6

IMPLEMENTATION

In developing Plan 2035, the NJTPA took stock of the full range of the region's transportation needs. As outlined in Chapter 4, these span a wide spectrum, from repair and maintenance of the network to addressing "hotspot" congestion to taking advantage of opportunities for transit expansion. In addition, the region must meet important goods movement, safety and bicycle/pedestrian needs. This chapter outlines how the NJTPA will invest limited transportation funding over the next 25 years to address these extensive and diverse needs. It also discusses policy and other initiatives the region and state should pursue in its efforts to improve the transportation system while dealing with population and job growth over the next 25 years.

This chapter highlights just a few examples of the hundreds of projects and studies that are being conducted (or will be conducted) in the region. A complete picture of all the projects and initiatives called for by Plan 2035 is provided in the Project Index included at the back of this plan. These projects and initiatives make

Plan 2035 calls for new and improved transit service throughout the region. Morristown Station, Morris County.

Selected and Refined Strategies

As a follow-up to the Strategy Evaluation effort (as discussed in Chapter 4), which identified transportation needs and strategies around the region, the NJTPA undertook a Strategy Refinement project to develop concepts for future improvement projects on the highway and transit networks. Strategy Refinement will produce a total of 30 concepts, including studies, to address significant needs in 21 places within the NJTPA region. Each concept will include an assessment of the place's needs and strategies, specific potential transportation improvements, anticipated performance benefits, basic consideration of environmental issues in the area, cost estimates and recommendations for implementation.

While concepts emerge through many avenues in the NJTPA process, those developed in the performance-based Strategy Refinement become candidates for future project development and implementation. Further detailed study and project implementation will be the responsibility of the NJTPA and/or the region's implementing agencies, including NJDOT, NJ Transit, and Transportation Management Associations (TMAs).

The concepts developed through the Strategy Refinement are listed below. Further detail about the development of the Strategy Refinement Study is presented in Appendix C.

Ridesharing/Transit Support

- Create appropriate and safe bicycle and pedestrian facilities in an area of Bergen and Passaic Counties to be determined in consultation with the county.
- Create ridesharing and vanpool programs for areas in Hudson County not well served by traditional transit service.
- Evaluate the possible expansion of Park and Ride lots along the Morris & Essex Line between Summit and Dover and investigate local shuttle service to improve access to rail stations.
- Identify routing and long-term funding sources for rail shuttles around Raritan Valley Line stations in Somerset County.
- Study funding, purpose, market served (i.e. industrial, commuter, retail) and needs for shuttle services. Identify criteria to assist in evaluating and funding shuttles.
- Identify routing and long-term funding sources for rail shuttles around Northeast Corridor stations in Middlesex and Union Counties.

Public Transit Enhancements

- Provide improved transit service from residential areas in Jersey City to industrial and retail employment centers in Secaucus, which would build on the results of prior studies.
- Investigate express bus service from outlying park and rides to New Brunswick along Routes 9 & 18, and develop methods to prioritize bus mobility in the corridor.
- Study reverse peak transit service from Hudson County to job centers in Essex and Morris Counties including Livingston, East Hanover and Parsippany.
- Develop an inter-modal transit hub in Elizabeth to efficiently deal with the growing bus and rail service in the area and provide room for future expansions.
- Study improving bus service from the Route 9 corridor in Ocean, Monmouth and Middlesex Counties to Midtown Manhattan, including destinations outside the Port Authority Bus Terminal.
- Study using technology to improve transit operations region-wide including, but not limited to real-time information for

up the Plan 2035 Scenario that is the NJTPA's fiscally constrained plan for the region, based on reasonably anticipated resources through 2035. The targeted investment percentages among various categories of needs discussed in this chapter are based on the Plan 2035 Scenario.

As discussed in Chapter 5, two other investment scenarios were developed in the creation of this plan—a Baseline Scenario that considers more limited funding and less extensive investment, and an Aspirational Scenario that looks at opportunities for greater investment should more funding become available. The investment percentages among various needs in the Aspirational Scenario, based on desired funding levels, closely match the investment goals in the NJTPA's Regional Capital Investment Strategy (included in the back of this plan). These scenarios provide the NJTPA region with a degree of flexibility in making investment decisions depending on the future of transportation funding.

Roadway/Bridge Repair and Maintenance

The NJTPA region boasts an extensive network of roads, bridges, rail lines and other transportation facilities. No task is more vital to the future of transportation in the region than maintaining existing assets in a state of good repair. Only then can the region turn to other investments that will improve and expand the system. This is reflected in the investment principle calling for devoting the majority of funding to "fix it first."

As discussed in Chapter 4, the region's repair and maintenance needs are primarily identified by various management systems that track the condition of infrastructure in the region. Bridges, roads and transit systems

operators and passengers and improved communication between vehicles and operations management.

- Study BRT concepts in Bergen/Passaic area such as a bus service circulator around the River Edge Rail Station, regional shopping areas and the Hackensack Hospital in Bergen County.
- Create express bus service from the Route 9 and 35 corridors in Ocean and Monmouth counties to Metropark and surrounding areas.
- Study BRT concepts for bus service along Main Street in Paterson and Paterson-Hamburg Turnpike between Paterson and Wayne.
- Study concepts for express bus service along Route 27 between Princeton and New Brunswick.
- Extend the Passaic-Bergen Line from its current planned terminus in Hawthorne to the Butler area.

Roadway Improvements

- Create methods and facilities to manage congestion causing incidents and improve ramps on I-280 in Downtown Newark.
- Study operational improvements along I-78 and Route 31, including signal timing, intersection configuration and ramp design to alleviate congestion.
- Study operational improvements along Routes 33 and 66 between the Garden State Parkway and the Shore, including signal timing, intersection configuration and ramp design to alleviate congestion on this important east-west route in Monmouth County.
- Improve roadway operations along Routes 70 & 88 in the Lakewood-Point Pleasant area by improving signal timing, mitigating bottlenecks, and re-configuring intersections along this major east-west corridor in Ocean County
- Improve roadway operations along Routes 23 in Sussex County area by improving signal timing, mitigating bottlenecks, and re-configuring intersections along this major regional corridor.
- Investigate mitigating congestion along Route 22 in the Phillipsburg area by improving signal timing and re-configuring intersections.
- Investigate operational improvements at intersections along Route 18 in East Brunswick to mitigate congestion and improve access to transit and pedestrian facilities.
- Improve operations along I-80 in Morris County by improving interchanges and using technology to manage incidents and deliver real-time driver information.
- Improve operations along Route 202 in Hunterdon County by improving intersections, using technology to manage incidents and deliver real-time driver information, and managing access.

Freight Improvements

- Study and apply operation/safety technologies for freight-related incident and construction management, roadway safety and congestion, cargo security and road operation throughout of the Core Freight Facilities Area.
- Improve the operation of major rail bottlenecks (including Marion Junction, the eastern end of the Lehigh Valley Line and Port Jersey Junction) to facilitate region-wide movement of rail freight, as well as passenger service on the Raritan Valley Line.
- Improve port access, dock facilities, truck and rail access, and support areas to allow for better handling of larger cargo vessels.

all require extensive repair and maintenance in the region.

This section contains a summary of the region's commitment to address repair and maintenance on the roadway network focusing on bridges and pavement. Projects to improve transit maintenance (including transit bridges) are dealt with later in this chapter as part of a broader discussion of transit in the region.

Bridges

As stated in Chapter 3, nearly 4,800 of the state's 6,400 bridges are in the NJTPA region. Roughly a third of these bridges are functionally obsolete (meaning they do not meet current design standards for clearance, lane and shoulder width, or road geometry). Approximately 11 percent of the region's bridges are structurally deficient (meaning the deck or bridge structure is deteriorated).

The Plan 2035 Scenario calls for devoting 19 percent of available funding to bridges. Repair and maintenance of this critical infrastructure is a top priority of the region. In the future, bridge conditions are expected to worsen significantly due to age and years of under-investment if current funding levels are not increased. Plan 2035 calls for increasing bridge funding by 25 percent (to nearly $28 billion) so that the region can maintain current acceptable conditions.

One of the region's greatest challenges is finding a way to pay for the costly maintenance or replacement of a relatively small number of "high cost" bridges. Under Plan 2035, high cost bridge projects totaling more than $6 billion will be initiated in the near to mid term (with completion of some of the projects extending to the long-term). There may be options for reducing these costs through engineering approaches or "right-sizing." These

bridges are shown in Table 6-1.

In addition, NJDOT has identified a "second generation" of "high cost" bridges that will require replacement or significant rehabilitation over the life of this plan. While these projects are not expected to cost as much as the others, their replacement costs range from $75 million to $200 million. Significant rehabilitation of these bridges, while less costly, would still range from at least $25 million to $75 million per bridge. These bridges include:

Table 6-1
High Cost Bridges

Bridge	County	Estimated Cost
Route 1 & 9, Pulaski Skyway, replacement	Essex/Hudson	$4.6 billion
Route 1 & 9, Pulaski Skyway, interim repairs	Essex/Hudson	$787 million
Route 7, Hackensack River, Wittpenn Bridge	Hudson	$290 million
NJ Turnpike Newark Bay Extension	Hudson	$250 million
Route 3 Passaic River Crossing	Bergen/Passaic	$240 million
Route 72, Manahawkin Bay	Ocean	$207 million
Route 139 Viaduct	Hudson	$195 million

- Route 3 (eastbound and westbound) over Hackensack River in Bergen County
- Route 35 over Cheesequake Creek in Middlesex County
- Route 37 eastbound over Barnegat Bay (Mathis Bridge) in Ocean County
- Route 37 westbound over Barnegat Bay (Tunney Bridge) in Ocean County
- Route 46 over Hackensack River in Bergen County
- Route 21 southbound, Chester Avenue Viaduct in Essex County
- Route 495 Viaduct over US 1&9 in Hudson County

In addition, there are other high-cost bridges serving the region that fall within the jurisdiction of the Port Authority of New York & New Jersey, including the Goethals and Bayonne bridges. The Port Authority is moving forward with plans to construct a new Goethals Bridge, as the existing span is significantly functionally obsolete. The new bridge would have additional lanes and shoulders to bring this bridge up to current safety standards, as well as a bicycle and pedestrian walkway and a central area wide enough to accommodate potential future transit service. In addition, as discussed in the freight section, the clearance of the Bayonne Bridge must be addressed to meet the region's goods movement needs.

Also in the near-term, numerous less costly bridges are slated to undergo replacement or rehabilitation. This includes work on the state and county road networks throughout the region. All these projects are listed in the Project Index.

As these current identified needs are being addressed, the NJTPA and its partner agencies will work diligently to limit the backlog of bridge projects by identifying the most critical bridge needs as they emerge, relying primarily on NJDOT's Bridge Management System.

In the very near term, federal stimulus funding from the American Recovery and Reinvestment Act (ARRA) has added additional funds for bridge repair. The NJTPA has approved a set of ARRA projects with approximately 21 percent of that funding going to bridge projects on the state and county networks. These projects range from bridge painting and structural repairs to the replacement of bridge decks.

Roads

The Plan 2035 Scenario calls for investing approximately 23 percent of available funding to road preservation and enhancement needs. This will allow the region to maintain pavement in at least its current condition. However, the state faces a serious backlog of deficient pavement on its roads, particularly in the NJTPA region. Approximately 50 percent of the pavement surface on the NJDOT-maintained state highway system in the region is deficient and in need of repair. A funding shortage for increased resurfacing, rehabilitation, reconstruction and particularly preventive maintenance programs continues to be the major obstacle to significantly improving pavement quality.

As discussed in Chapter 4, the statewide Pavement Management System, operated by NJDOT, monitors road conditions through an ongoing evaluation that considers roughness, surface distress and other factors. These numbers, as well as how much traffic on the road, are used to

Table 6-2
Sample Roadway Preservation Projects

Roadway	County	Estimated Cost
Route 9 Pavement Rehabilitation	Middlesex/Monmouth	$28 million
Route 80, Parsippany-Troy Hills Roadway Improvement	Morris	$94 million
Route 78, Union/Essex Rehabilitation	Union/Essex	$80 million
Route 35, Restoration, Toms River Twp. to Mantoloking (MP 4-9)	Ocean	$62 million
I-287 resurfacing, Main St. to south of I-78	Somerset	$24 million

generate rankings that determine what must be done to bring each section of highway up to standards for safe and functional pavement.

Plan 2035 calls for systematic efforts to implement preventative maintenance on the regions' roads to avoid the need for more costly future repairs. The NJTPA will continue to provide adequate funds for an ongoing pavement program. In addition, available funding will be used for numerous rehabilitation projects each year to address major deficiencies and bring roads up to standards needed to accommodate growing volumes of traffic.

Some roads in the region require more than repaving. Each year numerous road reconstruction projects are undertaken that can involve excavating, grading and repairing road beds, widening shoulders, replacing curbs, improving drainage, adding signs and other improvements.

In the near-term, approximately 70 roadway preservation projects are slated for the NJTPA region. These projects are listed in the Project Index. As with the region's bridge inventory, additional stretches of roadway are constantly being evaluated and studied for the need for resurfacing or other major preservation efforts. Examples of projects in the plan are shown in Table 6-2.

Stimulus funding from the American Recovery and Reinvestment Act also is being used for much-needed roadway maintenance and preservation. The NJTPA has approved dozens of ARRA-funded roadway repair projects, totaling about 57 percent of the region's stimulus funding, primarily focusing on roadway resurfacing projects.

Under the Baseline Scenario, at any given time over the next 25 years approximately 40 to 50 percent of the region's roadway miles would require repaving or repair, due to continuing wear and tear. Plan 2035, however, calls for an increase of approximately 25 percent in pavement funding—enough to cut the amount of deficient road surface in the region approximately in half by 2035.

Roadway Enhancement and Expansion

The NJTPA is committed to making the region's roadway system work smartly and efficiently to deal with the heavy demand it sees. Building new roads or adding significant lane miles to existing ones, however, is difficult and not always cost-effective. Funding, environmental and other constraints limit the region's capacity to build and expand roads, and potential induced demand limits how long such projects will be able to handle traffic.

