PLAN 2035

Regional Transportation Plan for Northern New Jersey

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

PLAN 2035



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The NJTPA

The North Jersey Transportation Planning Authority is the federally authorized Metropolitan Planning Organization (MPO) for the 13-county northern New Jersey region. The federal government requires each urbanized region of the country to establish an MPO to provide local guidance over the use of federal transportation funding and ensure it is spent cost-effectively to improve mobility, support economic progress and safeguard the environment.

The NJTPA oversees over $2 billion in transportation investments every year. It analyzes transportation needs, approves proposed transportation improvement projects and provides a forum for interagency cooperation and public input into funding decisions. It also sponsors and conducts studies, assists county planning agencies and monitors compliance with national air quality goals.

The NJTPA Board consists of one elected official from each of the region's 13 counties; Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren, and its two largest cities, Newark and Jersey City. The Board also includes a Governor's Representative, the Commissioner of the NJ Department of Transportation, the Executive Directors of NJ Transit and the Port Authority of NY & NJ and a Citizens' Representative appointed by the Governor.

NJTPA Board meetings are held bi-monthly and are open to the public. The meeting schedule is at NJTPA.org.

The NJTPA Region

The NJTPA serves the fourth most populous MPO region in the nation, with over 6.7 million people and 3.2 million jobs. The 13-county region covers 4,200 square miles which is half the state's land area and includes 384 municipalities.

Key features of the regional transportation system serving the region include the following:

- The region is home to 2,000 miles of freeways/expressways, 6,000 miles of arterial highways and 15,000 miles of county and local roads.
- NJ Transit provides some 250 bus routes throughout the region.
- NJ Transit's rail system in the region includes 10 commuter rail lines, two light rail lines, 150 stations and 390 miles of track.
- The 14-mile PATH commuter rail service connects Newark, Harrison, Kearny, Hoboken and Jersey City with Lower and Midtown Manhattan.
- There are more than 4,800 bridges in the region.
- Three ferry companies operate routes between New Jersey and New York City from 19 piers.
- The region is home to the largest container port on the Atlantic seaboard, which also is the third largest in the U.S. and the 14th largest in the world.
- The region also is home to Newark Liberty International Airport, which handled 35 million passengers and more than 1 million tons of air cargo a year.
- The region has an extensive trucking industry that handles nearly 400 million tons of freight annually.

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INTRODUCTION AND SUMMARY

Northern New Jersey has always adapted to meet the demands of a changing economy and a growing population. As the nation industrialized in the late 19th century, the region evolved from a by-way between two major cities to become a major population center producing goods for the nation. Later, with shifts in national and global commerce, it became the east coast's largest platform for freight distribution, a site for corporate campuses and headquarters and the home of world-class education and research facilities.

These shifts have occurred in an incredibly diverse landscape that includes the famed Jersey Shore, dense urban centers, wide open suburban townships, rural farming communities as well as the rugged hills in the region's northwest. Stitching together this landscape is the region's extensive transportation system—an intricate network of roads, rail lines, river crossings, marine channels, walkways and bikeways—which has continually been upgraded and expanded to meet the needs of the evolving economy (Maps 1-1 and 1-2).

Creating and enhancing livable communities is a key goal of Plan 2035. Madison, Morris County.

Today, the region, like the nation, is facing an uncertain and challenging future. The economic growth that has buoyed employment and the quality of life in the region for much of the last two decades has been disrupted. Many sectors of the economy are in decline. But the region's many economic assets are intact and no doubt will provide the foundation for a strong recovery as national and international conditions improve. Along with an educated workforce and a diverse business sector, these assets importantly include the region's multi-modal transportation system, developed over more than a century.

Plan 2035, developed by the North Jersey Transportation Planning Authority (NJTPA), the federally authorized Metropolitan Planning Organization (MPO) for this 13-county region, once again looks to adapt and shape the transportation system to steer the region through the near-term economic downturn to a positive long-term future. It also seeks to address other critical challenges over the next 25 years—not the least of which is the need to use transportation investment to help avert the threat of global warming and achieve greater energy efficiency.

Foundation

Creating a transportation plan with a 25-year horizon is greatly complicated by the depth of the current uncertainties—economic, environmental and otherwise. But failure to make choices today that will guide the long-term development of the transportation system is not an option. There must be a steady stream of investments moving through the pipeline towards construction in anticipation of future infrastructure needs. Without it, the region could find itself lacking the ability to move both people and goods with the efficiency needed to sustain a robust near-term economic recovery and reap new economic opportunities over the long term. A similar case applies even more strongly to climate change—lack of steady progress beginning today could leave the region, nation and world facing an unprecedented environmental crisis.

Northern New Jersey must make its contribution to solving these and other critical challenges. Congress has recognized the importance of long-range transportation planning by creating federal mandates for urbanized regions to create and update long-range plans like Plan 2035.

The NJTPA did not have to start from scratch in building Plan 2035. Its previous long-range plan, Access & Mobility 2030, adopted in September 2005, provided the basis for fashioning a new transportation vision for the region. That plan was organized around eight principles that formed a "Regional Capital Investment Strategy," which is carried forward in Plan 2035. These principles, listed in full in the back of this plan, focus on the following objectives:

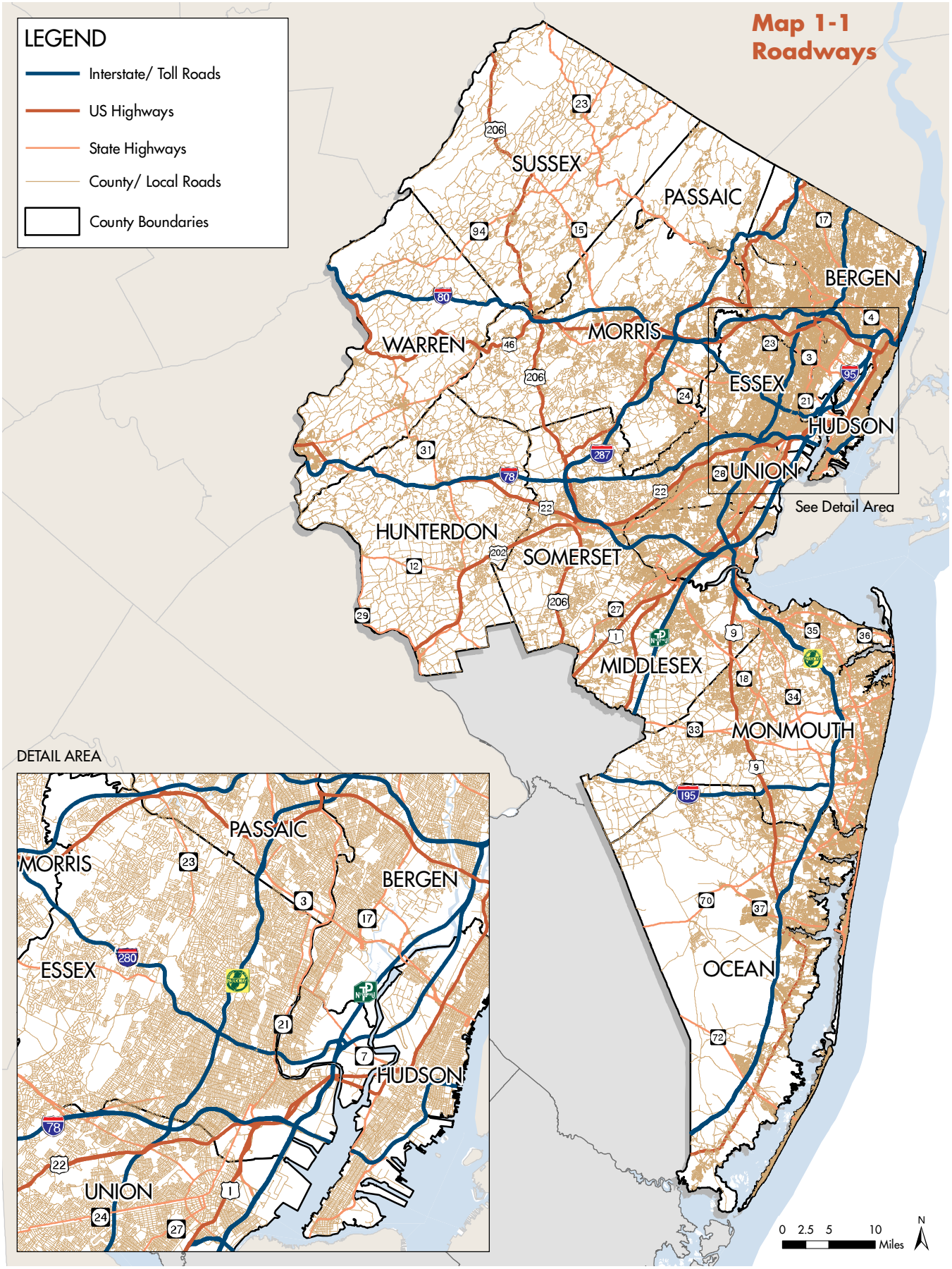
- Promote smart growth rather than continued sprawl.
- Make travel safer and more secure.
- Give highest funding priority to maintaining and repairing existing infrastructure.
- Expand public transit where possible
- Improve roads but limit capacity expansions.
- Move freight more efficiently
- Better manage incidents and apply new transportation technologies
- Support walking and bicycling

In developing Plan 2035, the NJTPA sought to explore new strategies and projects to implement these principles in keeping with changing conditions and the new unprecedented challenges facing the region. In doing so, it drew upon insights from extensive outreach to the region's citizens, elected officials, the business community and others, conducted as part of a wide ranging "visioning" process. The process (described in Chapter 2) gathered views from nearly a thousand individuals in every corner of the region and called on experts from around the state and nation to lead discussions on key issues. The NJTPA also engaged in extensive technical analysis, with a continuing focus on how well the transportation system performs and how potential transportation investments can improve that performance. Evaluation of specific improvement strategies throughout the region (discussed in Chapter 4) was one such performance-based study, as was a future scenarios analysis which forecasted trends and conditions using computer modeling (summarized in Chapter 5). Throughout the development of Plan 2035, an active and committed Board of Trustees composed of local elected officials and representatives of state agencies directed the process.

Plan 2035 thus represents the result of efforts to systematically sort through, assess and prioritize a host of options relating to the future of transportation in the region. The policies, projects and recommendations it presents are the necessary steps anticipated to safeguard the region's future.

Transportation Challenges

Over the next 25 years, the region's transportation system will have to serve a population that is estimated to


Map 1-1
Roadways
LEGEND
Interstate/ Toll Roads
US Highways
State Highways
County/ Local Roads
County Boundaries
SUSSEX
PASSAIC
BERGEN
MORRIS
WARREN
ESSEX
HUDSON
UNION
See Detail Area
HUNTERDON
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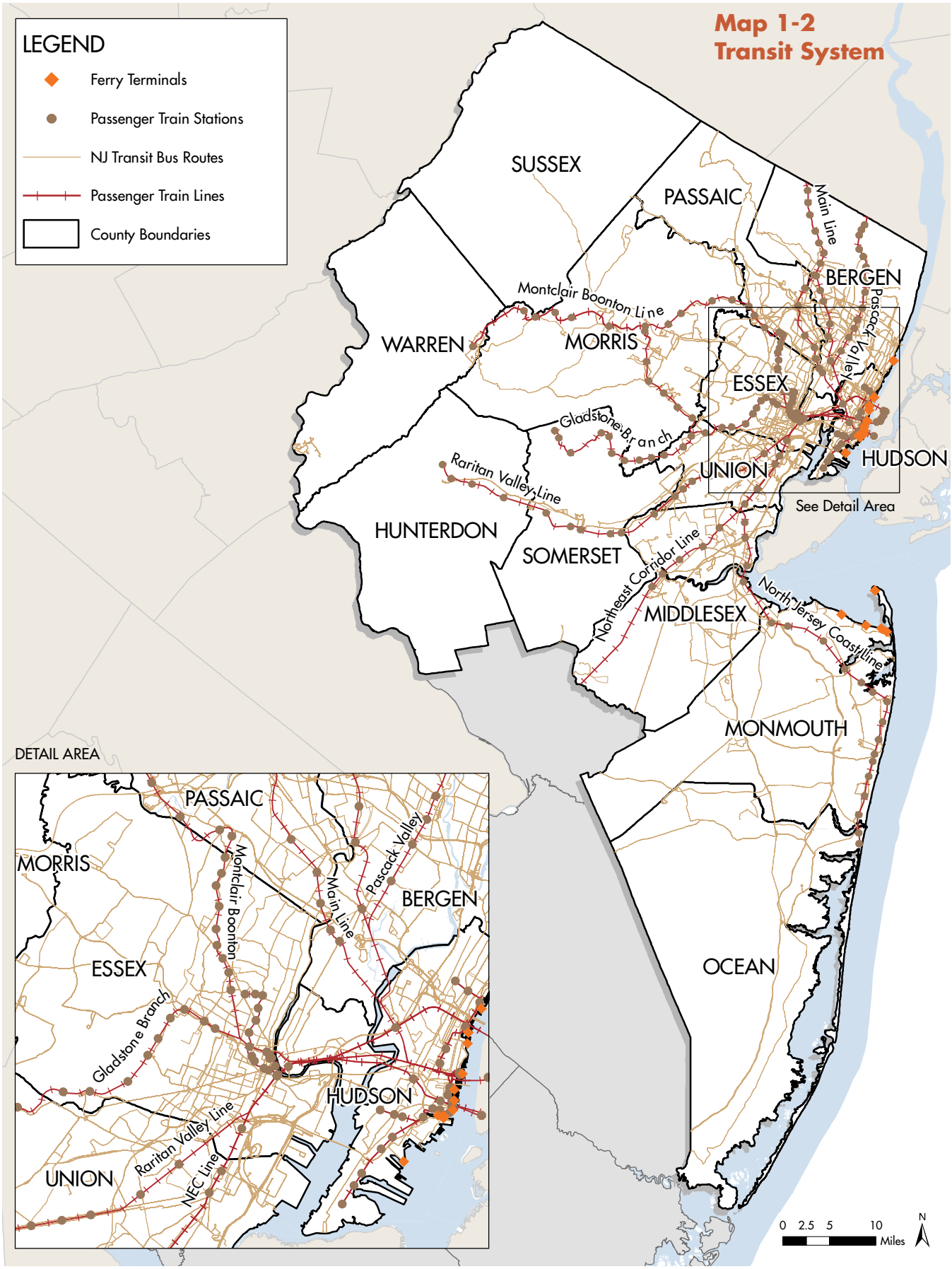

Map 1-2
Transit System
LEGEND
Ferry Terminals
Passenger Train Stations
NJ Transit Bus Routes
Passenger Train Lines
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
Montclair Boonton Line
Main Line
Pascack Valley
Gladstone Branch
Raritan Valley Line
Northeast Corridor Line
North Jersey Coast Line
See Detail Area
DETAIL AREA
NEC Line
0 2.5 5 10
Miles
N

grow by 16 percent (1.1 million) to 7.8 million. Employment will increase by 17 percent (515,000) to a total of about 3.7 million. At the same time, the transportation system must continue to support the region's diverse economy. While the economy may grow along a somewhat lower trajectory as a result of the lasting effects of the current downturn, over the next 25 years New Jersey can expect to maintain its position among the nation's largest state economies. Despite its small size, New Jersey ranked eighth in Gross State Domestic Product in 2007. Most of the state's industry and employment is located in the 13 counties of the NJTPA region.

Plan 2035 seeks to address key congestion hotspots and to make the region's road system handle traffic more efficiently. Route 3, Passaic County.

The next two decades are sure to bring shifts in the nature of employment in the region. In the near term, this will include less reliance on the finance, insurance and real estate (FIRE) sector. Over the long term, there will be new opportunities. In addition to jobs supporting new technologies and "green" industries, experts suggest that higher global transport costs could spur new manufacturing operations closer to population centers. Whatever form these shifts take, demands on the transportation system can only be expected to grow and do so in familiar patterns. That is:

- The region's port, air cargo and distribution facilities will continue to require large scale movement of freight via roads, rails and waterways;
- The region's corporate, commercial and industrial facilities located in major cities like Newark and Jersey City, and along major roadway corridors, will continue to require movement of millions of people each day, mostly by car in the suburbs but increasingly by transit in many denser locations;
- The region's participation in the larger metropolitan economy will require substantial commuting across the Hudson River to and from New York City, nearly all by transit; and
- Non-work travel by residents and visitors as well as trips by those traveling through the state will add further burdens to nearly every transportation facility.

The NJTPA and other transportation agencies must prepare to meet these rising demands to avoid exacerbating today's problems, including congested roadways, safety hazards for drivers and pedestrians, delays affecting goods deliveries, lack of access to rail and bus services, accelerating deterioration of the region's aging infrastructure and the ongoing effects on the system of sprawl development. Effectively responding to these challenges in large part will depend on the availability of transportation funding. But funding trends will likely follow the lower trajectory of economic growth itself. In addition, funding mechanisms now relied upon may no longer be adequate in the future. In particular, with an increasingly efficient auto fleet, the gasoline tax likely will yield declining revenues if kept in its current form and at current rates.

Scenario Planning

In building Plan 2035, the NJTPA conducted modeling to assess the performance impacts of various levels of funding and investments in three future scenarios (Chapter 5):

- A Baseline Scenario that continues current trends and carries forward current funding levels;
- A Plan 2035 Scenario that includes funding increases and changes to regional land use to emphasize smart growth; and
- An Aspirational Scenario with substantial funding increases and more extensive land use changes.

The Plan 2035 Scenario, which has been adopted as the required, fiscally constrained investment plan for the region, will be sufficient to maintain and moderately improve the "state of good repair" of the existing transportation system and achieve improvements in performance needed to safeguard future economic growth. Yet even this scenario will require significant additional revenue from current or new funding sources. It calls for increasing state funding during the plan period by an average of 4.2 percent per year (1.2 percent above the assumed inflation of 3 percent per year). Together with assumed periodic increases in federal funding that average 5 percent per year (2 percent above the rate of inflation), total funding to the region would increase from the current $2.6 billion per year to over $7 billion per year by 2035. This will yield $141 billion in inflation-adjusted dollars over the life of the plan, compared to $92 billion in the Baseline Scenario. In 2009 dollars, these funding assumptions translate into $91 billion for the Plan 2035 Scenario, compared to $63 billion for the Baseline Scenario.

Plan 2035 discusses options for achieving this funding level (Chapter 8)—extending the gas tax, instituting a mileage tax, using congestion pricing approaches, tolling more, and others. Generating this revenue will be neither simple nor easy—while participants in Plan 2035 visioning workshops recognized the need for added funding to support their chosen investments, they showed little agreement on the options.

Ultimately, the hard choices about how to fund the region's long-term needs will be the responsibility of elected officials at the state and federal levels. Plan 2035 assumes that, as was done repeatedly in the past, national and state leadership will meet these responsibilities. Relying on investment at the level of the Baseline Scenario—that is, continuing current funding levels—is not a realistic option. With declining purchasing power over time due to inflation, the Baseline would result in steady erosion of the performance of the region's extensive transportation network, in effect squandering the many, many billions of dollars invested in the past in creating and maintaining the network and jeopardizing the region's economy.

The NJTPA's scenario analysis does, however, provide the region with clear alternatives for the future. If a dim economic future comes to pass, the Baseline Scenario may become the default course of action given dire financial constraints affecting all sectors of government The scenario testing helps demonstrate the likely consequences in terms of failing to meet regional needs and declining investment in the system. On the other hand, the Aspirational Scenario features a plan that can be implemented should funding levels unexpectedly improve in the future.

Plan 2035 Scenario—A Realistic Vision

The investment agenda in the Plan 2035 Scenario makes progress towards meeting the eight investment principles outlined above. Above all, maintenance, preservation and repair of the region's extensive infrastructure already in place will receive top priority—and nearly two-thirds of available funding. This includes addressing needed maintenance—particularly on the region's bridges—that accumulates each year and removing safety hazards where they exist.

To address the rising demands on the system with constrained funding, Plan 2035 emphasizes achieving greater efficiency from the existing transportation network. Application of new technologies—Intelligent Transportation Systems (ITS) measures—offer great promise in the long term. In addition, careful study to prepare for capital projects—such as clearing roadway bottlenecks, modernizing traffic signal systems, redesigning intersections, completing partial highway interchanges or creating new park and rides—can enhance the throughput of the system and speed travel. Modeling suggests that the investments and strategies under the Plan 2035 Scenario can reduce average daily vehicle delay by 5 percent, a small but significant amount given the projected increase in travel demand over coming decades.

