSENGER FACILITY PERFORMANCE MEASURES

PERFORMANCE MEASURES	POINTS		
	0	1	2
ACCESSIBILITY (0-14 POINTS)			
trailblazer signs	none	signs at station	any advance signs
pedestrian directional signage	none	signs at station	any advance signs
kiss and ride area	no discharge area	unofficial discharge area	designated discharge area
pedestrian treatment	potential conflict of pedestrians & vehicles	no pedestrian-vehicle conflicts	special pedestrian provisions
taxi stand	none	unofficial	designated
bicycle racks/lockers	none	bicycle racks	bicycle racks & lockers
bike lane	none	-	designated
MOBILITY / CONNECTIVITY (0-6 POINTS)			
station layout	bus stops distant from station, must exit station to change modes	some aspects of an integrated station but missing features	well integrated station
other barriers	many barriers present	must cross a street between modes, pay a second fare	absence of barriers between modes
signage among modes	none or confusing	some modes covered or confusing	good signage for all modes
STATION AMENITIES (0-26 POINTS)			
covered waiting area/platform	none	some modes	all modes
enclosed waiting room	none	some modes	all modes
passenger seating	none	some modes	all modes
ticket agent	none	-	available
ticket vending machine	none	-	available
public restrooms	none	some modes	all modes
public address system	none	-	available
posting of schedules and information	none	limited information	detailed information widely available
distribution of schedules and information	none	schedules available for distribution	personnel available to give information
newspaper available	none	nearby	in station
retail/service stores	none	nearby	in station
food services	none	nearby	in station
telephone	none	-	available

TABLE 4 PASSENGER FACILITY PERFORMANCE MEASURES

PERFORMANCE MEASURES	POINTS		
	0	1	2
PARKING (0-2 POINTS)			
parking	large or small lot more than 90% utilized	small lot (under 100 spaces) less than 90% utilized	large lot (100+ spaces) less than 90% utilized
ADA COMPLIANCE (0-2 POINTS)			
wheelchair accessible	no	-	yes

Emphasis in the performance evaluation of passenger facilities is upon on-site attributes. Physical features that are not correctable, such as proximity to residential centers, are not considered. Complicated measures, such as adequacy of a kiss-and-ride area, would entail time-consuming field surveys that are feasible only when conducting detailed station studies. Lastly, station amenities refer to the presence of amenities and should not be confused with the condition of amenities which are not addressed in this report.

Freight Performance Measures

There are 19 performance measures for intermodal freight facilities distributed across five general categories. Table 5 lists and defines each performance measure used in assessing freight facilities.

Many freight terminals are privately owned and are in direct competition with other similar facilities. Due to these conditions, freight performance measures in the methodology are focused exclusively on roadway connections between the National Highway System and the facility's gate — and do not evaluate actual facility operations in any way. □

TABLE 5 FREIGHT FACILITY PERFORMANCE MEASURES

PERFORMANCE MEASURES	POINTS		
	0	1	2
ACCESS (0-8 POINTS)			
interchange/intersection configuration	partial interchange	full interchange with on and off ramps located on different streets	full interchange with on and off ramps located on same streets
directness of route	circuitous or confusing	long or indirect but easy to follow	direct with few turns
alternate routing	only one route available	-	multiple routes available
on-site queuing area for trucks	all trucks must queue on street	some trucks spillback into street	all trucks queue on-site
ROADWAY GEOMETRICS / CONDITION (0-10 POINTS)			
interchange, ramp acceleration/deceleration lanes	all ramps are deficient	some ramps are deficient	all ramps are adequate
turning radii	inadequate	-	adequate
pavement integrity	extensive deficiencies	some deficiencies	good
vertical clearance restrictions	posted restrictions	-	none
bridge weight restrictions	posted restrictions	-	none
TRAFFIC OPERATIONS (0-8 POINTS)			
traffic congestion on connector	persistent and recurring	minor or expected to become a problem	none
parked vehicles and other obstructions to traffic	frequent	occasional	none
traffic signals / stop signs	frequent	some	none
railroad grade crossings	create delay	some delay	no delay
SIGNS (0-6 POINTS)			
signs on major roads	no signs	some roads	all roads
trailblazer signs on connector roads	no signs	some roads	all roads
facility entrance signs	no signs	partially signed	fully signed
SAFETY (0-6 POINTS)			
police or private security	none	-	yes
lighted access route	no	-	yes
lighted waiting area	no	-	yes

4 ANALYSIS OF FACILITIES

This chapter presents the results of the performance evaluation of the intermodal passenger and freight facilities.

A field evaluation was conducted of all facilities in the IMS inventory using the performance measures identified in Chapter 3. All public transportation and airport facilities were evaluated as passenger facilities. On the other hand, due to extremely limited activity and amenity levels at the airports only the Trenton-Mercer Airport is reported in this performance review.

The results of the analysis are presented in a tabular format to aid site specific or systemwide comparisons.

Passenger Facility Ratings

Performance evaluations of the passenger facilities are summarized in Table 6. The last column in the table illustrates the total rating points or score awarded to each facility. Averages are calculated for each facility grouping to illustrate the performance of the particular class of passenger intermodal facility. The last row of the table shows an "efficiency rating" — the systemwide average for each performance measure as a percent of the total rating achievable within the measure.[4]

As a system, intermodal passenger facilities presently operate at an efficiency rating of 59 percent. Several measures perform above the systemwide average including mobility, amenities and ADA compliance. Conversely, the system is underperforming in accessibility and parking characteristics. Other generalizations about facilities within the system are:

- Hub stations, as a class, rate highest of all of the passenger facilities averaging 40 of 50 possible points (80 percent efficiency). Ratings are bolstered for the class due to the levels of access and amenities provided at the station.
- Regional / high speed rail stations average 31 of 50 points (63 percent efficiency).

[4] Most measures apply to all facilities. However, some are not appropriate, for example - parking supply conditions at subway stations. In these instances, and they are footnoted in Table 6, the effects of the non-applicable characteristics have been eliminated from the evaluation procedure.

TABLE 6 PASSENGER FACILITY RATINGS - EXISTING CONDITIONS

FACILITY	PERFORMANCE MEASURES					
	Access (0-14)	Mobility (0-6)	Amenities (0-26)	Parking (0-2)	ADA (0-2)	Total (0-50)
HUB STATION						
Trenton	11	6	25	2	2	46
Broadway *Rand Trans. Center*	6	2	21	2	2	33
average	9	4	23	2	2	40
REGIONAL / HIGH SPEED RAIL STATION						
Princeton Junction	9	6	26	2	2	45
Lindenwold	9	6	20	0	2	37
Ashland	8	6	20	2	0	36
Woodcrest	10	6	18	0	2	36
Haddonfield	10	5	20	0	0	35
Ferry Avenue	9	5	18	2	0	34
Westmont	6	4	20	1	0	31
Collingswood	7	4	19	0	0	30
Atco	8	1	14	2	2	27
Princeton	6	3	16	0	2	27
Cherry Hill	5	2	12	2	2	23
West Trenton	2	3	11	0	0	16
average	7	4	18	1	1	31
SUBWAY STATION						
City Hall	3 [1]	3	17 [2]	n.a. [3]	0	23
PARK-AND-RIDE LOT						
NJ Turnpike Interchange 5	4	2	19 [4]	2	2	29
Mount Laurel	4	2	17 [4]	2	2	27
Avandale	5	5	10 [4]	2	2	24
Willingboro	5	5	9 [4]	2	2	23
average	5	4	14 [4]	2	2	26

TABLE 6 PASSENGER FACILITY RATINGS - EXISTING CONDITIONS

FACILITY	PERFORMANCE MEASURES					
	Access (0-14)	Mobility (0-6)	Amenities (0-26)	Parking (0-2)	ADA (0-2)	Total (0-50)
BUS STATION						
Cherry Hill Mall	5	6	13 [5]	0	2	26
Woodbury	6	5	11 [5]	0	2	24
Deptford Mall	2	6	14 [5]	0	2	24
Echelon Mall	4	6	11 [5]	0	2	23
Quakerbridge Mall	2	6	13 [5]	0	2	23
Moorestown Mall	3	6	9 [5]	0	2	20
Glassboro	4	5	5 [5]	0	2	16
Burlington City	3	2	8 [5]	0	2	15
Mount Holly	1	1	3 [5]	0	2	7
average	3	5	10 [5]	0	2	20
AIRPORT						
Trenton Mercer	8	4	24	2	2	40
Average	6	4	15	1	2	28
EFFICIENCY RATING	**41%**	**72%**	**66%**	**43%**	**75%**	**59%**

[1] - The rating excludes the following performance measures: trailblazer signs, taxi stands, bike rack, and bike lane.
[2] - The rating excludes the following performance measures: retail/service stores, food services.
[3] - The rating excludes the following performance measures: parking.
[4] - The rating excludes the following performance measures: ticket agent, ticket vending machines,
[5] - The rating excludes the following performance measures: ticket agent, ticket vending machines, and distribution of schedules.

- City Hall Station, the only subway station in the system, operates with a rating of 23 points of 36 possible (64 percent efficiency). The station is presently undergoing renovation.
- Park-and-ride lots rate an overall total of 26 out of 46 possible points (56 percent efficiency). Situated very near interchanges with the regional freeway network, park-and-ride lots are simple in nature with a parking lot surrounding or placed adjacent to a bus loading area. As a consequence, on-site mobility / connectivity performance characteristics are emphasized and most easily satisfied.
- Bus stations as a category rank last (sixth) with an overall average score of 20 points out of 44 possible (45 percent efficiency). At the

present time, the intermodal function of this particular class of facility is very limited. Generally buses are at the location in a supporting role to the commercial activity (i.e., the bus simply delivers and picks-up customers and employees). However, in the near future, a greater reliance on these locations (and particularly the malls) for intermodal purposes is foreseen in response to welfare-to-work mandates. Expanded community based transportation services will supplement and expand fixed route bus services already focused at these commercial areas. As such, formalization of the category as a change of mode point is imminent as much as it is desirable.

- Trenton-Mercer Airport scores a total of 40 of 50 possible points (80 percent efficiency) with consistently high scores across all performance categories.

Passenger Facility Summaries

Presented below are some key observations related to the surveyed system. Recommendations emanating from the complete evaluation are presented in Chapter 5.