Therefore, the main focus for road investment in the region is to optimize the existing network through "road enhancement" projects, such as redesigning intersections

Bridge maintenance is one of Plan 2035's highest priorities. Route 1&9T over the Hackensack River, Hudson/Essex counties.

and interchanges at key chokepoints. Major capacity expansions will be very limited. Road projects also will incorporate improved safety features and take advantage of opportunities to promote walking and biking, wherever possible. Map 6-1 depicts roadway enhancement and expansion projects and candidates.

Road Enhancement

Strategy Evaluation identified dozens of places in the region that are likely to represent priority areas for roadway improvements. Some of these areas might contain more than one potential enhancement project. Physical improvements in road engineering can make traffic flow more smoothly and provide better access to some destinations. Such approaches work best when coordinated with intermodal, land use, and other "context-sensitive" considerations.

Improvements to intersections, interchanges, and ramps can maximize the efficiency of the road system at some locations. Various strategies that improve intersection function can reduce corridor-wide delays, since intersections and interchanges are often congestion hot spots that limit traffic flow.

In the near and mid-term, Plan 2035 will implement approximately 100 such projects throughout the region to address particular bottleneck areas and localized congestion. These projects are contained in the Project Index. In the long-term, another dozen such projects have been identified. Additional road enhancement projects in the mid- to long-term will be chosen based on the needs found in the Strategy Evaluation Study and additional, ongoing analysis of the region. Examples of projects in Plan 2035 are shown in Table 6-3.

In addition, Plan 2035 will seek to address partial interchanges on the region's interstate highway system. There are over 60 partial interstate interchanges with "missing movements" in at least one direction in the NJTPA region. Adverse impacts created by these partial interchanges include safety issues on local roads caused by travelers forced to move through residential areas by lack of direct access to the interstate; stress on the local network; traffic congestion; reduced connectivity to freight facilities; greater fuel consumption; and other related environmental impacts.

At the time many partial interchanges were constructed, traffic patterns and volumes were different than they are today. Because interchanges are key connection points between the regional and local roadway systems, and because their performance is critical to maintaining both regional and local access and mobility, the NJTPA is partnering with FHWA and NJDOT in an assessment of the interstate highway partial interchanges in the region. This analysis will identify possible future improvements.

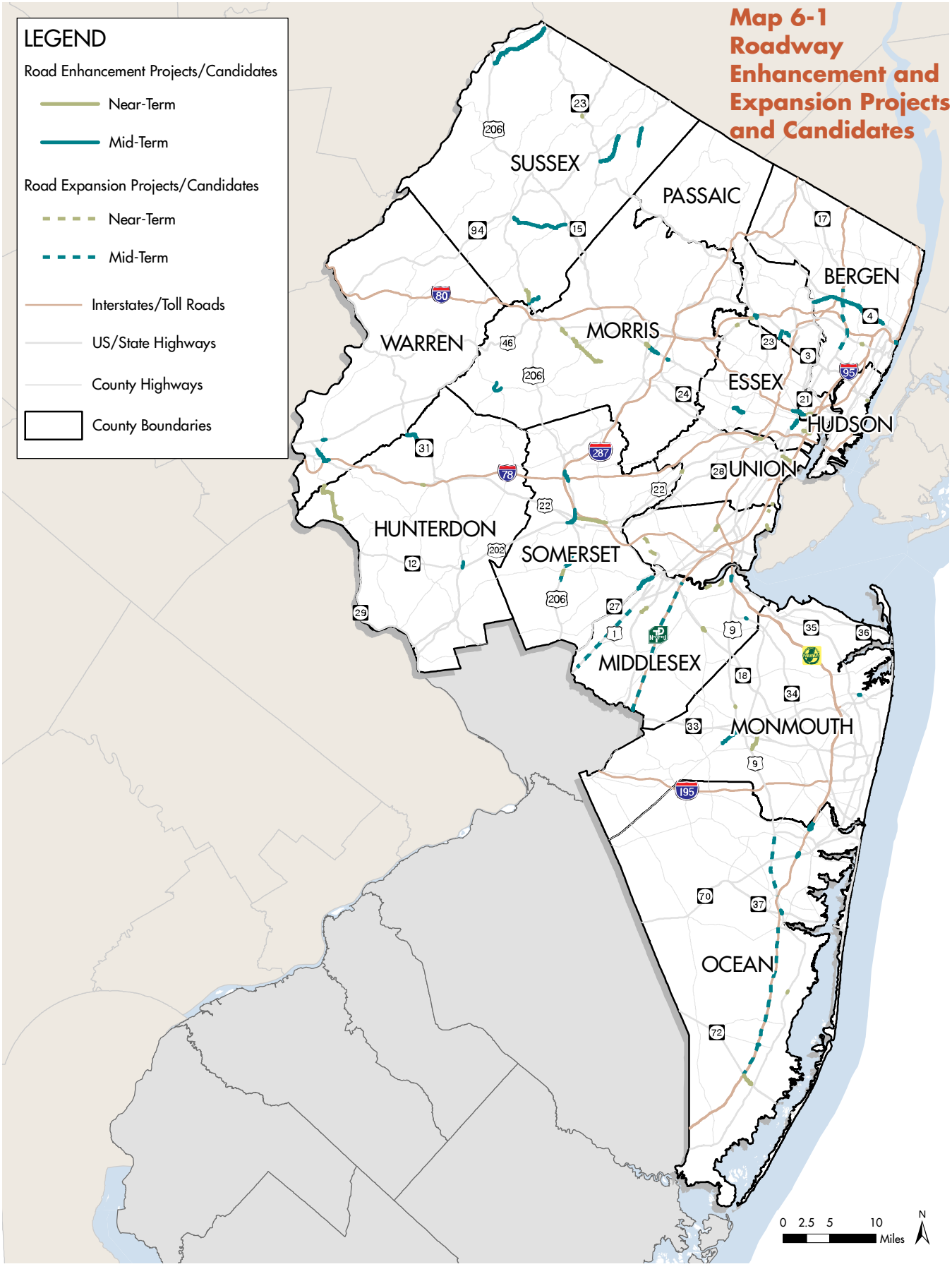
Table 6-3
Sample Roadway Enhancement Projects

Roadway	County	Estimated Cost
Route 10 Commerce Boulevard Improvements	Morris	$9 million
Milford-Warren Glen Road, CR 519	Hunterdon	$4 million
Route 3, Route 46, Valley Road and Notch/Rifle Camp Road Interchange	Passaic	$166 million
Route 280, Route 21 Interchange Improvements	Essex	$84 million
Palisades Interstate Parkway Connector Ramp	Bergen	$73 million
Route 22, Belvidere Road Vicinity to I-78	Warren	$60 million
Route 23/80, Long-term Interchange Improvements	Passaic	$52 million
GSP Interchange 67 Improvements (Bay Avenue)	Ocean	$50 million
Route 18 Interchange of CR 516/527	Middlesex	$18 million

Road Expansion

Over its life, Plan 2035 calls for approximately 3 percent of available funding to go to road expansion. This relatively low level of investment toward road expansion recognizes that fiscal, environmental, and planning considerations have combined to make major expansion of roadway capacity a solution with only very limited application in the NJTPA region.

Past experience has shown that expanding roadway capacity is expensive and often faces strong local opposition. It also may not provide permanent congestion relief, since it can encourage sprawl development that adds more cars to the road and,


Map 6-1
Roadway
Enhancement and
Expansion Projects
and Candidates
LEGEND
Road Enhancement Projects/Candidates
Near-Term
Mid-Term
Road Expansion Projects/Candidates
Near-Term
Mid-Term
Interstates/Toll Roads
US/State Highways
County Highways
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
0 2.5 5 10
Miles
N

under some circumstances, can even "induce" additional auto trips that otherwise would not be made. Yet meeting rising travel demand expected in the future, including a projected 16 percent increase in VMT, will inevitably require some increases in road capacity around the region.

This plan calls for such increases to be carefully chosen after detailed study. In addition, capacity increases should be considered in conjunction with appropriate complementary strategies—including ITS, smart growth, ridesharing and transit enhancement measures—to manage demand and maintain performance. Table 6-4 identifies examples of significant road expansion projects slated for implementation in the region.

Table 6-4
Sample Roadway Expansion Projects

Roadway	County	Estimated Cost
Turnpike Widening Interchanges 6–9	Middlesex	$2.5 billion
Garden State Parkway Widening Exits 63-80	Ocean	$200 million
Route 1, Forrestal Road to Aaron Road	Middlesex	$301 million
Route 17, North of Moonachie Road to Garden State Parkway	Bergen	$197 million
Route 9, Lakewood/Toms River, Congestion Relief	Ocean	$190 million
Tremley Point Connector Road	Union	$174 million
Route 206 Bypass, Mountain View Road to Old Somerville Road (Sections 14A & 15A)	Somerset	$120 million
Route 18 Ext., Hoes Lane Ext. to I-287 (3A)	Middlesex	$36 million

Importantly, proposed projects that would significantly expand roadway space or add new roads will continue to require special analysis in the NJTPA Congestion Management Process (CMP) before federal funds may be applied.

Transit System

The regional transit network, consisting of rail, bus and ferry facilities, provides a fast and reliable means of moving nearly one million travelers each weekday. It diverts hundreds of thousands of trips each day from automobiles, helps combat congestion, safeguards the region's air quality, reduces greenhouse gas emissions, provides essential travel to the disabled and those without cars and contributes to the quality of life enjoyed by the region's residents. Transit use in the region has grown substantially in recent years, as discussed in detail in Chapter 3 (Context & Trends).

The NJTPA has made support for and enhancement of the transit system among its highest priorities. Nearly half of all available federal transportation funding each year is allocated to the transit system. Plan 2035 calls for strategic investments that will make transit a viable travel alternative for a greater share of residents over the next two decades.

Maintaining the region's extensive transit network in a state of good repair and fully realizing the potential for transit ridership growth will depend on adequate financing for the transit system, as discussed in Appendix D and Chapter 8 (Financing). While recognizing that the funding challenges are great, Plan 2035 calls for reasonable steps to ensure adequate financing.

Measures to shape regional land use are also necessary to make possible cost effective transit services. Chapter 7 (Transportation, Land Use, and the Environment) discusses the many smart growth and transit supporting measures needed, including creating walkable neighborhoods and Transit Oriented Development near transit stations and hubs; and adapting major employment and retailing clusters to make them more accessible by transit. Without serious efforts to realize such transit supporting measures, many of the expansions to the transit system desired by residents will not be viable. Appendix D discusses transit issues and investments in greater detail.

Transit Repair and Maintenance

The Plan 2035 Scenario calls for about 37 percent of available funding to be allocated to repair and maintenance needs on the transit network. As described in Chapter 4, this includes significant investments in the region's transit fleet to replace aging rolling stock, to address bridge and rail needs and to provide additional capacity for increasing ridership. In addition, there is an ongoing need to address "core system capacity needs." These involve upgrading and improving rail lines to address capacity, reliability and other shortfalls. On the bus side, these needs include ex-

panding garage space and places to stage buses for the evening rush hours.

Mass Transit Tunnel (MTT)

The Mass Transit Tunnel (MTT) project involves building two new state-of-the-art single-track tunnels under the Hudson River. Supporting the tunnel will be a new rail station adjacent to Penn Station New York under 34th Street. Improvements in New Jersey include new track along the Northeast Corridor and a connection to existing rail lines serving residents of Bergen, Rockland and Orange counties (Map 6-2).

The MTT tunnel and related rail system upgrades will allow more train service between New Jersey and New York City. It will provide capacity for 48 trains an hour during peak periods (current capacity is only 23 trains per hour). This additional rail capacity is expected to alleviate congested conditions on the NJ Transit rail system and other trans-Hudson modes including buses, PATH and automobile.

In addition, other MTT-related project investments such as the Secaucus Loop will allow for new one-seat direct rail service from the Pascack Valley, Port Jervis, Main and Bergen Lines to Manhattan. This investment will provide a higher level of service for customers by saving overall travel time and eliminating the need for riders from these lines to transfer at Secaucus Junction (to very crowded trains operating on the Northeast Corridor Line). Another key related investment will be the replacement of the Portal Bridge over the Hackensack River to accommodate additional rail traffic.

The NJTPA has made completion of the MTT the highest long range transit priority. The final cost of the tunnel and related improvements is projected to be $8.7 billion. Construction commenced in June 2009, with completion projected for 2017.

The MTT will relieve a significant choke point in the regional rail system. Currently, NJ Transit provides 44 million passenger trips annually to Penn Station New York, a 150-percent increase in just the last 10 years. This brings the existing rail infrastructure to capacity during peak hours. It will provide the capacity necessary to meet future trans-Hudson demand and to accommodate the various proposed rail expansions discussed below.