The NJTPA's Strategy Evaluation process (described in Chapter 4) systematically examines needs in the region's varied "place types," tying land use to transportation to help identify needed projects and strategies. Beyond capital projects, new policies and incentives created in cooperation with the state and private sector can make use of latent capacity in the system, for instance, shifting goods movement to off-peak hours.

The greatest long-term gains in system efficiency will be realized by modifying land use patterns in the region in

Plan 2035 calls for expanding and enhancing the region's transit system. Hoboken Terminal, Hudson County.

keeping with smart growth goals. As discussed below, this will require a steady and accelerated shift away from the auto-oriented sprawl that has contributed to the length of trips in the region and left large numbers of residents without convenient alternatives to driving.

Even if greater system efficiency can be achieved, some additional capacity will still be needed to meet rising travel. However, participants at visioning workshops almost universally recognized that the region cannot build its way out of congestion. The cost of expanding roads is too high, the environmental impacts are too great, and adding capacity only encourages more driving over the long term. For this reason, Plan 2035 foresees very limited highway expansion.

On the other hand, Plan 2035 gives high priority to enhanced and expanded services on the transit system. Added transit service brings many benefits—removing cars from the road, relieving development pressures on open space, improving air quality, enhancing energy efficiency and reducing greenhouse gas emissions, among others. Workshop participants from every area saw the need for greater access to transit, particularly the rail network.

Completion of the $8.7 billion Mass Transit Tunnel (MTT), formerly known as the Access to the Region's Core (ARC) rail tunnel under the Hudson River (slated for 2017) will provide an extraordinary boost to regional transit. The MTT will create increased frequency of service on rail lines leading into the tunnel and better connections for many riders, helping the region achieve a projected 42 percent increase in transit trips by 2035.

In cooperation with NJ Transit, the NJTPA will fund additional enhancements to the transit network. Following the completion of the MTT, funding will be available for at least the initial operating segments of the several proposed rail expansions around the region. These will have to be carefully planned and matched with land use measures such as transit-oriented development to create adequate ridership levels to meet federal funding requirements and ensure cost-effective operations. A stable source of operating funds at the state and federal levels will also be needed.

Improvements and expansions to the bus network—which carries the majority of transit passengers—must accompany strategic rail expansions. Over the life of the plan, the region should pursue innovative Bus Rapid Transit systems operating along dedicated and semi-dedicated rights of way. As with the highway network, there will also be opportunities to improve the efficiency of the transit network through application of ITS technologies, new rail signal technology and small-scale targeted capital projects.

The region must continue to look to the non-profit and private sector to provide crucial support for the public transit network and additional alternatives to driving. In particular, Transportation Management Associations offer shuttle buses for access to the transit network as well as ridesharing and other services, many of which bridge the "last mile" between transit and employment sites. In addition, private bus carriers provide heavily used express buses and the region's ferry services provide flexible capacity and routes for commuter access to New York City.

If the region could achieve levels of funding at the level of the Aspirational Scenario, then significantly more progress could be made. This would require increasing state funding by an average of 7.9 percent annually and federal funding by nearly 7 percent annually (both well above the assumed inflation rate of 3 percent per year), yielding a total of $209 billion in inflation-adjusted dollars over the life of the Plan. With this funding, maintenance would con-

sume a smaller portion of available funds, and more resources could be devoted to expansions and improvements to the road and rail systems. Among the impacts would be a 60 percent increase in transit trips and an 8 percent reduction in current daily vehicle delay on the road network. As the hard choices about future funding are made, these impacts and opportunities must be seriously considered.

Maintaining safe, walkable communities will enhance the region's quality of life. Madison, Morris County.

Smart Growth

As noted, changing regional land use to fulfill smart growth goals holds much promise for improving transportation efficiency. The connection between land use and transportation is a central focus of Plan 2035 (Chapter 7).

In terms of transportation, smart growth means a shift away from the auto-oriented development that has held sway for at least the last 50 years throughout the region. New Jersey was one of the first states to step back from auto-oriented growth policies through the enactment of its State Development and Redevelopment Plan in the 1980s. It sought to move the state in the direction of a more sustainable approach to land use, including channeling development to areas where infrastructure to support it is already in place; creating more compact, mixed-use communities that can be served by rail and bus; and revitalizing declining urban areas.

Achieving smart growth has taken on a new urgency in light of the current trends. In recent years, investment in housing, retail and other land use development helped revitalize many communities and helped fill tax coffers, but it also fueled continued sprawl and artificially inflated real estate prices in many locations. In the future, communities will have to look to locations and forms of development—in keeping with smart growth principles—that will rein in overbuilding, be more sustainable and avoid fiscal, environmental and other impacts.

The need to address climate change and energy independence also has increased the importance of smart growth. Studies have shown that more compact development—especially if it provides options for transit use—significantly reduces greenhouse gas emissions. At the same time, it uses energy more efficiently and reduces trip distances and the need for driving. In doing so, it relieves congestion on the roadway network, creating a more efficient transportation system.

In sum, smart growth more than ever is a strategy needed to ensure the long-term health of the region. Participants in outreach meetings voiced generalized support for smart growth measures, including higher density development and a greater mix of land uses, though at the same time not wishing to see changes that would drastically alter the character of communities. Continued, measured but decisive progress towards smart growth in the region appears advisable.

The NJTPA and other transportation agencies do not have direct control over the land use decisions needed to fully realize this approach. New Jersey's home rule tradition puts most land-use power in the hands of municipalities. However, since all development depends on access via the transportation system, transportation investments can help influence development trends. Among other measures, Plan 2035 calls for giving greater priority to investments that support smart growth, providing continued strong support for mass transit, promoting walking and biking, and funding smart growth studies.

Smart growth also encompasses environmental protection. Plan 2035 seeks to preserve open space and natural resources in ways that are consistent with the economic

health of the region. This includes working with regional development agencies charged with stewardship of natural resources including the Highlands Council, the Meadowlands Commission and the Pinelands Commission, ensuring wise and balanced investments.

Climate Change

According to a report by the New Jersey Department of Environmental Protection, transportation represents the largest single source of greenhouse gas (GHG) emissions in New Jersey, accounting for more than a third of New Jersey's total emissions. New vehicle technologies and a switch to alternative fuels may reduce transportation-related greenhouse gas emissions substantially over the next 25 years. Simultaneously, efforts must be made to reduce the miles of vehicle travel. As noted above, smart growth measures offer a means to reduce both the number and length of trips and with them greenhouse gas emissions. Plan 2035 has modified its investment principles to reference its commitment to work with other agencies to fulfill the New Jersey Global Warming Response Act of 2007 and be in a position to address emerging federal direction anticipated in pending energy and transportation legislation.

Yet even with action beginning now to reduce transportation-related greenhouse gas emissions, the region faces the likelihood that global warming will impact its infrastructure over the next 25 years. Rising sea levels and more severe weather could mean that bridges, roads and other infrastructure—much of it along critical evacuation routes—suffer increased flooding and deterioration and must be modified or rebuilt. Plan 2035 looks to prepare for this eventuality through its study and investment plans.

Closely related to the challenge of climate change is the need to improve the region's energy efficiency, including reducing dependence on fossil fuels. The brief spike in gasoline prices in 2008 gave the public a glimpse of the disruptions and hardships that can result from higher oil prices if energy efficiency is not achieved.

New Jersey has established a goal of meeting 20 percent of the state's energy needs through energy efficiency and conservation gains by 2020. Plan 2035 makes a commitment to supporting that goal within the transportation sector, including through promotion of smart growth, increased transit investments and giving high priority to investments that encourage energy efficiency.

The Future

With a view to the lessons of the past and with wide input from the region's citizens and officials, Plan 2035 seeks to chart a realistic, achievable course through the current economic uncertainties toward renewed growth and progress. Private sector decision makers ultimately will determine the shape of the region's economy over the next 25 years. Yet, as has long been the case, transportation infrastructure will provide the crucial underpinning to allow the region—its businesses, citizens and communities—to pursue new opportunities.

The transportation investments and policies in Plan 2035 offer the prospect of many benefits over the next 25 years: a broad-based and sustainable economic recovery; more energy efficient development in cities, towns and suburbs; support for new technologies and practices that will help meet the challenges of climate change; new employment in green industries; protected environmental resources and many others.

One critical key to all these benefits will be the extensive and adaptable transportation system that for centuries has been one of northern New Jersey's most vital economic assets. The implementation of Plan 2035 will see that it remains so far into the future.

2

DEVELOPING PLAN 2035

This 2009 plan update continues the NJTPA's comprehensive approach to transportation planning. The extensive outreach and visioning process described below built on and broadened the scope of the NJTPA's previous long range plan adopted in 2005, recognizing the fundamental connections between transportation and the environment, economy, energy use, global climate and social equity.

In developing Plan 2035, the NJTPA looked to the public for guidance in developing a transportation planning vision for the 13-county region of northern and central New Jersey. Through a series of public workshops and forums as well as an online survey and other methods, the NJTPA gained valuable input from the public for the development of all aspects of the Plan 2035. The extensive outreach also helped shape the NJTPA's technical analysis of issues facing the region, including guiding the development of three future scenarios that underwent computer modeling.

The public helped guide development of Plan 2035 through visioning workshops held throughout the region. Visioning Workshop, Somerset County.

This chapter provides background on the development of the plan and summarizes the public outreach efforts. Further detail of the public outreach activities is provided in Appendix A.

Planning Factors, Goals & Principles

Plan 2035 was developed to fulfill federal requirements for long range transportation planning. It also was guided by goals and principles developed in the past as part of the NJTPA planning process. These are described below.

Federal Requirements

The NJTPA must follow certain federal regulations in developing the Regional Transportation Plan (RTP). The federal government requires an RTP for every metropolitan area. Plan 2035 was developed in accordance with federal requirements for regional transportation planning.

A key requirement is that year-to-year investments of federal transportation funding be guided by a long-term plan and vision approved by elected officials and state representatives in each metropolitan region. This helps ensure that investments are the result of open debate about the desired shape of the future transportation system; take into account the needs of all of the region's residents rather just the interests of particular communities; and lead to lasting solutions. The long-range plan must be updated every four years to reflect changing conditions and priorities.

In particular, this plan reflects consideration of several "planning factors" that have long been fundamental aspects of the federal surface transportation law and accompanying regulations. They are:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
- Increase the safety of the transportation system for motorized and nonmotorized users;
- Increase the security of the transportation system for motorized and nonmotorized users;
- Increase the accessibility and mobility of people and for freight;
- Protect and enhance the environment, promote energy conservation, and improve quality of life; and promote consistency between transportation improvements and State and local planning growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.

NJTPA Goals

- **Protect and improve the quality of natural ecosystems and the human environment.**
- **Provide affordable, accessible and dynamic transportation systems responsive to current and future customers.**
- **Retain and increase economic activity and competitiveness.**
- **Enhance system coordination, efficiency and intermodal connectivity.**
- **Maintain a safe and reliable transportation system in a state of good repair.**
- **Select transportation investments that support the coordination of land use with transportation systems.**

NJTPA Goals

In addition, the NJTPA has its own long-standing goals that guided development of this plan. These goals, which are fully consistent with federal requirements, are listed in the box above.

NJTPA Regional Capital Investment Strategy

The NJTPA seeks to put its broad goals to work through a Regional Capital Investment Strategy. This strategy, which informs the project selection and policy direction of Plan 2035, was initially developed for NJTPA's 2030 Regional Transportation Plan, approved in September 2005. This RCIS has been carried forward into Plan 2035 (with minor modifications regarding environmental issues as noted in Chapter 7). It is presented at the back of this plan. The core principles of the investment strategy are listed in the box on the facing page.

Coupled with the required federal planning factors and the NJTPA's regional goals, the RCIS embodies a performance-based approach to planning. The RCIS itself utilized specific performance measures, seeking particular benefits in realizing sustainable growth, increasing overall accessibility including transit accessibility, making travel safer,

maintaining existing infrastructure, slowing the growth of roadway congestion, accommodating increased freight traffic, and realizing system efficiency.

These and other performance measures are continually applied in NJTPA planning, from the assessment of regional trends (discussed in Chapter 3) to the Strategy Evaluation study, Safety Priorities study and asset management systems (described in Chapter 4) to the Scenario planning analysis (presented in Chapter 5). Moving forward from Plan 2035, the NJTPA is looking to learn more about the actual impacts of implemented projects in a new Project Performance Results study. In these and other ways, the NJTPA will continue to use performance measures to analyze and communicate about planning issues and to support collaborative decision-making.

Workshops gave residents and local officials the opportunity to share their thoughts on land use and transit investment in the region. Visioning Workshop, Middlesex County.

Public Outreach for Plan 2035

In developing Plan 2035, the NJTPA worked with a wide range of citizens, elected officials, interest groups, government agencies and other stakeholders, as well as nationally recognized experts on key issues related to transportation planning. Outreach came in many forms, including symposiums, roundtables, hands-on local visioning workshops, a webpage and an online survey. In all, nearly a thousand people voiced their opinions about how to improve transportation in the region and address the challenges of an uncertain future. As part of the efforts, the NJTPA used a hands-on computer exercise and other tools to achieve an extensive level of participation.

Providing direction throughout was the NJTPA Board of Trustees, which held three special sessions on development of the plan and discussed key planning initiatives at its regular meetings. Also providing assistance was a Technical Advisory Committee which met throughout the

Regional Capital Investment Strategy

- **Help the Region Grow Wisely**: Transportation investments should encourage economic growth while protecting the environment and minimizing sprawl in accordance with the state's Smart Growth Plan, Energy Master Plan, and Greenhouse Gas Plan.
- **Make Travel Safer**: Improving safety and security should be explicitly incorporated in the planning, design and implementation of all investments.
- **Fix it First**: The existing transportation system requires large expenditures for maintenance, preservation and repair, and its stewardship should be the region's highest priority.
- **Expand Public Transit**: Investment to improve the region's extensive transit network should be a high priority, including strategic expansions to serve new markets.
- **Improve Roads but Add Few**: Road investments should focus on making the existing system work better, and road expansion should be very limited.
- **Move Freight More Efficiently**: Investments should be made to improve the efficiency of goods movement because of its importance to the region's economy and quality of life.
- **Manage Incidents and Apply Transportation Technology**: Investments should be made to improve information flow, operational coordination and other technological advances that can make the transportation system work smarter and more efficiently.
- **Support Walking and Bicycling**: All transportation projects should promote walking and bicycling wherever possible.

course of Plan development, focusing on modeling issues. In the end, all these efforts kept one over-riding goal in mind—to develop a plan that reflected a sustainable, achievable vision for the NJTPA region. The key public outreach activities are highlighted below.

Symposiums and Roundtables

The NJTPA called on experts from the region and around the nation to offer insights and direction for the development of Plan 2035 on many of the broad trends and issues facing the region—energy prices, the economy, climate change, affordable housing, and others. They engaged in spirited discussions and interacted with interested citizens and officials at a kick-off symposium in June 2008, three roundtables held between June and December 2008 and a final symposium in June 2009.

Symposium on the Future of Transportation - On June 26, 2008, a group of six experts with backgrounds in economics, transportation policy, climate change and regional development gathered at the NJTPA to discuss the critical issues and global forces that will affect the region for the next 25 years. More than 100 people attended the session, which was led by Dean James W. Hughes of the Edward J. Bloustein School of Planning and Public Policy at Rutgers University. Key themes of the symposium included the following:

- The rapid pace of technological change will create future economic opportunities.
- The region and state will face increasingly stiff economic competition from other states and nations.
- A comprehensive, multimodal transportation system is critical for the state and region to remain competitive.
- Rising transportation costs will make distance matter more in locating agricultural, manufacturing and other operations.
- New sources of funding for transportation are needed, as traditional sources are becoming scarcer.
- There will be an increasing need to forge stronger links between transportation, land use, and environmental policies in order to address the scarcity of resources and climate change.

Freight Roundtable (October 7, 2008)—The first of three roundtables, this session featured two parts—a morning panel of experts and a joint afternoon session with the NJTPA's Freight Initiatives Committee. The purpose was to learn more about the needs, challenges and opportunities connected to freight movement in the region. Former New Jersey Transportation Commissioner Jack Lettiere led the first session, which featured 16 other regionally recognized freight experts. At both sessions, participants noted the region's strengths in terms of freight movement which include its geographic location in a densely populated, wealthy consumer market and its extensive road, rail, port and air cargo facilities. Among the challenges to the goods movement system discussed were:

Symposiums at the NJTPA offices focused on key national and global issues affecting transportation in the region. Finance Symposium, June 2009, Newark.

- Extensive infrastructure maintenance needs especially on heavily traveled truck routes.
- Insufficient clearance under the Bayonne Bridge which hampers access by the largest ships to the port.
- Lack of truck rest areas, forcing truck drivers to park in unauthorized locations.
- Limited roadway access to the port.
- Rail lines that cannot accommodate heavier rail cars.
- Conflicts between passenger and freight needs on rail lines.

Climate Change Roundtable (November 17, 2008)— The second roundtable examined how the NJTPA could address the challenge of climate change in Plan 2035

and in its ongoing activities. The workshop looked at strategies for mitigation (reducing transportation-related greenhouse gas emissions that contribute to climate change)—and adaptation (changing infrastructure to deal with the effects of climate change). George Eads, Vice President of Charles River Associates and a member of the Transportation Research Board's Committee on Climate Change and Transportation, was the featured speaker. He was joined by 10 panelists representing the federal government, transportation agencies, tri-state area metropolitan planning organizations, universities and non-profit advocacy groups. Themes that emerged from this roundtable included:

Roundtable discussions focused on how Plan 2035 could best address critical emerging issues. Transportation 2035 symposium, June 2008, Newark.

- Many communities and businesses have started adopting policies to address climate change and more are poised to do so.
- Better estimates are needed of potential climate change impacts, especially on coastal communities.
- Promoting transit use and smart growth are important strategies for reducing greenhouse gas emissions.
- The NJTPA and other agencies must begin identifying infrastructure that is most vulnerable to climate change impacts and creating plans to address this.

Socioeconomic, Housing and Transportation Roundtable (December 8, 2008)—The nexus of housing, jobs and access creates some of the most challenging issues that Plan 2035 must address. This roundtable considered how the NJTPA can best address issues of access to jobs, affordable housing and environmental justice. The featured speaker was Professor Myron Orfield, Executive Director of the Institute on Race & Poverty, University of Minnesota. He was joined by a panel of 12 experts including representatives of transit agencies, non-profit advocacy groups, state government and universities. Among the topics discussed:

- Tax-sharing arrangements and reduced dependence on property taxes to fund education.
- Attracting investment to centers and downtowns.
- Promoting workforce housing development throughout the region.
- Overcoming public resistance to density and transit-oriented development.

Symposium on Financing Our Transportation System: Options and Actions—On June 25, 2009, this symposium was held to discuss the great challenges facing the nation and state related to transportation financing. A panel of experts addressed the immediate funding crisis and options for meeting longer term investment needs. Moderated by Martin E. Robins, Senior Fellow at the Rutgers University Voorhees Transportation Center, the session's keynote speaker was Richard T. Hammer, New Jersey Department of Transportation (NJDOT) Assistant Commissioner for Capital Program Management. They were joined by four experts on state and national transportation policy. Among the key insights from the symposium:

- New Jersey is confronting a backlog of expensive infrastructure needs, including several major high cost bridges and the need to reconstruct major highway roadbeds.
- Initiatives to address climate change at the national level, such as the proposed cap and trade system, may offer opportunities for funding transit and transportation investments beneficial to the environment.
- A major transportation policy goal is to move away from our dependence on petroleum. Transportation industry in the US is 97 percent dependent on petroleum.
- Public education and outreach has been shown in cities around the world as an essential ingredient in success-

PLAN 2035 REGIONAL WORKSHOPS

Hunterdon County
Oct. 22, 2008—Freeholder
Matthew Holt

City of Newark
Oct. 23, 2008—*Deputy Mayor*
Stefan Pryor

Bergen County
Oct. 27, 2008—County
Executive Dennis McNerney

Monmouth County
Oct. 27, 2008—
Freeholder
William C. Barham

Jersey City
Oct. 28, 2008—Mayor
Jerramiah T. Healy

Warren County
Oct. 29, 2008—
Freeholder
John DiMaio

Ocean County
Oct. 30, 2008—David
McKeon, Director, Ocean
County Dept. of Planning

Union County
Nov. 5, 2008—Freeholder
Daniel P. Sullivan

PLAN 2035 REGIONAL WORKSHOPS

Somerset County
Sept. 20, 2008—Freeholder Peter S. Palmer

Hudson County
Sept. 23, 2008—County Executive Thomas DeGise

Middlesex County
Sept.23, 2008—George Ververides, Middlesex County Planning Director

Sussex County
Oct. 2, 2008—At left, NJTPA Chairman Susan M. Zellman, Sussex County Freeholder

Essex County
Oct. 14, 2008—David Antonio, Transportation Planner, Essex County

Morris County
Oct. 16, 2008—Freeholder Gene F. Feyl

Passaic County
Oct. 20, 2008—Freeholder Pasquale "Pat" Lepore

fully implementing innovative financing measures like congestion pricing and High Occupancy Toll lanes.