Hub Stations:
Bolstered by the levels of access and amenities, hub stations rate the highest of all passenger facilities.

Trenton Station - The station serves Amtrak, NJ Transit rail service, SEPTA rail service and NJ Transit bus service. Amenities and pedestrian guide signs inside the terminal are superior. Taxi stands and kiss-and-ride loops are present. The station is also well integrated with its neighborhood; pedestrian street scape improvements are taking place in the station's immediate surroundings. An excellent trailblazer network is afforded along the adjacent highway connector between US 1 and the station.

PATCO's Broadway Station / NJ Transit's Rand Transportation Center Complex - PATCO Station renovations and improvements are in progress. Trailblazer signs are not present on the surrounding connector highways — a significant shortcoming considering that the facility serves NJ Transit's seashore routes, Greyhound bus services and a 480 space (estimated) parking garage.

There is not as much interaction between the modes at the facility as one might expect. Physical separation between the operators, within the center, mirrors the different travel markets served by the facility. PATCO's

Broadway Station users originate or are destined to offices in the area of the station (e.g., Camden County Courthouse). A very large volume of local bus-to-bus transfers at the Rand Center are exhibited as mid-block pedestrian crossings of Broadway (occurring despite the presence of "Do Not Jaywalk" signs). Interconnection between the platform and the west headhouse would reduce surface street crossings on Broadway, but is not proposed as part of the station renovation currently in progress at the station.

Regional / High Speed Rail Stations:
As a group, regional / high speed rail facilities afford good accessibility with designated trailblazer networks, pedestrian signing, kiss and ride and taxi staging areas afforded at all but the lower boarding locations (West Trenton, Cherry Hill and Collingswood). Amenities available at the PATCO stations remain high despite relatively short passenger dwell times.

Atco - The site and its access plan is shared with a multiplex theater. Station ingress from the north, west and south is successfully supported by trailblazer signing within the US 30 / NJ 73 interchange — to compensate for right-turn-only access at the facility's driveways. A directional signing plan to facilitate egress from the station, needs to be corrected and enhanced.

Cherry Hill - At the present time, the Cherry Hill NJ Transit station site is undergoing improvements associated with construction of a new shopping center adjacent to the station (scheduled for opening in January 1999). As a result of a land swap to accommodate the new shopping center an expanded supply of parking spaces will be provided at the station. It is also expected that the shopping center project will increase the level of amenities available to the station user, and reduce isolated feelings at the station as a result of increased activity levels surrounding the station.

NJ Transit Route 406 (Philadelphia to Medford Lakes via NJ 70) passes the station but does not pull into the station. The bridge carrying the NJ Transit Atlantic City Rail Line (ACRL) over NJ 70 has been brightly painted to serve as an advertising sign for the ACRL and a highly visible facility entrance sign for westbound NJ 70 traffic. Conversely, eastbound traffic approaching Cornell Avenue (the facility's entrance roadway) is afforded no entrance sign.

West Trenton - Station accessibility is compromised by an absence of trailblazer signs and facility entrance sign at Grand Avenue. Additionally, the station's main driveway intersecting Railroad Avenue is poorly located contributing to inefficient egress from the station. The parking lot is

stabilized with gravel and is as a result not striped. SEPTA proposes to expand parking at the station within its regular parking expansion program. Substantial opportunities are present for linkages with surrounding land use which is devoted to (and developing as) industrial and office parks. Conditions within the tunnel at the station are offensive while there are no barriers to crossing the tracks at grade.

Subway Stations:
City Hall Station - Station renovations are in progress. The underground pedestrian concourse and stairway directly connecting the station with the northeast corner of the 5th and Market Streets intersection is closed, and is not proposed for reopening. This connection obviated certain street level crossings by PATCO riders. On the other hand, each pedestrian crossing of the 5th and Market Streets intersection has painted crosswalks and pedestrian crossing signal displays.

Park-and-Ride Lots:
NJ Turnpike Interchange 5 - NJ Transit's Route 409 bus operating between Trenton and Philadelphia along US 130 does not interconnect with the parking facility. Station amenities offered are above the minimum since the station serves long distance travelers.

Mount Laurel - NJ Transit's Route 457 bus operating between Camden and Moorestown Mall along Kings Highway does not interconnect with the parking facility. The trailblazer sign network to the park-and-ride lot is misleading and needs to be corrected. Station amenities offered are above the minimum since the station serves long distance travelers.

Avandale - A far reaching and comprehensive trailblazer sign network supports the facility. Station amenities are sparse with only the necessities provided (shelters, benches, honor boxes, route and schedule signing). Bike racks are excluded from the set of amenities, yet parked bikes were observed at the lot, chained to fences and trees.

Willingboro - Trailblazer signs are provided only along northbound US 130 and the facility entrance sign is partially obscured by a ride-share sign. The Willingboro Plaza is a large abandoned shopping center; as such, station area amenity levels are extremely limited.

Bus Stations:
Bus stations, within this study, have two or more fixed route bus lines focusing on a regional mall (5) or an outlying business district - OBDs (4). The degree to which these facilities actually function as change of mode facilities is limited at this time. In practice, bus services to such locations are typically relegated to a supporting role to the commercial establishment. Service is provided and direct amenities are allowed at the invitation or approval of the property owner. Hours of operation coincide with mall operations and higher level amenities are provided by surrounding land use, but not necessarily in proximity to the transit station.

The intermodal role of these locations will likely strengthen as state initiatives are phased in to offset the effects of impending federal welfare-to-work mandates. Within the context of this work, therefore, we are suggesting that a more robust and visible identity for the bus station be created — to serve as satellite transportation hubs — particularly at the malls.

Expanded private and public, corporate and community-based transportation services should be integrated at the malls to extend the reach of the fixed route services already provided there. Consequent with its increased role, a standard level of amenities should also be provided. Trailblazer signs and designated parking areas are proposed in addition to shelters, schedules, signs and telephones. Information kiosks, whether part of a mall or a street scape design, should identify the location of the bus station.

Some existing characteristics of bus centers which are models for imitating, and/or pose opportunities in implementing intermodal services are highlighted below.

Echelon Mall - The bus stop is at the most visible and accessible mall entrance to / from the surrounding external roadways. The bus station is also at the most brightly lit and well appointed mall entranceway.

Cherry Hill Mall - The mall's entrance is very convenient to the surrounding highway system and external bus routings. Separate, but coordinated bus station furniture is provided by the mall. An outlying parcel on the mall's property (adjacent to Haddonfield Road) is available for use as an official park-and-ride lot.

At OBDs bus routes converge upon a common street segment and traverse several blocks within the commercial district. As such, it is difficult to define the precise (or most practical) location of a bus station. An urban design study can assist in this matter, and street furniture (benches, street lighting, bus stop signs, shelters, pedestrian signing and honor boxes) should be common elements at the bus station which support the street's transit function and the commercial district's need.

Burlington City - Bus shelters are provided along both directions of Broad Street, but are separated by two blocks. The bus station should be focused at the business district's most central intersection — Broad and High Streets (between the existing stops) — and integrated with the downtown's street scape improvement. The relocated and redesigned stop will complement the South Jersey Light Rail Transit line proposed to traverse the city along Broad Street.

Mount Holly - A street scape improvement has been completed which upgraded sidewalk and street lighting within the business district, yet there are no facilities promoting transit utilization, not even bus stop signs. The intersection of Washington Street and High Street / White Street is the most logical focus for a formalized bus station. However, because of variable sidewalk widths and limited opportunities to restrict curbside parking (for installing a sheltered bus stop) alternate locations along Washington Street as far northward as Pine Street may also be considered. All improvements should be complementary in design to the current street scape.

Airports:
Airports were evaluated using passenger intermodal facility performance criteria.

Trenton-Mercer - Currently the Trenton-Mercer Airport is the only commercial airport on the New Jersey side of the region. A comprehensive trailblazer signing system supports the facility reaching into the interchange signing for I-95, and along local roads in the surrounding area. The airport is indirectly served by NJ Transit Bus Route 607 (Independence Mall-Trenton-Ewing) operating along Bear-Tavern Road (Mercer County Route 579) during the daylight hours on weekdays.

The airport's main terminal is closest to Bear-Tavern Road. The intersection is controlled by a stop sign on the airport's driveway and separate turning lanes are provided to accommodate left turns at the three way intersection.

The airport terminal's site design is complemented by a large supply of parking. Although field inspections, conducted shortly after the Memorial Day weekend, suggested that overflow parking conditions were probably experienced at the facility as a result of increased holiday travel.

The main terminal building houses a variety of ancillary uses, such as a car rental service, restaurant and gift shop. Three hangars and related corporate activities are also present on the property. These share the access roadway through the airport, but are located closer to Scotch Road (Mercer County Route 611). The Scotch Road and airport roadway intersection is signalized with jughandles present to serve left turns from the county highway.

Passenger Systemwide Findings

Presented below is a summary of the systemwide evaluation of the passenger network's performance characteristics.

Accessibility:

Trailblazer signs - The connector highways between the NHS and the passenger intermodal facilities are appropriately signed with trailblazers. Hub stations and regional / high speed rail stations serving longer distance travel (i.e., those with Amtrak and NJ Transit rail service) typically have a signing network with a longer reach. PATCO's trailblazers typically begin closer to the station — reflecting the local markets from which their operations draw. One shortcoming of the PATCO system was the absence of facility signs which identify the station name at or from the periphery of the station property.

Systemwide signing for park-and-ride lots deserves re-visiting. NJ DOT has an extensive signing network supporting park-and-ride lots throughout the New Jersey portion of the region. However, during field surveys conducted for this study, it was determined that the NJ DOT signing network should be re-inventoried and updated for revised parking lot locations and or missing signs (the NJ Turnpike Interchange 5, the Mount Laurel and the Willingboro sites inventoried in this work would be especially relevant to such a review).

As bus stations become formalized as mode-change points and grow in activity levels, it will become more important that highway trailblazer signs are installed to support their expanded role.

Pedestrian signing - Subway and bus stations are the facilities which are most reliant on pedestrian arrivals. Pedestrian oriented trailblazer signs are

therefore recommended. In the malls, the location of the bus station should be identified on the information kiosks located within the mall.