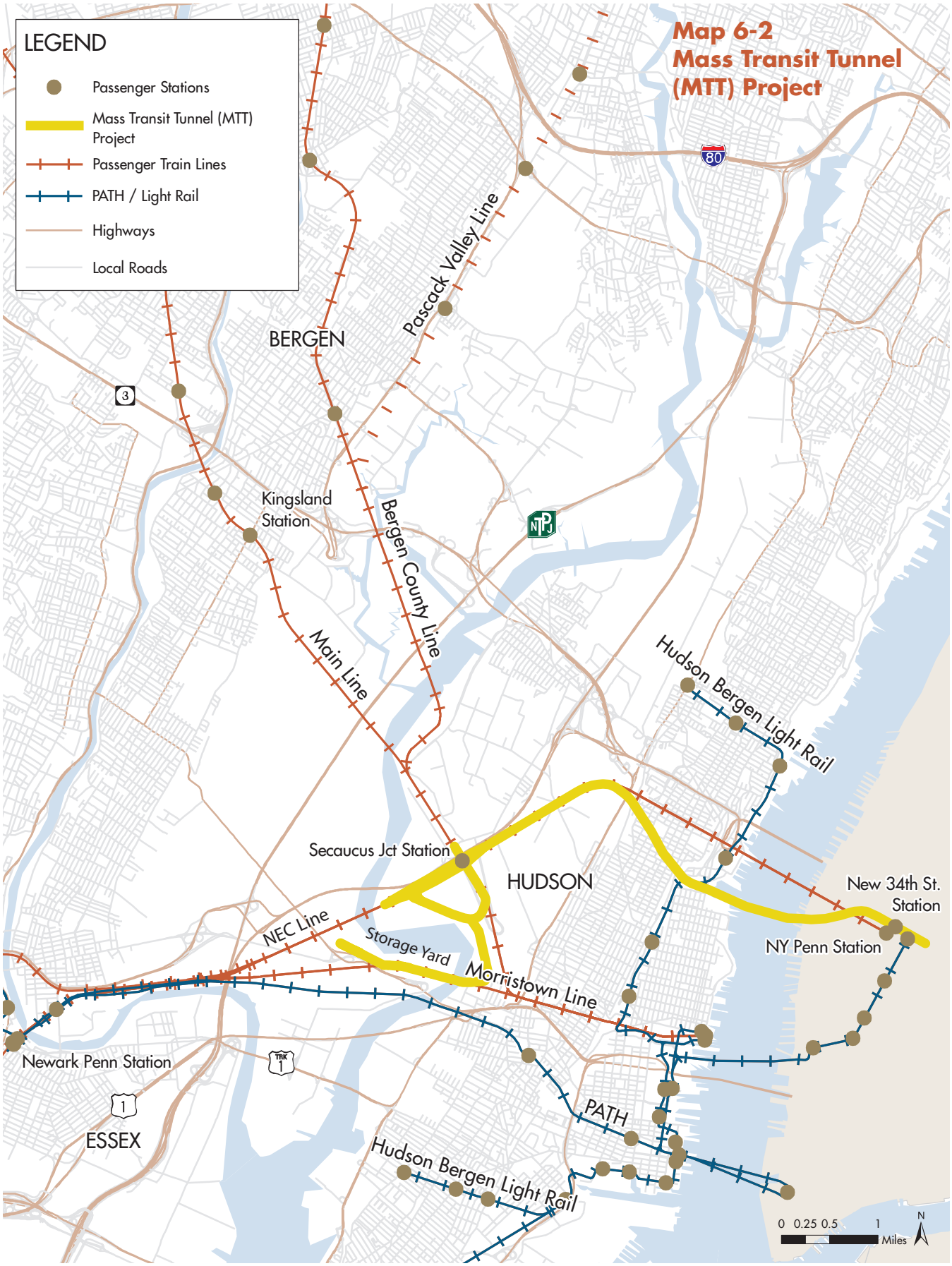
Dual Mode Locomotives

NJ Transit plans to procure dual mode locomotives. The dual mode locomotives will allow trains to "switch" to electric power before entering the Hudson River tunnels, allowing for direct, one-seat service for riders originating from "diesel territory" on the Morris and Essex Lines and the Raritan Valley Line, where direct, electrified service to Manhattan does not currently exist. This will eliminate the need for transfers to electric services on these lines, typically occurring now at Newark Penn and Newark Broad Street stations. Such locomotives also would allow passengers traveling to or from the southernmost stations on the North Jersey Coast Line to avoid switching in Long Branch.

Expansion of the region's rail system is a key long-term goal. Bergen County Line, Meadowlands, Bergen County.

Strategic Passenger Rail Expansions

Expansion of the region's rail network is a key long-term goal. Three projects—the MTT, the Lackawanna Cutoff to Andover and the Passaic-Bergen NYS&W Project—have been approved as part of the fiscally constrained portion of Plan 2035 (Appendix D). Several other projects are undergoing various levels of planning and environmental analysis as possible candidates for future funding, including:


LEGEND
Passenger Stations
Mass Transit Tunnel (MTT) Project
Passenger Train Lines
PATH / Light Rail
Highways
Local Roads
Map 6-2
Mass Transit Tunnel (MTT) Project
80
Pascack Valley Line
BERGEN
3
Kingsland Station
Bergen County Line
Main Line
NJ
Hudson Bergen Light Rail
Secaucus Jct Station
HUDSON
New 34th St. Station
NY Penn Station
NEC Line
Storage Yard
Morristown Line
Newark Penn Station
TRK 1
1
ESSEX
PATH
Hudson Bergen Light Rail
0 0.25 0.5 1 Miles
N

- Northern Branch Light Rail or Commuter Rail to Bergen County
- Monmouth-Ocean-Middlesex Rail Line
- West Trenton Line
- Extension of Hudson-Bergen Light Rail Across Rt. 440
- Lackawanna Cutoff (to Scranton)
- Extension of Raritan Valley Line or Morris & Essex Line to Phillipsburg

Other transit concepts are under consideration and may lead to more specific proposals emerging from studies in coming years. As mentioned above, these specific concepts are highlighted in Appendix D's discussion of transit in the region. These future projects might include building entirely new rail lines, extending existing rail lines or adding passenger trains on existing freight lines. It must be recognized that operational and institutional challenges must be overcome in adding passenger service to existing freight lines. The proposals involve both commuter rail and light rail technologies and extend across the NJTPA region (Map 6-3).

This very ambitious agenda of projects will confront continuing funding limits as discussed in Chapter 8. The high cost of transit expansions means some choices and compromises must be made. This is reflected in the NJTPA's Regional Capital Investment Strategy (provided in the back of the plan) which states that the region should "Expand the system in measured steps based on the ability to attract new riders and achieve cost-effective operations." In practice this will mean that all proposals must undergo careful scrutiny and study—as part of required federal reviews and supplemental investigations.

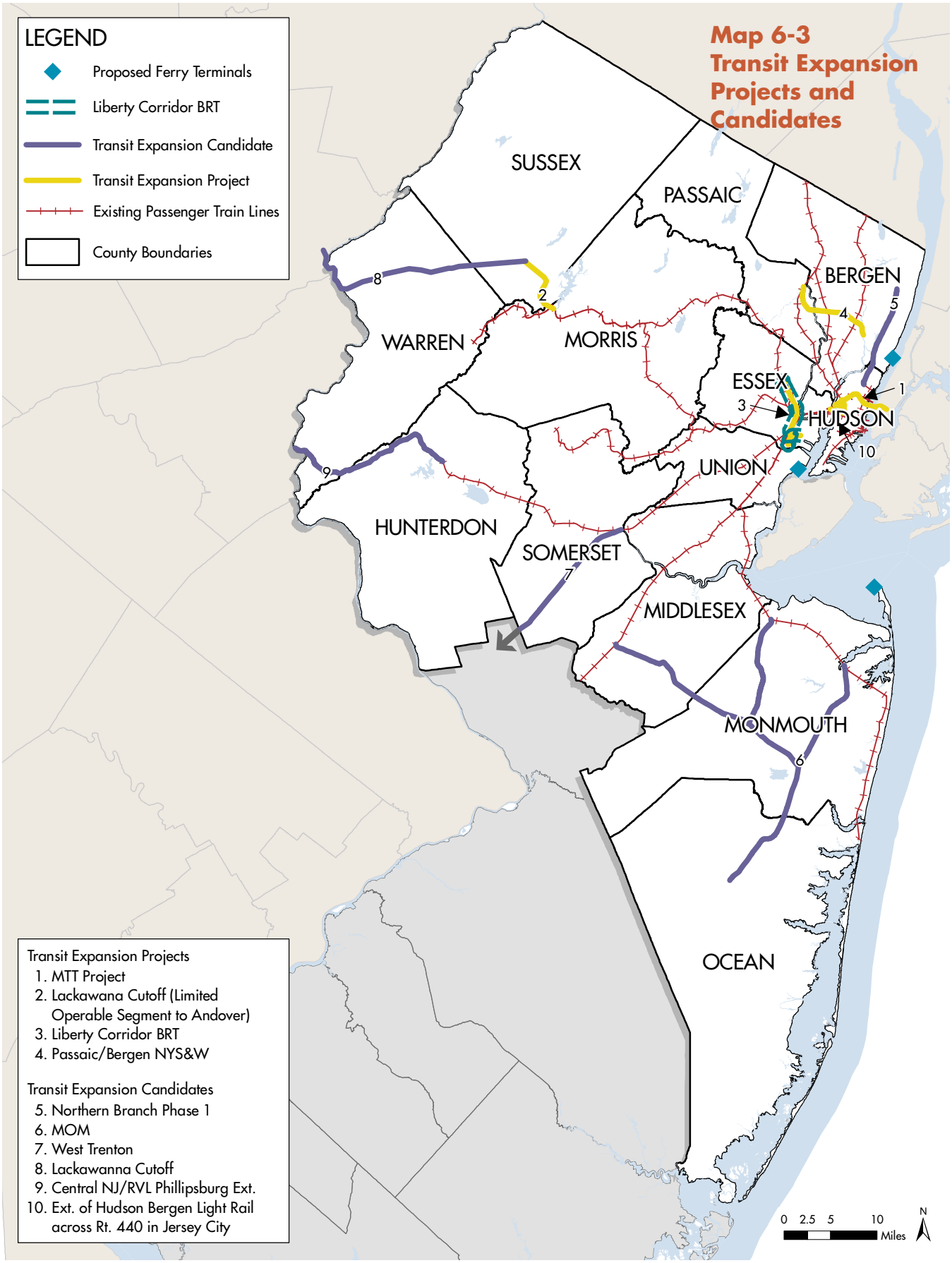
In studying proposals, consideration must be also given to limiting costs through phased implementation. This might involve constructing segments that stand the greatest prospect of attracting riders and serving regional needs while leaving other segments for future consideration based on the performance of the initial investment and additional funding opportunities. The studies should also look at technologies and configurations that can reduce costs and implementation schedules, such as the use of dual mode locomotives able to switch from diesel to electric power. These studies can also consider Bus Rapid Transit, as described later, as an alternative to rail in some locations.

The result of these studies will be locally preferred alternatives that can be submitted for funding to FTA and advanced through the NJTPA Transportation Improvement Program (TIP). Such locally preferred alternatives must meet FTA eligibility requirements for the "New Starts" program (or "Small Starts" program for bus systems); be physically and operationally feasible; demonstrate that they can generate sufficient ridership and revenue; and result in projected public benefits that will exceed the capital and operating costs.

In general, the NJTPA expects that at least initial operating segments of all the rail proposals listed above (and in Appendix D), if found justified and feasible through detailed study, can be accomplished within the next 25 years. The extent and timing of implementation will depend not only on funding but, as discussed previously, progress in realizing transit supporting land use in communities throughout the region.

In conjunction with upgrading NJ Transit's rail system, continued progress must be made in improving the Port Authority's PATH system, which serves 250,000 riders each weekday. A $3 billion, 10-year plan to modernize the PATH system is underway. In addition, Amtrak must maintain and upgrade the Boston-to-Washington D.C. Northeast Corridor Rail Line (NEC) on which many NJ Transit trains operate.

Plan 2035 calls for an increased emphasis on bus transit. Irvington Transportation Center, Essex County.


Map 6-3
Transit Expansion Projects and Candidates
LEGEND
Proposed Ferry Terminals
Liberty Corridor BRT
Transit Expansion Candidate
Transit Expansion Project
Existing Passenger Train Lines
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
1
2
3
4
5
6
7
8
9
10
Transit Expansion Projects
1. MTT Project
2. Lackawana Cutoff (Limited Operable Segment to Andover)
3. Liberty Corridor BRT
4. Passaic/Bergen NYS&W
Transit Expansion Candidates
5. Northern Branch Phase 1
6. MOM
7. West Trenton
8. Lackawanna Cutoff
9. Central NJ/RVL Phillipsburg Ext.
10. Ext. of Hudson Bergen Light Rail across Rt. 440 in Jersey City
0 2.5 5 10
Miles
N

Bus System Improvements and Expansions

Bus service in northern New Jersey is the backbone of mass transit in the region, accounting for two-thirds of NJ Transit ridership. In general, bus transit is less expensive to operate and more flexible than rail in addressing transit needs, especially in suburban areas with a dispersed development pattern. Buses also provide essential mobility to transit-dependent populations including low-income residents, the disabled and many elderly. Despite the importance of the bus system, the speed, reliability, and convenience of bus travel suffers due to growing road congestion in many locations.

Bus Rapid Transit and other priority treatments for buses can improve regional transit. Go Bus, Newark

To help address these issues, NJTPA and NJ Transit have cooperated on a number of ongoing studies of the bus system in the region. These include:

- I-78 Corridor Transit Study
- Greater Newark Bus System Study
- Northwest New Jersey Bus Study
- Jersey City Bus Study
- Northeast New Jersey Metro Mobility Study

These and future efforts, such as the Elizabeth Intermodal Study, examine bus service and facility needs across all areas of the NJTPA region at the corridor or subregional level. They contain recommended project concepts and areas for further study.

In general, buses in the region should be able to operate at posted speed limits at all times—even during peak hour congestion. To move towards this goal, the design of all roadway improvements should include physical features to facilitate bus movement such as road "cut outs," and pedestrian walkways at bus stops. Further, the region must support preferential "treatments" and other measures to speed bus travel including:

- Implementing preferential signal systems to speed buses through congested roadway intersections. Traffic signal priority technology allows buses to communicate with signals so that a light stays green slightly longer or turns green slightly sooner so that an approaching bus does not have to wait at a red light. NJ Transit is investigating bus preferential treatments along the Route 9 and 18 corridors, including opportunities for new or expanded park and rides and intermodal facilities, as a way to increase the performance of service and improve its safety, convenience and potential for increased ridership. Route 9 in Monmouth and Ocean counties is one of the busiest bus service corridors in the region. Presently, thousands of commuters to Northern New Jersey and New York City originate along the Route 9 Corridor. With improved service, trip times and reliability, and select bus service improvements, ridership will grow. These efforts are targeted to be incrementally advanced so the benefits can occur sooner as compared to larger complex projects taking many years to implement.
- Expanding the use of highway shoulders for bus operations along highly congested routes during peak hours. While this requires rebuilding highway shoulders to certain federal standards and making other improvements, it is being employed successfully in the region, for example, on Route 9 in Old Bridge Township and on a section of Route 22 in Union Township. NJ Transit is also working with NJDOT in pursuing the use of the highway shoulders on Route 9 to permit bus usage from Old Bridge where it now ends to Lakewood in Ocean County. Similar to the preceding initiative, this proposal can be advanced incrementally so benefits can occur sooner.
- Expand the Lincoln Tunnel Exclusive Bus Lane (XBL).