- The bi-partisan effort in 1984 that spearheaded the creation of the New Jersey Transportation Trust Fund can serve as a model for addressing today's transportation financing crisis.

Visioning Workshops

In many ways, the visioning workshops formed the core of the NJTPA's outreach efforts. NJTPA Central Staff and consultants worked closely with the Trustees and their staffs to arrange the workshops. Each subregion was given a great deal of flexibility in the scheduling of the workshops and their format. Attendance generally ranged from 10 to 50 people, with more than 350 people attending the sessions in total.

Workshop participants used an interactive "visioning tool" that helped illustrate the potential effects of land-use and transportation decisions in the region through 2035. Participants made choices about land use and transportation investment, and the tool revealed the combined impact of these choices on travel time, settled land, access to transit, air quality and other key transportation, environmental and quality of life factors. The tool also included information on the cost of transportation improvements and potential funding sources.

At each workshop, the tool served to spur lively and extensive discussion on transportation and land use in the region. The main themes that emerged from the visioning exercise and discussion at the workshops included:

- Near universal agreement on the need to invest heavily in infrastructure maintenance and preservation. Few thought investing in road capacity expansion made sense. Most took the view that the region should fix the system it has and make it work better.
- A strong desire for greater investment in transit improvements. A viable transit system was seen as a critical element in maintaining economic vitality.
- Support for well-planned park and ride facilities to support transit use and intercept drivers at key locations as well as bicycle and pedestrian improvements, and telecommuting incentives.
- Agreement by many on the need for a greater mix of land uses, clustering of development, and promotion of development oriented toward mass transit. But in some areas, higher density was seen as a threat to the current character of towns and counties.
- Recognition that state mandates and regulations, including those on affordable housing and development in the Highlands, present challenges to towns and counties in planning for their future.
- Desire by many for greater use of rail and barges for freight movement rather than trucks, and clustering of port-related activity (particularly warehousing) around the port rather than in the region's outer fringe.
- General agreement that funding needs to be increased, but little agreement on the best ways to achieve that.
- Recognition that the lack of coordination on land use issues among all levels of government contributes to sprawl.

Internet, Information and Outreach

As part of outreach for the plan, the NJTPA established an interactive website featuring plan information, an online forum for submitting comments and feedback and an online version of the regional visioning tool used at the workshops. The website also provided extensive audio and video files of presentations and discussions at the symposiums and three roundtables.

A very successful internet feature was an online survey that garnered over 350 responses. It offered another avenue for input to the development of Plan 2035. It was promoted at the visioning workshops and other events and through the NJTPA website and postcards. The survey was intended to provide insight into broad issues:

- What direction is the region headed in the next 25 years?

An interactive visioning tool illustrated links between land use and transportation. Visioning Workshop, Essex County.

- Is it the right direction?
- What are the driving forces that are shaping and will shape the region in the coming decades?
- What are the public's priorities for the region's transportation system?

The survey featured 10 main questions dealing with these issues and several optional questions about the background of survey respondents. A Spanish language version of the survey was available, as was a toll-free number for those who wanted to comment without accessing the internet.

Key results of the survey included:

- For all trip purposes, single-occupancy auto is the most common mode.
- Thirty percent of respondents expressed a desire to travel more by train.
- Asked about changes in behavior due to high gas prices, respondents said they had engaged in "trip chaining," driving less and doing more online shopping.
- Asked what actions they might take if gas reached $6 per gallon, respondents said they would buy more fuel-efficient vehicles, cut back on long distance travel and carpool.
- The least viable options for those considering $6 per gallon gas were moving, finding a new job and commuting at non-peak hours.
- The three most significant transportation challenges people see facing the region are lack of choices in public transportation and destinations served (23 percent), increasing traffic congestion and delays (17 percent), and aging and deteriorating infrastructure (16 percent).
- Challenges that go beyond transportation included rising energy costs, increasing cost of living and suburban sprawl.
- Strategies recommended included expanding the public transit system, encouraging development around transit stations, and encouraging flex-time and telecommuting.
- There was little support for new roads or new lanes on existing roads.
- The most acceptable methods for increasing transportation funding were more federal money, public-private partnerships, increasing existing tolls, and increasing the gas tax.
- The least support was given to adding tolls to roads that are now free, providing access to high-occupancy vehicle lanes for a fee and increasing transit fares.
- Recognition and agreement that an outreach campaign to educate the public on infrastructure needs and financing, and dedicating sources of revenues for transportation investments should be undertaken by the NJTPA as part of its public outreach activities.

Using Public Input

A few of the major themes that emerged during the various phases of outreach discussed above were the following:

- Maintaining and upgrading the existing, extensive road and rail network is essential.
- Major highway expansions are no longer a realistic option, though the roadway network remains vital.
- Investing in expanded mass transit and new technologies will make the transportation network work more efficient.
- Pursuing denser development in keeping with smart growth principles can bring benefits, but must fit with community needs and desires.
- Measures to protect the environment and address climate change are needed.

These themes, together with other input from visioning workshops, roundtables and other outreach efforts, were considered and addressed by the NJTPA in creating Plan 2035. In addition, the input helped shape the three future scenarios that underwent computer modeling to show the impacts of alternative funding levels and policies on transportation system performance. The scenarios use updated population and employment projections that were reviewed by the 15 NJTPA subregions.

As described in Chapter 5 (Scenarios), the travel demand model allows for gauging the effects of similar choices under different investment and land use scenarios. In addition to public input, the scenario testing incorporated data and insights from management systems and studies of regional needs and strategies, as discussed in Chapter 4.

As noted in the introduction, among the three scenarios modeled, a "Plan 2035 Scenario" was developed and tested to capture a realistic set of choices that will guide the region's future transportation investments. It forms the basis for the analysis, plans and recommendations discussed in the chapters that follow.

3

CONTEXT & TRENDS

As a guide to long-term transportation investments, Plan 2035 must meet the needs of a dynamic region, one that will change dramatically over the next 25 years. To do so, Plan 2035 considers the impact on the transportation system of a host of complex factors, including economic and demographic trends, changes in lifestyle and travel choices, as well as concerns about climate change and energy efficiency. But more than just reacting to future change, Plan 2035 recognizes that investments, if carefully chosen, can help shape and direct change, creating a balanced transportation system that supports economic and social progress while protecting natural resources and the environment.

This chapter summarizes the trends and issues considered in developing Plan 2035 and their impacts on the transportation system. Other parts of the plan discuss many of these topics in greater detail, with reference to specific investments and strategies. Appendix B provides details on the forecasts of population, employment and households used in the development of this plan.

A growing regional population will mean more and more travel through 2035. Metropark, Iselin, Middlesex County.

Population

The NJTPA region's transportation system serves a growing population. From 2000 to 2008, the 13-county region grew by over 160,000 people to 6.5 million, a 2.6 percent increase. The population increase in recent years has occurred most rapidly in suburban and outlying counties, notably Ocean (11.4 percent), Somerset (9.1 percent), Warren (7.3 percent) and Hunterdon (5.8 percent) counties. Cities and older suburbs in and around the northeast urban core remained relatively stable in population, showing both slight increases and slight declines.

Continued population growth is predicted over the life of this plan (Map 3-1). Plan 2035 foresees population in the region growing to approximately 7.8 million in 2035, a net increase from 2009 of 1.1 million people or roughly 16 percent. This will increase travel activity in every corner of the region—the NJTPA's Regional Household Travel Survey estimated that each person generates about 3.3 trips per day. Yet some areas will see more of these trips than others. Recent trends suggest that future population growth will be most rapid in lower-density, outlying counties, where sprawl patterns of development will continue to add to the number and length of auto trips. However, land use policies can affect the course of future growth. For example, the Highlands Act of 2004, discussed in greater detail in Chapter 7, has dampened the potential for growth in a large section of northwest New Jersey.

Plan 2035 seeks to encourage growth in existing population centers where infrastructure is available, in keeping with the state's emphasis on smart growth and the need to protect natural resources. This will lessen, but not eliminate, the high growth trends in the outlying counties in the region. According to computer modeling of the realistic Plan 2035 Scenario conducted for this plan, the average commuting distance will increase by only .4 miles (from 10.1 to 10.5 miles) despite the continued growth in the region. Of course, continued population and employment growth will strain existing infrastructure, requiring Plan 2035 to include a significant investment in maintenance, refurbishment, and replacement. Chapter 7 further discusses the implications of future growth patterns in the region.

Other demographic trends will also affect the transportation system. New Jersey is a state with a significant number of foreign-born residents. According to the National Center on Immigrant Integration Policy, New Jersey is ranked 6th in the nation in the size of its foreign-born population, which grew by 17.3 percent between 2000 and 2007. This pattern of immigration will continue, in particular sustaining population growth in existing urbanized areas.

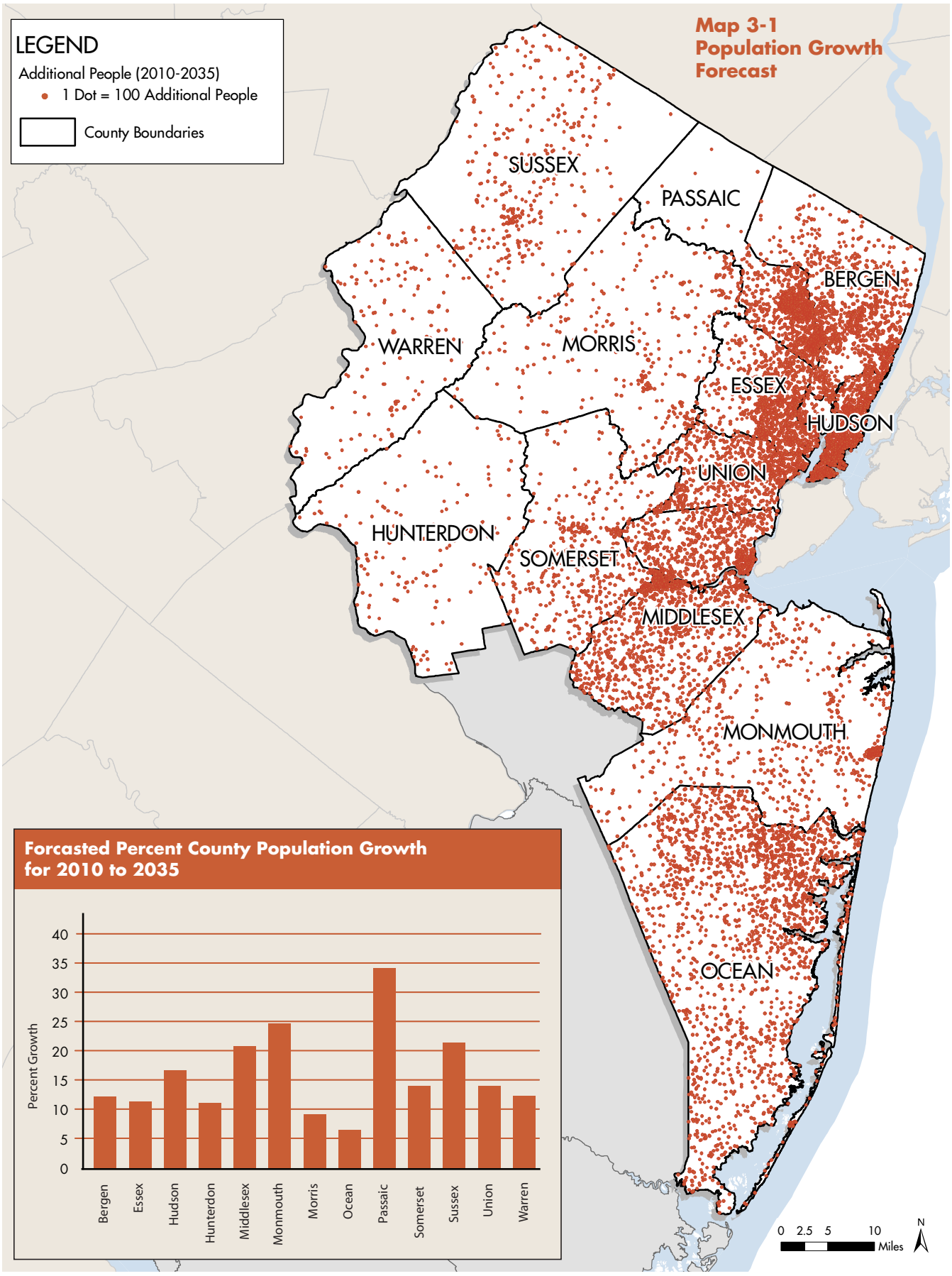
Many newcomers to the region are economically disadvantaged and depend on transit for daily travel needs, as do the elderly and disabled populations that are unable to drive a car. Many live in urban centers, and when jobs and services move into the auto-dependent suburbs, they are left with fewer options for employment, education, and medical services. The Job Access and Reverse Commute (JARC) and New Freedom programs provide transportation options for these populations throughout the state, and are discussed in greater detail in Chapter 6.

Additionally, low-income and minority populations historically have borne the burden of noise, pollution and other negative impacts of infrastructure investments, without necessarily benefiting from them. Highways have split neighborhoods, blocked access to waterfronts, and created harmful levels of emissions in some residential neighborhoods. Plan 2035 continues to weigh environmental justice issues when prioritizing infrastructure investment in order to prevent increased burdens on low-income communities.

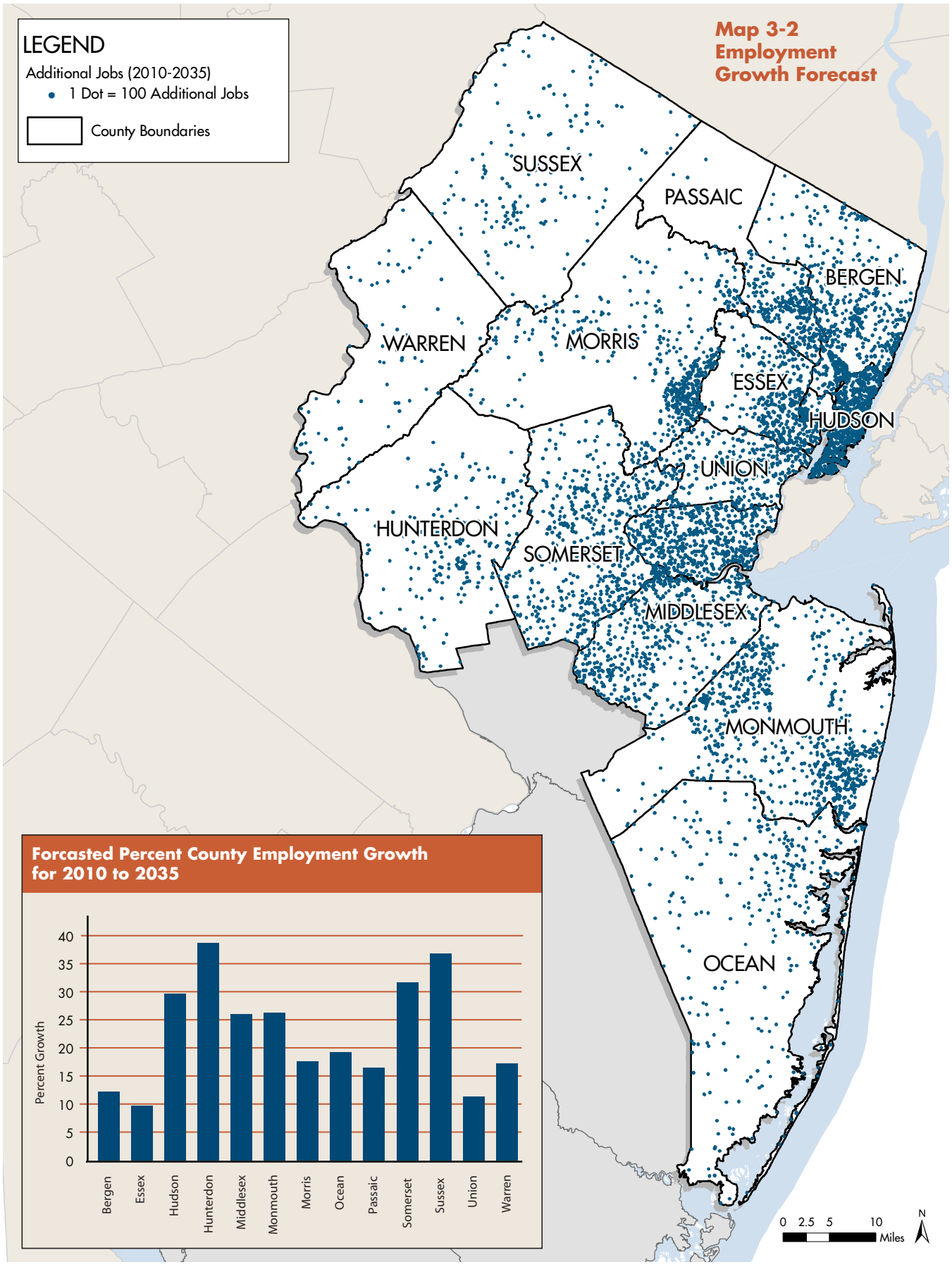
Another important trend is the aging of the population. In 2000, 13 percent of the state's population was 65 or older. By 2035, it will be 20 percent or more. The shift to an older population has substantial implications for transportation planning. In the future, the elderly will drive more, which suggests the need for measures to accommodate older drivers, such as making roads easier to navigate through modified design and signage. For those who cannot or choose not to drive, providing attractive travel alternatives will be necessary. In addition to continuing to make public transit more available and accessible, new residential developments for seniors should offer the possibility of a pedestrian lifestyle.

Due to the aging of the population and lifestyle choices, household size is projected to continue to decrease, resulting in a 21 percent increase in the number of households by 2035. Smaller, more numerous households tend to generate an increase in trips on the transportation system. Other impacts of the aging populations are unknown, such as how many people will remain in the workforce, and the potential effects of more travel specifically for healthcare and recreation. Implementation of the Coordinated Human Services Transportation Plan, discussed in Chapter 6, will help address transportation needs related to the aging population.

Map 3-1
Population Growth Forecast



Forcasted Percent County Population Growth for 2010 to 2035


LEGEND
Additional Jobs (2010-2035)
1 Dot = 100 Additional Jobs
County Boundaries
Map 3-2
Employment
Growth Forecast
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
Forcasted Percent County Employment Growth
for 2010 to 2035
Percent Growth
0
5
10
15
20
25
30
35
40
Bergen
Essex
Hudson
Hunterdon
Middlesex
Monmouth
Morris
Ocean
Passaic
Somerset
Sussex
Union
Warren
0 2.5 5 10
Miles
N

Economy

The current recession is putting a damper on virtually all types of economically vital travel, but economic growth is predicted to resume to some extent in the next few years. In the 25-year horizon of this plan, additional economic cycles of growth and decline are certain to occur. This means Plan 2035 must prepare for continued demands on all aspects of the transportation infrastructure over the long term.

The region's many office parks and corporate campuses generate a great deal of travel. Bedminster, Somerset County.

Since 1990, employment in the region increased by 15 percent from 2.6 million jobs to 3.0 million jobs in 2007. Most of this increase occurred in the 1990s, with overall regional employment from 2000 to 2007 remaining relatively stable. However, some counties realized substantial employment increases: Monmouth, Middlesex and Ocean counties each added more than 10,000 net new jobs during the period.