Other locations warranting pedestrian signage, based upon the nature and size of surrounding land use, include Trenton Station, Princeton Station and Rand Transportation Center. The pedestrian networks to be signed should be identified as part of an urban design study and should be installed as part of any downtown revitalization work.

Bicycle treatments - Bike lockers are present at the hub stations while racks are present at most of the regional / high speed rail stations. Surprisingly, only one station (Woodcrest) has a designated bike route to the station. Those stations which appear to invite and/or would support bike treatments (because of low traffic volumes, conducive roadway geometry and/or appropriate surrounding land use conditions) as determined through the field view effort, include:

- Princeton - borough wide,
- Ashland Station / Echelon Mall - along Somerdale and Burnt Mill Roads,
- Woodcrest Station - west on Oak Avenue into Lawnside,
- Haddonfield - along Cedar Grove Road,
- Westmont Station - along Crystal Lake Road,
- Collingswood Station - along Cuthbert Boulevard, and
- Trenton-Mercer Airport / West Trenton Station - along Bear-Tavern Road / Grand Avenue.

The Greater Mercer Transportation Management Association is sponsoring a "station bike" program at the Princeton Station. The TMA is acquiring 45 bicycles, which will be brightly painted for visibility and placed at the station. The bikes will increase accessibility to current transit services, and be available to the public free of charge — on a first come-first served basis.

Mobility / Connectivity:

Station layout and signage among modes - The set of intermodal passenger facilities successfully integrate mode and user. However, sometimes bus stops are remote from the train or bus station and/or airport.

Other barriers - A systemwide flaw that restricts interconnectivity within the system is the lack of cooperative fare-transfer agreements between PATCO and NJ Transit and SEPTA and NJ Transit. System benefits resulting from integrated fares include encouraging regular and reverse ridership, and

strengthening feeder bus services to help offset parking constraints at the stations.

Discounted fares are offered through existing fare sharing arrangements between PATCO and SEPTA. Additionally, travel advice to some of Philadelphia's major attractions is prominently posted, above a SEPTA ticket dispenser, within all the PATCO stations.

Amenities:
Park-and-ride lots and bus stations provide minimal levels of amenities considering the lower levels of transit service provided. Often amenities at bus stations are indirectly provided as a result of the surrounding land use (like enclosed or covered waiting areas, benches, phones, restrooms, and food and retail outlets). This is particularly true at the malls, and the Woodbury business district.

Parking:
The lack of readily available station parking is one factor which constrains the ability of the public transportation system to foster increased ridership. Of the inventoried network, excluding the nine bus stations, parking supply constraints exist at eight intermodal passenger facilities and particularly within PATCO's set of regional / high speed rail stations. City Hall, Collingswood, Westmont, Haddonfield, Woodcrest and Lindenwold (all PATCO), Princeton (NJ Transit) and West Trenton (SEPTA) are at or near parking capacity.

West Trenton is targeted for improvement within SEPTA's regular parking expansion program. Collingswood, Westmont, Haddonfield and Lindenwold are served by existing NJ Transit bus routes. Greater reliance on passenger delivery by these services could help to ease parking utilization at the stations. Shared fare and transfer agreements, if instituted between the systems (NJ Transit and PATCO), could facilitate spreading the demand.

At Lindenwold Station and Ashland Station opportunities for satellite parking are available. The Bradlees Shopping Center located at the White Horse Pike and New Road has an abundant supply of parking spaces to supplement the Lindenwold Station's supply. It lies along or with minimal diversion from NJ Transit bus routings already traveling to the station.

The Echelon Mall is a potential remote parking location for the Ashland Station. The Echelon Shuttle, a successful private bus service (operating

between the Community of Echelon, a neighboring corporate center, the Echelon Mall and the Ashland Station) is in place to transport park-and-riders to the station should parking constraints arise in the future.

Woodcrest, which is not served by NJ Transit buses, is immediately surrounded by large employment sites which either do not fully utilize their parking lots, or have available area on their properties for expansion parking adjacent to the station. These areas should be explored as satellite parking lots for PATCO. Sidewalks would be necessary along Woodcrest Road and across the bridge over PATCO. It should be noted that the Woodcrest Station layout includes a stairway from Woodcrest Road to the parking lot just west of the bridge.

Another possibility for supplementing the parking constraints at Woodcrest would be to expand feeder bus services to the station. Serious consideration should be given to instituting community based feeder bus services, operating between the station and surrounding residential neighborhoods and suburban work sites (on the order of the Echelon Shuttle Bus).

The addition of NJ Transit's Hamilton Station will provide far reaching benefits. Currently in construction and scheduled for Fall 1998 operation, the station will provide 1,600 new parking spaces within the US 1 corridor. The new station and its parking supply will create new transit demand, divert existing parking demands from and free up supply at the Princeton Junction and Trenton stations.

City Hall, a subway station, and Princeton a regional rail stop, exhibit non-traditional modes of approach to rail stations. In the case of City Hall, patrons walk or are dropped-off. Additionally, the next outlying station on the line (Broadway at the Rand Transportation Center), is within a very short distance of the City Hall stop and has a parking garage with an excess supply of parking spaces. Therefore, parking is not a major issue at the City Hall Station.

Princeton is surrounded by on-street and off-street municipal parking facilities which simultaneously serve the commercial district's needs and student parking. Train service at the station (the Dinky) acts as a feeder to the Princeton Junction Station. Because of the additional transfer, transit users arriving by private auto are judged to be a very small component of the overall parking situation in Princeton.

Instead the Princeton Station draws walk-on, drop-off and bike riders (hundreds of bikes were parked at the station). The Greater Mercer Transportation Management Association is administering a "station bike" program to expand the reach of the station with 45 loaner bikes.

At bus stations there are no supplies of parking devoted to the transit user. At these locations parking is principally intended for patrons of commercial establishments. At malls, especially, it is recommended that some area within the lot be designated expressly for the transit user to facilitate an expanded intermodal role for the facility. It may be near the existing bus station, or at an outlying location on the mall property, which could be provided as an alternate or additional stop on the property.

ADA Compliance:
The operators are complying with their contracts to be accessible to their clients. The only station that was not wheelchair accessible, but reasonably could be, is the West Trenton Station.

Freight Facility Ratings

Performance evaluations of the intermodal freight facilities are summarized in Table 7. As with the passenger data, the last column in the table illustrates the total rating points awarded to each facility. Averages are calculated where clusters of facilities exist to illustrate the performance of the connector highway network relative to the freight terminals. The last row of the table shows the systemwide efficiency rating for each performance measure (i.e., the average score divided by the total rating achievable for the measure — shown as a percentage).

Systemwide, roadway connections to the intermodal freight facilities operate at 74 percent efficiency. Other generalizations about the system are:

- Highway access and roadway geometry / conditions as pertain to highway connections between the intermodal freight facilities and the National Highway System (NHS) perform satisfactorily (73 percent and 75 percent efficiency ratings respectively).
- Traffic operations and directional signing along connector highways perform slightly below the systemwide average (with 67 percent and 65 percent efficiency ratings, respectively).
- Exceptional highway safety and security conditions are provided along the existing connector highway system (92 percent efficiency).

TABLE 7 FREIGHT FACILITY RATINGS - EXISTING CONDITIONS

FACILITY	PERFORMANCE MEASURES					
	Highway Access (0-8)	Roadway Geom/cond (0-10)	Traffic Operations (0-8)	Directional Signs (0-6)	Highway Safety (0-6)	Total (0-38)
Citgo Asphalt	6	9	8	6	5	34
Coastal Eagle Point Oil Co.	8	8	7	5	5	33
Port of Camden South						
- Gloucester Marine Terminal	7	9	7	4	6	33
- Koch Fuels	7	9	6	4	6	32
- Broadway Terminal	6	9	7	3	6	31
- Trans Ocean Marine Services	6	7	6	2	6	27
average	7	9	7	3	6	31
Port of Paulsboro						
- Valero (formerly Mobile)	7	10	5	5	6	33
- GATX Terminal Corp.	6	9	4	5	6	30
- Tosco (formerly BP)	6	9	4	3	6	28
- Dupont Repauno	5	6	6	5	6	28
average	6	9	5	4	6	30
National Gypsum	5	8	7	2	5	27
Port of Camden Central						
- Beckett Street Terminal	3	8	4	5	6	26
- GA Pacific Gypsum Plant	4	8	4	4	6	26
average	4	8	4	5	6	26
Port of Camden North						
- Amerada Hess Corp.	7	5	5	4	5	26
- Citgo Petroleum Corp.	5	3	3	3	4	18
- Trailer Marine Transportation	5	3	3	2	4	17
average	6	4	4	3	4	20
Average	6	8	5	4	6	28
EFFICIENCY RATING	**73%**	**75%**	**67%**	**65%**	**92%**	**74%**

Freight Facility Summaries

Presented below are some key observations related to the surveyed system. Recommendations emanating from the full evaluation are presented in the following chapter (Chapter 5).

Citgo Asphalt:

This is the most highly rated facility on the New Jersey side of the region. It is located in very close proximity to I-295 via the Paradise Road interchange (#19). While some movements are restricted at the interchange, all movements between the Citgo Asphalt facility and I-295 (north and south) are accommodated. Shortcomings are minor in nature and are contained within the segment of Paradise Road west of NJ 44.

Paradise Road to the west of NJ 44 is a cul-de-sac serving Citgo Asphalt and another industrial concern. As such, there are no alternate routes directly to the facility. Surface conditions along Paradise Road require overlay, and a grade crossing in the segment needs reconstruction.

Coastal Eagle Point Oil Company:

This is the most accessible freight terminal. Its access design provides direct ingress and egress capability to both I-295 and US 130. Its southerly driveway takes direct access from the I-295 and US 130 interchange. Its northerly driveway intersects US 130 at an existing median break.

Because there are two entrances, separated by a significant distance, alternate routing needs are almost non-existent. The facility benefits from roadway design standards provided by the interstate highway system. Traffic congestion is not a factor as I-295's main line has diverted substantial volume from US 130 in the vicinity of the site.

Shortcomings are minor. Signing and roadway geometry needs relate to providing an efficient signing plan for the facility's southern driveway and improved turning conditions at the facility's northern driveway. Safety reviews indicated that the Coastal Eagle Point Oil Company is the only freight facility inventoried which does not have lights along the connector roadway system serving it. On the other hand, lighting in the I-295 interchange and within the confines of the property, along its US 130 frontage, offsets these deficiencies.