The exclusive bus lane on I-495 into the Lincoln Tunnel accommodates approximately 1,700 buses and 62,000 commuters daily. But the XBL has nearly reached its capacity. A study is analyzing several options including combined bus/HOV lanes, among others. Exclusive bus lanes are proposed further west, including Route 3 in Hudson County and Route 46 in Passaic County. Also, the issues of bus flows, staging and storage during the evening rush must be adequately addressed. In particular, the Port Authority Bus Terminal facility has exceeded its bus parking capacity.

Plan 2035 supports increased use of local shuttles to improve access to the transit system. Meadowlink Shuttle, Secaucus, Hudson County.

Bus Rapid Transit

Bus Rapid Transit (BRT) systems also offer much promise along some routes. BRT involves a combination of the transit priority treatments described above and more advanced infrastructure, such as bus-only transit-ways, off-vehicle fare collection and even self-guided buses that can "dock" at raised BRT station platforms like a train. The idea behind BRT is to develop new bus systems that function with the speed and efficiency of a light rail system, but with lower costs, shorter construction timeframes, and greater operating flexibility.

The first BRT-like system in the region—NJ Transit's Springfield Avenue "Go Bus"—was implemented in Newark and Irvington in April 2008. It makes a reduced number of stops, uses unique bus vehicles and high visibility signage, a simple route structure, and upgraded passenger information systems. These are the first steps toward a more advanced BRT system for that corridor. The Go Bus service quickly proved to be popular, and NJ Transit doubled service in September 2008, showing that such services do indeed appeal to riders.

Other proposed BRT systems in advanced planning stages include:

- A Central New Jersey Route 1 Bus Rapid Transit system in northern Mercer and southern Middlesex counties. It would make use of existing roads with improvements, as well as new alignments.
- A Greater New Brunswick Area Bus Rapid Transit system in Middlesex County. This study will focus on two corridors along Route 18 and Route 27, crossing at the New Brunswick rail station.
- A Liberty Corridor Bus Rapid Transit will run from Bloomfield, through downtown Newark to Newark Liberty International Airport and the Port of Newark. Branches will serve downtown Newark and the University Heights district along the way, and will be coordinated with local buses, light rail and commuter rail stations.

Private Bus Carriers

In addition to NJ Transit, there are 27 private bus carriers in the NJTPA region operating approximately 60 local and interstate bus routes. These carriers provide service vital to the region, yet they face a unique set of challenges in maintaining profitability—including high fuel and insurance costs and the need to invest in facilities and vehicles, among others. In some cases, carriers facing difficulties have scaled back operations, leaving NJ Transit, counties and municipalities scrambling to come up with alternatives.

Improve System Access and Connectivity

Measures to improve access to the transit system—as well as measures to facilitate connections to a wide range of destinations—will create the kind of intermodal system that allows residents to routinely consider transit as an al-

ternative for all or part of their trips. Among the key strategies that must be pursued are the following:

- *Expand Park-and Rides*—There are many opportunities throughout the region to expand bus park-and-ride capacity. These facilities serve as cost-effective collection points for commuters, especially in low density suburban areas. Opportunities include: making use of underutilized parking areas at key shopping hubs and creating new bus park-and-rides along key highway corridors.
- *Support Local Shuttles*—Community shuttles can play an important role in providing access to the transit system. They can be an important component of Transit Oriented Development and improved transit in the suburbs. Transportation Management Associations (discussed below) have played a critical role in providing such shuttles. The NJTPA in cooperation with NJ Transit provides TMAs with federal Congestion Mitigation and Air Quality (CMAQ) funds to support shuttles. In 2007, federal CMAQ funding was provided through the NJTPA to seven new and five ongoing shuttle routes. Shuttles are playing an increasingly important role in providing a variety of services including a "last mile" transit connection. However, funding for these shuttles needs to be established on a more permanent basis so that vital services are not disrupted or abandoned when operating funds are exhausted from existing sources such as CMAQ (currently the CMAQ program allows for funding operating expenses for a maximum of three years). Funding allocations to these local shuttles should be expanded if the region is to continue its support for these connecting services. Funding for these shuttles should be based on performance, and performance measures should be identified to gauge their success.
- *Develop New Transit Hubs*—Developing intermodal transit hubs where people can conveniently access more than one transit mode via car, bus, shuttle, bicycle, or on foot will be a critical tool in promoting increased transit use and addressing parking constraints. Transit hubs have been developed in several locations (such as in Wayne and Mount Arlington).
- *Selectively Expand Rail Station Parking and Explore Shared Car Options*—NJ Transit will continue to expand parking near train stations to reduce waiting lists at many locations. However, many towns object to such expansions due to concerns about congestion and use by non-residents. Creating parking decks at regional hub stations with highway access can help address local opposition. In addition, expanded parking facilities serving multiple towns with significant transit commuters, such as towns in southeastern Morris County, hold promise. (A Strategy Refinement concept evaluating both expansion of parking and shuttle services to rail stations in this area is listed earlier in this chapter.) Stations also can include parking set aside for autos that individuals rent or share with others (through Zipcar or other services). These could include short-range electric cars that charge overnight at the stations.
- *Better Accommodate Bikes on Transit and at Stations*—NJ Transit provides accommodations that encourage bicycle connections to its fleet of trains and buses, including bike racks, lockers and options for taking bikes on trains during non-peak hours and on selected buses.
- *Fare Automation and Integration*—To help realize the goal of a single payment system providing convenient access to all regional transit systems, NJ Transit and the Port Authority will begin a pilot program in 2009 to offer PATH's automated "Smart Card" for fare payment on local bus routes that link to PATH stations in Jersey City. A significant step to fare integration was taken in 2005 when the PATH system began accepting Metropolitan Transportation Authority's Metrocard (the farecard for the New York City transit system). NJ Transit is also pursuing fare integration with certain private carriers.
- *Support Transportation Management Associations*—TMAs provide important shared-ride services to access and supplement the transit system including shuttle bus services, carpools/vanpools and subscription buses. Many of their services bridge the "last mile" between rail stations or bus stops and workplaces allowing employees to travel on transit rather than driving on the longest part of their commute. TMAs also work with employers to adopt payroll incentives (like TransitChek) and guaranteed-ride-home programs that facilitate transit use. Their flexible services, tailored to the needs of particular employers and communities, will continue to provide vital support for the regional transit system.

Regional Coordinated Human Services Transportation

The NJTPA's Regional Coordinated Human Services Transportation Plan (CHSTP) provides a regional perspective for ongoing efforts by the region's 13 counties to improve human services transportation coordination for individuals with disabilities, older adults, and people with lower incomes. The CHSTP was developed in response to a federal initiative called "United We Ride," the purpose of which is to simplify and coordinate rules and regulations regarding access to and provision of special needs transportation services for greater efficiency and more travel options for clients.

The Regional CHSTP, adopted by the NJTPA Trustees in 2008, incorporates individual county plan analysis and input from stakeholders and service providing agencies. Recommendations aim to facilitate increased regional coordination of services in the NJTPA region and state through regular dialogue and information sharing among service providers and client representatives.

In order to advance the CHSTP goals of promoting service coordination and increase mobility options, the NJTPA works in partnership with NJ Transit to solicit projects for and fund grant programs that provide services to special needs populations. Two federal grant programs, Job Access and Reverse Commute (JARC) and New Freedom are targeted at providing transportation options to people who lack access to an automobile. The JARC program provides services to help low-income populations in urban areas reach jobs in the suburbs. The New Freedom program is intended to fund programs that provide disabled populations with transportation access to jobs. In addition, as required by the Americans with Disabilities Act, NJ Transit's Access Link program provides paratransit service comparable to local transit service. Many counties in the region also provide paratransit systems for senior citizens and others.

Ferries

Passenger ferries augment the regional bus and rail transit system, providing a travel alternative for some 30,000 riders between New Jersey and Manhattan each day. Three ferry operators serve 18 different piers, handling as many passengers as more than 600 buses. The majority of ferries operate short routes across the Hudson River but there are also routes from Monmouth County accessing Manhattan in under one hour.

Ferries provide an important travel alternative between the region and New York City. Ferry service, Jersey City.

Ferries build important flexibility and redundancy into the transportation network. After the September 11th attacks on the World Trade Center closed PATH service to Lower Manhattan, ferries provided access to the area while the station was being rebuilt. During the blackout of 2003 ferries also provided service to stranded train riders. More recently, in January 2009 when American Airlines Flight 1549 was forced to make an emergency water landing in the Hudson River, commuter ferries assisted Coast Guard with rescue operations.

The current recession has worsened long-standing financial difficulties facing ferry operators. The region's largest ferry operator, New York Waterways, reportedly has experienced a 12 percent ridership decline in February 2009 from a year earlier, to 26,400 daily commuters. Estimated ridership by all operators shows a 16 percent decline from April 2009 over the same month in 2008.

This declining ridership has once again raised the issue of expanding public support to include subsidies for ferry operations. This would help hold down fare increases and ensure continued service on core routes

needed to preserve the flexibility and redundancy ferries provide to the transportation system. However, funding limitations—including a pressing need for transit operating support as reported in Chapter 8—make providing public operating subsidies problematic. Moreover, limiting public support to capital funding is consistent with long-standing policies relating to key private bus services around the region.

Still, the region should explore tax incentives and other non-subsidy approaches to supporting the services in the near- to mid-term. Capital funding should also continue. Capital improvements such as restored ferry slips in Hoboken, now under construction, as well as upgraded road and transit access could bolster ferry ridership. As the economy recovers, new services from other locations around the region should be explored.

Goods Movement

Plan 2035 calls for improving the efficiency of goods movement because of its importance to the regional economy and quality of life. Many thousands of regional jobs are tied to the northern New Jersey goods movement sector which includes some of the nation's busiest freight facilities, including:

- Port Newark/Port Elizabeth, the East Coast's largest container port;
- Newark Liberty International Airport's air cargo facilities;
- NJ Turnpike and other major Interstate Highways;
- Rail terminals connecting to points throughout North America;
- Warehousing and distribution facilities operated by some of the nation's largest companies; and
- The East Coast's largest petroleum refinery and terminus for two major petroleum products pipelines.

The sector handles a wide range of freight including consumer goods, petroleum products, foodstuffs, recycled materials, waste and more. Yet along with the jobs and other benefits, the freight sector brings transportation and environmental challenges that must be addressed.

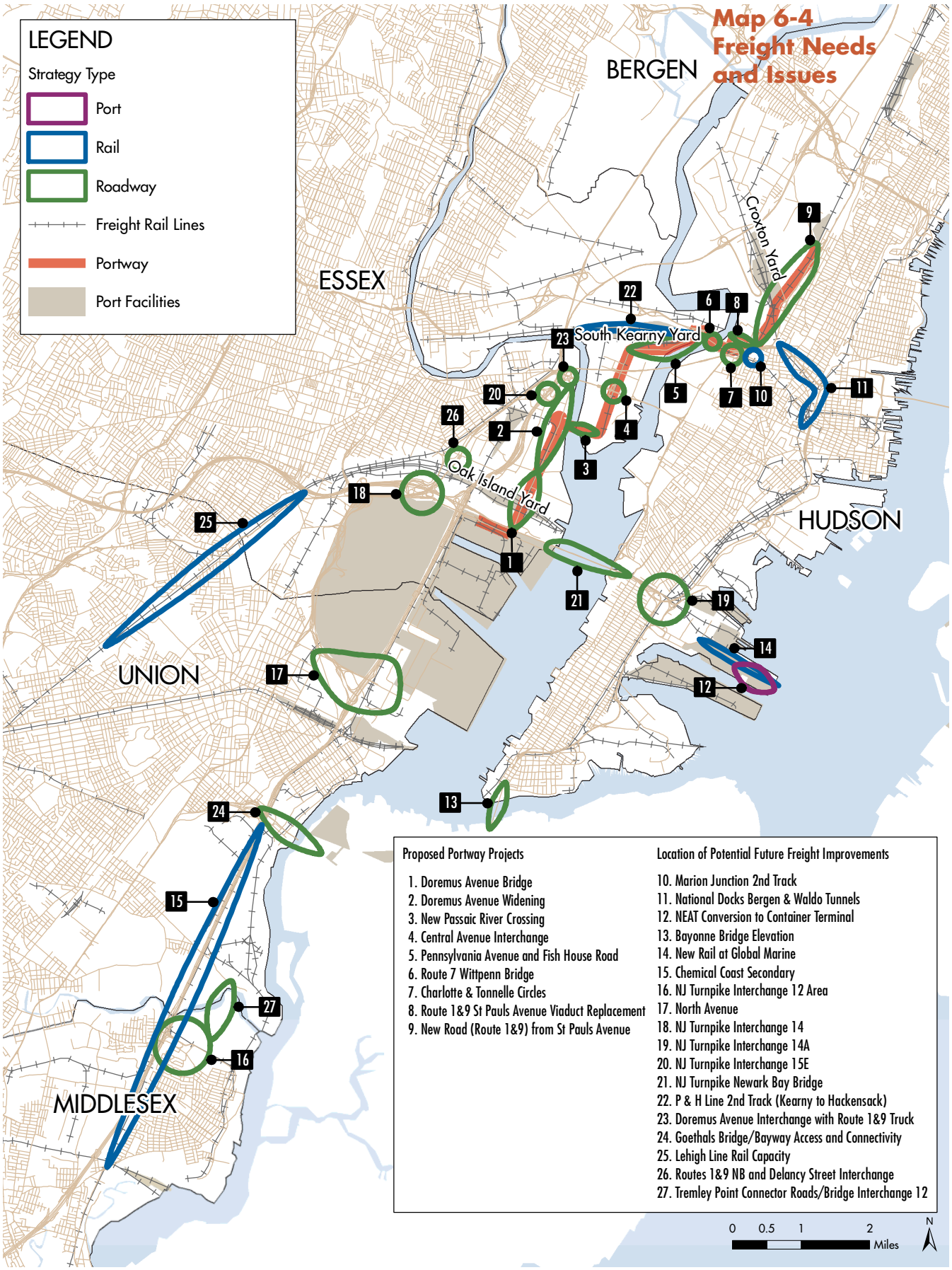
As discussed in Chapter 3 (Context and Trends), despite the current downturn which has dramatically reduced some freight movement activity, over the long term, Plan 2035 foresees a significant increase in regional freight activity. For example, the volume of containers handled at the port is projected to double. Accommodating this increase will require improvements in all freight infrastructure.