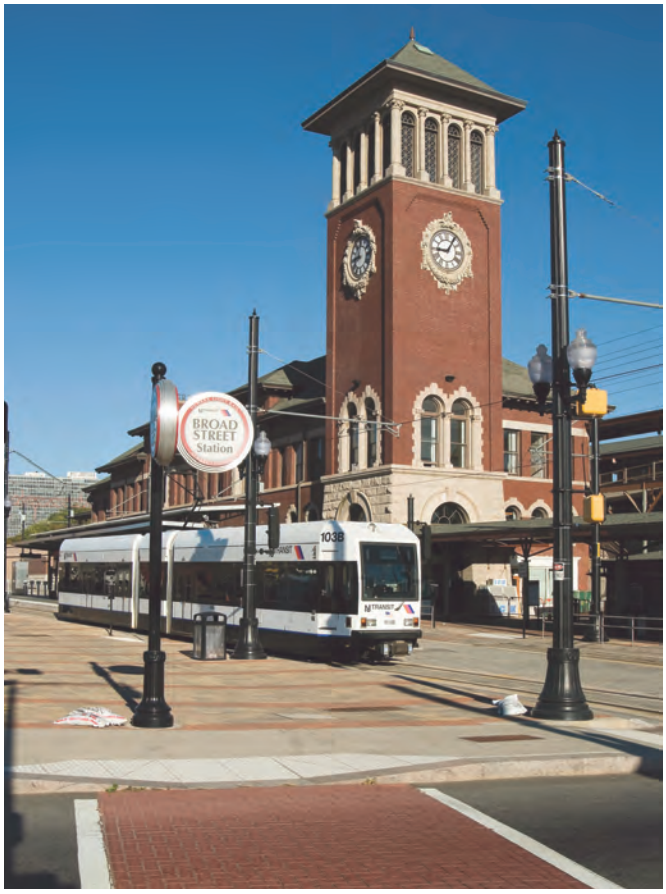
The recession, commencing in January 2008, led to significant employment losses. The New Jersey unemployment rate almost doubled from 4.2 percent prior to the recession to 8.2 percent in April 2009. These job losses will offset any gains since 2000, creating a net employment loss for the decade of the 2000's.

Gauging the timing and dimensions of the recovery and future growth in demand is difficult. The near term economic outlook remains extremely uncertain. The Congressional Budget Office, in its January 2009 testimony to Congress, foresaw "a marked contraction in the U.S. economy in calendar year 2009, with real (inflation-adjusted) gross domestic product (GDP) falling by 2.2 percent [and] a slow recovery in 2010, with real GDP growing by only 1.5 percent." However, it also voiced uncertainty about the "degree and persistence of turmoil in financial markets and the resulting impact on the future course of the economy," given the unprecedented aspects of the current crisis. For the longer term, the Budget Office estimates that the nation will not reach its full potential output in terms of GDP until early 2015, and after that will grow at the rate of 2.3 percent through 2019. This is slightly below the 2.6 growth rate of 2004 to 2007.

For purposes of preparing this plan, the NJTPA assumed that the current recession will have lasting effects in terms of lowering the trajectory of average growth over the life of the plan. This will have consequences, most notably in somewhat constraining the long-term growth in travel demand as compared to projections in the previous 2005 plan and creating the fiscal challenges discussed later in this plan. Nevertheless, in total, Plan 2035 projects that employment in the region will increase from 2009 levels by approximately 17 percent (or about 515,000 jobs) in the next 25 years to a total of about 3.7 million for the region. (Map 3-2)

The economic downturn will also have lasting effects on the nature of employment in the region. While the downturn has affected all sectors of employment, it has particularly impacted the many northern New Jersey residents employed in professional and business services, manufacturing, construction and financial sectors (as defined by the U.S. Census). The financial sector alone accounted for 7 percent of the region's employment, with concentrations in Hudson (19 percent), Morris (14 percent), Bergen (13 percent), Essex (13 percent) and Middlesex (12 percent) counties.

With the recovery in the near- to mid-term, it is expected that jobs lost in these key sectors will rebound to some extent, but this gain will not fully offset losses. In the long term, the region will likely resume significant growth but also undergo a shift in the nature of employment in its economy. The region—together with the larger New York-



Light rail provides an alternative mode of transportation in urban areas. Broad Street Station, Newark.

New Jersey-Connecticut metropolitan region—is fortunate to have a diversified economy, a highly educated workforce, world-class research institutions, one of the nation's largest ports and distribution networks, among other economically critical assets.

These assets will likely provide a significant advantage in the competition among regions, nationally and globally, to realize future employment growth. This growth may take the form of the widely touted "green jobs"—such as developing more efficient energy technologies and retrofitting the nation's built environment to make use of them. But it may also involve other sectors and industries yet to be developed. Future sources of employment could very well involve new genetic based therapies, renewable energy, nanotechnologies or artificial intelligence systems.

Speakers at NJTPA's Plan 2035 Symposium on the Future of Transportation (see Chapter 2), raised the possibility that manufacturing of consumer goods could be bolstered in the region, after many decades of steep decline. The likelihood of significantly higher oil prices over the long term, on the order of that seen during the price spike of 2008, the experts said, could make transporting goods over long distances prohibitively expensive and favor manufacturing close to the massive consumer market in New Jersey and neighboring states. Northern New Jersey is poised to take advantage of this potential trend with its current manufacturing capacity, distribution facilities and industrial land available for redevelopment, among other assets.

One of the central themes of Plan 2035 is that investments in transportation infrastructure are vital to fully realizing these and other economic potentials. But optimizing the impact of these investments will require more than the reasonably anticipated future funding envisioned in the "Plan 2035 Scenario" discussed in Chapter 5 that forms the basis of this plan. That funding will be sufficient to maintain current system performance through a focus on maintenance with limited enhancements. Higher levels of funding, at the level of the Aspirational Scenario, would enable the region to better address current transportation problems and increase the efficiencies in movement of goods and people to support future economic growth. Citizens and officials who participated in Plan 2035 visioning workshops around the region were nearly unanimous in recognizing the importance of transportation funding and investment to the economic future of the region.

Transportation Trends

Regional demographics and economic growth, as discussed above, are the key factors that influence how and where travel occurs in northern New Jersey. The expected changes in these factors will create a variety of new and difficult challenges for the efficient operation of the regional transportation system.

The following sections provide an overview of the key transportation trends that the region expects to confront in the next 25 years. It provides a context for discussions later in this plan of how the region will invest in projects and programs to help accommodate, manage and shape transportation trends and future travel demand.

Increased Travel Demand

The volume of travel in northern New Jersey—by every single mode—will increase over the next 25 years, stressing every aspect of the transportation system.

Most of the increase will occur on the roadway system. According to 2007 Census estimates, 70 percent of commuters in the NJTPA region travel alone to work by car,

with another 9 percent traveling with at least one other passenger. Nationally, vehicle miles traveled (VMT) will grow by 60 percent by 2030. By 2035, VMT in the region is projected to increase by 16 percent over 2009 levels—along with a .4-mile increase in the average trip.

While this is a substantial increase, it represents a lower level than previously projected for the region in the 2030 Regional Transportation Plan. Past modeling had projected an increase of 1 percent per year in regional VMT; Plan 2035 projects a .7 percent increase per year, both due to lower population and employment projections and the impacts of land use measures assumed in the Plan 2035 Scenario underpinning this plan .

Based on these projections of VMT, congestion is projected to increase over the next 20 years. By 2035, under the Plan 2035 Scenario, the average delay per trip experienced by commuters will increase to 7.5 minutes from 5 minutes in 2009.

Transit ridership—on buses, rail lines and ferries—will also grow. According to US Census data from 2007, 12 percent of northern New Jersey commuters use transit to get to work, but some locations had substantially higher transit shares: Newark, 21 percent; Jersey City, 45 percent; and Hudson County, 38 percent.

More people have opted to use transit in recent years, with ridership growing 46 percent from 1990 to 2007. Over the last five years, NJ Transit rail ridership increased 23 percent, while bus ridership increased 10 percent during that time. Rising fuel prices, new services, stable fares and high employment levels all pushed transit ridership to record levels beginning in the last quarter of calendar year 2007. Records were achieved in average weekday passenger trips as well as weekend trips. This growth ended by late 2008 as fuel prices dropped, and the regional economy declined. NJ Transit ridership in January and February 2009 was down by about 3.5 percent from a year earlier. Regarding ferries, after a sharp ridership increase after 2001, ridership dropped to pre-2001 levels in 2004 and stabilized. The first few months of 2009 saw a significant decline due to the recession.

Over the long term, Plan 2035 foresees a strong rebound in transit ridership. Under the Plan 2035 Scenario, transit trips are projected to grow by 42 percent, largely as a result of improved transit services resulting from the completion of the Mass Transit Tunnel under the Hudson River. It is anticipated that a 60 percent increase in transit trips could be achieved with the increased funding levels under the Aspirational Scenario.

Increasing the share of walking or biking trips in the region is another priority of the NJTPA. On a regional basis, while only 4 percent of work trips are made on foot or by bicycle, 10 percent of non-work trips are made without motorized travel. This varies widely around the region: From a high of 9 percent of work trips and 31 percent of non-work trips in Hudson County, to only 2 percent of work trips and 4 percent of non-work trips in Hunterdon and Somerset counties. Land use changes that are part of the Plan 2035 and Aspirational scenarios could boost regional walking and biking trips significantly over the next 25 years.

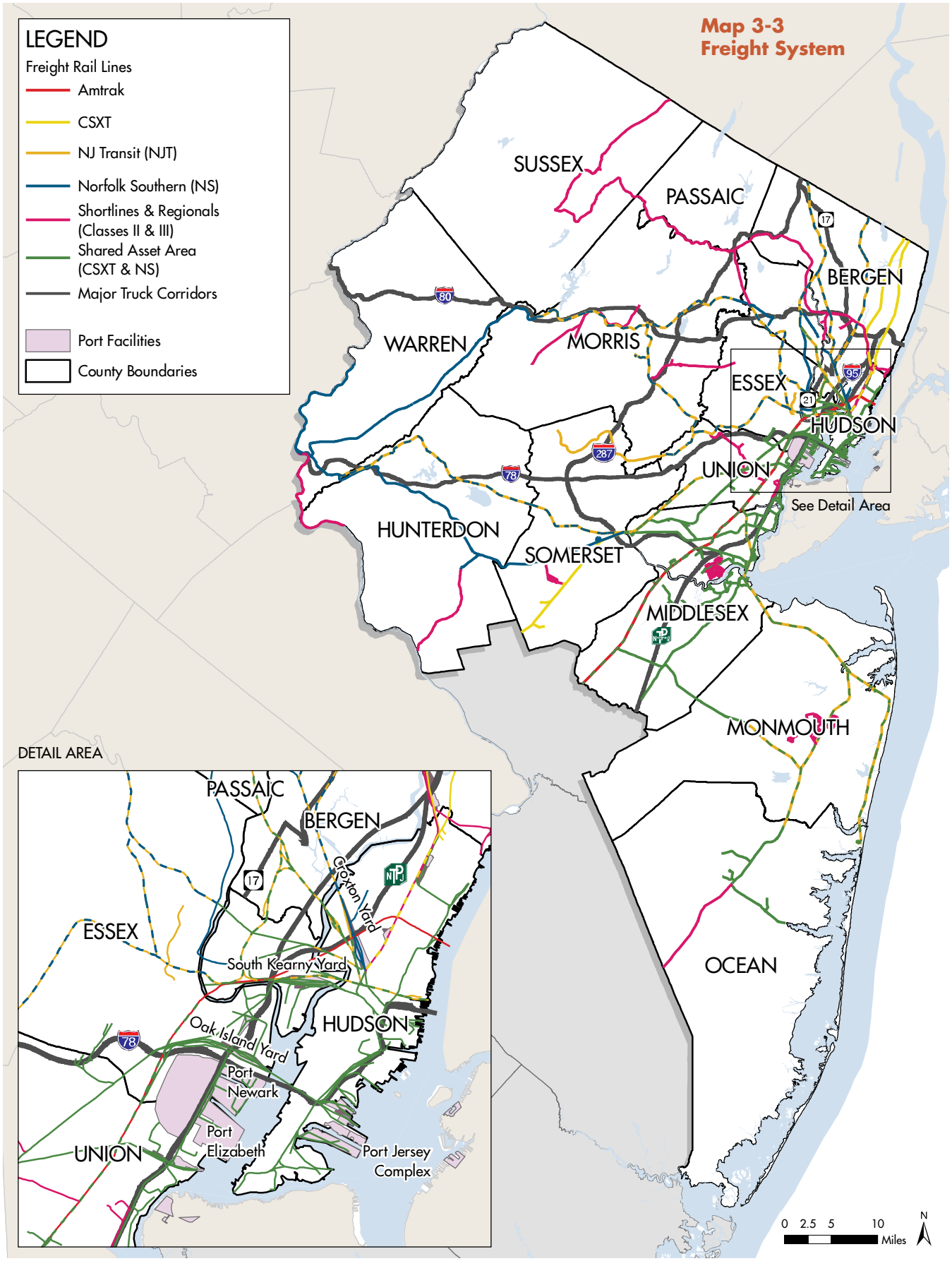
The likelihood of significant increases in regional trips by residents and businesses—including escalating freight movement, as discussed below—clearly represents a potential dilemma if measures are not taken today to prepare for it tomorrow. And yet it is important to note that it is also a sign of the region's vitality—more travel means more workers employed, more commerce being conducted, more visits to friends, more recreation and more of every activity that contributes to the region's attractiveness as a place to live. The intent of this plan is to facilitate and sustain increased travel in beneficial ways.

Freight Movement Trends

Goods movement is a critical element of the regional economy, directly creating some 500,000 jobs associated with freight-related activities. The region is home to businesses and residences that produce and consume millions of tons of goods annually. Goods movement in the NJTPA region consists of movements that originate, terminate, or simply move through the region on our transportation system. (Map 3-3)

The NJTPA estimates that over 550 million tons of freight moves in the region annually. Of this total, 80 percent originates or terminates within the region, and 20 percent passes through the region. Trucks account for over 90 percent of all surface freight (which excludes marine traffic), with approximately 10 percent moving by rail. Even when marine traffic is included, trucks carry 76 percent of all freight in the region.

Goods movement within and through the region has increased greatly in recent years. Seaport freight traffic more than doubled between 1991 and 2007. Although rail handles a relatively small percentage of all goods moved in the region, it has been gaining ground, especially when it


Map 3-3
Freight System
LEGEND
Freight Rail Lines
Amtrak
CSXT
NJ Transit (NJT)
Norfolk Southern (NS)
Shortlines & Regionals (Classes II & III)
Shared Asset Area (CSXT & NS)
Major Truck Corridors
Port Facilities
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
See Detail Area
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
DETAIL AREA
PASSAIC
BERGEN
ESSEX
Croxton Yard
South Kearny Yard
Oak Island Yard
HUDSON
Port Newark
Port Elizabeth
Port Jersey Complex
UNION
0 2.5 5 10 Miles
N

comes to port containers. The Port's ExpressRail facility more than doubled its number of annual container lifts to over 350,000 between 2000 and 2007.

However, the economic downturn has resulted in a reduction of all aspects of goods movement in the region:

- Seaport traffic decreased 0.5 percent from 2007 to 2008. This marked the first decrease in 15 years. While to date the region's port has fared better than other U.S. ports (port traffic at the top 10 North American ports declined by an average of 5 percent in 2008), the international marine shipping industry is experiencing tremendous decreases in demand leading to idle ships of well over 1 million twenty-foot equivalent units (TEUs—a standard container size used as a measure of freight capacity) worldwide.
- The total air cargo trade at New York/New Jersey airports fell 30 percent in 2008.
- According to the Association of American Railroads, U.S. freight rail traffic for the first 20 weeks of 2009 was down 18.2 percent from the same 20-week period in 2008 in terms of ton-miles, a standard industry measure that calculates demand by summing up the product of tonnage and distance moved.
- According to the American Trucking Association, U.S. truck tonnage in April of 2009 decreased by 13.2 percent compared to April 2008. This drop resulted in the lowest monthly truck tonnage reported in seven and a half years.

Plan 2035 seeks to maintain the region's economic competitiveness by helping make port and other freight-related transportation more efficient. Port of Newark.

It is expected that as the economy recovers over the next few years, the growth of freight activity will resume. Some long-term projections prior to the recession had envisioned a tripling of freight traffic—rail, truck, marine and air cargo—over the next 25 years. The lasting effects of the recession likely mean less growth, but a doubling of traffic is still a reasonable expectation. This is based on a number of key factors, including the region's central location in the midst of a huge consumer market; its extensive marine, rail and highway infrastructure; and the extensive warehouse and distribution facilities located in the region, among others. In addition, the 2015 completion of the Panama Canal expansion will permit larger vessels to reach the East Coast from the Pacific, boosting containerized goods entering the port. As discussed in Chapter 6, accommodating these larger vessels will require addressing low clearance under the Bayonne Bridge that limits access to the port.

These projected increases in freight emphasize the need for strategic investments to accommodate goods movement and sustain economic growth, while minimizing impacts upon other transportation system users.

Safety Trends

Improving the safety of travel is a high priority of the NJTPA in all aspects of the transportation planning process. Over 220,000 motor vehicle crashes occur in the region annually, about 440 of which result in fatalities. As population and vehicle miles traveled have grown, the region's crash statistics have declined moderately. This indicates that programs designed to improve travel safety are effectively lowering crash rates.

The total number of crashes in the region dropped each year between 2003 and 2006, from a high of 248,521 to a low of 223,923. That number climbed back to 232,526 in 2007, which was still well below previous years. In 2007, crashes resulted in about 70,000 injuries, including about 4,000 to pedestrians.

Crash statistics in the region indicate that the most vulnerable travelers among us—pedestrians and bicycle riders—remain disproportionately at risk. Of the region's 428 crash-related deaths in 2007, 25 percent were pedestrians, although walking accounts for less than 10 percent of all trips in the region. This trend shows why pedestrian safety has been, and will continue to be, a

Plan 2035 seeks to protect the region's natural resources while improving transportation in a sustainable manner. Clinton Reservoir in the Highlands region, Passaic County.

top priority of the NJTPA's safety improvement work.

Crash analysis has identified many contributing factors to roadway crashes, such as driver age, experience and education; vehicle types; and inadequate roadway design. Relatively small-scale roadway design improvements can reduce safety hazards, especially at "hot spot" locations. To that end, NJTPA initiatives like the Local Safety and High Risk Rural Roads programs have focused on funding quick and simple fixes to some of the most crash-prone roadways in the region (see Chapter 6 for more on these programs).

Continued efforts and active partnerships with state and local law enforcement, state agencies such as NJDOT, NJ Transit, and the NJ Division of Highway Traffic Safety, engineers, planners, educators, medical personnel, and stakeholders is critical to improving safety through 2035. Access to accurate crash data and reliable data analysis tools makes these efforts more effective. Plan4Safety, a new crash data analysis tool developed by Rutgers University is now available for a wide variety of analyses. In its first year, already approximately 400 local, regional, and state agencies including NJTPA are using it to support their safety improvement efforts.

Environmental & Other Challenges

In addition to considering the demographic, economic and transportation trends discussed above, Plan 2035 takes into account a number of developing issues that have grown in importance to the region and its citizens since the 2005 approval of the last Regional Transportation Plan. These issues have been the subject of state and federal legislative efforts in recent years. They represent additional challenges for long-range transportation planning:

Climate Change—A near consensus has developed in the state and nation about the need to address climate change. The state's Global Warming Response Act aims to cut carbon/greenhouse emissions between now and 2020. The NJTPA has responded with the establishment of a Climate Change working group to examine how transportation planning efforts can address this global issue. Climate Change issues are discussed further in Chapter 7.

Energy Costs—Gasoline prices rose dramatically in 2008 to nearly $4 per gallon, causing disruptions to the economy and hardships for many citizens. While prices subsequently retreated, they are again on the rise in 2009. For the long term, increases in energy costs are likely to rise for the transportation sector, though they may be mitigated to some extent by new technologies or alternate fuels. Improving energy efficiency of the transportation sector and the broader economy—which simultaneously contributes to reducing carbon emissions—has been the subject of government programs and legislation, including New Jersey's Energy Master Plan. These issues are addressed further in Chapter 7.

Highlands Legislation and Master Plan—A master plan implementing the Highlands Water Protection and Planning Act was approved in 2008. As noted above, it will constrain potential development in the multi-county highlands region in the interest of preserving the environmentally-sensitive watershed. How the master plan will be implemented is still under discussion, with input from the NJTPA and its member agencies. The master plan is also addressed in Chapter 7.

Transportation Trust Funds—The transportation trust funds at both the state and federal levels must be renewed and reauthorized within the next year or two. They are the

source of funding for the majority of transportation investment in the NJTPA region. At the federal level, Congress must reauthorize the nation's principal transportation law, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which expired in September 2009. At the state level, legislators must renew the state Transportation Trust Fund, which will exhaust available funding in 2011. Assumptions about state and federal financing are addressed in Chapter 8.