Port of Camden - South:
The Port of Camden South is an unofficial "umbrella" title for a conglomeration of four intermodal freight facilities (Broadway Terminal, Trans Ocean Marine Services, Gloucester Marine Terminal and Koch Fuels) in the City of Camden and Gloucester City. The cluster shares the same connector highway routing to I-676 at the Morgan Boulevard interchange (#4) yet facility and trailblazer signing is lacking. Additionally, the present directional signing plan along I-676 to the port terminals is inconsistent.

To more efficiently route vehicles to the facilities, it is recommended that the port community adopt the umbrella title (or something similar) and use it in the legends of interchange signing along I-676. A supporting trail blazer signing network (in and out) along Morgan Boulevard, Broadway and King Street should be installed as a complement to the improved regional highway signing. Lastly, upgraded facility entrance signing for Broadway and for Trans Ocean Marine Services are needed.

Broadway Terminal - Broadway between Morgan Boulevard and the facility entrance is deteriorated.

Trans Ocean Marine Services (TOMS) - Broadway and King Street between Morgan Boulevard and the facility entrance is deteriorated and the rail crossings through the intersection of Broadway and King Street should be reconstructed. The access drive to/from the facility intersects King Street on a skew particularly close to the intersection of Broadway and King Street. In turn, the intersection of Broadway and King Street is also skewed. These intersection conditions contribute to less than safe conditions particularly for trucks destined for the Morgan Boulevard / I-676 interchange.

Gloucester Marine Terminal - In the site's immediate vicinity pavement, grade crossing, access and facility entrance signing conditions are satisfactory.

Koch Fuels - The facility's entrance and exit drives are at a bend in King Street at the intersection of Jersey Avenue. The entrance drive is oriented perpendicular to King Street and opposite Jersey Avenue. The exit drive from the Koch site, forms a fifth leg to the intersection which is directly aligned with the north intersection leg (King Street).

The skewed alignment of King Street, south of Jersey Avenue, causes that approach to be in the exiting (Koch Fuels) truck driver's blind spot (i.e., the "No Zone"). As there are low traffic volumes traversing the intersection at

relatively low speeds, the situation does not pose a significant traffic, roadway or safety deficiency. However, in any redesign of the intersection or the Koch site, revising / reversing the site's access scheme should be considered.

Port of Paulsboro:
The Port of Paulsboro is an unofficial "umbrella" title for a conglomeration of four intermodal freight facilities (Tosco - formerly BP, GATX and Valero - formerly Mobile Oil, in Paulsboro, and from the perspective of this study DuPont Repauno in Greenwich Township). A system of truck routes are in place along the county routes (CR 673, CR 680, and CRs 678 and 667) leading to the facilities from I-295's interchanges: #16b, #17, and #18.

Of these truck routes, interchange #16b (CR 673) is generally substandard with regard to the length of acceleration lanes and ramp turning radii. Interchange #18 (CRs 678 and 667) is in the process of being reconstructed, but is connected with roadways which restrict certain truck movements (presumably as a neighborhood traffic calming measure). Interchange #17 (CR 680) has an upgraded design and is the most centrally located interchange serving the cluster. Interchange #17 is also the least disruptive to the residential neighborhoods in the vicinity. As implied by the available set of interchanges, all of the facilities are served by alternate signed truck routings.

To more efficiently route vehicles to the facilities, it is recommended that the port community adopt the umbrella title (Port of Paulsboro or a similar title) and add the title to the legends of interchange #17's signing along I-295. A supporting consolidated trail blazer signing network for the cluster of facilities and a facility entrance signing for Tosco should be prepared as a complement to the upgraded regional highway signing.

The initial step in this process would be to conduct a landside access study of the activity center. That study would clearly define constraints and opportunities, and should directly involve the freight constituents, the business and residential communities as well as representatives of the state, county and local governments. Certain aspects of that study would lend support in documenting recommended additions to the NHS's official network of intermodal connector highways.

Valero (formerly Mobile Oil Co.) - Of the facilities within the Paulsboro cluster, Valero is the closest to and most directly accessed from I-295. It is

also the most easily identifiable as a consequence of its location, size and facility signing.

Along the truck approach route (CR 680 and CR 653), two grade crossings are encountered on CR 653 just before the Valero site. Both are adequate in terms of the quality of the crossing surface and warning systems, but serious delays are encountered at one — the Penns Grove Secondary. There is an existing TIP project to construct a grade separation at the crossing to rectify the deficiency.

GATX - The facility's truck route shares the Penns Grove Secondary grade crossing problem along CR 653 experienced by Valero. Furthermore, the truck route to the facility utilizes local roads, adjacent to residential areas, as part of its connection with I-295.

Tosco (formerly BP) - The facility's truck approach route shares the Penns Grove Secondary grade crossing problem along CR 653 with Valero and GATX, and needs the same local residential streets that GATX uses. However, the facility is located deeper within Paulsboro and has several unsigned gates along Mantua Avenue and Industrial Road. The areawide truck route trailblazer system serving Valero and GATX all but disappears before guiding arriving trucks through the residential neighborhood to Tosco's entrance gate.

DuPont Repauno - The DuPont facility currently relies on access to I-295 via CR 673 (interchange #16b - Democrat Road). While the interchange accommodates all traffic movements, its design is outdated with respect to ramp turning radii and acceleration and deceleration lane lengths. There is a signed trailblazer truck route to the interchange and an informal signing plan for the DuPont facility. A short segment of Repauno Avenue, between Democrat Road and West Broad Street, is particularly narrow and simultaneously accommodates residential on-street parking and the signed truck route.

National Gypsum:
National Gypsum is located on River Road (Burlington County Route 656) in the northernmost corner of Burlington Township. Primary access to the facility from northbound US 130 is somewhat circuitous, requiring the use of Dulty's Lane as a bypass to a residential section of Neck Road (which is posted for a 10 ton weight limit). The surface condition along Dulty's Lane, including an at-grade railroad crossing in the segment, is in very poor repair.

Secondary access to the River Road corridor is possible, but not to be emphasized, through Florence's residential area north of the site.

National Gypsum is surrounded by large industrial, manufacturing (Occidental Petroleum) and trucking (National Distribution) concerns. Its immediate surroundings are also undergoing substantial development as witnessed by the Whitesell Corporation's 660 acre proposed manufacturing, warehouse and industrial development (surrounded by Dulty's Lane, the railroad right of way, the New Jersey Turnpike Extension and River Road, in Burlington and Florence townships).

Strong areawide growth is expected to continue as a consequence of the New Jersey Turnpike Extension's new interchange being constructed at US 130 (interchange #6a) and the provision of the SNJLRT line and station at Dulty's Lane. The longer term forecast for the area surrounding the National Gypsum site is that traffic volume will increase substantially on the NHS routes in its vicinity and congestion will be introduced along the facility's connections to the NHS.

A cohesive destination and trailblazer signing plan is deemed to be particularly important to provide for efficient truck travel in the face of such traffic growth. Therefore, it is recommended that the port and business communities, Burlington Township, Burlington County, NJ DOT and the New Jersey Turnpike Authority identify and adopt an umbrella title for the industrial sector. That title should subsequently be added to the legends of interchange signing along the New Jersey Turnpike Extension, and directional signing along US 130.

As a complement to improved regional highway signing — a supporting trail blazer network, selected traffic engineering measures and appropriate facility entrance signing are also recommended along Dulty's Lane, Neck Road and River Road. Finally, it is recommended to add this set of highway connections (Dulty's Lane, Neck Road and River Road) to the official list of connectors included in the NHS.

Port of Camden - Central:
The Port of Camden Central is an unofficial "umbrella" title for two large intermodal freight facilities (Beckett Street Terminal and the Georgia Pacific Gypsum Plant) in the heart of the City of Camden's industrial waterfront. The cluster shares the same NHS connector highways to I-676 at the

Atlantic Avenue interchange (#3) on the south, and to Mickle Boulevard on the north.

To more efficiently route vehicles to the facilities, the port community should adopt the umbrella title and use the title in the legends for signing along I-676 at interchange #3 (the present directional signing along I-676 to the port terminals is inconsistent). A supporting inbound trail blazer signing network along Atlantic Avenue, Ferry Avenue and 2nd Street (and more visible Georgia Pacific entrance signing) is also necessary. Outbound trailblazers to the Atlantic Avenue interchange (i.e., "to I-676") are intermittently available (suffering from vandalism or knock-down) and require maintenance.

Pavement conditions along the southern connector routes are variable and require improvement for efficient goods movement. Reconstruction of Atlantic Avenue's pavement through the I-676 interchange to Ferry Avenue (including regrading of the roadway crown at the Broadway intersection and reconstruction of the railroad crossing between Broadway and Ferry Avenue) is necessary.

Additionally, reconstruction of Ferry Avenue and 2nd Street, between Atlantic and Kaighns Avenue, will facilitate faster truck movement along the connector. Traffic operations along the southern connector route also would benefit from repainting lane lines through, and retiming traffic signals regulating the I-676 / Atlantic Avenue interchange.

The routing of the northern connector, between the facility and Mickle Boulevard, is incorrectly designated with the state and federal highway departments and should be officially "realigned". The suggested route realignment proposes to replace the 2nd Street to Mickle Boulevard segment, which is not continuous, with an alignment comprised of 2nd Street, Clinton Street, and 3rd Street to Mickle Boulevard. The latter set of streets are presently equipped with trailblazers to I-676, have good pavement conditions, and have proper design elements and control measures to accommodate trucks.

Beckett Street Terminal - The Beckett Street Terminal has a very visible facility entrance sign at 2nd and Beckett Streets and field observations support that "Beckett Street" is one of the most active of the inventoried freight facilities.

Substantial congestion is experienced in the vicinity of the entrance to the facility. The area available to process truck arrivals within the security gates is quite small, and its entrance is located immediately at the intersection of Beckett and Front Street. In consequence, Beckett Street between Front and 2nd Streets is used as a truck staging / marshaling area for the terminal. Trucks regularly back away from the gate to park along both sides of Beckett Street interfering with new arrivals to the gate.

Further complicating access conditions at the terminal are a railroad siding and a driveway, serving an employee parking lot, also occupying the Front and Beckett Streets' intersection.