While NJTPA supports shifting freight movement to non-truck modes when possible, Plan 2035 recognizes the importance of investments supporting safe and efficient trucking in the region given the predominant role of trucking in freight distribution. In addition, of particular importance is improving the efficiency of transfers of goods from one mode to another—from ship to rail, from rail to truck, from large truck to small truck, etc. The intermodal nature of virtually all goods movements means that freight facilities are highly interdependent—problems at one can affect many others throughout the system. This interdependence is the context for the following discussion of recommended future improvements.

Freight-Related Projects in the Region

NJTPA has identified strategies to address freight in the region. Nearly all of them will require close cooperation between the NJTPA, partner agencies and the freight

Plan 2035 calls for more efficient goods movement to strengthen the region's economy. Port Newark Channel.


Map 6-4
Freight Needs
and Issues
LEGEND
Strategy Type
Port
Rail
Roadway
Freight Rail Lines
Portway
Port Facilities
BERGEN
ESSEX
HUDSON
UNION
MIDDLESEX
Croxton Yard
South Kearny Yard
Oak Island Yard
Proposed Portway Projects
1. Doremus Avenue Bridge
2. Doremus Avenue Widening
3. New Passaic River Crossing
4. Central Avenue Interchange
5. Pennsylvania Avenue and Fish House Road
6. Route 7 Wittpenn Bridge
7. Charlotte & Tonnelle Circles
8. Route 1&9 St Pauls Avenue Viaduct Replacement
9. New Road (Route 1&9) from St Pauls Avenue
Location of Potential Future Freight Improvements
10. Marion Junction 2nd Track
11. National Docks Bergen & Waldo Tunnels
12. NEAT Conversion to Container Terminal
13. Bayonne Bridge Elevation
14. New Rail at Global Marine
15. Chemical Coast Secondary
16. NJ Turnpike Interchange 12 Area
17. North Avenue
18. NJ Turnpike Interchange 14
19. NJ Turnpike Interchange 14A
20. NJ Turnpike Interchange 15E
21. NJ Turnpike Newark Bay Bridge
22. P & H Line 2nd Track (Kearny to Hackensack)
23. Doremus Avenue Interchange with Route 1&9 Truck
24. Goethals Bridge/Bayway Access and Connectivity
25. Lehigh Line Rail Capacity
26. Routes 1&9 NB and Delancy Street Interchange
27. Tremley Point Connector Roads/Bridge Interchange 12
0 0.5 1 2
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industry. This will be accomplished, in large part, through the forum provided by the NJTPA's Freight Initiatives Committee. The recommendations, some of which are shown on Map 6-4 are discussed in the following sections of the Plan.

Highways and Bridges

Trucks and roads are the mainstay of the goods movement system. Unless shippers or receivers are located directly at ports, airports or along rail lines, trucks are necessary to deliver/pick up their goods. Even for those industries with direct access to these other modes, final distribution of the goods received by these other modes must be done by truck. Some of the nation's most heavily traveled truck routes are in the NJTPA region. Five of the six major truck corridors identified by NJDOT are in the NJTPA region illustrating the heavy concentration of freight activity in the northern part of the State. The major truck corridors in the NJTPA region (shown on Map 3-3 in Chapter 3) include the following: the New Jersey Turnpike, Interstate 78, Interstate 80, Interstate 287 and New Jersey Route 17.

The projected growth in truck traffic means that the busiest truck routes will see even more intense use. Warehouse/distribution patterns will lead to increased truck traffic along the main highways. Additionally, current pavement and bridge conditions may impede efficient truck movements. The following strategies are recommended:

- Pursue new and complete ongoing improvements along the region's major truck corridor, the New Jersey Turnpike. Planned and ongoing improvements include interchanges 12 and 14A, as well as the widening of the Turnpike from interchanges 6-9. Additional areas of potential need include interchanges 14 and 15E as well as improvements to the Newark Bay Bridge.
- Pursue highway improvements that could improve truck flow, including separating truck traffic from passenger traffic with truck only lanes where applicable. Consider giving funding priority to highway projects that incorporate such provisions. Complete the remaining Portway (a series of individual roadway and bridge projects as shown on Map 6-4) and Portway Extensions projects, which would improve truck flow between northern New Jersey's freight facilities including Port Newark/Port Elizabeth, freight rail terminals and warehouses/distribution centers.
- Make improvements to roads in and around the port district to support trucks. Identify improvements such as new access roads, improved intersections including turning lanes, upgraded pavement and bridges, increased clearances, optimized signal timings, and new dedicated truck routes. Work closely with officials to plan and design improvements that will serve goods movement objectives while minimizing impacts on the community. Identify a network of roadways that can accommodate the larger, heavier truck traffic originating at Port Newark/Port Elizabeth and the Port Jersey Complex.

A recent NJTPA study found that many commercial truck drivers encounter a shortage of secure parking facilities, especially for long-term overnight parking (Federal law requires that drivers exit the roadway and observe a 10 hour rest period after 14 hours on duty). Yet, over 80 percent of the region's truck parking facilities are over ca-

The region must address the limited clearance under the Bayonne Bridge to remain competitive in a changing global marketplace.

pacity with an estimated regional truck parking shortage of 1300 spaces. Some truck drivers park on highway shoulders if sufficient off-highway parking is not available, presenting serious safety hazards to passing motorists. The strategy recommended to address this need is as follows:

- Pursue expansion of truck parking at two New Jersey Turnpike service areas (Vince Lombardi and Molly Pitcher) and explore opportunities at other Turnpike facilities and other locations, especially the junction of I-78 and I-95, for increasing the regional truck parking capacity with particular attention to safety, security, accessibility and accommodations.

Additional strategies to address highway and bridge needs include the following:

- Enhance highway safety related to truck operations. Continue motor carrier safety inspection programs and provide safe locations for inspections, including additional weigh in motion inspection locations along major truck corridors. Maintain and improve commercial vehicle electronic information exchange (truck registration, licensing, inspection records and cargo documentation).
- Apply technology to improve truck operations, safety, and security. Implement wider applications of intelligent transportation system (ITS) technology, such as electronic tolling, electronic traffic monitoring and variable message signs to improve truck flows.
- Promote the implementation of off peak deliveries (nights and weekends) to address regional congestion, pollution and supply chain efficiency.
- Continue to work towards reducing truck emissions via incentive programs for operators to upgrade their equipment, anti-idling technologies for trucks as well as stationary anti-idling units at truck stop facilities. Encourage the development of hybrid truck technology and use of ultra low sulfur fuels.

Ports and Port Access Initiatives

The Port of New York and New Jersey (PONYNJ) district, which encompasses publicly-owned Port Authority of New York and New Jersey (PANYNJ) facilities as well as privately-owned marine terminals, is the largest international gateway on the east coast and the country's third largest container port. The PANYNJ reports the following volumes for 2008:

- Container trade: 5.3 million 20-foot container equivalent units (TEUs)
- Vehicular trade: 1 million vehicles
- Bulk cargo trade: 55.3 million metric tons

Port Newark and the Elizabeth Port Authority Marine Terminal operate as one fully integrated marine terminal. The port encompasses a full range of maritime activities including major container handling terminals, automobile processing and storage facilities, liquid and solid bulk terminals, breakbulk facilities, and the ExpressRail System. The Port Jersey Marine Complex comprises two facilities: the Auto Marine Terminal and Global Marine Terminal.

At the NJTPA Freight Roundtable in October 2008 there was general agreement that the Bayonne Bridge was the most critical issue facing the region's freight community. The 78 year old bridge has inadequate vertical clearance. It has a mid-span clearance of 151 feet above the Kill van Kull at mean high water. Some of the modern vessels which call at Port Newark/Port Elizabeth measure up to 175 feet above the waterline, and the next generation of vessels will be larger still. Once the expansion of the Panama Canal is completed (currently scheduled for 2015), the large cargo vessels currently used in the Pacific trade will begin to call at ports on the east coast. If the Bayonne Bridge clearance is not increased, these larger vessels may not be able to enter and leave Newark Bay and the terminals at Port Newark/Port Elizabeth, limiting them to the Port Jersey Complex—which offers limited terminal capacity—or other east coast ports. The U.S. Army Corps of Engineers is currently conducting a study of the Bayonne Bridge issue. The strategy recommended to address this need is as follows:

- Raise or replace the Bayonne Bridge to ensure adequate clearance for the new generation of mega container vessels to access and depart Port Newark/Port Elizabeth.

Port Newark/Port Elizabeth has only two main truck routes to and from their terminals. A substantial portion of truck traffic uses the North Avenue corridor, where it must mix with auto traffic for retail, hotel, and other commercial land uses in the area. There is a clear lack of redundancy in the roadway system accessing Port Newark/Port Elizabeth. To address rail access

to the terminals, the PANYNJ has made a substantial investment in its ExpressRail System at Port Newark/Elizabeth. There are plans to address a major future rail need by expanding the ExpressRail System to the Port Jersey Complex. Recommended strategies to improve access to/from the port facilities include:

- Complete the North Avenue corridor project, which will separate Port Newark/Port Elizabeth truck traffic from other traffic in the area. Consider a truck-only interchange between the New Jersey Turnpike and the port facilities.
- Improve connections with rail freight service. Improve the port's ability to transfer marine cargo to and from rail. Continue to improve the availability and efficiency of intermodal marine-rail connections by completing the ExpressRail System expansion.

Additional strategies to address marine transportation needs include the following:

- Provide and maintain adequate channel depth to handle the large "post-Panamax" ships, requiring 48 feet or more, that will call on this region after expansion of the Panama Canal. The PANYNJ is currently deepening the channels throughout the entire harbor to a projected depth of up to 50 feet, with an expected completion date of 2013.
- Provide adequate port facility capacity to handle the projected increase in shipments. Complete the planned Port Authority infrastructure and development capital improvements at Port Newark/Port Elizabeth. Improve facilities at the Port Jersey Complex, including mooring and berthing capacity and landside truck and rail connections.
- Promote increased hours of operation for port facilities and related warehouse and distribution facilities to increase capacity and efficiency of the regional supply chain. Use information technology to streamline cargo processing, which will reduce wait time for truckers and reduce emissions from idling vehicles.
- Address environmental impacts and concerns. Continue existing efforts, particularly those of the US Army Corps of Engineers, to monitor and mitigate the impacts of port operations upon the marine environment, and advance restoration initiatives. Continue the ongoing initiatives to reduce emissions from all sources including ocean going vessels, cargo handling equipment, harbor craft, rail, and trucks.
- Support the Maritime Administration Marine Highway Program. Explore potential for additional facilities for waterborne freight movement. Support Port Authority improvements to the New York & New Jersey Railroad carfloat operation between New York City and the Greenville Yard in Jersey City. Consider possibilities for inland port development. Support opportunities for marine transportation for cross-harbor/coastwise short sea shipping and in-region freight barge and ferry services.

The number of containers entering the Port of Newark is expected to increase dramatically over the life of Plan 2035.

Warehousing Initiatives

In recent years, the industry trend has been toward new larger warehouses in outlying greenfield areas far from the ports, including in eastern Pennsylvania. This trend has led to increased truck traffic to, from, and through the NJTPA region. There is substantial brownfield acreage and older industrial properties located closer to both the port and the ultimate consumers. These properties represent potential development and redevelopment opportunities for

Liberty Corridor–Plan 2035

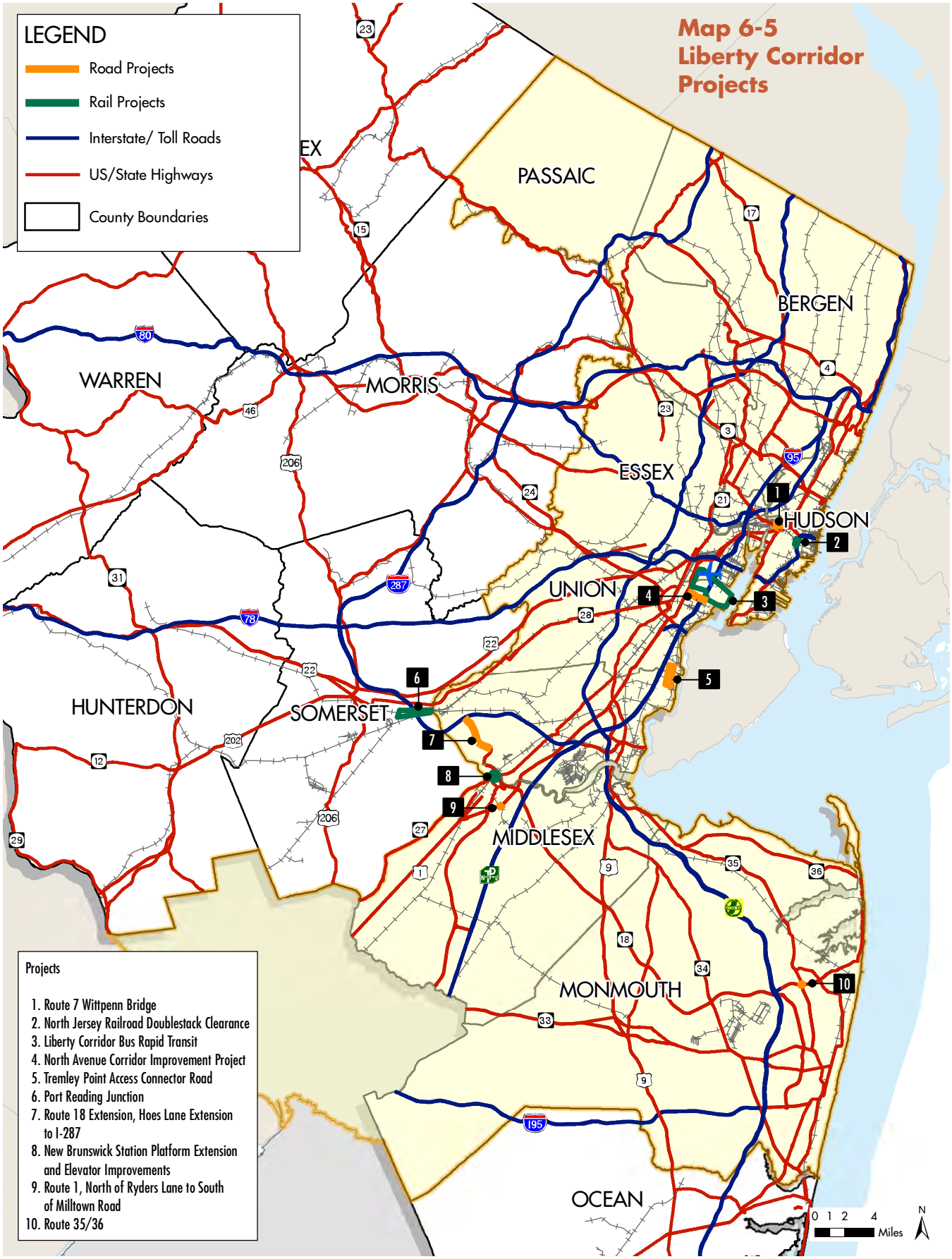
The Liberty Corridor is a congressionally designated economic development and transportation zone that encompasses major port facilities, roadways, rail lines, an international airport, brownfield development sites, universities, corporate campuses and research and development facilities. The corridor encompasses the NJ Turnpike (I-95) and Northeast Corridor rail line and includes seven NJTPA counties. The Liberty Corridor will connect research and development, manufacturing and import/export facilities to establish a critical economic stimulus for the state.