Conclusion

Plan 2035 was developed at a time of great uncertainties about the future course of the regional economy—indeed the economic challenges confronting the region and the nation are in many respects unprecedented in the post-World War II era. The depth of these uncertainties—together with uncertainties about climate change, energy and other matters—immensely complicates making predictions about the future transportation demands and conditions that Plan 2035 is intended to address. Yet making judgments about the future—and assessing their implications for regional transportation—was a central task in the preparation of Plan 2035.

Drawing upon computer modeling, the advice of experts and input from elected officials and the public, Plan 2035 provides direction for the many investments—amounting to as much as $140 billion over 25 years—to be made in the region's transportation system. The uncertainties mean that the investment framework provided by Plan 2035 is based on best estimates about future conditions and system performance. But it is a framework that nevertheless insures that year-to-year investments will help meet larger goals and emerging needs vital to the region's 6.5 million citizens.

4

REGIONAL TRANSPORTATION NEEDS & STRATEGIES

This chapter outlines the various transportation needs in the NJTPA region. In identifying these needs, the NJTPA considers transportation problems—such as unacceptable levels of traffic congestion—as well as opportunities—such as a densely populated area that could support greater use of public transit. The NJTPA investigates needs through analysis of data, studies of specific locations and facilities, computer modeling, consultations with local officials and citizens, among other activities. And investigating needs often necessarily includes consideration of the range of strategies that might address them. Thus transportation needs and strategies are closely related in the transportation planning process conducted by the NJTPA.

This chapter describes the process by which the NJTPA has investigated needs and strategies in preparing Plan 2035. It summarizes key findings of these investigations, which have been used to develop the implementation plans described

Plan 2035 seeks to keep the region moving, even as population and employment steadily increase. Interstate Route 78, Somerset County.

in Chapter 6, as well as the agenda of planned projects in the Project Index at the back of this plan. It is important to emphasize that while much of the investigation of needs and strategies undertaken by the NJTPA involves technical analysis—using performance measures, computer modeling, GIS systems and other planning techniques—these investigations include extensive and ongoing consultations with NJTPA Board members, their staffs, the staffs of member agencies and interested citizens in affected subregions. Decisions about allocations to address regional needs are made by the NJTPA Board of Trustees.

Plan 2035 calls for repair and maintenance of the region's many bridges. Pulaski Skyway, Essex and Hudson counties.

Maintenance and Repair—Asset Management

Nearly two-thirds of the $2.5 billion allocated each year to the region's transportation system goes to maintaining existing facilities in good working order—in effect, preserving the enormous public investment in these assets made over generations and generations. By and large, this funding is allocated based on inspections and other objective measures of the condition of the system. Infrastructure management systems overseen by the state in cooperation with the NJTPA and the other two New Jersey Metropolitan Planning Organizations continually gather and analyze data about the condition of the system and create schedules for repair and replacement.

Roads, bridges, pavement and other facilities that show the most deterioration generally get the highest priority for maintenance funding, although efforts are also made to perform cost-effective preventative maintenance in a coordinated fashion. There are management systems for bridges, roadway pavement, and drainage operated by NJDOT; toll road and public transit assets are managed by the New Jersey Turnpike Authority and NJ Transit, respectively. (NJDOT also studies key issues such as congestion and safety with a management system approach, related to the needs described later in this chapter.)

Many key facilities in northern New Jersey were built 50 years ago or more and are due for major overhaul or replacement. Maintaining and improving the condition of our roads, bridges, and public transit facilities is complicated by the vast amount of travel in the region. Not only does the heavy travel increase wear on roads, bridges and other facilities but it increases repair costs as work has to be conducted in ways to avoid disruptions to key travel routes. The following summarizes some key maintenance issues in the region.

Bridge Maintenance, Repair & Replacement

Nearly 4,800 of New Jersey's 6,400 bridges are in the North Jersey region. The average age of these bridges—which are owned by the State, the New Jersey Turnpike Authority, NJ Transit, and by individual counties and municipalities—is almost 50 years. In general, bridges are designed to last from 50 to 75 years if properly maintained. Statewide, there are a total of 1,439 bridges that are 70 or more years old, including many that are over 100 years old. In the recent years, the State of New Jersey increased inspections and accelerated repair of the state's bridges, in part prompted by the concern of public officials about the bridge collapse in Minneapolis in 2007, but mainly by the state's great need to replace aging bridges and rehabilitate those in need of repair.

As shown in Table 4-1, approximately 33 percent, or 1,581 of the region's bridges are functionally obsolete (meaning they do not meet current design standards for clearance, lane and shoulder width, and/or road geometry), and approximately 11 percent, or 524, are structurally deficient (meaning the deck or bridge structure is deterio-

Table 4-1
NJTPA Bridge Conditions bu Number of Bridges

Not Deficient	2,686	56.1%
Structurally Deficient	524	10.9%
Functionally Obsolete	1,581	33.0%
Total Bridges	**4,791**	

Table 4-2
NJTPA Bridge Conditions by SqFt of Deck Area

Not Deficient	30,058,718	57.9%
Structurally Deficient	5,572,917	10.7%
Functionally Obsolete	16,275,598	31.4%
Total SqFt of Deck	**51,907,233**	

rated). However, a bridge classified as structurally deficient or functionally obsolete does not mean that it is unsafe for use; rather, it is a candidate for repairs, replacement or other investment.

Bridge condition can also be considered in terms of deck area (Tables 4-2 and 4-3). There is nearly 52 million square feet of bridge deck in the region. Of this, over 5.5 million square feet is structurally deficient and over 16 million square feet is deemed as functionally obsolete. Transit bridges (under the jurisdiction of NJ Transit) show special need. While accounting for only 1 percent of the bridge deck area in the region, these bridges are generally older that the region's highway bridges. They have relatively high levels of both structural deficiency (17 percent) and functional obsolescence (53 percent).

Despite substantial funds invested each year in the region's bridges, between now and 2035, 10 million square feet of additional deficient bridge deck (20-50 bridges, depending on size) are projected to accrue as a result of facility age and heavy use. Of particular concern are several "high-cost bridges" which are defined as those exceeding $50 million in construction costs. There are seven high-cost bridge projects in the NJTPA region requiring funding of more than $6.5 billion. These are listed in Chapter 6 (Implementation).

As shown in Table 4-3, bridges located on county or municipal roads comprise about 11 percent of bridge deck area in the region as state bridges are generally wider and carry more lanes. While the actual number of bridges under county and state jurisdiction is roughly equal, NJDOT structures carry more traffic, while county bridges provide the critical links between the downtowns, economic centers and residential areas and the regional highway network.

County Bridge Needs

There are 1,865 county bridges within the North Jersey region, all serving an important part of the region's transportation system. Due to their age, condition, and high usage levels, the repair and maintenance of these bridges have been identified as an investment priority. As part of an analysis of county and municipal transportation needs in 2008, the New Jersey Association of Counties (NJAC) examined the condition of county bridges and reported that approximately 18 percent of the region's county bridges are functionally obsolete and an additional 19 percent are structurally deficient. The NJAC report estimated the improvement cost to be over $800 million for structurally deficient county bridges in the region and over $500 million for those functionally obsolete for a total price tag of more than $1.3 billion. Table 4-4 below depicts the condition of the county bridges in the NJTPA region by deck area.

Minor bridges: Besides the extensive needs for county bridges described above, there is also a need for the repair and replacement of minor bridges. These are defined as structures between 5 and 20 feet in span. The vast majority of minor bridges are located on the county and municipal

Table 4-3
NJTPA Bridge Conditions by Owner and Deck Area

Owner	Total Deck Area (Sq Ft)	Not Deficient	Structurally Deficient	Functionally Obsolete
NJDOT	25,197,314	57%	17%	26%
Counties	5,675,794	66%	15%	19%
Cities and Towns	267,858	50%	26%	24%
NJ Transit	554,652	30%	17%	53%
Turnpike	19,467,655	58%	1%	41%
All Other (incl. unknown)	743,960	52%	13%	35%
Total	**51,907,233**			

Table 4-4
County Bridge Conditions Within the NJTPA Region

Not Deficient	1,173	62.9%
Structurally Deficient	362	19.4%
Functionally Obsolete	330	17.7%
Total Bridges	**1,865**	**100%**

road system. Of the 3,662 minor bridges in the region, 72 percent require repair or replacement. The above referenced NJAC report estimated the cost for these improvements to be over $750 million. The cost to repair and replace these minor bridges is generally borne by county and municipal governments, which are often forced to defer these types of investments during difficult economic periods.

Pavement Maintenance & Repair

Pavement conditions in the region must also be addressed. The statewide Pavement Management System, operated by NJDOT, assesses the needs of the region through an evaluation procedure that takes into account a Roughness Quality Index and a Surface Distress Index. These numbers, as well as how much traffic a particular road experiences, are used to generate a ranking that determines how much rehabilitation is required to bring each section of highway up to standards for safe and functional pavement.

According to the Pavement Management System, approximately half of the NJDOT-maintained state highway system is currently deficient based on the program's measures, while almost 60 percent of the system is beyond its planned service life. With the projected 16 percent increase in vehicle miles traveled over the next 25 years, wear to pavement will increase. The projected doubling of freight traffic in the region will particularly affect pavement conditions. A 1997 FHWA report estimated that the cost of pavement wear caused by trucks can be up to 100 times greater than that caused by passenger cars.

County roads in the NJTPA region cover 12,048 lane miles. A 2005 analysis by NJDOT found that to eliminate all deficiencies on county lane miles would require rehabilitation of 1,377 miles annually, or 34,428 over a 25-year period. With the current limited funding available to counties, only a portion of these needs can be addressed.

The region's ability to address these accruing bridge and pavement needs will depend on the level of available funding. It is important to note that adequate levels of funding can allow the region to move beyond addressing the backlog of needs to focus on conducting the kind of preventative maintenance that avoids more costly future repairs and slows the accrual of needs. In some cases, compromises may have to be made in the timing and extent of repairs—for instance NJDOT can review replacement plans for "right-sizing" into life-extension projects without sacrificing safety.

As discussed in Chapter 5 (Scenario Planning), moderate funding increases under the Plan 2035 Scenario will allow the region to make reasonable progress in addressing accruing needs and maintaining the condition of the region's bridges and pavement. Continued monitoring of conditions and needs through the management systems will be important to the cost effective use of available funds.

Drainage Management System

Flooding is New Jersey's most frequent natural hazard and the State seeks to maintain mobility on its highway system during flooding events. Revised in recent years, the Drainage Management System (DMS) is based on an annual review of problem locations. This review uses various available data to prioritize improvements. NJDOT estimates it could fully eliminate the backlog of flooding/drainage-related projects on its facilities and areas of concern (adjacent sites impacting state facilities) at a cost of $50 million each year over 10 years. However, NJDOT currently spends only $10 million each year, about $5 million per year for roadway flooding mitigation and areas of concern, and about $5 million for cleaning, inspection and repair. This is enough to meet critical needs and make some progress in reducing the backlog.

Transit Maintenance

NJ Transit spends the majority of its capital funding each year for preservation and maintenance. This includes replacing vehicles as they age as well as attending to 600 rail bridges, over 500 miles of track, signal systems, stations and other infrastructure—most of it located in the northern New Jersey region. With this investment, delays due to breakdowns and system failures are held to a minimum.

Elements of the rail system that must be maintained include:

- Track—Upgrading and replacement of rail, ties,

switches and grade crossings must occur as part of a continuous program. NJ Transit replaces 10 miles of track every year.

- Structures—In addition to inspecting and maintaining 600 bridges, the agency must attend to a large number of other structures such as culverts.
- Electric Traction—Overhead catenary wire and power substations must be maintained.
- Signaling—Maintenance and upgrades are required for grade crossing warning systems, train operation signals, switching and interlocking signal devices and the communication backbone.
- Rolling Stock—The useful life of rail equipment can exceed 25 years if properly maintained and overhauled. Currently, NJ Transit must replace self-propelled cars over 30 years old and aging diesel locomotives.
- Stations—A number of NJ Transit's train stations need improvement, including improving accessibility for individuals with disabilities.

NJ Transit must maintain its fleet of buses in good operating condition.

- Rolling Stock—NJ Transit is replacing many of its buses including the ongoing purchase of 1,145 transit-style buses (approximately 200 buses per year over six years).
- Equipment Overhaul—The useful life of buses can exceed 12 years, if properly maintained and overhauled.
- New Minibus Equipment—Smaller buses are being purchased for the Access Link Para-Transit service.
- Private Carrier Improvement Program—NJ Transit has provided private carriers over 500 cruiser buses as part of cruiser bus procurement. Private carriers also receive funding for rehabilitation of vehicles, facility improvements, and vehicle purchases.
- Environmental Friendly Bus Purchases—New buses being purchased are designed to reduce emissions though use of compressed natural gas, ultra-low sulfur fuel or hybrid-electric power.
- Passenger Facilities, Bus Terminals and Shelters—NJ Transit must maintain and rehabilitate a large number of bus passenger facilities.
- Park-Ride Locations—Numerous park-and-ride facilities and bus stops must be kept in safe condition including attending to lighting, pavement and/or shelters.

In addition to these maintenance needs, 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. One major project is replacement of the Portal Bridge on the Northeast Corridor. On the bus side, these needs include expanding garage space and places to stage buses for the evening rush hours.

Looking towards the future, investment in information technology will improve the system's efficiency and improve the passenger travel experience. Better and more integrated information about transit and highway delays or service disruptions, along with multi-modal fare integration, will allow transit riders to make informed decisions about their trips and to move seamlessly between the many options available in the region. In addition, purchase of new vehicles and related systems will allow the implementation of Bus Rapid Transit systems, such as the GoBus operating in Newark and Irvington, as discussed in Chapter 6.

Plan 2035 prioritizes maintenance and upkeep of rail facilities and rolling stock. Berkeley Heights, Union County.

In recent years, NJ Transit has attended to all these needs to maintain a state of good repair for the region's extensive transit network. However, as discussed in the Chapter 8 (Financing), the limited funding provided by the state has forced NJ Transit to use some capital funding each year to support its operations. Plan 2035 calls for improved

funding for the transit network and a stable mechanism for operating support.

Safety Needs—A Performance Priority

Beyond preserving transportation infrastructure in a state of good repair, it is essential that it performs in a safe manner. As noted in Chapter 3 (Context & Trends), safety is a priority concern of the NJTPA in all aspects of the transportation planning process. The 230,000 crashes in the region in 2007 resulted in some 440 fatalities as well as numerous injuries and property damage. Crashes also impact roadway congestion in the form of roadway incident delays, which, most critically, can delay lifesaving emergency services immediately following serious crashes. This type of roadway delay is especially prevalent in the NJTPA region with its older infrastructure and limited availability of highway capacity in peak periods.

To address safety needs, the NJTPA participates in a statewide Safety Management Task Force and was a founding leader of the state's nationally recognized Safety Conscious Planning efforts. In 2007 the Task Force worked with NJDOT to develop New Jersey's Comprehensive Strategic Highway Safety Plan (CSHSP) which addresses eight emphasis areas and identifies strategies, responsibilities and timelines for each. 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.

As an active participant in the CSHSP's development, NJTPA has been working to advance safety in the eight emphasis areas. In particular, the NJTPA has conducted two studies in recent years to identify crash prone locations and develop quickly implementable solutions using crash data and input from multi-disciplinary teams which included law enforcement personnel, the medical community, educators, engineers, planners, and the public. "Mini safety audits" were conducted at dozens of locations around the region. Many of the recommendations from these audits have been implemented. NJTPA also initiated the New Jersey Deer Crash Coalition to work towards reducing the over 5,000 deer vehicle crashes that occur in the region each year.

The NJTPA has also focused on pedestrian safety needs as part of its series of Walkable Community workshops conducted around the region with participation by local planners, police and other stakeholders.

In addition, the NJTPA has also conducted a Freight Rail Grade Crossing Assessment Study to assess safety as well as other concerns such as traffic and community impact issues at 64 grade crossings along five of the region's major freight rail lines. The study developed grade crossing reports that identify the issues and potential solutions at 15 selected grade crossings. Improvements at these and other grade crossings will be considered in coming years.

The NJTPA has analyzed dozens of at-grade freight rail crossings throughout the region. Perth Amboy, Middlesex County.

As part of the safety needs investigated by the NJTPA as discussed in this chapter, numerous measures were identified that could address hazardous or unsafe conditions. These include:

- Adding or retrofitting of structures or other measures to eliminate or reduce accidents involving vehicles and wildlife.
- Installing and maintaining signs (including fluorescent, yellow-green signs) at pedestrian-bicycle crossings and in school zones.
- Installing rumble strips or other warning devices to alert motorists to high hazard areas or other areas where speeds need to be reduced.

Walkable Community workshops have been held throughout the region. Newton, Sussex County.

- Installing skid-resistant surfaces at an intersection or other location with a high frequency of crashes.
- Making safety improvements for pedestrians, bicyclists and for people with disabilities, such as road striping or crosswalks.
- Eliminating roadside obstacles.
- Improving highway signage and pavement markings.
- Installing or upgrading of traffic control or other warning devices to improve a documented safety hazard area.
- Installing guiderails, barriers (including barriers between construction work zones and traffic lanes for the safety of motorists and workers), and crash attenuators.
- Widening pavement or shoulders including the addition of passing lanes to remedy unsafe conditions.
- Eliminating hazards at railroad and highway crossings by grade-separation or adding safety features such as barriers, gates and signage.

Over the life of Plan 2035, efforts to identify locations where these and other measures can improve travel safety will be a high priority. This includes safety funding programs administered by the NJTPA, such as the Local Safety program, the High Risk Rural Roads program, and support of county efforts to advance safety conscious planning activities that integrate engineering, education, and enforcement strategies. These are described in Chapter 6 (Implementation).

Accessibility, Mobility and Congestion—Strategy Evaluation

Addressing many of the maintenance, preservation and even safety needs discussed above often involves fairly straightforward engineering solutions with a limited range of options. Many other needs in the region—particularly the "opportunity" needs referenced at the beginning of this chapter—are more complex. Addressing them involves considering a variety of often interrelated options, sometimes involving multiple modes and spanning geographic areas.

Traffic congestion is one of these complex problems. Sometimes the cause and solution may appear straightforward. For instance, a bottleneck on a stretch of roadway can be widened to ease spot congestion. However this straightforward solution often is not appropriate for larger stretches of roadway with heavy traffic volumes. Widening a roadway may provide short term relief but over the long term the more free-flowing conditions can attract drivers to the route and even induce additional trips.

Addressing heavy traffic volumes on a route therefore may require considering not just widening but a host of possible measures—improvements to alternate routes, the provision of bus or rail transit alternatives, limiting driveways and other access points or retiming traffic signals, among others. Assessing which measures are appropriate must include an investigation of the accessibility and mobility issues on the larger transportation network of which the route is a part—that is, determining the destinations travelers are seeking to access and the mobility options for getting them there. As discussed in Chapter 7 (Transportation and Land Use), considering land use patterns is also important to finding lasting solutions.

Strategy Evaluation is the NJTPA's process for systematically investigating complex accessibility and mobility issues and needs around the region. Congestion is one of the key focuses of Strategy Evaluation. Indeed, because of the prevalence of congestion in metropolitan areas, Congress has mandated that Metropolitan Planning Organizations like the NJTPA establish a Congestion Management Process (CMP) to address the issue. The Strategy Evaluation process is the core of the NJTPA's designated CMP.

However, in addition to assessing congestion on the roadway system, Strategy Evaluation also assesses needs involving bus and rail transit, ridesharing, walking and bicycling, and freight transportation. And since these types of issues deal with the fundamental nature and capacity of the transportation system, Strategy Evaluation intrinsically considers the connections with related travel markets, development, land use and environmental concerns.

Strategy Evaluation identifies locations in the region where various types of transportation improvements, grouped into broad strategies, are likely to most effectively meet access and mobility needs. These determinations are made by looking at measures of transportation system performance in various "place types" around the region—areas that share similar characteristics in terms of land use, population density, employment, the nature of economic activities, street patterns, and other traits. Strategy Evaluation identified ten place types, each with specific standards for transportation needs. For instance, levels of congestion that indicate a need are lower in the "rural town" or "suburb" place types than in the "urban center" place type where a greater level of congestion is often expected and tolerated.