Georgia Pacific Gypsum - This facility shares the same external access conditions as its neighbor "Beckett Street". The facility's entrance sign at 2nd and Chestnut Streets needs greater visibility and Chestnut Street's cartway is in extremely poor condition.

Port of Camden - North:
The Port of Camden - North is an unofficial "umbrella" title for three intermodal freight facilities (Amerada Hess, and the Citgo Petroleum and Trailer Marine Transportation facilities located on Petty's Island) which share a common connector having 36th Street and River Road (Camden County Route 573) as its elements.

Amerada Hess takes access directly from River Road. The facilities on Petty's Island are directly served by 36th Street from River Road. The connector routes are each two-lane highways ultimately interconnecting with NJ 73 (for delivery to the Tacony-Palmyra Bridge).

Although it is not a full interchange, the River Road and NJ 73 interchange offers all ramps necessary for ingress and egress by the freight facilities. The interchange design, judged upon today's criteria, is considered substandard from the aspects of ramp radii and the lengths of acceleration and deceleration lanes.

Pavement conditions are in need of repair along River Road between NJ 73 and DeRousse Avenue. An at-grade railroad crossing within the segment, at Water Works Road, is in need of reconstruction. River Road travels under the Delair Bridge which has a restricted vertical clearance of 13 feet-8 inches.

A signed alternate truck route, located in the central portion of the connector, is available. The alternate route is less direct than the primary connector, but it does avoid the clearance problem at the Delair Bridge. The alternate uses Sherman Avenue and Westfield Avenue between River Road and US 130 (for delivery to the Betsy Ross Bridge, NJ 90 and/or NJ 73). Surface conditions within the cartway are substantially better along the alternate route, and Westfield Avenue was recently resurfaced. Conversely, a railroad grade crossing on Sherman Avenue is substantially worse than any of the roadway surface conditions along River Road.

While the vestiges of a trailblazer network are apparent along River Road, it is by no means fail-safe. The trailblazer network is limited in its reach, uncoordinated and needs maintenance. Additionally, the directional aid afforded through roadway signing does not extend to the regional highway system (NJ 73 or US 130, etc.).

To more efficiently route vehicles to and from these facilities, the port community in concert with Pennsauken, the City of Camden, Camden County, DRPA and NJDOT should consider adopting an umbrella title (for example: Port of Camden - North) and use the title in the legends for signing along NJ 73, the Betsy Ross Bridge, NJ 90 and US 130.

Amerada Hess - The facility's entrance is encountered abruptly when traveling westbound along River Road after passing under the Delair Bridge. Re-orienting the facility's entrance sign perpendicular to passing traffic would better define the plant's driveway.

Citgo Petroleum and Trailer Marine Transportation (Petty's Island) - Access to the facilities are controlled at a gate at the foot of 36th Street. Traveling south from the gate, exiting trucks directly pass through a residential neighborhood. At 36th Street and River Road, intersection geometry is very tight and turning radii are small. Single traffic lane operations are regulated by a two-phase traffic signal. These roadway features are consistent with a city's residential environment, but are not conducive for efficient truck movement. The east leg of the intersection is a bridge over a rail spur (paralleling 36th Street and also serving Petty's Island), which further constrains "constructibility" of traffic improvements at the intersection.

While street signing is in place, there are no trailblazers present to direct trucks efficiently into the facility and/or back to the regional highway system. Trailblazers at the western end of the connector are particularly important —

to route trucks away from residential areas and/or more problematic congestion locations in the City of Camden.

Freight Systemwide Findings

Presented below is a summary of the systemwide evaluation of the intermodal freight network's performance characteristics.

Accessibility:
Without exception, the system is afforded full highway access once the connector highway reaches interchanges and intersections with the NHS. On the other hand, indirect truck routings and/or unacceptable alternate truck routes are the most widespread deficiencies which compromise the effectiveness of the connector routes. These latter conditions particularly impact: the Citgo Petroleum and Trailer Marine Transportation facilities on Petty's Island; Beckett Street and Georgia Pacific Gypsum in Central Camden, and; DuPont Repauno outside Paulsboro.

Roadway Geometrics / Conditions:
Systemwide pavement deficiencies are the most common impediments within this performance characteristic. Almost all facilities require roadway rehabilitation in some form (repaving, roadway and/or grade crossing reconstruction) along the connectors and truck route serving them.

The River Road connector, serving the Port of Camden North, is the only connector highway within the system that has posted restrictions (13 feet-8 inches vertical clearance under the Delair Bridge). A signed alternate truck route is in place to guide outbound trucks around the bridge.

Traffic Operations:
There is no consistency or global cause for deficient traffic operations on the connector highways serving the intermodal freight facilities. Recurring traffic congestion is most notable on the connector highways serving:

- the northern Camden ports - where traffic needs of nearby business parks compete for available roadway capacity along River Road, and;
- the central Camden ports - where multiple users of the system converge at the Atlantic Avenue interchange of the I-676 interchange.

On-street parking is most problematic for truck flows along the connector highways presently leading to or away from:

- DuPont Repauno, and;
- Citgo Petroleum and Trailer Marine Transportation on Petty's Island.

Facility gate deficiencies (inefficient operation and poor location) contribute to congested highway conditions in the vicinity of the Beckett Street Terminal.

Signs:
The entire system warrants attention with regard to deficient signing for the intermodal freight network. Providing comprehensive, coordinated, and cohesive directional / destinational trailblazer signing should be integral to the IMS.

Of the component elements, trailblazer signing along the connector highways is the most serious and widespread deficiency. Areawide destinational signing at nearby interchanges is also needed. Facility entrance signs are required at TOMS, Tosco and Trailer Marine Transportation, but are in need of improvement (enlargement, re-orientation) at Amerada Hess, National Gypsum, Georgia Pacific Gypsum, and Broadway.

Safety:
The connector highways perform safely and securely in accommodating the delivery and movement of goods. □

5 RECOMMENDATIONS

Recommendations emanating from the analysis of intermodal passenger and freight terminals are detailed in this chapter. The recommendations take the forms of:

- physical and operational improvements - to components of the systems (both passenger and freight);
- institutional actions - which will facilitate the physical improvements and/or more completely integrate the systems, and;
- further investigations - to be undertaken to more precisely define system and/or facility needs.

A re-assessment of the intermodal transportation network's performance, is also presented in this chapter, to illustrate the benefits offered by the recommendations.

Passenger Recommendations

Recommendations for improving the performance of the intermodal passenger system are itemized in Table 8. Highlights of the recommendations are presented below.

Hub stations and the City Hall "subway" station

These stations are designated for pedestrian access improvements.

Regional / high speed rail stations

These rail stations contain the most substantial and varied set of recommendations. Accessibility improvements will be afforded by: adding trailblazers along connectors; adding station identification and/or facility entrance signs; providing bike routes at six stations, and; conducting roadway rehabilitation / reconstruction in the vicinity of Ashland Station.

Mobility improvements will accrue at Princeton by: implementing the "station bike program" being administered by the Greater Mercer TMA; constructing traffic engineering improvements at Lindenwold, Atco and West Trenton, and; instituting community integrated shuttle transit service to Woodcrest and Cherry Hill stations.

Bus stop amenity enhancements and station parking expansions are cited for the West Trenton Station. Satellite parking lots are identified for the Lindenwold, Woodcrest and Ashland PATCO stations.

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
HUB STATION					
Broadway / Rand Transportation Center	1) install trailblazers along connector routes 2) install pedestrian trailblazers 3) paint mid-block pedestrian crosswalk on Broadway for NJ Transit bus riders 4) open PATCO's "West Headhouse" to provide customer/pedestrian access to and from the platform from both sides of Broadway 5) install pedestrian actuated signals at Broadway and Mickle Blvd intersection				
Trenton	install pedestrian trailblazers	sidewalk improvements in the vicinity of the station in progress - programmed in 1998 TIP (4305)			
REGIONAL / HIGH SPEED RAIL STATION					
Princeton Junction	install trailblazers along connector routes			relief expected (Fall 1998) when the Hamilton Station opens with 1600 spaces	install tactile warning surface on platform

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
Princeton	add pedestrian trailblazers	initiate Greater Mercer TMA rail station bike program			
Lindenwold	install station identification sign	Construct New Rd extension through UMDNJ campus		pursue off-site parking opportunities with Bradlee's shopping center	
Atco	install facility entrance sign on westbound US 30	1) revise traffic circulation signage in parking lot 2) construction of the Pinehurst Av Extension programmed in 1998 TIP (2342)			install tactile warning surface on platform
Ferry Avenue	1) install trailblazers on connector routes 2) install facility entrance signs 3) install station identification sign	replace interconnecting TNJ signs with NJT route structure			
Haddonfield	1) install trailblazers on Grove St (CR 644) from NJ 38 to Station 2) install station identification sign 3) install bike lane along Grove St (CR 644)	install pedestrian directional signs from turnstiles to bus stop located at station			

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
Woodcrest	1) install trailblazers on connector routes 2) create bike lane along Oak Av west from station into Lawnside	design and operate a community based shuttle bus service		pursue off-site parking opportunities with adjacent land owners	
Westmont	1) install trailblazers on connector routes 2) install station identification sign 3) create bike lane along Crystal Lake Rd (CR 643)	install pedestrian directional signs, in the station, to nearby bus stops located on Crystal Lake Rd (CR 643) and Haddon Av (CR 561)			
Ashland	1) add station Identification sign 2) create bike lane along Burnt Mill Rd (CR 670) and Somerdale Rd (CR 678) 3) resurface Burnt Mill Rd (CR 670) 4) widen Evesham Rd (CR 544) to four lanes between Berlin Rd (CR 561) and Ashland Station			pursue off-site parking opportunities with Echelon Mall	

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
Collingswood	1) install trailblazers on connector routes 2) add station Identification sign 3) create bike lane along Cuthbert Blvd (CR 636)	install pedestrian directional signs, in the station, to nearby bus stops on Haddon Av (CR 561)			
Cherry Hill	install trailblazers on eastbound NJ 70	1) design and operate a community based shuttle-bus service 2) provide a pedestrian overpass upon redevelopment of Garden State Park property			
West Trenton	1) add station identification sign 2) provide bike rack 3) install trailblazers on Grand Av (CR 579) from the station to I-95 4) add pedestrian crossing striping across Grand Av (CR 579) to bus stop 5) create bike lane along Grand Av (CR 579)	1) reconstruct intersection of Grand Av (CR 579) at Railroad Av and station driveway 2) post bus service information for NJTransit Bus Route 608 at station	install bus shelter, bench, lights, and schedule at bus stop	expand, pave and stripe parking lot	install tactile warning surface on platform