U.S. Sen. Robert Menendez in 2005 secured $100 million in federal funding for the corridor. This funding allows the region to leverage hundreds of millions of dollars in additional funds from the state, the Port Authority of New York and New Jersey, and the New Jersey Turnpike Authority. A Liberty Corridor Advisory Board with supporting committees made up of various business, industry, transportation and academic representatives, including NJTPA representation, was established to identify the best mix of projects for this funding.

In December 2007, based on the Advisory Board's recommendations, the NJTPA Board of Trustees authorized funding for ten highway, bridge, public transit and rail freight projects in the corridor. The projects, shown in Map 6-5, are:

1. Route 7 Wittpenn Bridge: This project will replace the existing Wittpenn Bridge and address a major choke-point with a new vertical-lift bridge on a new alignment.
2. North Jersey Railroad Doublestack Clearance: This project will raise the overhead clearances on Conrail's National Docks Secondary Line in Hudson County from the existing 19 foot 6 inches to the industry intermodal standard of 20 feet 6 inches.
3. Liberty Corridor Bus Rapid Transit: A 15-mile bus rapid transit line in Essex and Union counties that will serve Bloomfield, the Newark Innovation Zone, University Heights Science Park, downtown Newark, Newark Liberty International Airport, and the Port of Newark and Elizabeth.
4. North Avenue Corridor Improvement Project: This project will construct direct ramp connections from North Avenue to Jersey Gardens Boulevard, grade separations at North Avenue/Kapkowski Road and North Avenue/Dowd Avenue/Division Street, and related improvements in Elizabeth, Union County.
5. Tremley Point Access Connector Road: This project consists of a new four-lane, approximately 1.1-mile roadway/bridge between Linden in Union County and Carteret in Middlesex County.
6. Port Reading Junction: This project will create a double-track rail connection between the CSX Railroad's West Trenton Line, the Norfolk Southern Railroad's Lehigh Valley Line, and Conrail's Port Reading Secondary Line in the vicinity of Manville, Somerset County.
7. Route 18 Extension, Hoes Lane Extension to I-287: This project will rehabilitate Hoes Lane from the Hoes Lane Extension to I-287 in Piscataway, Middlesex County.
8. New Brunswick Station Platform Extension and Elevator Improvements: This project will construct a new link between Middlesex County's New Brunswick Station on the Northeast Corridor Line and the adjacent medical research complex, including the Cancer Institute of New Jersey and Robert Wood Johnson University Hospital.
9. Route 1, North of Ryders Lane to South of Milltown Road: This project includes total replacement of a deficient bridge and related improvements in North Brunswick, Middlesex County.
10. Route 35/36: This project will realign Route 35 to provide a near 90-degree intersection with Route 36 in Eatontown, Monmouth County.

A second phase of project funding is being explored. The Liberty Corridor effort seeks to make the state a national leader in efficient people movement, goods movement, technical innovation and economic growth. Plan 2035 supports continued coordinated transportation and economic development planning in the corridor.


Map 6-5
Liberty Corridor
Projects
LEGEND
Road Projects
Rail Projects
Interstate/ Toll Roads
US/State Highways
County Boundaries
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
Projects
1. Route 7 Wittpenn Bridge
2. North Jersey Railroad Doublestack Clearance
3. Liberty Corridor Bus Rapid Transit
4. North Avenue Corridor Improvement Project
5. Tremley Point Access Connector Road
6. Port Reading Junction
7. Route 18 Extension, Hoes Lane Extension to I-287
8. New Brunswick Station Platform Extension and Elevator Improvements
9. Route 1, North of Ryders Lane to South of Milltown Road
10. Route 35/36
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A projected increase in truck traffic means the region's busiest truck routes will see even more use. Port Elizabeth.

freight-related uses that would have a positive impact on the region's transportation system by eliminating unnecessary truck VMT and associated air quality impacts. Recommended strategies to address regional warehousing include:

- Promote freight-related development near port facilities. Build upon existing programs, particularly the Portfields initiative, to redevelop industrial sites close to the ports. Encourage converting these areas into warehousing and freight processing centers where feasible. Coordinate with local officials in assessing optimal land uses near port facilities, and work to prepare integrated land use/economic development/goods movement strategies.
- Appropriate agencies should work to streamline regulations and the parallel permitting process that may be impeding freight related development.
- Promote vertical warehouse construction where appropriate due to parcel size constraints. Support green warehousing initiatives such as solar roof panels. Explore freight village opportunities. Improve public transit and parking options for workers in the area.

Rail Initiatives

The region's rail freight system is comprised of Class I carriers (Norfolk Southern, CSX, Conrail Shared Assets and Canadian Pacific), their main lines and branches, short line railroads, and various related facilities including terminals and yards. The major lines, carrying upwards of 74 freight trains per day, include the following:

- The CSX River Line, which connects the region with Chicago and points west via Selkirk, New York.
- The Norfolk Southern Lehigh Line, which connects the region to Harrisburg, PA. and points west and south.
- The CSX West Trenton Line, which connects North Jersey with Philadelphia and points south.

A third Class I carrier, the Canadian Pacific (CP), provides intermodal service via trackage rights over Conrail and NJ Transit lines.

Other rail freight lines in the region include branches, secondary tracks, running tracks and industrial tracks, accommodating lower-volume, lower-speed traffic and providing last mile connections to industrial customers. In addition, the region has eight shortline railroads which provide switching services to various industries located along their lines and bulk transfer intermodal services.

The existing rail freight network (see Map 3-3 in Chapter 3) has capacity constraints and related issues including congestion, scheduling conflicts and limited operating speeds. Analysis has shown that some rail freight lines may not be able to handle the projected 2035 demand even with currently-planned improvements. In addition to general capacity limitations, certain specific locations present "bottlenecks" to rail freight traffic. Any improvements to regional rail operations should be accomplished within a larger context of making these rail corridors sustainable for the future. This was the intent behind the I-95 Corridor Coalition's Mid-Atlantic Rail Operations Study (MAROPS) which identified a number recommended projects. The strategies to address these major freight rail needs are as follows:

- Continue support of, and collaboration with, the Class I and Shortline railroads. Improve physical capacity of the NJTPA region's freight rail system. Enhance capacity by double-tracking existing lines (including but not

limited to the River Line, the Lehigh Line, the Chemical Coast Secondary Line and the West Trenton Line), addressing clearance issues, reactivating abandoned and/or out of service rail lines, and developing new rail rights-of-way. Pursue additional projects including but not limited to triple tracking the Lehigh Line in the shared assets area, double tracking the P&H Branch, eliminating the freight rail bottleneck at Marion Junction, and making track and signal improvements to the Port Reading Secondary Line.

- Over the long term, explore the possibility of a dedicated rail freight corridor(s) through the region. Explore rail shuttle services connecting the port to major distribution center clusters.

The standard of U.S. railroads for railcar gross weight is rapidly becoming 286,000 pounds, greater than the capacity of much of the track in northern New Jersey and statewide. Some lines are restricted to 263,000 pound cars because of their use for rail passenger service, others due to structural limitations (bridge restrictions, light weight rail). These restrictions hamper a railroad's ability to offer their customers the economies of scale that result from larger/heavier rail cars, sometimes forcing industries to consider relocating, frequently out of state. The inability to offer modern rail service works against the State's economic development efforts when neighboring states can offer economic incentives and modern rail infrastructure. The strategy that addresses this need is as follows:

- Identify critical locations that do not meet the 286,000 pound standard and increase weight capacity of rail tracks and bridges. Provide assistance to rail operators to improve weight capacity from 263,000 to 286,000 pound cars throughout the region. Revisit the 263,000 pound restriction on tracks that carry passenger traffic but are also used for freight.

NJTPA recently completed a study of 64 grade crossings on the region's major freight rail mainlines, which resulted in a multi-criteria ranking that identified 15 locations for detailed analysis. Projected increases in rail freight will result in increased delay at grade crossings, and raise safety and quality of life issues in those communities where these crossings are located. The study systematically identified and assessed issues at these 15 crossings and offered potential remedies to address impacts.

- Pursue the potential of implementing recommendations from the NJTPA Freight Rail Grade Crossing Assessment Study as appropriate. Expedite enhancements at the top 15 sites identified in the study. Provide educational and informational resources regarding Quiet Zones and the designation process where appropriate.

Additional strategies to address the region's freight rail needs include the following:

- Promote the use of available technology to reduce rail impacts. Pursue the provision of technologies to reduce or eliminate locomotive idling impacts. Explore and pursue programs and technologies to provide environmentally friendly alternatives such as the 2009 CMAQ acquisition of ultra low emission Gen-Set locomotives.

Air Cargo Initiatives

Newark Liberty International Airport (EWR) and Teterboro Airport are the two major hubs for the movement of air cargo in the NJTPA region. Air cargo activity at EWR includes Federal Express and United Parcel Service facilities, which make this airport the overnight small package hub for the region. In 2007, the airport handled about one million tons of air freight (9th in the U.S. and 22nd in the world), over half of which was carried by Federal Express. Teterboro is a center for the emergency movement of donor organs, U.S. mail and packages, and for a decreasing, but still significant, traffic in Federal Reserve Bank documents. Two strategies that address the major needs of air cargo operations in the region are:

- Improve access to air cargo facilities based at Newark Liberty International Airport (EWR). Develop improved and potentially truck-only road connections between EWR air terminals and nearby off-site air cargo warehouse and distribution facilities. Improve local signage for freight facilities, clearance restrictions and detours.
- Explore alleviating congestion and delays at EWR caused by landside and airside capacity constraints.

Other

Additional strategies that cross over all of the modes of goods movement include:

- Ensure revenues from goods movement activities go toward freight-related transportation improvements.

- Educate the public about the nature, need, and value of goods movement.

Abandoned Rights-of-Way

Abandoned rail rights-of-way are scattered throughout the NJTPA region. These properties, the majority of which were once used to move freight, are an important resource for potential future transportation uses. The expansion of highway, transit, freight rail, bicycle, and pedestrian facilities is often constrained by the availability of suitable rights-of-way. This is especially true in the densely developed NJTPA region.

In the 1990's, the Legislature authorized the use of bond funds by the NJDOT to preserve a number of these former rail lines. The Lackawanna Cutoff, Staten Island Railroad and Rahway Valley Railroad are examples of former rail properties that were acquired and are in various stages of reactivation for the movement of people and/or freight. Currently there are no dedicated funding sources for preserving abandoned rights-of-way.

The NJTPA calls for preservation of abandoned rail rights-of-way for transportation purposes, such as this one being integrated into the Barnegat Branch Trail. Berkeley, Ocean County.

To facilitate their preservation, the NJTPA, with input from the subregions, identified abandoned rail rights-of-way in northern New Jersey (shown in Map 6-6). Potential plans for these properties were also identified (shown in Appendix E) with the understanding that this is a starting point and further analyses would need to be performed with regard to the feasibility of these plans.

Plan 2035 views these properties as strategic resources for the region and recommends protecting the identified rail rights-of-way, especially those that have been identified as having potential future transportation uses.