Assessing needs and appropriate strategies within each place type involved analysis and computer modeling of a wide range of transportation system performance data, including roadway congestion, the extent of public transit use, the prevalence of walking and biking trips and how readily travelers can reach nearby destinations. Regarding roadway congestion, three types were analyzed: routine delay, usually caused by heavy traffic volumes on a daily basis; hotspot congestion, the most extreme congestion at choke points on the system; and unexpected or incident delay, caused by accidents or other events. Freight movement and various factors related to transit use and ridesharing were also studied. Ongoing consultations with planners and elected officials around the region helped validate and adjust the findings to real world conditions.

The resulting assessments about where transportation strategies will work best were mapped in Geographic Information Systems (GIS) with multiple data layers. The findings of the Strategy Evaluation are used to suggest possible future improvement projects that deserve further investigation. Chapter 6 (Implementation) discusses 30 project concepts identified through a "Strategy Refinement" effort—a follow-up to the latest round of Strategy Evaluation. It is important to note that the strategy locations (represented on maps in the remainder of this chapter) do not represent all needed improvements in the region. While the Strategy Evaluation analysis discussed in this section is an essential tool for identifying transportation needs, project needs are also identified through the management systems discussed earlier, as well as additional corridor and subregional studies and other analysis by the NJTPA and its member agencies. Strategy Evaluation findings are used by the NJTPA to assess and screen proposals for transportation improvement projects. Strategy evaluation findings will be regularly updated as new needs are identified or strategies are reassessed in the planning process.

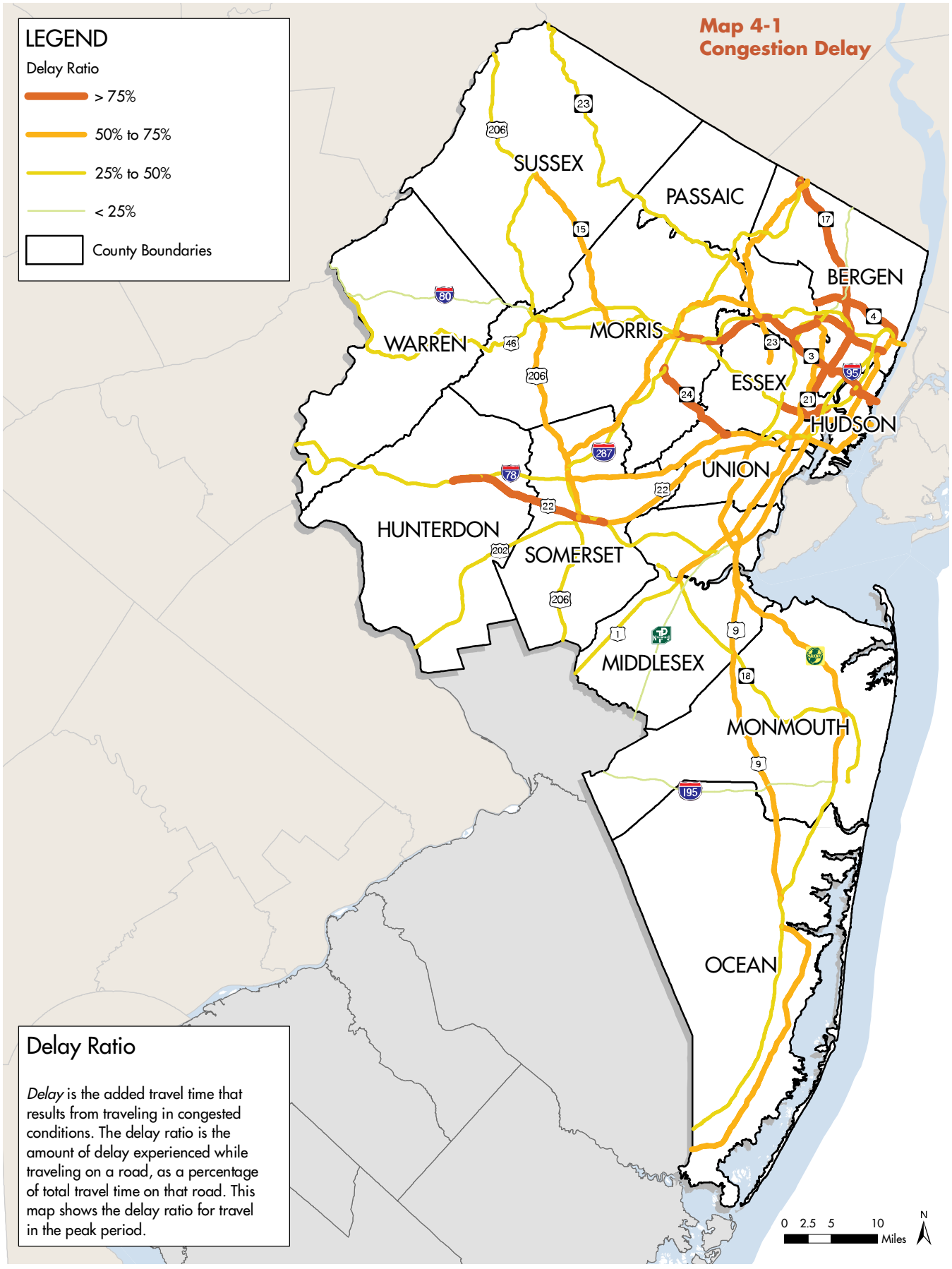
The following are some summary findings and maps from the latest Strategy Evaluation relating to four strategy groupings: Roadway Improvements; Public Transit Enhancement; Ridesharing and Transit Support; and Freight Movement. It should be noted that while Strategy Evaluation investigated walking and biking needs and reflects their priority throughout the region as recognized by the NJTPA, strategies to address these needs are highly localized and cannot be depicted on regional scale maps (walking/biking is discussed in Chapter 6). Further details on the Strategy Evaluation are available in Appendix C.

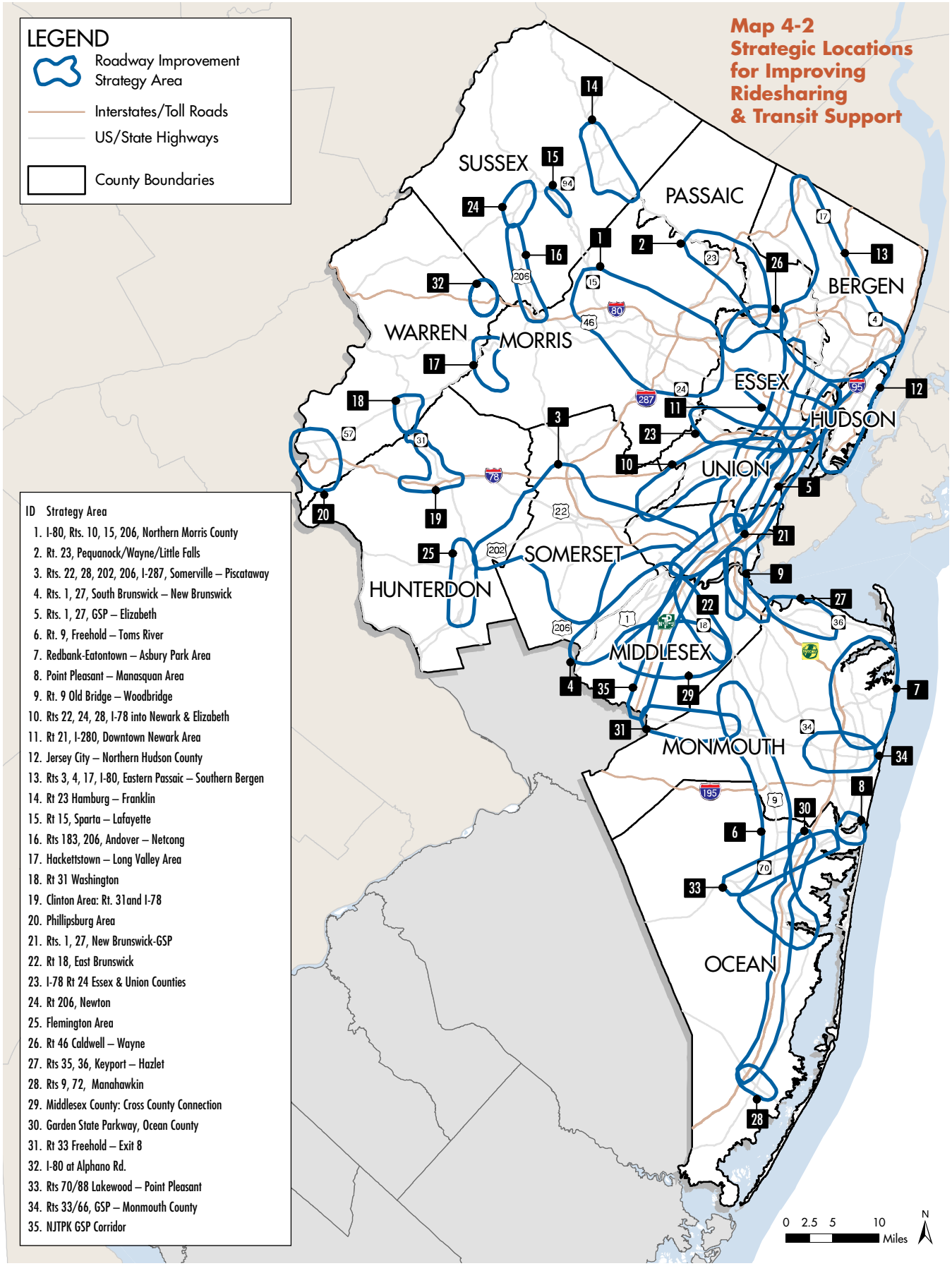
Roadway Improvements

The NJTPA's roadway system is the principal means of travel for most trips in the region, but traffic congestion and delay constrain access to many places. Congestion of all types in the region has been increasing. According to NJTPA modeling, on a typical weekday approximately 1.6 million hours are spent in congestion by travelers in the region each year. The major roads with the highest peak hour volumes are also typically the ones with the highest congestion levels. As indicated in Map 4-1, these roads are concentrated in the densest areas (Hudson, Essex and Bergen counties), and in the denser parts of Union, Middlesex and Monmouth counties.

Also, several main arterials (e.g., Route 9 and Route 17) have high congestion because they are lined with commercial developments that have numerous entrance and exit points. As discussed in Chapter 5 (Scenario Planning), the region can expect increased congestion in the future due to the growth in population, employment and regional travel. The average delay faced on trips will increase in the range of 46 to 54 percent over current levels depending on transportation funding.

One approach to addressing roadway delays is to directly improve roadway operations or capacities. Based on the analysis of congestion and other variables around the


Map 4-1
Congestion Delay
LEGEND
Delay Ratio
> 75%
50% to 75%
25% to 50%
< 25%
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
Delay Ratio
Delay is the added travel time that results from traveling in congested conditions. The delay ratio is the amount of delay experienced while traveling on a road, as a percentage of total travel time on that road. This map shows the delay ratio for travel in the peak period.
0 2.5 5 10
Miles
N


Map 4-2
Strategic Locations for Improving Ridesharing & Transit Support
LEGEND
Roadway Improvement Strategy Area
Interstates/Toll Roads
US/State Highways
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
SOMERSET
HUNTERDON
MIDDLESEX
MONMOUTH
OCEAN
ID Strategy Area
1. I-80, Rts. 10, 15, 206, Northern Morris County
2. Rt. 23, Pequanock/Wayne/Little Falls
3. Rts. 22, 28, 202, 206, I-287, Somerville – Piscataway
4. Rts. 1, 27, South Brunswick – New Brunswick
5. Rts. 1, 27, GSP – Elizabeth
6. Rt. 9, Freehold – Toms River
7. Redbank-Eatontown – Asbury Park Area
8. Point Pleasant – Manasquan Area
9. Rt. 9 Old Bridge – Woodbridge
10. Rts 22, 24, 28, I-78 into Newark & Elizabeth
11. Rt 21, I-280, Downtown Newark Area
12. Jersey City – Northern Hudson County
13. Rts 3, 4, 17, I-80, Eastern Passaic – Southern Bergen
14. Rt 23 Hamburg – Franklin
15. Rt 15, Sparta – Lafayette
16. Rts 183, 206, Andover – Netcong
17. Hackettstown – Long Valley Area
18. Rt 31 Washington
19. Clinton Area: Rt. 31and I-78
20. Phillipsburg Area
21. Rts. 1, 27, New Brunswick-GSP
22. Rt 18, East Brunswick
23. I-78 Rt 24 Essex & Union Counties
24. Rt 206, Newton
25. Flemington Area
26. Rt 46 Caldwell – Wayne
27. Rts 35, 36, Keyport – Hazlet
28. Rts 9, 72, Manahawkin
29. Middlesex County: Cross County Connection
30. Garden State Parkway, Ocean County
31. Rt 33 Freehold – Exit 8
32. I-80 at Alphano Rd.
33. Rts 70/88 Lakewood – Point Pleasant
34. Rts 33/66, GSP – Monmouth County
35. NJTPK GSP Corridor
0 2.5 5 10 Miles
N

region and taking into account expected roadway performance standards in each of the region's place types—together with the results of consultations with county and local officials—Strategy Evaluation identified potentially appropriate locations for making various roadway improvements. As noted previously, expansion of roads or adding new roads is a limited option for most locations due to high costs, environmental impacts and the likelihood that capacity expansion may provide only temporary congestion relief. However, capacity expansions will be appropriate for some locations, often matched by transit, travel demand management and land use measures to limit their negative impacts and sustain their benefits.

Other targeted roadway strategies seek to improve the efficiency or "throughput" of roadways. As described more fully in Chapter 6 (Implementation), they include:

- *Improve Operation of Roadways, Intersections, Interchanges:* Road improvements can make traffic flow more smoothly and provide better access to destinations. Improvements to intersections, which are often congestion hot spots, are particularly important. They can include signalization, signage upgrades, intersection geometry modifications, lane and shoulder widenings, channelization, restriping, and new turning or acceleration/deceleration lanes. Grade separation of existing intersections or reconfiguration as roundabouts may also be an option. In addition, improved signage, including coordinated efforts to meet upgraded reflectivity standards, will help improve operational efficiency.
- *Manage Roadway Access:* Improving the location, spacing and design/operation of driveways, median openings and street connections, and coordinated planning of adjacent land uses can prevent conflicts between through travel and local activity. Access on many roads is controlled by the state Highway Access Code. Roadway access controls include limiting curb cuts, providing service roads, designating limited use of breakdown lanes and allowing for bus stops, pullouts, and priority lanes.
- *Implement Intelligent Transportation Systems and Incident Management:* Technological improvements can be used to improve traffic flow, lessen the impacts of incidents such as vehicle breakdowns or accidents, and provide real-time information to help drivers speed their trips by changing routes or modes in response to notification of delays. Some technologies include traffic control centers, high speed toll plazas, electronic incident notification networks, roadside traffic monitors and computerized traffic signaling. "Smart" traffic signaling, where the signal timing changes depending on traffic conditions, are also an option. Statewide and regional traffic coordination will play an increasingly important role.

Map 4-2 identifies priority locations in the region where these and other roadway strategies appear most promising for meeting access and mobility needs. Recommended improvements tend to be concentrated along the major roadway corridors of the region.

Examples of these corridors include roadways such as the New Jersey Turnpike, Interstate Routes 78, 80, 280 and 287, and Routes 1, 3, 9, 23, 31, and 202. Additional locations suggest enhancements throughout the region, in places from Point Pleasant by the Shore in Ocean County to Hamburg and Franklin in Sussex. Improvements to local collector roads will have beneficial impacts for regional travel.

Regional roadway corridors are oriented along the historic routes that have structured the region since the early days of settlement, and they will continue to do so through the duration of the 2035 planning horizon. The major corridors are also, with the exception of I-287, radial, heading to higher-density urban areas in Bergen, Hudson and Essex counties. This, again, reflects historical patterns.

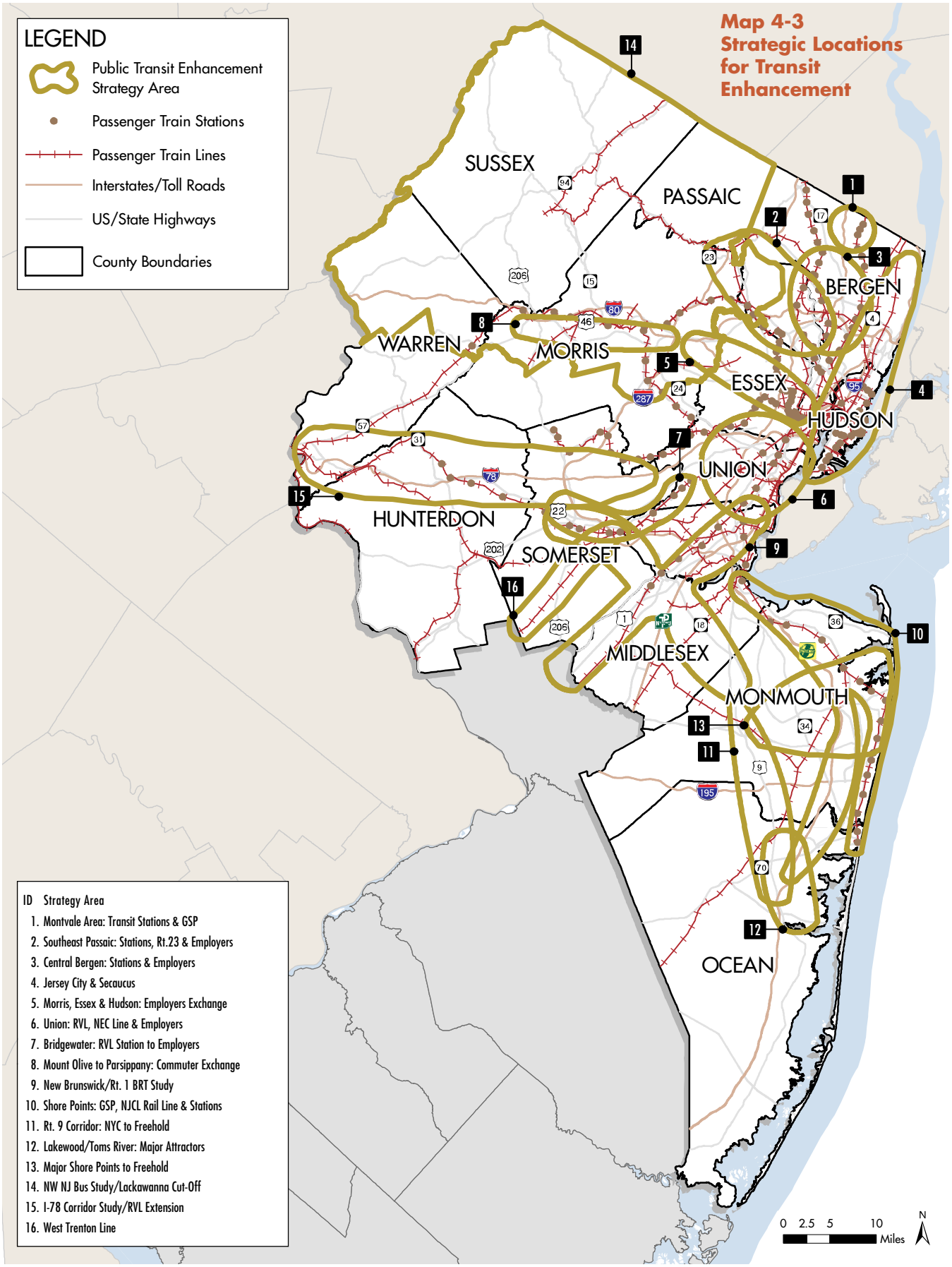
Public Transit Enhancement

Many areas of the region lack convenient access to bus and rail transit as an alternative to driving to work and for other trips. As discussed in Chapter 6 (Implementation) and Appendix D, improving the reach of the transit system helps remove trips from the region's congested highway networks, supports land development in focused regional centers, safeguards the region's air quality and provides essential travel to lower income residents, the disabled, elderly and those without cars.

Strategy Evaluation assessed needs and strategies for public transit enhancement by considering a host of measures. These included current patterns of bus and rail usage, residential densities around the region that can support bus and rail transit, and the current ability of residents to access destinations—such as employment and commercial centers—that have the potential to be served by transit.