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
SUBWAY STATION					
City Hall	1) install pedestrian trailblazers 2) relocate the backlit PATCO entrance sign from the NE corner of 5th and Market St (closed stairway) to the SW corner	install pedestrian directional signs at turnstyles to bus stop at 5th and Market St			
PARK-AND-RIDE LOT					
Avandale	install bike rack				
Mount Laurel	install trailblazers to Fellowship Rd, on NJ 73 between I-295 and NJTurnpk	direct NJTransit Bus Route 457 into station			
NJ Turnpike Interchange #5	install trailblazers along Burlington - Mt Holly Rd (CR 541) from NJ Turnpike to I-295	integrate with NJTransit Bus Route 409 by installing a bus turnout on Burlington - Mt Holly Rd (CR 541) with shelter and bench			
Willingboro	1) install trailblazers on southbound US 130 in advance of the Van Sciver Blvd jughandle 2) install bike rack	relocate the rideshare sign which obscures the park-and-ride sign on northbound US 130			

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
BUS STATION					
Cherry Hill Mall	1) install bike rack 2) incorporate bus-service information inside the mall	design and operate a community based shuttle-bus service	post schedules at bus stop	integrate lot adjacent to Haddonfield Rd as a park-and-ride lot and formalize with amenities & trailblazer signs	
Deptford Mall	1) install bike rack 2) incorporate bus-service information inside the mall	design and operate a community based shuttle-bus service		create a formal park-and-ride lot with amenities & trailblazer signs to integrate fixed route bus and shuttle bus services, and private vehicle needs	
Echelon Mall	1) incorporate bus-service information inside the mall 2) create bike lane on Burnt Mill Rd (CR 670) and Somerdale Rd (CR 678) 3) resurface Burnt Mill Rd (CR 670) 4) widen Evesham Rd to four lanes between Berlin Rd and Ashland Station		provide shelter, seating, and schedules at bus stop	create a formal park-and-ride lot with amenities & trailblazer signs to integrate fixed route bus and shuttle bus services, and private vehicle needs	
Woodbury	install bike rack at Delaware St and Broad St				

TABLE 8 PASSENGER FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Access	Mobility/ Connectivity	Amenities	Parking	ADA
Moorestown Mall	incorporate bus-service information inside the mall	design and operate a community based shuttle-bus service	install bus sign, shelter, seating, schedules, and lighting at bus stop	create a formal park-and-ride lot with amenities & trailblazer signs to integrate fixed route bus and shuttle bus services, and private vehicle needs	
Quakerbridge Mall	1) incorporate bus-service information inside the mall 2) install bike rack	design and operate a community based shuttle-bus service	post bus schedules	create a formal park-and-ride lot with amenities & trailblazer signs to integrate fixed route bus and shuttle bus services, and private vehicle needs	
Burlington City		construct the Southern NJ LRT (Camden-Trenton) with station at Broad St & High St	focus bus shelters, seating, lighting, and schedules on Broad St at High St		
Glassboro			install bus sign, shelter, seating, schedules, and lighting at bus stop		
Mount Holly	conduct an urban design study of Washington St to determine correct bus station location				
AIRPORT					
Trenton -Mercer	create bike lane along Bear Tavern Rd (CR 579)	direct NJTransit Bus Route 607 into airport			

Bus stations
Increased roles for bus stations are foreseen as initiatives are phased-in to ease and assimilate the effects of welfare-to-work mandates. As such, these facilities are well represented by programmatic improvements (particularly at the regional malls: Cherry Hill, Deptford, Echelon, Moorestown and Quakerbridge malls).

Enhancements to accessibility through trailblazers, improved mobility via new shuttle bus services, expanded operating schedules, and formalized amenities — shelters, schedules, benches, phones and lighting, and designated parking at bus stations — will amplify the intermodal role of bus stations.

Park-and-Ride Lots
Recommendations to improve accessibility suggest that NJDOT's trailblazer sign network for park-and-ride lots be inventoried and updated. Mobility needs indicate that physical linkages between public and private transportation carriers and resources be provided.

Trenton-Mercer Airport
Improved network mobility results after the surface public transportation service, operating along Bear-Tavern Road (NJ Transit bus route 607), is directly integrated with the airport.

Systemwide
Assuming that the identified set of improvements are implemented, the overall passenger system's efficiency rating will increase from 59 percent to 68 percent (see Table 9). On a systemwide basis, passenger facility performance will appreciate most in accessibility (plus 15 percent), mobility / connectivity (plus 14 percent) and parking (plus 29 percent) as a result of the improvement program.

The most common actions which elevate the ratings in the accessibility category include signing and bikeway improvements. Station identification, trailblazer and external pedestrian signing are recommended throughout the system, while provision of bike routes leading to seven stations are also cited.

Mobility and connectivity betterments are represented by: driveway improvements at three locations; expanded opportunities for transit service interconnection at nine locations, and; systemwide enhancements to internal station signing.

TABLE 9 PASSENGER FACILITY RATINGS - AFTER RECOMMENDED IMPROVEMENTS

FACILITY	PERFORMANCE MEASURES					
	Access (0-14)	Mobility (0-6)	Amenities (0-26)	Parking (0-2)	ADA (0-2)	Total (0-68)
HUB STATION						
Trenton	12	6	25	2	2	47
Broadway *Rand Trans. Center*	9	2	21	2	2	36
average	11	4	23	2	2	42
REGIONAL / HIGH SPEED RAIL STATION						
Princeton Junction	10	6	26	2	2	46
Lindenwold	10	6	20	2	2	40
Ashland	12	6	20	2	0	40
Woodcrest	11	6	18	2	2	39
Haddonfield	13	6	20	0	0	39
Ferry Avenue	11	6	18	2	0	37
Westmont	12	5	20	1	0	38
Collingswood	10	5	19	0	0	34
Atco	9	5	14	2	2	32
Princeton	7	3	16	0	2	28
Cherry Hill	6	6	12	2	2	28
West Trenton	8	6	13	2	0	29
average	10	6	18	1	1	36
SUBWAY STATION						
City Hall	4 [1]	5	17 [2]	n.a. [3]	0	26
PARK-AND-RIDE LOT						
NJ Turnpike Interchange 5	5	4	19 [4]	2	2	32
Mount Laurel	5	5	17 [4]	2	2	31
Avandale	6	5	10 [4]	2	2	25
Willingboro	7	5	9 [4]	2	2	25
average	6	5	14 [4]	2	2	28

TABLE 9 PASSENGER FACILITY RATINGS - AFTER RECOMMENDED IMPROVEMENTS

FACILITY	PERFORMANCE MEASURES					
	Access (0-14)	Mobility (0-6)	Amenities (0-26)	Parking (0-2)	ADA (0-2)	Total (0-68)
BUS STATION						
Cherry Hill Mall	7	6	14 [5]	2	2	31
Woodbury	7	5	11 [5]	0	2	25
Deptford Mall	5	6	14 [5]	2	2	29
Echelon Mall	8	6	14 [5]	2	2	32
Quakerbridge Mall	5	6	14 [5]	2	2	29
Moorestown Mall	5	6	14 [5]	2	2	29
Glassboro	4	5	10 [5]	0	2	21
Burlington City	3	5	10 [5]	0	2	20
Mount Holly	1	1	3 [5]	0	2	7
average	5	5	12 [5]	1	2	25
AIRPORT						
Trenton Mercer	9	6	24	2	2	43
Average	8	5	16	1	2	32
EFFICIENCY RATING	**56%**	**86%**	**69%**	**72%**	**75%**	**68%**

[1] - The rating excludes the following performance measures: trailblazer signs, taxi stands, bike rack, and bike lane.
[2] - The rating excludes the following performance measures: retail/service stores, food services.
[3] - The rating excludes the following performance measures: parking.
[4] - The rating excludes the following performance measures: ticket agent, ticket vending machines,
[5] - The rating excludes the following performance measures: ticket agent, ticket vending machines, and distribution of schedules.

Systemwide parking performance increases as a consequence of expanded supply at the West Trenton and the Hamilton regional rail stations, and designated supplies created at the bus stations at the five regional malls. Additional benefits will result if opportunities for satellite parking areas supporting the Lindenwold and Woodcrest PATCO stations can be negotiated.

Formalizing and expanding the role of bus stations will have broad consequences upon the system. Enhancing accessibility through trailblazers, expanding mobility through new shuttle bus services and expanded operating schedules, formalizing amenities — shelters, schedules, benches, phones and

lighting — and designating parking at bus stations will amplify their presence, strengthen the transportation services already provided there, and extend the reach of public transportation services within the region.

Freight Recommendations

Recommendations for intermodal freight facilities are itemized in Table 10. A narrative summary of significant findings are presented below.

Citgo Asphalt

Overlaying the pavement along Paradise Road will improve connecting roadway conditions.

Coastal Eagle Point Oil Co

Enhancing physical conditions and operations at the facility's northern driveway (median reconstruction and creation of separate turn lanes on US 130), and adding trailblazer signs between the southern driveway and the I-295 interchange will elevate the facility's total score to the highest within the system.

Port of Camden South

Recommendations for improved directional signage (including area-wide destinational, trailblazer and facility entrance signing) and roadway rehabilitation along the highway connectors are the primary and most influential recommendations for the freight cluster. Revisions to traffic circulation patterns are also advanced to improve driveway operations at TOMS and Koch Fuels.

Port of Paulsboro

Traffic operations improvements are anticipated through the implementation of the grade separation of the Penns Grove Secondary and Billingsport Road (CR 653). Anticipated benefits resulting from an areawide signing plan are deferred for the completion of the recommended landside access study.

National Gypsum

Recommendations for improved directional signage (including areawide destinational, trailblazer and facility entrance signing) along the NJ Turnpike Extension, US 130 and Dulty's Lane, and traffic operational improvements at the intersection of Dulty's Lane and US 130 are the most influential recommendations for the growth center. Roadway rehabilitation along Dulty's Lane is necessary to accommodate current traffic conditions.