Safety and Security

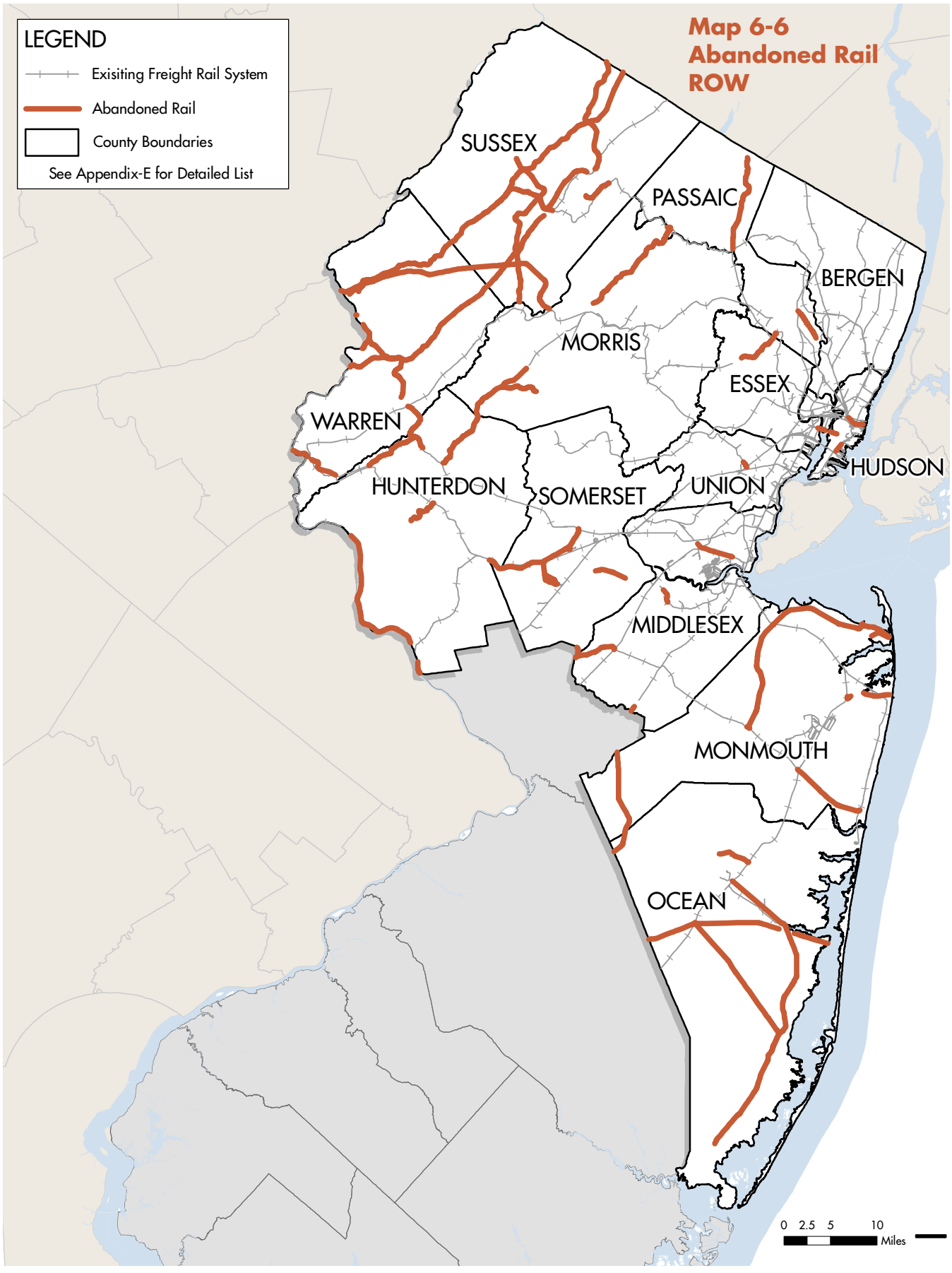
Transportation planning and investment in the region must make travel safer and more secure. Over the life of this plan, safety and security measures should, whenever possible, be included in the planning, design and implementation of all projects. The region also will look to increase spending on direct safety improvements in addition to safety features integrated into other projects.

In 2007, as noted in Chapter 4 (Needs & Strategies), the NJTPA worked with NJDOT and other agencies and safety stakeholders to develop New Jersey's Comprehensive Strategic Highway Safety Plan (CSHSP) which addresses eight emphasis areas. The eight emphasis areas are: prevent and minimize roadway departure crashes; improve the design and operation of intersections; curb aggressive driving; reduce impaired driving; reduce young driver crashes; sustain senior safe mobility; increase driver safety awareness; and reduce pedestrian, bicycle, rail and vehicular conflicts. All of the NJTPA's safety activities advance at least one of these eight goals.

The backbone of NJTPA's safety activities is the 2005 Development of Regional Safety Priorities study and the follow-up Regional Safety Priorities Update, completed in 2008 and incorporated into Plan 2035.

In the Regional Safety Priorities Update, over 840,000 crash sites were mapped electronically to identify 25 of the region's most crash-prone half-mile stretches of local and county roads. Site visits were coordinated with local officials, police and other stakeholders before the 25 initiatives were documented in reports that suggested the proper improvements, cost estimates and the agency responsible for implementation.

Plan 2035 contains a wide variety of safety improvements to be implemented in the near and mid-term (Map 6-7). These range from participation in NJDOT's well established, successful Safe Corridors Program to the Route 287/202/206 interchange improvement to pedestrian safety measures in Hudson County. In all, 11 specific safety improvements and programs are scheduled for the near-term timeframe, while others are specified for the mid-term. These projects are included in the Project Index found at the back of this plan.


Map 6-6
Abandoned Rail
ROW
LEGEND
Exisiting Freight Rail System
Abandoned Rail
County Boundaries
See Appendix-E for Detailed List
SUSSEX
PASSAIC
BERGEN
MORRIS
ESSEX
WARREN
HUDSON
HUNTERDON
SOMERSET
UNION
MIDDLESEX
MONMOUTH
OCEAN
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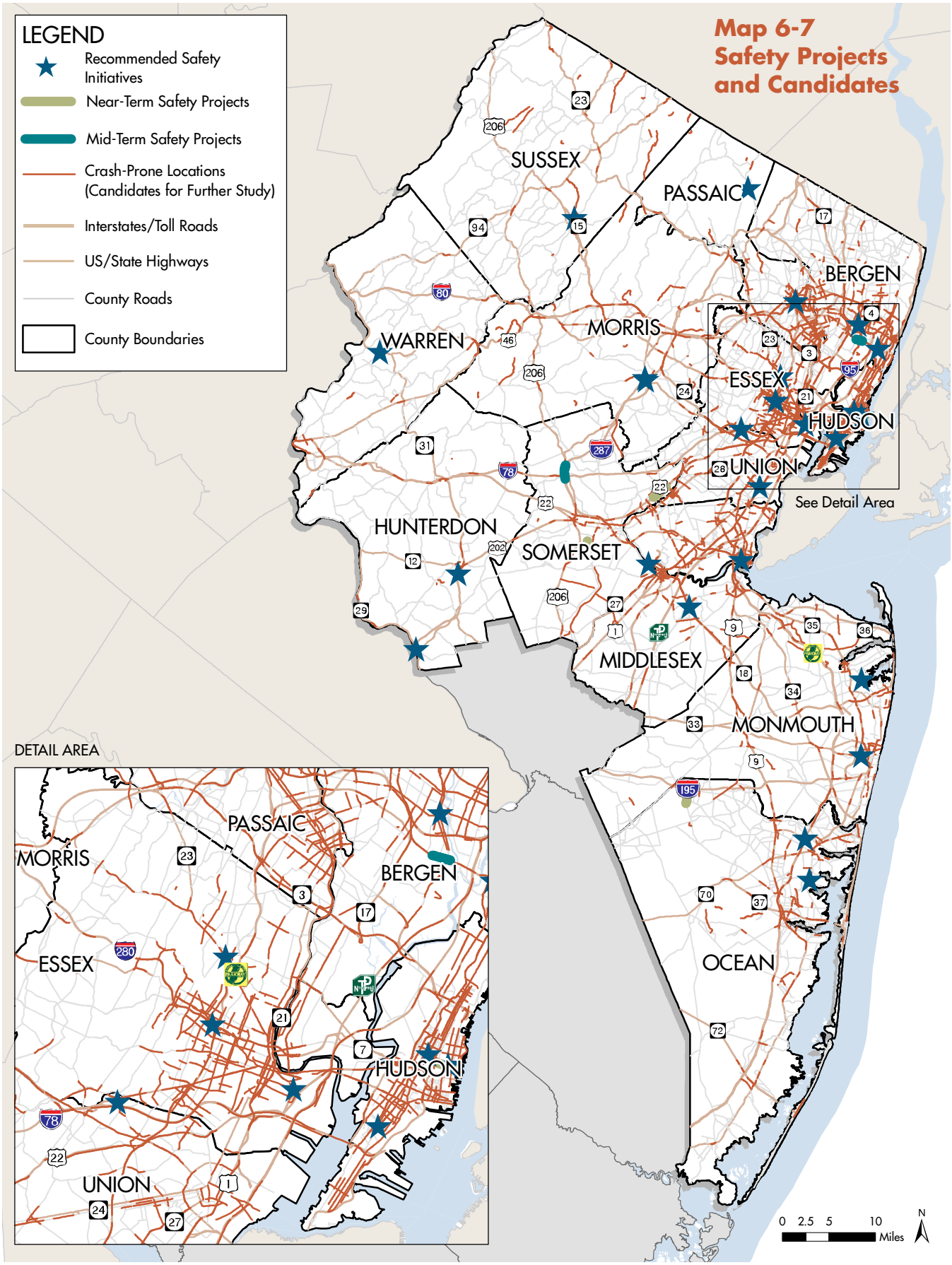
Miles


LEGEND
Recommended Safety Initiatives
Near-Term Safety Projects
Mid-Term Safety Projects
Crash-Prone Locations (Candidates for Further Study)
Interstates/Toll Roads
US/State Highways
County Roads
County Boundaries
Map 6-7
Safety Projects and Candidates
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
See Detail Area
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
DETAIL AREA
0 2.5 5 10 Miles
N

In addition, dozens of other projects—including bicycle/pedestrian improvements, ITS efforts, roadway enhancements and others—will specifically incorporate safety improvements into their design and implementation.

Transportation security is also considered as part of the metropolitan transportation planning process. USDOT defines transportation system security as "the freedom from intentional harm and tampering that affects both motorized and nonmotorized travelers, and may also include natural disasters." Events such as the September 11, 2001 attacks, the attack on the London transit system and evacuation of over a million people during Hurricane Katrina have increased awareness of the vulnerability of the transportation system and the need to prepare for emergency evacuations.

To help secure the transportation system in the NJTPA region, Plan 2035 calls for:

- Funding new strategies, technologies and projects that will help prevent and better prepare the region for possible security threats.
- Promoting projects that address transportation security.
- Disseminating information on transportation security.
- Funding recovery strategies, if needed.
- Conducting transportation network analyses to determine most effective recovery investment strategies.

In these and other security activities, the NJTPA will work with the New Jersey Office of Homeland Security and Preparedness (OHSP) and other appropriate agencies. OHSP is funding the Jersey City/Newark Urban Area Initiative Regional Evacuation Planning Study which will produce an evacuation plan through collaboration among jurisdictions. The research team has adapted the transportation model currently used by the NJTPA to develop and apply a network-based regional evacuation planning transportation model. Similarly, Monmouth County has completed a Coastal Evacuation Routes Improvements Study. Such evacuation route planning is discussed further in Chapter 7 (Land Use and Transportation).

Local Safety Program

NJTPA's federally funded Local Safety Grant Program supports construction of quick-fix, high-impact safety improvements on crash-prone county and local roadways in the NJTPA region. Since its inception with a pilot program in 2004, the NJTPA has allocated over $8 million in Local Safety Program funds for almost two dozen projects designed to increase the safety of drivers, bicyclists and pedestrians. Among other measures, these projects have involved installing upgraded traffic signals, pedestrian countdown signals, new signs and crosswalks, reflective striping and radar-based driver feedback. The program, which has been funded at approximately $2 million annually, will continue under Plan 2035.

Plan 2035's safety initiatives aim to protect all the region's travelers. Ridgewood, Bergen County.

High Risk Rural Roads Program

First solicited by the NJTPA in FY 2009, the High Risk Rural Roads Program (HRRRP) provided $1 million in federal safety funds specifically set-aside under SAFETEA-LU to implement safety improvements on eligible crash-prone roadways in rural areas. Five projects were funded that applied anti-skid treatments at crash-prone roadway locations along County Routes 517, 519, 565, 611, 616 and 650 in Sussex and Warren Counties in order to reduce vehicle run-off-road crashes. The program, funded at $1 million, will continue under Plan 2035.

Bicycle/Pedestrian Safety Technology

Two promising new technologies are being used nationally and in New Jersey to aid pedestrians and bicyclists in crossing streets and highways.

The first is the HAWK (High-intensity Activated crosswalk) signal, for use at mid-block crossings. A reconfiguration of the traditional traffic and pedestrian signal with additional signage, the HAWK device activates only by a button pushed by a pedestrian. If not activated, it remains unlit. The signal is currently "experimental" and requires specific approval from the Federal Highway Administration (FHWA) for its use. The HAWK signal has been proposed for inclusion in the national Manual on Uniform Traffic Control Devices (MUTCD).

The second new technology is the Rectangular Rapid Flashing Beacon (RRFB). This device has interim approval from the FHWA for use as a warning beacon at crossing locations. These flashing beacons supplement pedestrian crossing or school crossing warning signs at crossings without traffic lights or stop signs. Studies show drivers yield to pedestrians more readily when these beacons are used. The interim approval allows the state, counties and municipalities to use these beacons, which offer significant safety and cost benefits by achieving very high rates of compliance at a quite low relative cost compared to other more restrictive and expensive approaches, such as full signalization. In the NJTPA region, the RRFB will be installed near the Metropark rail station and on Route 4 in Elmwood Park.

The NJTPA will look for additional opportunities to use these emerging pedestrian and traffic control technologies in the region.

New Jersey Deer Vehicle Crash Coalition

Access and Mobility 2030 identified a growing problem with deer vehicle incidences. In March 2006 the New Jersey Deer Vehicle Crash Coalition chaired by NJTPA was formed to explore ways to reduce deer-vehicle crashes and to launch a public education campaign. Meeting bi-annually, representatives from affected communities, government agencies and NJTPA staff have worked together to secure a safety grant to print "Watch for Deer!" educational materials.

Public response to these materials has been strong. In addition, new technologies are being tested in New Jersey to warn drivers of deer in the area. The Coalition continues to see growth in its membership and interest in developing new ways to combat the growing deer population. Plan 2035 calls for continuing this important effort.

Walking and Bicycling

Plan 2035 is committed to improving walking and biking in the region by incorporating "Complete Streets" principles into the NJTPA planning process. Complete streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and bus riders of all ages. A fully instituted complete streets policy ensures that streets are routinely designed and operated to enable safe access for all users. The goal is to make walking and biking convenient, safe, efficient and attractive transportation modes for short trips and for recreation. Much of this commitment is made through direct investment in bicycle and pedestrian facilities. In addition, projects such as bridge replacements and intersection improvements will incorporate features to make walking and biking safer and more attractive travel options wherever possible. In all, Plan 2035 calls for expenditures of $402 million on bicycle and pedestrian projects over the life of the plan. See the Project Index for details.