As discussed in more detail in Chapter 6 (Implemen-

Map 4-3 Strategic Locations for Transit Enhancement



tation), the strategies for enhancing public transportation include the following:

- Support Enhancements to Rail Service: Possible rail improvements include new stations on existing lines, new lines or increased frequency of service, intermodal connections, and use of diesel-electric locomotives. Given the expense of fixed rail infrastructure, difficult choices must be made on where best to invest in rail enhancements.
- Enhance and Expand Local Bus Service: Bus service in northern New Jersey is the backbone of mass transit in the region, used by almost two-thirds of NJ Transit passengers in the region. Bus transit is less expensive to operate and more flexible than new rail lines in addressing the transit market needs of a dispersed development pattern.
- Implement Bus Rapid Transit and Enhance Express Bus: Premium buses and long distance express buses can cost-effectively deliver service that is comparable in many ways to fixed guideway rail.

Map 4-3 identifies priority locations in the region where these and other transit strategies appear most promising for meeting access and mobility needs. The identified locations are related to one or more of these three basic transit markets: travel to Manhattan; travel to major regional centers within New Jersey (e.g., to Newark, Jersey City, and New Brunswick); and local travel

For example, the "X" shaped priority location (the no. 9 strategy area) on the map centered on New Brunswick represents a strategy to improve regional transit service to the New Brunswick area including possibly along the Routes 1, 9, 18, and 27 corridors. This would include regional bus initiatives such as enhanced service along Route 18 and continued support for the New Brunswick-oriented bus rapid transit (BRT) services (see Appendix D).

Other locations relate to transit improvements for travel to Manhattan. The series of locations in Ocean, Monmouth, and Middlesex along the Route 9 corridor were identified as areas where there was a need to improve transit opportunities for accessing Lower and Midtown Manhattan such as upgraded express bus service (current priority treatments for buses along Route 9 help address this need).

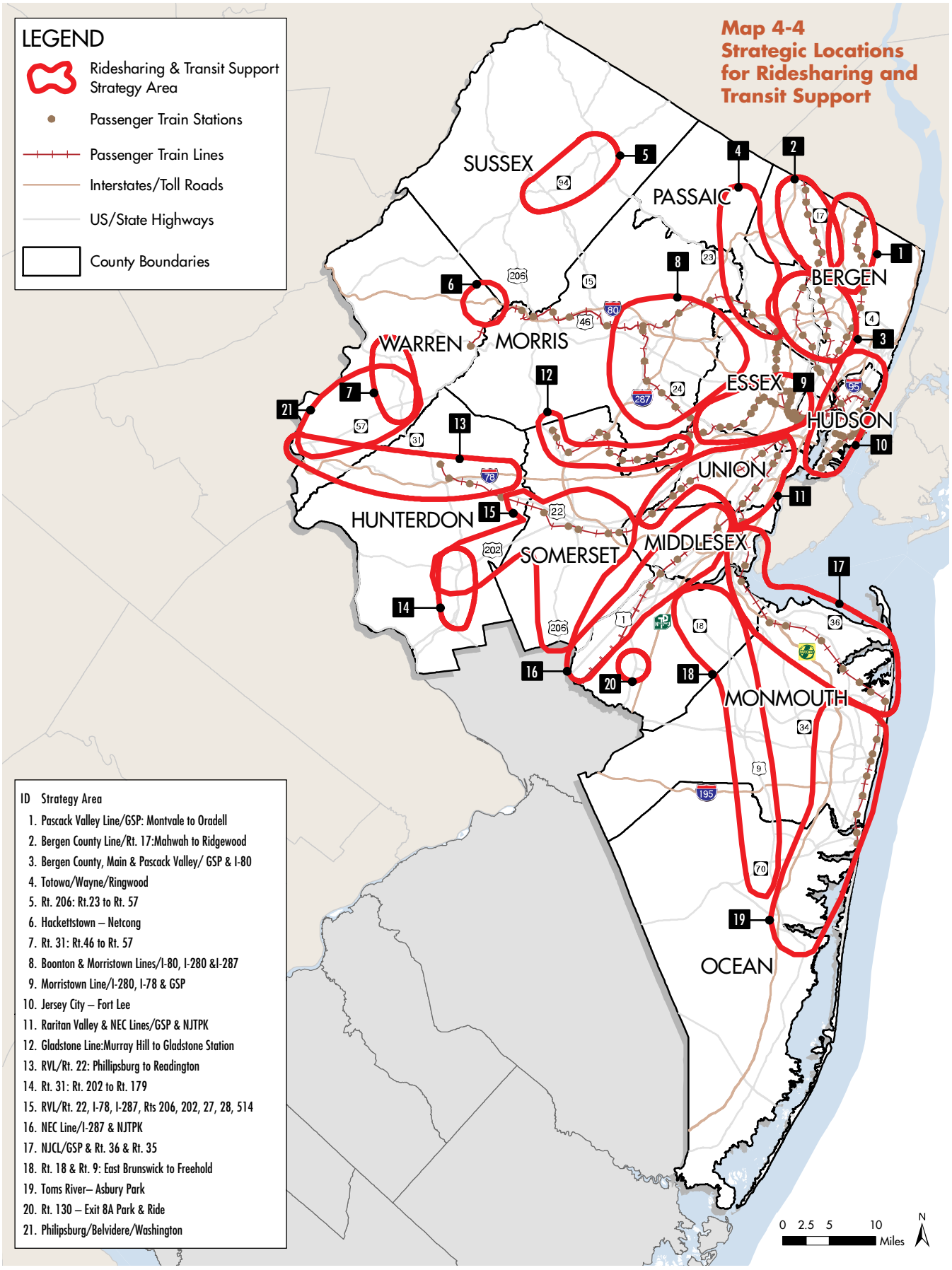
Ridesharing and Transit Support

Strategy Evaluation assesses needs and opportunities for strategies that enable travelers to conveniently access bus, rail and ferries and to coordinate their travel in shared autos and vans. These are important in helping improve the efficient movement of people, including increasing transit ridership. This assessment involved considering residential patterns around current transit stations, hubs and routes; patterns of regional commuting; and demographic trends, among others.

As described more fully in Chapter 6 (Implementation) strategies for enhancing ridesharing and transit support include:

- Improve Pedestrian and Bicycle Facilities Near Transit: Well-designed pedestrian and bicycle facilities around transit stations and stops can expedite trips, enable travelers to make efficient travel connections, reduce the need for parking facilities and result in enhanced public transit service overall.
- Expand Bus and Carpool Park-and Rides: There are many opportunities throughout the region to expand bus park-and-ride capacity. These facilities serve as cost-effective collecting points for commuters, especially in low density suburban areas "upstream" of major highway congestion.
- Improve Rail Park-and-Rides: For large parts of the region, adequate parking is essential to enable commuter rail or light rail use.
- Support Community Shuttles: Community shuttles can play an important role in providing access to the transit system. These small buses can often link residents with rail or bus service during peak commuting hours and then serve other purposes during the day.
- Support Ridesharing and Other Trip Reduction Programs: NJDOT, Transportation Management Associations (TMAs) and numerous employers operate programs to encourage the formation of carpools and vanpools and to link residents with employment centers. They include programs such as ride-matching and guaranteed ride-home services that make shared rides commutes a viable option, and telecommuting and flex-time policies help to either reduce trips or at least shift them out of the most congested times.

Map 4-4 identifies priority locations in the region


LEGEND
Ridesharing & Transit Support Strategy Area
Passenger Train Stations
Passenger Train Lines
Interstates/Toll Roads
US/State Highways
County Boundaries
Map 4-4
Strategic Locations for Ridesharing and Transit Support
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
ID Strategy Area
1. Pascack Valley Line/GSP: Montvale to Oradell
2. Bergen County Line/Rt. 17:Mahwah to Ridgewood
3. Bergen County, Main & Pascack Valley/ GSP & I-80
4. Totowa/Wayne/Ringwood
5. Rt. 206: Rt.23 to Rt. 57
6. Hackettstown – Netcong
7. Rt. 31: Rt.46 to Rt. 57
8. Boonton & Morristown Lines/I-80, I-280 &I-287
9. Morristown Line/I-280, I-78 & GSP
10. Jersey City – Fort Lee
11. Raritan Valley & NEC Lines/GSP & NJTPK
12. Gladstone Line:Murray Hill to Gladstone Station
13. RVL/Rt. 22: Phillipsburg to Readington
14. Rt. 31: Rt. 202 to Rt. 179
15. RVL/Rt. 22, I-78, I-287, Rts 206, 202, 27, 28, 514
16. NEC Line/I-287 & NJTPK
17. NJCL/GSP & Rt. 36 & Rt. 35
18. Rt. 18 & Rt. 9: East Brunswick to Freehold
19. Toms River– Asbury Park
20. Rt. 130 – Exit 8A Park & Ride
21. Philipsburg/Belvidere/Washington
0 2.5 5 10
Miles
N

where these and other strategies appear most promising for meeting access and mobility needs. Locations on the map cover much of the region, as reducing single occupant vehicle travel is to be supported everywhere. Particular strategies may differ from place to place based on what types of transit services are available or what shared rides are practicable. Vanpool/carpool and other trip reduction programs are not specifically mapped here, but are supported by this plan throughout the region.

Freight Movement

The NJTPA region is one of the busiest freight handling centers in the nation. Goods from all over the world enter and leave the United States through its marine terminals, and raw materials and finished products arrive and depart through major rail freight terminals. In addition, high-value, time-sensitive commodities are shipped via air cargo through its international airport and numerous small airports; and distribution centers along major highways dispatch goods via trucks to much of the northeastern U.S. The region's status as a freight hub is a key advantage in retaining and attracting businesses, and in supporting its overall economy. But it also creates ongoing needs to address increased highway traffic and improve infrastructure to support the port, rail terminals and other freight facilities.

Strategy Evaluation examined a host of potential strategies for improving the efficiency of goods movement in the region. These strategies are identified and discussed in Chapter 6 (Implementation). They address freight movement needs involving: highways and bridges; ports and port access initiatives; warehousing initiatives; rail initiatives; and air cargo initiatives.

Map 4-5 identifies locations where these freight-related infrastructure strategies will most effectively support regional goods movement. The facilities in the port area have been greatly developed over the past 100 years and will continue to play a critical role in the region's growth. Among the key needs for improving port access will be addressing inadequate clearance under the Bayonne Bridge and improving roads, possibly through grade separations or exclusive truck routes.

Beyond the port area, the map highlights a broad "Core Freight Facilities Area" representing the concentration of cargo facilities, warehouses, custom firms, intermodal facilities and railyards in Bergen, Essex, Hudson, Middlesex, and Union Counties. Improvements here should focus on meeting future freight movement and warehousing needs through enhanced network connectivity, intermodal freight facilities improvement and development, intelligent transportation systems and warehouse expansion.

Efficient truck transport is integral to the movement of freight in, out and through the NJTPA region. The map highlights major regional truck corridors for potential improvements: I -78, I-80, I-95, I-195, I-287, the NJ Turnpike, Route 17 and Route 18. Beyond general road enhancements, truck-specific improvements for these corridors might include intelligent transportation systems, expansion of rest areas (such as on the western portion of I-78 and I-80 and southern portion of I-95) and access management to minimize traffic conflicts, such as on Route 17 in Bergen County or Route 18 in Middlesex and Monmouth counties.

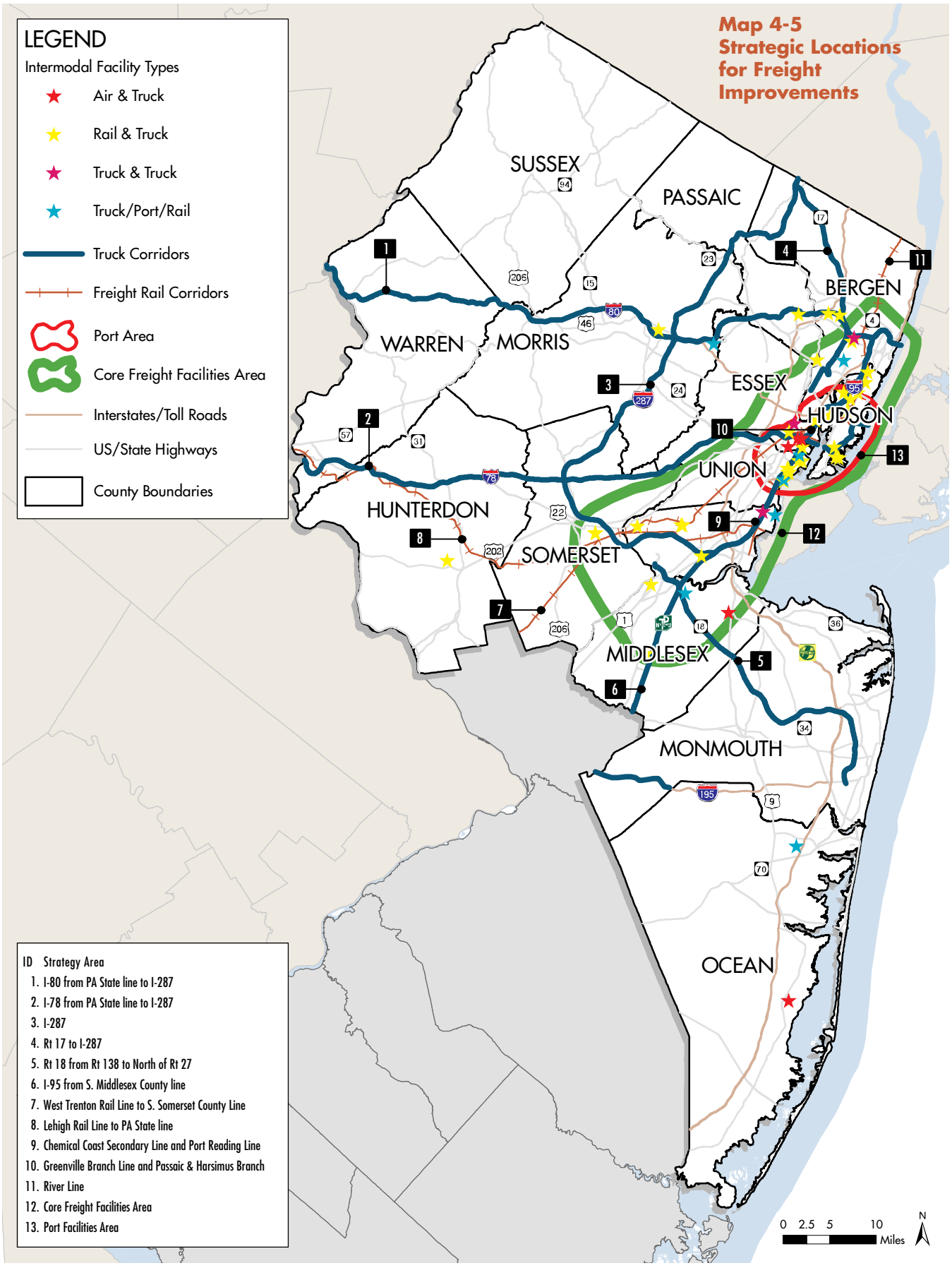
Moving freight by rail as much as possible has enormous benefits and the map shows primary rail freight corridors in the region. With the Chemical Coast, Lehigh Valley, Port Reading, River and West Trenton Lines, goods are moved efficiently through the region and into and out of neighboring Pennsylvania and New York. Supporting rail freight can involve track improvements and upgrades and enhanced signalization.

From Strategies to Projects

Identifying needs and strategies to address them, as discussed in this chapter, is usually only the first step in developing specific improvement projects that can be funded for construction. Particularly for more complex needs, there are multiple additional steps that can span a number of years prior to gaining funding for a specific project. Among the steps: further study of project concepts and options, assessing engineering requirements and costs, soliciting public comments, completing environmental reviews and analysis, preparing final engineering plans, gaining permits and approvals and acquiring needed land.

The NJTPA has a role in many of these steps. In particular, it administers and oversees programs that transform general strategies and project concepts into specific improvement projects. As discussed elsewhere in this plan, it conducts and supports corridor studies; provides funding for ongoing transportation planning by member subregions; provides competitive grants for studies of specific needs; and participates in cooperative studies of transportation needs with NJDOT, NJ Transit and other agencies.

Map 4-5 Strategic Locations for Freight Improvements



ID Strategy Area

1. I-80 from PA State line to I-287
2. I-78 from PA State line to I-287
3. I-287
4. Rt 17 to I-287
5. Rt 18 from Rt 138 to North of Rt 27
6. I-95 from S. Middlesex County line
7. West Trenton Rail Line to S. Somerset County Line
8. Lehigh Rail Line to PA State line
9. Chemical Coast Secondary Line and Port Reading Line
10. Greenville Branch Line and Passaic & Harsimus Branch
11. River Line
12. Core Freight Facilities Area
13. Port Facilities Area

Each year the NJTPA updates a Project Development Work Program that schedules the work needed to develop proposed projects for inclusion in updates of this long-range plan and for eventual funding through the yearly Transportation Improvement Program (TIP).

Despite this careful and often lengthy attention to regional needs, a fundamental fact remains—the region's needs greatly outstrip the funding available to address them. Hard decisions must be made each year about which needs to address. For this reason, creating long-term plans for financing and guidance for investment decisions is essential. That is the subject of the next chapter, Scenario Planning.

5

SCENARIO PLANNING

As discussed earlier (Chapter 3, Context & Trends), Plan 2035 predicts significant regional population and job increases between 2009 and 2035. The current economic downturn has slowed growth for now, but over the next 25 years, the region can expect to experience substantial growth. By 2035, the region will be home to:

- About 7.8 million people (an increase of nearly 1.1 million or 16 percent)
- About 3.7 million jobs (an increase of more than 500,000 or 17 percent)
- About 3 million households (an increase of more than 500,000 or 21 percent)

More people and more jobs mean more travel. The region's existing transportation network already is struggling to meet travel demand during peak periods, with drivers in many areas facing significant congestion-related delays. These delays have substantial

The future scenarios examined for Plan 2035 all forecast a significant increase in transit ridership. Light rail station, downtown Jersey City.

negative consequences, including worsening air quality, higher emissions, greater energy consumption and lost productivity. The region's public transportation system, particularly crossing the Hudson, is handling record-high ridership. The additional demand created by growth will severely challenge the transportation system to provide acceptable service to travelers.

To explore and understand appropriate responses and strategies to meet the demands of such growth, Plan 2035 identifies and evaluates three different future scenarios—a Baseline Scenario, the Plan 2035 Scenario and an Aspirational Scenario. These scenarios were developed using demographic and travel data as well as input from the visioning workshops discussed in Chapter 2. The scenarios were examined using a regional travel demand model that can gauge the effects of different land use and transportation choices guiding investments over the next 25 years.

The goal of this scenario planning process was to evaluate the effectiveness of a set of transportation and land development strategies to determine how well the transportation system would function in the future, given regional growth expected under all three scenarios. The future will of course not follow any of these scenarios precisely—elements of each may materialize or unforeseen events may occur. However, this exploration provides important insight into a realistic range of possibilities for the future.

The NJTPA region faces a future in which transportation investment needs (for both the existing system and new highway and transit services) far exceed projected funding from current sources. This means that significant policy decisions will be required at both the state and regional level to close the gap, whether through increased revenues, reductions in planned investments, changes in demand due to different land development patterns, or a combination of all three.

Plan 2035's three scenarios each offer a different possible path for the region as it attempts to align its goals with its resources. A common element of all three scenarios is the completion of the $8.7 billion MTT tunnel in 2017, which results in substantial increases in transit ridership. Also assumed for all is the region's desired and anticipated overall growth—growth which in actuality could fail to materialize if the transportation system does not continue to maintain the region's competitiveness. This chapter describes the scenarios and the results of modeling and includes a discussion of the outlook for bridge and pavement maintenance under each scenario. Details on the financial aspects of the scenarios can be found in Chapter 8 (Financing).

Baseline Scenario

The Baseline Scenario reflects a level of investment in transportation through 2035 commensurate with current trends in the region. These trends include:

- *Funding*—As described in Chapter 8 (Financing), transportation funding in New Jersey is currently on a negative trajectory, and the Baseline Scenario models the continuation of current funding trends. For both highways and transit, this funding level is below the level needed to simply maintain the condition of the existing networks, so performance will worsen and the backlog will grow (e.g., the percentage of deficient highway pavement will increase).
- *Demographics and Land Use*—The Baseline Scenario assumes current demographic trends, with no new changes in land use policy to encourage more population and job growth near transit stations and in other "centers."
- *Service and Capacity*—The Baseline Scenario includes only committed transit investments and highway improvements in the region.

In terms of highway capacity, the Baseline Scenario assumes that continued deterioration of the road network over time, combined with the increased demand created by a larger population, will reduce effective capacity by 5 percent. This reduction of capacity would stem from a failure to make necessary repairs to bridges and pavement, as well as an inability to make minimal capital expenditures to address the most critical highway congestion needs.