TABLE 10 FREIGHT FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Highway Access	**Roadway Geometry/Condition**	**Traffic Operations**	**Directional Signs**	**Highway Safety**
Port of Camden South - *Broadway Terminal* - *Trans Ocean Marine* - *Gloucester Marine Terminal* - *Koch Fuels*	adopt an umbrella title for the cluster of ports	1) repave Broadway and King St from Morgan Blvd to Trans Ocean Marine entrance and provide new pavement markings 2) reconstruct the railroad grade crossings at Broadway and King St 3) reconstruct railroad grade crossing on Morgan Blvd	1) consolidate access plans of Trans Ocean Marine and Ply-Gem (King St - entry for both, and Broadway - exit for both) 2) revise access scheme of Koch Fuels (potential)	1) add trailblazers between the facilities and I-676 along Morgan Blvd, Broadway, and King St 2) standardize placards on I-676 (Port of Camden South use exit #4) 3) upgrade Morgan Blvd interchange signing on I-676 (to include umbrella title) 4) upgrade facility entrance signs for Broadway Terminal and Trans Ocean Marine	
Port of Paulsboro - *Valero (Mobile Oil Co)* - *Tosco (BP)* - *GATX Terminal* - *DuPont Repauno*	1) adopt umbrella title for the cluster of ports 2) conduct access study of the area surrounding the ports to define trailblazer network using CR 680 as a spine 3) recommend addition to the NHS connector route system (CR 680 and CR 653 between I-295 and Valero)		grade separate CR 653 over Conrail's Penns Grove Secondary (1998 TIP # 3410A-B)	upgrade interchange #17 signing on I-295 (to include umbrella title)	

TABLE 10 FREIGHT FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Highway Access	Roadway Geometry/Condition	Traffic Operations	Directional Signs	Highway Safety
National Gypsum	1) adopt umbrella title for the cluster of industries (e.g. Burlington's Industries) 2) recommend addition to the NHS connector route system (between the facility and US 130 along River Rd, Neck Rd, and Dulty's Ln)	1) reconstruct Dulty's Ln and railroad grade crossing 2) replace existing vertical clearance sign (15') at National Gypsum's conveyor belt bridge over River Rd with standard DOT sign	1) install right turn lane on southbound US 130 at Dulty's Ln 2) Realign River Rd and Neck Rd intersection	1) add trailblazer/ destination sign on northbound US 130 at Neck Rd to Dulty's Ln. 2) add trailblazer southbound on US 130 at Dulty's Ln 3) provide trailblazers along Dulty's La, Neck Rd and River Rd 4) reorient facility entrance sign 5) Add Umbrella trailblazer signs along US 130 and at the Interchange with the NJ Turnpike Extension interchange - #6a (in construction)	
Coastal Eagle Point Oil Company		reconstruct pavement in median of US 130 at north gate	1) construct a left turn lane on northbound US 130 at north gate 2) construct right turn lane on southbound US 130 at north gate	1) add trailblazers from northbound I-295 through the interchange to the main (south) gate 2) add trailblazer signs from the main gate to northbound I-295	

TABLE 10 FREIGHT FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Highway Access	Roadway Geometry/Condition	Traffic Operations	Directional Signs	Highway Safety
Citgo Asphalt		overlay Paradise Rd west of NJ 44 and reconstruct the railroad grade crossing		1) provide trailblazers to/from I-295 interchange (#19) 2) add larger facility entrance sign at NJ 44 and Paradise Rd intersection	
Port of Camden Central - *Beckett Street Terminal* - *GA Pacific Gypsum*	1) adopt umbrella title for the cluster of ports 2) realign designated NHS connector route: 2nd St to Clinton St to 3rd St to Mickle Blvd	1) reconstruct Atlantic Av through the I-676 interchange to Ferry Av (includes railroad grade crossing and roadway crown at Broadway) and repaint lane lines 2) reconstruct Ferry Av and 2nd St between Atlantic and Kaigns Av 3) Reconstruct Chestnut St between 2nd and Front Sts	1) coordinate traffic signals through the I-676 and Atlantic Av interchange 2) reconstruct Front St between Beckett St and Clinton St as a truck marshaling area for Beckett St Terminal	1) add trailblazers between facilities and Atlantic Av / I-676 interchange need substantial maintenance 2) revise / standardize placards on I-676 (Port of Camden Central use exit #3) 3) upgrade Atlantic Av interchange signing on I-676 (to include umbrella title) 4) install larger facility entrance sign at Ga-Pacific at 2nd and Chestnut Sts	

TABLE 10 FREIGHT FACILITY RECOMMENDATIONS

FACILITY	RECOMMENDATIONS				
	Highway Access	Roadway Geometry/Condition	Traffic Operations	Directional Signs	Highway Safety
Port of Camden North - *Amerada Hess Corp* - *Citgo PetroleumCorp* - *Trailer Marine Transportation*	1) adopt umbrella title for cluster of ports 2) conduct access study for Petty's Island, utilizing 37th St or other route, as an alternate to 36th St -- a residential street	1) reconstruct River Road between NJ 73 and the Delair Bridge to: rectify deficient pavement conditions, improve railroad grade crossing at Water Works Rd, and eliminate the posted height restriction at the Delair Br (13'8") 2) reconstruct grade crossing on Sherman Av	1) re-stripe 36th St and River Rd intersection, provide setback stop bar on the southbound 36th St approach with "stop here on red" sign 2) Update 36th St and River Rd intersection traffic signal, provide actuated split phase operation on the 36th St approaches	1) upgrade NJ 73 and NJ 90 / US 130 interchange signing to include port umbrella title 2) upgrade trailblazer network and signs to/from facilities and NJ 73 via 36th St and River Rd (and US 130 via Sherman and Westfield Av) 3) add facility entrance sign at the entrance to Petty's Island for Trailer Marine Transportation 4) re-orient Amerada Hess entrance sign to passing traffic on River Rd	provide paved lighted waiting/staging area in advance of Petty's Island entrance gate

Port of Camden Central
Roadway conditions and traffic operations along connections to the NHS will be most improved by: reconstructing Atlantic Avenue and Ferry Avenue; coordinating traffic signal timing through the Atlantic Avenue interchange, and; reconstructing Front Street to serve as a separated truck marshaling location for the area. Upgrading areawide destinational and directional signing complement the physical and operational improvements.

Port of Camden North
Access related recommendations emphasize directional signing (including new areawide destinational signs, upgraded trailblazer and revised facility entrance signing) for the efficient delivery of truck traffic. An access study is cited to comprehensively address long-term circulation needs and opportunities for the Petty's Island facilities (i.e., Trailer Marine and Citgo Petroleum). Rehabilitation of the northern half of River Road — to correct pavement, grade crossing and vertical clearance deficiencies — is a recommendation which will benefit all of the facilities in the port. Traffic operational improvements are recommended at the 36th Street and River Road intersection as near-term, "small-cap" improvements for truck access to/from Petty's Island until the ultimate solution can be determined and implemented.

Systemwide
Reassessment of the system's performance — "after improvement" — is tabulated in Table 11. With the set of identified improvements, the freight system's efficiency rating will increase from 74 percent to 88 percent. On a systemwide basis, the freight network's performance will appreciate most in the following categories, as a result of the recommended improvement program: roadway geometry / conditions (plus 20 percent), traffic operations (plus 15 percent) and directional signing (plus 33 percent).

Improvements to roadway geometry and roadway conditions are cited for implementation at six of the seven freight centers. Specific improvements include reconstructing or repaving conditions along the connector roadways and/or reconstructing at-grade rail / highway crossings.

Improvements to traffic operations are also cited for implementation at six of the freight centers. Site access modifications are identified at TOMS, Koch Fuels, National Gypsum, Coastal Eagle Point and Beckett Street Terminal.

TABLE 11 FREIGHT FACILITY RATINGS - AFTER RECOMMENDED IMPROVEMENTS

FACILITY	PERFORMANCE MEASURES					
	Highway Access (0-8)	Roadway Geom/cond (0-10)	Traffic Operations (0-8)	Directional Signs (0-6)	Highway Safety (0-6)	Total (0-38)
Citgo Asphalt	6	10	8	6	5	35
Coastal Eagle Point Oil Co.	8	10	8	6	5	37
Port of Camden South						
- Gloucester Marine Terminal	7	10	7	6	6	36
- Koch Fuels	7	10	7	6	6	36
- Broadway Terminal	6	10	7	6	6	35
- Trans Ocean Marine Services	6	10	7	6	6	35
average	7	10	7	6	6	36
Port of Paulsboro						
- Valero (formerly Mobile)	7	10	7	6	6	36
- GATX Terminal Corp.	6	9	6	6	6	33
- Tosco (formerly BP)	6	9	6	4	6	31
- Dupont Repauno	5	8	6	6	6	31
average	6	9	6	5	6	33
National Gypsum	5	10	8	6	5	34
Port of Camden Central						
- Beckett Street Terminal	5	10	6	6	6	33
- GA Pacific Gypsum Plant	4	10	6	6	6	32
average	5	10	6	6	6	33
Port of Camden North						
- Amerada Hess Corp.	7	8	5	6	5	31
- Citgo Petroleum Corp.	5	8	5	6	6	30
- Trailer Marine Transportation	5	8	5	6	6	30
average	6	8	5	6	6	30
Average	6	9	7	6	6	34
EFFICIENCY RATING	**75%**	**95%**	**82%**	**98%**	**96%**	**88%**

Physical and operational improvements are called for along the connector highway system. These include the 36th Street and River Road intersection (to facilitate movements to/from Citgo Petroleum and Trailer Marine Transportation on Petty's Island), and along Atlantic Avenue through the I-676 interchange (serving the Port of Central Camden). Finally, construction of a new bridge to separate conflicting at-grade freight movements is proposed within the Paulsboro cluster.

New directional signing plans, or enhancements thereof, are proposed at all of the freight facilities. Key to the success and efficiency of the signing plans, particularly along regional highways, is the formalization of district "umbrella titles" proposed for five of the seven freight districts. Some candidate titles have been identified in these analyses, including: Port of Paulsboro; Port of Camden South; Port of Camden Central, and; Port of Camden North. However, the growing industrial area surrounding the National Gypsum site also warrants a title.