Pedestrian and Bicycle Strategies

To maximize mobility and accessibility benefits, bicycle and pedestrian improvements must be considered in both a local and regional context. At the local level, bicycle and pedestrian improvements are often best designed to connect activity centers (e.g., office complexes and schools) to commercial and service locations (e.g., shopping centers, post offices, malls, restaurants) and nearby public transit services. Many local improvements incorporate sidewalks, bicycle lanes or even dedicated paths and use design and

NJTPA programs fund safety improvements on local and rural roads. Milford, Hunterdon County.

construction practices that are relatively small in scale and scope. Another local example is the provision of bicycle storage at train stations to encourage riders to bike to the station, as already done by many TMAs and municipalities in the region.

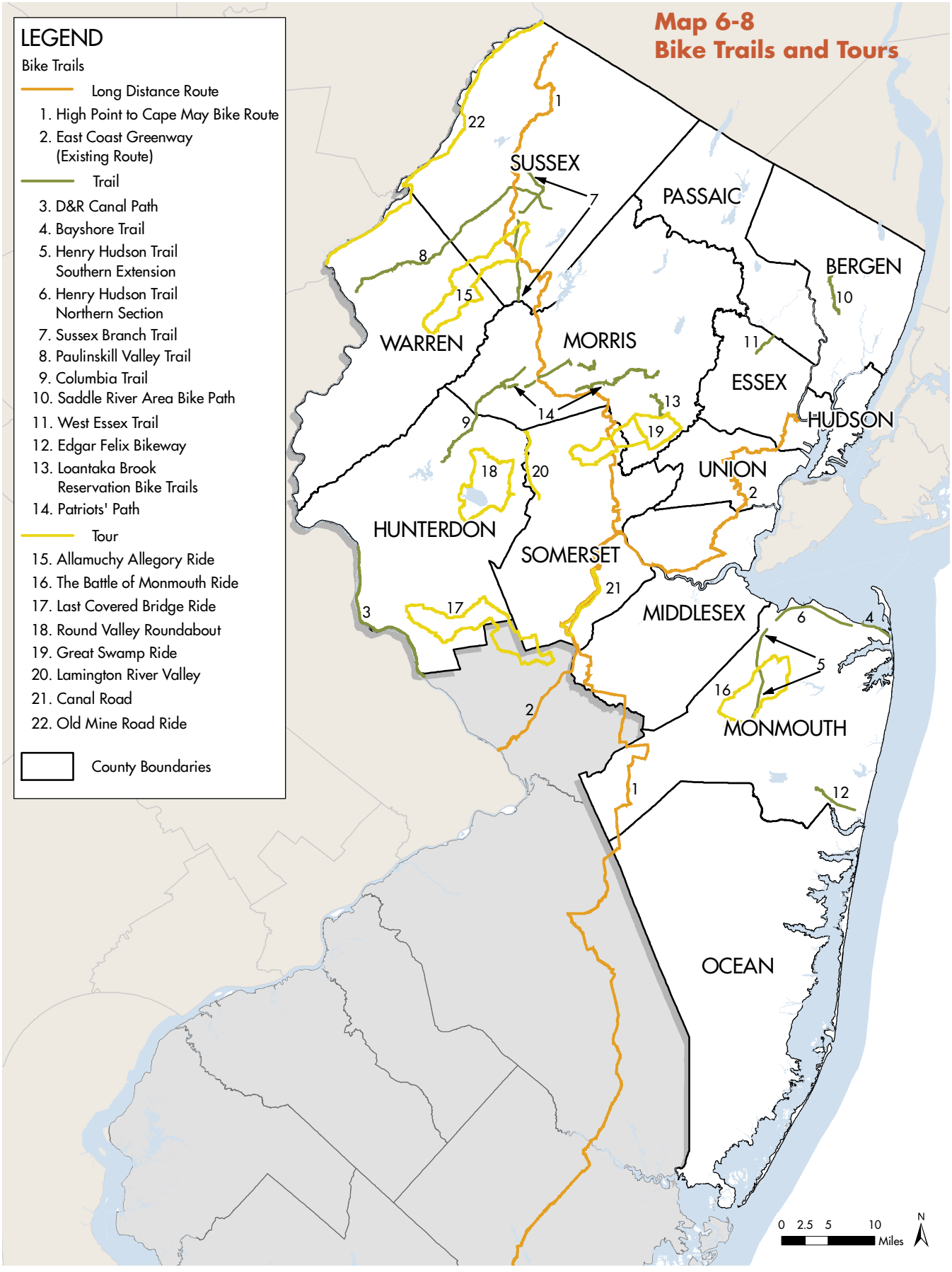
At the regional scale, several larger inter-county paths, routes and trails are in various stages of planning, development or construction, supporting regional bicycle and pedestrian connections. Although a number of these regional trails use the shoulder of existing roadways, others are designed as separate off-road facilities away from motor vehicles. Some incorporate abandoned transportation or utility rights-of-way. Development of regional trails can take a good deal of time, given the relatively long lead times needed for a project that requires land purchases or significant funding for construction. Nevertheless, such projects present an important opportunity to promote longer travel opportunities. They also frequently intersect with local bicycle and pedestrian facilities, expanding local opportunities for nonmotorized travel (Map 6-8).

One key regional project is completion of New Jersey's portion of the East Coast Greenway. The Greenway is a 3,000-mile planned route connecting various on-road and off-road facilities to link 25 major cities, from Maine to Florida. In New Jersey, it runs 93 miles between Pennsylvania and New York, passing through some of the region's major urban areas (New Brunswick, Newark, Jersey City) and rural and suburban communities. Greenway segments include the 35-mile Delaware and Raritan Canal State Park from Trenton to New Brunswick. Other planned sections will link through Union, Essex, and Hudson counties with an optional route to New York City through Bergen County.

The region's other long distance trails (such as the Capital-to-Coast Trail from Trenton to Manasquan, the Liberty to Water Gap Trail linking Liberty State Park in Jersey City to the Delaware Water Gap, and the Henry Hudson Trail from Atlantic Highlands to Freehold) also offer mobility benefits to municipalities along the routes, as well as opportunities for connections to nearby communities.

In addition, as part of its commitment to this vision of improved bicycle and pedestrian transportation in the region, the NJTPA has identified numerous near-term bicycle and pedestrian projects, including:

Plan 2035 supports investments to improve bicycle and pedestrian mobility. Green Village, Morris County


Map 6-8
Bike Trails and Tours
LEGEND
Bike Trails
Long Distance Route
1. High Point to Cape May Bike Route
2. East Coast Greenway (Existing Route)
Trail
3. D&R Canal Path
4. Bayshore Trail
5. Henry Hudson Trail Southern Extension
6. Henry Hudson Trail Northern Section
7. Sussex Branch Trail
8. Paulinskill Valley Trail
9. Columbia Trail
10. Saddle River Area Bike Path
11. West Essex Trail
12. Edgar Felix Bikeway
13. Loantaka Brook Reservation Bike Trails
14. Patriots' Path
Tour
15. Allamuchy Allegory Ride
16. The Battle of Monmouth Ride
17. Last Covered Bridge Ride
18. Round Valley Roundabout
19. Great Swamp Ride
20. Lamington River Valley
21. Canal Road
22. Old Mine Road Ride
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
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Miles
N

- The 6th Street Viaduct Pedestrian and Bicycle Pathway in Jersey City;
- Safe crossings for the East Coast Greenway route at Route 27, Route 35, Route 28 and Route 82;
- The Route 18, Raritan Riverfront Multipurpose trail;
- The Rahway River Corridor Greenway Bicycle and Pedestrian Path;
- Route 4 pedestrian mobility improvements in Teaneck;
- The NYS&W Bicycle and Pedestrian Path from Pequannock to Wayne.

Additional projects, including major regional bicycle and pedestrian routes have been identified for development over mid to longer-term time horizons. New projects will enter project development each year, with a special emphasis placed on projects within the areas identified by the NJTPA Strategy Refinement that show significant need and promise for investments to promote walking and biking.

By far, the most important changes the region can make to support bicycling and walking as transportation modes is to develop and re-develop land uses incorporating the principles of smart growth as discussed in Chapter 7. Input received through the Plan 2035 visioning workshops and other sources indicates public support for more modal options, and an increasing willingness to develop and shape community land uses in ways that are more pedestrian, bicycle and transit friendly.

The NJTPA will work with its member subregions to assist municipalities as they begin this new way of approaching mobility in their communities. Actions that will support this agenda will include:

- Continue to provide supportive technical studies funding to subregions for bicycle and pedestrian plans and studies;
- Encourage counties and municipalities to develop bicycle and pedestrian plans;
- Continue to work with sub-regions to incorporate bicycling and pedestrian projects into the Transportation Improvement Programs (TIP).

Pedestrian and Bicycle Safety

With its ability to bring subregional stakeholders to the table, the NJTPA will partner with NJDOT in its efforts to develop a Complete Streets policy for state highways.

Safety initiatives are imperative to improving bicycle and pedestrian transportation, especially in urbanized areas and areas with substantial young and senior populations. As mentioned, basic improvements (such as adding countdown pedestrian signals and bike lane striping) can stand alone or work in conjunction with more elaborate improvements that create physical changes to roadways that "calm" motor vehicle traffic and reduce travel speeds. New signal technologies can be used to protect mid-block crosswalks. The NJTPA's member subregions are encouraged to incorporate these strategies into their own bicycle and pedestrian planning activities based on local needs and community input.

The NJTPA will work with NJDOT in its effort to revise its Roadway Design Manual to integrate chapters for bicycle planning and design, pedestrian planning and design and traffic calming planning and design.

Safe Routes To Schools

One such effort is the NJTPA's coordination with NJDOT on the selection of Safe Routes to School (SRTS) initiatives. SRTS projects not only heighten pedestrian safety awareness among motorists and schoolchildren, they also improve environmental health and quality of life by reducing traffic jams and air pollution. In addition, the program encourages healthy lifestyles among children by promoting regular physical activity. The latest round of grant funding distributed $3.4 million in federal funding among 23 towns in 10 counties within the NJTPA region.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) use innovative technology to improve transportation safety, efficiency, and system performance. Examples of ITS include E-ZPass's open-road tolling, which allows for toll collection without affecting driving speed; variable message signs that direct travelers to alternate routes and provide information about delays; incident management coordination to clear accidents more quickly and manage affected traffic; integration of transit fares through smart cards; and vehicle ITS whereby communication between vehicle and highway allows for greater speeds and reduced distances between vehicles.

By making the transportation system work more efficiently, ITS serves the traveling public by helping to reduce congestion and improve safety. It also can play an important role in reducing greenhouse gas emissions and improving air quality.

The state and region have already developed federally required "ITS Architectures" to help identify the informa-

tion needs for ITS and opportunities for its implementation. New Jersey has implemented a 2007-2016 Investment Strategy to advance design and construction of ITS initiatives within the state. The state continues to work with stakeholders to identify information to be shared and to improve information exchange. Future ITS improvements will include components to evaluate the benefits of each project by looking at pre- and post-construction conditions.

Plan 2035 supports ITS as an integral component of a sustainable regional transportation system. The region has made a tremendous public investment in its roadway network. Creative strategies to improve roadway operations will become increasingly important over the next 25 years as travel demand continues to increase.

The region should continue to expand its use of ITS to communicate with travelers and to improve the management of roadway incidents. Speeding the response and the clearance of accidents and breakdowns will reduce delays and save lives. Agency centers such as the NJDOT Operation Centers and the TRANSCOM incident advisory network help manage recoveries when traffic incidents occur.

As part of its commitment to implement ITS throughout the region, the NJTPA has identified more than a dozen ITS programs and projects in the plan. Several of these projects are planned for the near- and mid-term, including:

- Interstate 78 over the Delaware River, Open Road Tolling (High-Speed E-ZPass);
- Delaware Water Gap Open Road Tolling (High-Speed E-ZPass);
- ITS improvements to Route 46, Interstate 80 to Interstate 80/280

The first two projects are planned by the Delaware River Joint Toll Bridge Commission. Additional committed ITS initiatives can be found in the Project Index.

Other ITS strategies the region might consider implementing include such measures as "ramp metering," which addresses congestion by controlling the rate at which vehicles enter a freeway through traffic signals at entrance ramps. ITS approaches also can benefit transit users by:

- Providing better information about travel schedules and delays;
- Creating intelligent bus stops that inform waiting passengers about bus arrival times;
- Continued integration of fare collection across transit modes with "smart" electronic fare cards such as those already in use; and
- Expanding and improving use of internet and telephone-based trip planning services

Such services should be expanded throughout the region.

The Region's Airports

Northern New Jersey's diverse airports range in size from small general aviation airports with turf runways to Newark Liberty International Airport, one of the nation's busiest commercial hubs serving 35.4 million passengers in 2008 and over 1 million tons of air cargo in 2007. Between the two extremes lies a complex system of airports operated by state, county, municipal and private entities.

Airports are vital components to the region's economic health. The state's commercial and general aviation airports account for some $13 billion in economic activity. The NJTPA supports New Jersey's investment priorities for general aviation, which are safety, airport preservation, runway/taxiway improvements, airport planning and aviation promotion. While many of these issues are beyond the jurisdiction of the NJTPA, general aviation makes critical contributions to the region's economy by serving air transportation needs that cannot be effectively or efficiently served by either surface transportation modes or the commercial airlines.

In acknowledging the importance of aviation to the region, a general aviation airport study conducted by the NJTPA in 2008 found that several airports in the region are affected by the deterioration of transportation infrastructure, particularly the road and highway network, serving their facilities. Like many businesses in the region, they face access problems due to traffic congestion in peak periods as well as the need to upgrade outdated infrastructure (narrow bridges, lack of turn lanes, etc.). Further, a particular issue affecting airports was found to involve "wayfinding"—the lack of adequate signage to direct users to their facilities. Recommendations from the 2008 NJTPA report, incorporated into Plan 2035, include:

- Address signage issues through state and county planners;
- Cooperate and collaborate with NJDOT Bureau of Aeronautics on developing a regional general aviation airport signage program.