Other Recommendations

Institutional action and further study requirements are also needed to improve the intermodal network. Very often these items need to be accomplished to initiate / facilitate the physical and operating improvements (detailed above).

Institutional Actions

In order to effect the improvements to the system, a procedure for comprehensively identifying projects, priorities, funding and implementation resposibilities should be created with the participation of the steering committee. Therefore, it is recommended that a capital improvement program of the recommended passenger and freight improvements be created. This effort will necessitate collection of current, complete and comparable performance data for the inventory of facilities and an estimation of implementation costs for each of the recommendations.

Another institutionally based recommendation is to define the area surrounding the NJ Turnpike's new interchange with US 130 in Burlington and Florence townships in Burlington County (which includes the existing National Gypsum site and the proposed Whitesell industrial development) as a *"Growth Center"* within DVRPC's Year 2020 Plan.

Integrated fare arrangements, may be facilitated with current smart card technologies, and are being pursued between NJ Transit, PATCO and SEPTA.

Petition NJDOT and the Federal Highway Administration (FHWA) to make the following revisions to the NHS connector roadway system within the region.

- Add Sloan Avenue (CR 649) between the Hamilton NJ Transit station and I-295, in Hamilton Township, Mercer County (Hamilton Train Station).
- Add Harmony Road (CR 680) and Billingsport Road (CR 653) between I-295 and Valero / Jefferson Street in Greenwich Township, Gloucester County (Port of Paulsboro).
- Add Dulty's Lane, Neck Road (CR 658) and River Road (CR 656), between US 130 and the National Gypsum plant in Burlington Township, Burlington County (National Gypsum).
- Realign the existing NHS connector designation from 2nd Street: between Beckett Street and Mickle Boulevard to 2nd Street: from Beckett Street to Clinton Avenue to 3rd Street to Mickle Boulevard in the City of Camden, Camden County (Port of Camden Central).

Further Investigations

The effort to obtain current, complete and comparable facility activity data sets (using station boardings at passenger facilities, and truck generation at freight facilities) has been problematic in this study (NJ Transit records its ridership data on a fare zone basis and some within the freight community are reluctant to release proprietary information).

However, the requirements for the data are clear if prioritized improvement programs are to be formulated. Therefore outreach to owner and operators of the freight and passenger systems to accumulate and maintain direct performance statistics are recommended to fill the data holes and keep the data current. To supplement the participation of the operators, traffic count programs and/or special transportation and/or passenger survey efforts should be conducted. As a last resort, surrogate information could be used as an approximation (or in replacement of) direct performance indicators.

With the participation of the owners and operators, select and conduct detailed studies of high priority or problematic intermodal passenger stations and freight terminals throughout the region.

Conduct a regionwide study investigating the special needs of bikes accessing rail stations. Increased utilization of bikes within the system can extend the coverage of the passenger rail network, and help to reduce parking constraints at its stations. □

6 IMPLEMENTATION

The management systems were created as systematic processes to assist decision makers' selection of cost effective transportation improvements. The Intermodal Management System provides the process to plan for and implement improvements which expedite the transfer of people and goods between different modes of travel. The Year 2020 Plan continues this charge for the Delaware Valley Region and has culminated in this report and its recommendations.

The set of improvement recommendations, detailed in chapter 5, represent the first step in New Jersey to meet the challenge. The implementation process for some of the recommendations has already begun, and several of the cited projects are already included in the region's 1998 - 2002 TIP for the New Jersey Subregion. Examples are listed below.

- Tip project #4308 - Sidewalk improvements in the vicinity of the Trenton Station;
- TIP project #2342 - Pinehurst Avenue's extension, which provides a new driveway connection to the Atco Station;
- TIP project #3410 - Grade separate Billingsport Road (Gloucester County Route 653) and Conrail's Penns Grove Secondary within the cluster of Paulsboro Port facilities.
- TIP project #N035 - Design and build Southern New Jersey Light Rail Transit Line (SNJLRT) will strengthen the intermodal presence of Burlington City Bus Center and introduce an intermodal passenger presence at the freight growth center surrounding National Gypsum and Whitesell's proposed industrial development in Burlington and Florence townships.

Where projects already programmed on the TIP are located in close proximity to the recommended NJ IMS improvements, it may make sense to amend the scope of the TIP project to complete the projects most efficiently. In these instances adding the intermodal recommendations into the scope of the project's design or issuing change orders within the construction contract may be appropriate. Examples follow.

- Add trailblazer signs to the PATCO Ferry Avenue Station as part of the Collingswood Circle elimination project (TIP project #2008).
- Add trailblazer signs along NJ 73, between the NJ Turnpike and I-295, as part of the improvement of NJ 73 and Church, Atrium and

Fellowship roads to facilitate access to the NJ Turnpike Interchange #5 Park-and-Ride Lot located on Fellowship Road (TIP project #1315).

- Implement pedestrian trailblazer signage within the construction contract improving sidewalks around the Trenton Station (TIP project #4305).
- Create a formalized Bus Center at the Deptford Mall consequent with design and construction activities providing a new southbound on-ramp to NJ 42 from NJ 41 (TIP project #3015).

Another avenue for implementing the recommendations is by adding the projects as candidates to established categorical capital and ongoing maintenance programs of the State, counties and NJ Transit which appear on the TIP. Examples of the available programs and their applicability to the NJ IMS recommendations are detailed below.

- TIP project #2343 - Camden City Traffic Signal Upgrade Program: could modernize control and detection capabilities at 36th Street and River Road (Port of Camden North, Petty's Island), and pedestrian access treatments at Mickle Boulevard and Broadway (Broadway / Rand Transportation Center).
- TIP project #2239 - The Camden County Pedestrian / Bicycle Extensions program may be suitable for bikeway enhancements surrounding the Collingswood, Haddonfield, Woodcrest, Westmont and Ashland PATCO stations.

Other categorical improvement programs, currently referenced on the TIP, which may be suitable for implementing the intermodal recommendations are identified below.

- TIP project #3412 - Resurfacing Gloucester County owned and maintained highways.
- TIP project #0046 - Regionwide rail-highway grade crossing hazard elimination program.
- TIP project #0047 - Regionwide program to re-stripe state highways.
- TIP project #0048 - Regionwide program to upgrade signs along state highways.
- TIP project #0062 - Regionwide resurfacing program for state highways.
- TIP project #0067 - Regionwide traffic signal replacement program.
- TIP project # 0066 and #0068 - New Jersey transportation trust fund distributions to counties within the region and municipalities within the region for locally identified improvements.

- TIP project #X185 - Statewide bicycle and pedestrian facilities accommodations is a program to develop and implement infrastructure on state and county transportation systems throughout the state.
- TIP project #X34 - Statewide freight program contains funding to rehabilitate and improve key elements of the state's freight and intermodal goods movement networks and support economic development initiatives.
- TIP project #X161 - Local aid for Centers of Place is funding intended for the development and implementation of transportation improvements supportive of designated centers within the State Development and Redevelopment Plan.
- TIP project #N045 - Funding for rail station and terminal improvements throughout the NJ Transit system.
- TIP project #N053 - Funding for bus passenger facilities improvements, including bus stop signs and shelters throughout the NJ Transit system.
- TIP project #N057 - Funding for park-and-ride land acquisition, design and construction to provide more parking at rail stations through the NJ Transit system.

Bus station enhancements may be also be sought through Access to Jobs and Reverse Commute programs funded from the new surface transportation act ("TEA 21") and through Department of Labor grants — all of which seek to facilitate welfare recipients' mandated return to work.

Recommendations can be also be brought to fruition by leveraging through the land development application, review and approval process (conducted in varying levels by municipal, county and state jurisdictions). Intermodal locations which have improvements which may be implemented through this process include:

- Lindenwold PATCO Station - construct New Road extension through the University of Medicine and Dentistry of New Jersey (UMDNJ) campus to improve mobility between the station and points west.
- Cherry Hill NJ Transit Station - install trailblazers along eastbound NJ 70 with shopping center and construct pedestrian overpass when and if Garden State Park property undergoes redevelopment.
- Trans Ocean Marine Services (TOMS) - Consolidate driveway access and site circulation with Ply-Gem if intersection improvements at King Street and Broadway are proposed and/or expansion of freight facility is proposed.

- Koch Fuels - Revise site access scheme if intersection of King and Jersey Avenue is reconstructed and/or expansion of the freight facility is proposed.
- National Gypsum (Burlington-Florence Freight Cluster) - Dulty's lane reconstruction, River Road and Neck Roads intersection realignment, installation of southbound right-turn lane on US 130 at Dulty's Lane, and destinational and trailblazer sign installation.

DVRPC's Planning Work Program offers a means for implementing high priority transportation and land use studies within the region. Formulation of a candidate list of planning studies is undertaken annually by the staff of the DVRPC and its member governments. The current year's planning work program (FY99) includes an investigation into long term truck access needs and solutions for Petty's Island.

Clearly, many of the recommendations involve projects which fall outside of or between the jurisdictions which are identified to benefit from the improvement. Consequently, the most systematic means toward implementing the recommendations is to formulate candidate regionwide intermodal improvement programs for the passenger terminals and the freight facilities. The programs should include the recommendations identified herein as well as intermodal projects incorporated into pre-existing owner-operator improvement schedules. The proposed capital programs should detail priorities, cost estimates, funding sources, and even partnerships in implementing the recommendations. A program solely devoted to intermodal freight and passenger improvements will help to elevate the profile of intermodal issues and will stand as a ready resource should new or dedicated funding be made available through TEA 21.

In the final analysis, the annual development of the Planning Work Program and the TIP are competitive processes. Candidate studies for inclusion within the work program are submitted annually by the membership to DVRPC (states, counties, transit operators and the Delaware Valley Goods Movement Task Force, and DVRPC staff). Ultimately the final program is adopted by the DVRPC Board of Commissioners based upon need, support and funding availability.

Inclusion in the TIP is a necessary initial step toward project implementation where federal-aid funding is sought. TIP inclusion depends upon individual project ranking, funding availability and priority setting by local governments.

Ultimately, project inclusion requires multi-jurisdictional support from both the public and private sectors.

Formulation of a candidate capital program for intermodal improvements will support the voices of the various owners and operators through the implementation processes at the DVRPC. □