For more details on these projects, see Chapter 6 (Implementation) and Appendix D (Transit Investment Analysis).

Baseline Scenario Results

Key results from this scenario, projected for 2035 (and compared to 2009 conditions) include the following:

Impacts to Trip Making and Mode Choice:

- A roughly 17 percent increase in the number of trips made, driven largely by population and employment growth in the region.
- An increase of nearly 18 percent in the number of automobile trips made.
- A 48 percent increase in transit trips*
- The combined share of trips made by transit, walking and bicycling is expected to rise to 16 percent of all trips (as compared to 14 percent of trips in 2009).

Plan 2035's scenarios looked at different potential growth patterns for the region's cities, suburbs and rural areas. Newark.

Impacts to Highway Network Performance:

- Given increased activity with the large growth in population and employment anticipated for the region, roadway delays due to traffic congestion will go up—in this scenario to 7.8 minutes for the average trip as compared to 5.1 minutes in 2009.
- A 15 percent increase in regional Vehicle Miles Traveled (VMT).
- A more than 50 percent increase in VMT on roads experiencing extreme congestion (Level-of-Service "F").
- A 29 percent increase in the regional Vehicle Hours Traveled (VHT). This means overall network speeds will decrease by 2035, as hours traveled will increase significantly faster than miles traveled. Average highway speeds would be reduced by about 10 percent.

Implications of Baseline Scenario Results:

- Significantly greater automobile congestion (and associated delay) would occur by 2035 on an already stressed highway network.
- This increased highway congestion would mean significant corresponding negative impacts to the region, with higher greenhouse gas emissions, continued loss of productivity, and higher energy usage.
- A consequence of allowing highway conditions to degrade (along with the significant investment in new transit capacity brought about by the MTT and continued strong growth in the region's urban core—particularly Jersey City and New York City) might be a lower rate of growth in automobile usage than otherwise would be anticipated, with significant growth in transit ridership.
- The region would fail to address its backlog of maintenance needs on bridges and pavement.

** This dramatic rise in transit trip-making would, in large part, stem from the completion of the committed, major capital investments for the transit system, especially the MTT project with its associated increase in service and convenience offered by one-seat rides into Manhattan. However such an anticipated increase also reflects travelers avoiding the highway network which would suffer a degradation due to increased congestion and deteriorated highway pavement and bridge conditions under this scenario.*

Plan 2035 Scenario

This scenario represents the cornerstone of Plan 2035. The Plan 2035 Scenario assumes that additional new funding will become available, allowing the region to maintain its existing infrastructure while also adding a few critical new links to improve capacity and system performance. The Plan 2035 Scenario serves as the foundation of the financially constrained plan required by federal regulations. It also reflects the recurring themes that emerged in the visioning workshops held throughout the region to help develop Plan 2035—that the region needs to grow smarter by focusing development and redevelopment around transit and in mixed-use centers; invest in maintaining the existing transportation system that is in place today; and make investments that focus on "last mile" transit services (shuttles

to and from train or BRT stations to employment locations and/or concentrated residential locations).

Of note, the assessment of land development in this and the Aspirational Scenario implicitly takes into account transportation efficiencies that arise with smart growth, especially with respect to maximizing the number of people that can take advantage of investments in public transit service. (As discussed in Chapter 7, smart growth in general aims for efficiencies in land use, cost-effectiveness of infrastructure investments and environmental benefits.)

- *Funding*—As described in Chapter 8 (Financing), transportation funding for the existing network in this scenario allows the region to maintain and slightly improve existing system performance.
- *Demographics and Land Use*—Under this scenario, county-level demographics were held constant, but forecasts assumed improved land use that helps to focus more growth in development and redevelopment around existing or planned transit stations and stops and within mixed-use centers. Eight criteria were used to identify locations that would have potential for such development or redevelopment:
  - Participation in the Urban Tax Credit program
  - State Plan Center designation within the Plan Endorsement process
  - Transit Village designation
  - Urban Enterprise Zone community
  - Highlands Planning Area designation and Highlands Plan Conformance
  - Other plans (such as local transit-oriented development plans)
  - Input from visioning workshops conducted for Plan 2035
  - Redevelopment zones
- *Service & Capacity*—The Plan 2035 Scenario includes a modest (5 percent) increase in bus service in the region (representing such investments as new shuttles or connectors, increased frequency on bus routes or the implementation of bus priority treatments or BRT on critical corridors). However, the rail system used in this scenario (which includes the completion of the MTT and associated system upgrades) is identical to that of the 2035 Baseline Scenario. As discussed in Chapter 6 (Implementation), a number of other future rail projects in the region are now undergoing planning and environmental analysis and may be candidates for federal funding. It is expected that at least the initial operating segments, if found justified and feasible through detailed study, could be accomplished under the level of funding assumed for the Plan 2035 Scenario. However, since the exact mode, power source, alignment and other factors of these potential services are not determined at this point, the travel demand modeling for this scenario did not include these possible rail investments. Under this scenario, modest congestion mitigation efforts will occur on the highway network, allowing the region to maintain its current highway capacity. The Plan 2035 scenario assumes that bridges and pavement will be kept at least at current acceptable conditions, avoiding the degradation to highway capacity in the Baseline Scenario.

The connection between transportation and land use was an important aspect of the scenarios examined in developing Plan 2035. Phillipsburg, Warren County

Plan 2035 Scenario Results

Key results from this scenario include:

Impacts to Trip Making and Mode Choice:

- Trip making and mode choice under the Plan 2035 Scenario are anticipated to be similar to the Baseline: an increase in total trips, with transit and non-motorized trips making up a

greater share of all trips in the region overall as compared to 2009.

- Transit trips produced in the region are projected to grow substantially, totaling about 42 percent more than in 2009.*

Impacts to Highway Network Performance:

- With the region's projected increases in population and employment, delays experienced due to roadway congestion will increase from 5.1 minutes for the average trip in 2009 to 7.5 minutes under the Plan 2035 Scenario. This represents a somewhat smaller increase in such delay compared to the Baseline Scenario, amounting to about a 4 percent less.
- Under the Plan 2035 Scenario, the region would see 1 percent more VMT than under the Baseline. However, there would be a slight (3 percent) reduction in VMT on highways with extreme congestion (Level-of-Service "F"). Both of these changes would be due to the effective maintenance of pavement and bridges as opposed to the continued degradation of these assets assumed in the Baseline Scenario.
- Regional Vehicle Hours Traveled under the Plan 2035 Scenario would be the same as in the Baseline Scenario. With slightly more road travel occurring (VMT), this means overall highway speeds would be slightly higher under the Plan 2035 Scenario as compared to the Baseline Scenario. However, speeds are expected to be lower than 2009 in both the Baseline and the Plan 2035 Scenarios due to higher traffic volumes.

Implications of the Plan 2035 Scenario Results—Similar to Baseline Scenario

- Compared to 2009 conditions, the region's significant anticipated growth will mean that even under the Plan 2035 Scenario, the region's already stressed highway network will see more automobile congestion by 2035. The level of congestion would be similar but slightly lower than that of the Baseline Scenario.
- Maintaining pavement and bridges in a state-of-good repair, as assumed in the Plan 2035 Scenario, is critical to ensure that the highway network's ability to handle traffic does not degrade further. This results in slightly higher speeds and slightly lower levels of delay in Plan 2035 as compared to the Baseline.
- As was found in the Baseline, increased congestion levels compared to 2009 means significant corresponding negative impacts to the region with higher greenhouse gas emissions, continued loss of productivity, and higher energy usage. However, this will occur at a somewhat lower level than at the Baseline.
- Similar to the Baseline, the significant growth in transit system ridership is driven by increased highway congestion levels, the capacity provided by transit network expansion and continued strong growth in the region's Urban Core (particularly in Jersey City and New York City).

Under the Plan 2035 scenario, biking and walking trips in the region would grow significantly. Oldwick, Hunterdon County.

**The 42 percent increase identified here likely underestimates the actual transit ridership in the 2035 Scenario compared to the Baseline Scenario due to limitations of the analysis. In particular, the planned transit system expansion for which the Plan 2035 Scenario includes financial capacity could not be fully modeled. This includes several proposed rail expansions that are not yet fully specified (in terms of alignments and other details).*

Aspirational Scenario

The Aspirational Scenario assumes that significant new funding sources will be identified to make additional transportation investments in the region as compared to

Mixed-use centers are a key aspect of land use considered in Plan 2035. Newton, Sussex County.

the Baseline Scenario and the Plan 2035 Scenario.

As described above for the Plan 2035 Scenario, this Scenario also reflects the recurring themes that emerged in the visioning workshops, especially the need to grow smarter and invest in system maintenance while expanding the transit system. Details about the Aspirational Scenario include:

- *Funding*—As described in Chapter 8 (Financing), funding in this scenario significantly increases, allowing the region to virtually eliminate the backlog of deficient highway pavement and bridges and make significant improvements to address highway congestion at critical locations such as bottlenecks and improve transit service by increasing service frequency and expanding the transit system to serve new locations.
- *Demographics and Land Use*—This scenario assumes an even greater concentration of development and redevelopment into mixed-use centers by channeling more of the growth forecasted for the region into urban core areas, additional centers along transit lines, and additional mixed-use centers in the smaller cities and towns. The reallocation of regional growth for this scenario did not hold constant county-level demographic projections.
- *Service and Capacity*—The Aspirational Scenario includes a variety of system improvements such as:
  - Expanded Bus Services—All non-New York City bus routes experience 25 percent additional service (more frequent service).
  - Improved Transit Network Coverage—Includes enhanced accessibility to transit to reflect likely future extensions and expansions and the concentration of a greater share of regional growth in mixed use centers near transit stations which are more conducive environments to walking and bicycling to transit.
  - Rail Service Expansion—Provides for more frequent train service in the peak-period to Hoboken Terminal and increases the frequency of off-peak train service on all existing passenger rail lines.
  - PATH Service Expansion—Provides additional off-peak service frequency.

This scenario also assumes increased driving costs and parking fees, helping to make transit the mode of choice for more travelers in the region and to support the expanded transit services that would be operating in the region. These increased costs, depending how they are structured, might focus principally on auto trips in certain congested corridors; specific locations such as downtowns, concentrated employment centers and entertainment destinations; and/or peak periods. However, they might also include region-wide measures such an increased gas tax.

Additionally, this scenario assumes that a greater share of anticipated demographic growth would happen in locations where parking charges are in effect, including urban core areas, denser towns and cities in the region and around mixed-use transit centers. The assumed increased costs of auto use would be matched by more extensive and convenient transit services for many trips now made by auto. It is also possible that the increased costs could come about because of market conditions creating significantly increased gasoline prices (as occurred in 2008).

It should be noted that the assumptions for increased costs of driving and increased parking fees were included in the scenario to allow assessment of the impacts of substantially increased transit demand in the region. In reality, implementation of such increased costs or fees would have to be balanced against the need to support auto mobility where transit is not a viable travel alternative. In addition, it will be desirable for many downtown business districts to pursue creative, innovative parking strategies to attract

patrons and businesses. The assumptions about driving cost and parking fees were as follows:

- Automobile operating costs 50 percent more than in 2009—This could involve toll increases, congestion pricing policies, increased fuel prices, higher registration fees, VMT taxes, etc. Or it could involve dramatically higher gasoline prices.
- Increased Parking Fees—Includes parking fees 20 percent higher than 2009 for areas of the NJTPA region that have a transit score of medium or above. (NJ Transit calculates a "transit score" for areas based on population density, employment density and zero-car household density to anticipate the success of various transit investments.)

Aspirational Scenario Results

Impacts to Trip Making and Mode Choice:

- Under the Aspirational Scenario, the total number of auto trips would be slightly less than under the Plan 2035 Scenario. Non-motorized trips (those made by bicycling or walking) would grow—an increase of 100,000 trips per day when compared to the Baseline and Plan 2035 Scenarios. This is a result of further concentrating forecasted regional growth in centers, where non-motorized modes can be used effectively.
- Transit trips in the region would also grow by more than 100,000 (approximately 7 percent) versus the Baseline and Plan 2035 Scenarios (60 percent as compared to 2009 conditions). This is due to the significant investment in transit and is related to the increase in non-motorized travel, both facilitated by capturing more growth in center-oriented development, as described above.

Impacts to Highway Network Performance:

- Delays experienced due to roadway congestion will increase to "only" 7.1 minutes for the average trip under the Aspirational Scenario. This represents a somewhat smaller increase compared to the Baseline Scenario and is slightly smaller than under the Plan 2035 Scenario.
- Slightly lower regional VMT is anticipated under the Aspirational Scenario as compared to the Baseline Scenario, with 5 percent less VMT occurring on facilities with extreme congestion (Level-of-Service "F"). This is due to the effective maintenance of pavement and bridges as opposed to the continued degradation of these assets considered in the Baseline Scenario.
- Three percent lower regional VHT is anticipated under the Aspirational Scenario than estimated for the Baseline.

Implications of the Aspirational Scenario Results—as Compared to Baseline and Plan 2035

- While growth in congestion over current conditions is anticipated regardless of scenario, the congestion delay experienced during an average trip is expected to be 8 percent lower in the Aspirational Scenario than in the Baseline Scenario. This represents avoiding about a quarter of the projected growth in the delay anticipated for the Baseline Scenario.
- Substantial increases in travel by bicycling and walking.
- Significantly higher utilization of the public transit system.
- Improved highway network performance that results in lower congestion levels, higher speeds, and lower pollutant emissions. With not as much time spent in travel, average travel speeds would be correspondingly faster for the Aspirational Scenario than under the Baseline. Thus, the highway system would move vehicles more efficiently than under the Baseline Scenario.
- Bridges and pavement maintained in a state of good repair.

Table 5-1 summarizes the key indicators under each of the scenarios discussed in this chapter. (Some of the small differences noted above may not be evident in the table due to rounding.)

Implications for Highway and Pavement Maintenance

The charts below show the projected impact of the three plan scenarios on meeting the need for addressing pavement and bridge maintenance, as discussed in Chapter 4 (Needs and Strategies). As Figure 5-1 demonstrates, pavement condition in North Jersey is actually projected to continue to improve even under current funding trends. However, this would still leave a significant fraction of the roadway network in an unacceptable condition, and thus the Plan 2035 Scenario anticipates an increase of roughly 25 percent in pavement funding, while the Aspirational Scenario posits a 50 percent in-

Table 5-1
Average Weekday Indicators for Scenarios

Indicator (*NJTPA region, average weekday*)	2009	2035 Baseline	2035 Plan	2035 Aspirational
Auto Trips (million)	17.2	19.8	19.8	19.6
Transit Trips (million)	1.0	1.5	1.5	1.6
Non-motorized trips (million)	1.8	2.2	2.2	2.3
Average Delay (minutes per trip)	5.1	7.8	7.5	7.2
Vehicle-Miles Traveled (million)	144	165	167	164
Vehicle-Miles Traveled at Level of Service "F" (million)	25	38	37	36
Vehicle-Hours Traveled (million)	4.9	6.3	6.3	6.1

Numbers are rounded

Figure 5-1
NJTPA Region Highway Pavement Acceptability
Three Plan Scenarios

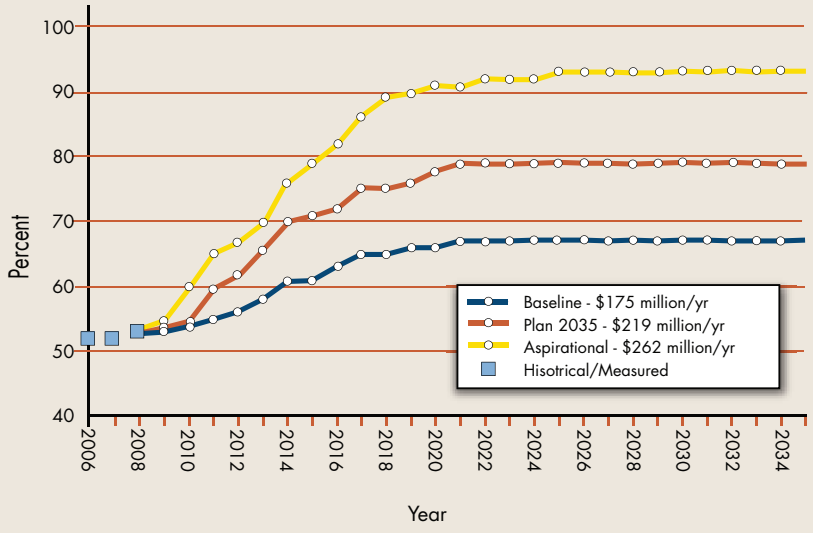
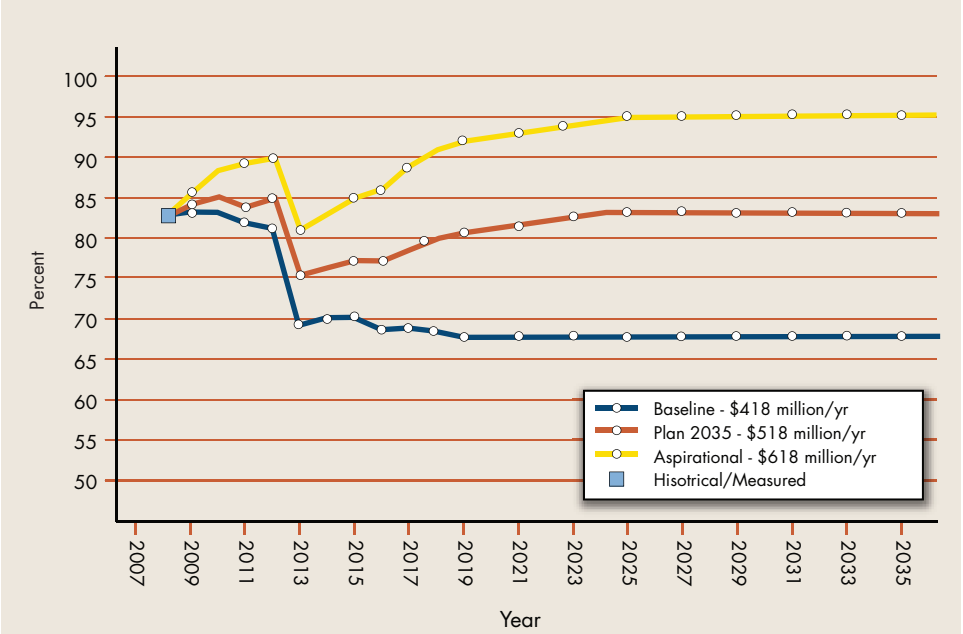


Figure 5-2
NJTPA Region State-Maintained Bridge Acceptability (% not Structurally Deficient): Three Plan Scenarios



crease in funding in order to truly meet the region's pavement needs.

Figure 5-2 demonstrates the more precarious conditions of the region's bridges. As the region's bridges continue to undergo wear from heavy traffic volumes, an increasing share are projected to become deficient in the next five years. The region's overall bridge acceptability rating will fall significantly. At current funding levels, the region will never recover from this drop and will be forced to play "catch-up," potentially even facing the restriction of traffic on certain deficient bridges. A 25 percent increase in bridge funding, as in the Plan 2035 Scenario, will at least allow the region to make a long-term recovery back to currently acceptable conditions, while a 50 percent increase would allow for more rapid near-term bridge improvements and a path toward a very high long-term level of acceptability. As noted in Chapter 4 (Needs and Strategies) adequate levels of funding can allow the region to move beyond addressing the backlog of needs to conducting the kind of preventative maintenance that avoids more costly future repairs and slows the accrual of needs.

Direction for the Future

Plan 2035 predicts strong northern New Jersey growth in the coming decades, but this growth both relies on and impacts the transportation system. The scenario analysis illuminates how choices made now can foster not only population and employment growth, but can also help ensure such growth is sustainable, that the environment is protected, that infrastructure remains safe, dependable and flexible, that the region's economic competitiveness is strengthened and that the region's communities are shaped in ways that enhance quality of life.

The Plan 2035 Scenario and the knowledge gained from considering Baseline and Aspirational Scenarios demonstrates that the funding levels for transportation must be increased and investments must be made that specifically support the goals of this plan. This means targeting improvements to support public transit, walking and biking trips, making the roadway system work better, supporting more efficient goods movement, and providing a smarter, more interconnected system for a better informed traveling public. The measures that will be taken to accomplish these goals are presented in the next chapter, focusing on how Plan 2035 will be implemented.

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.

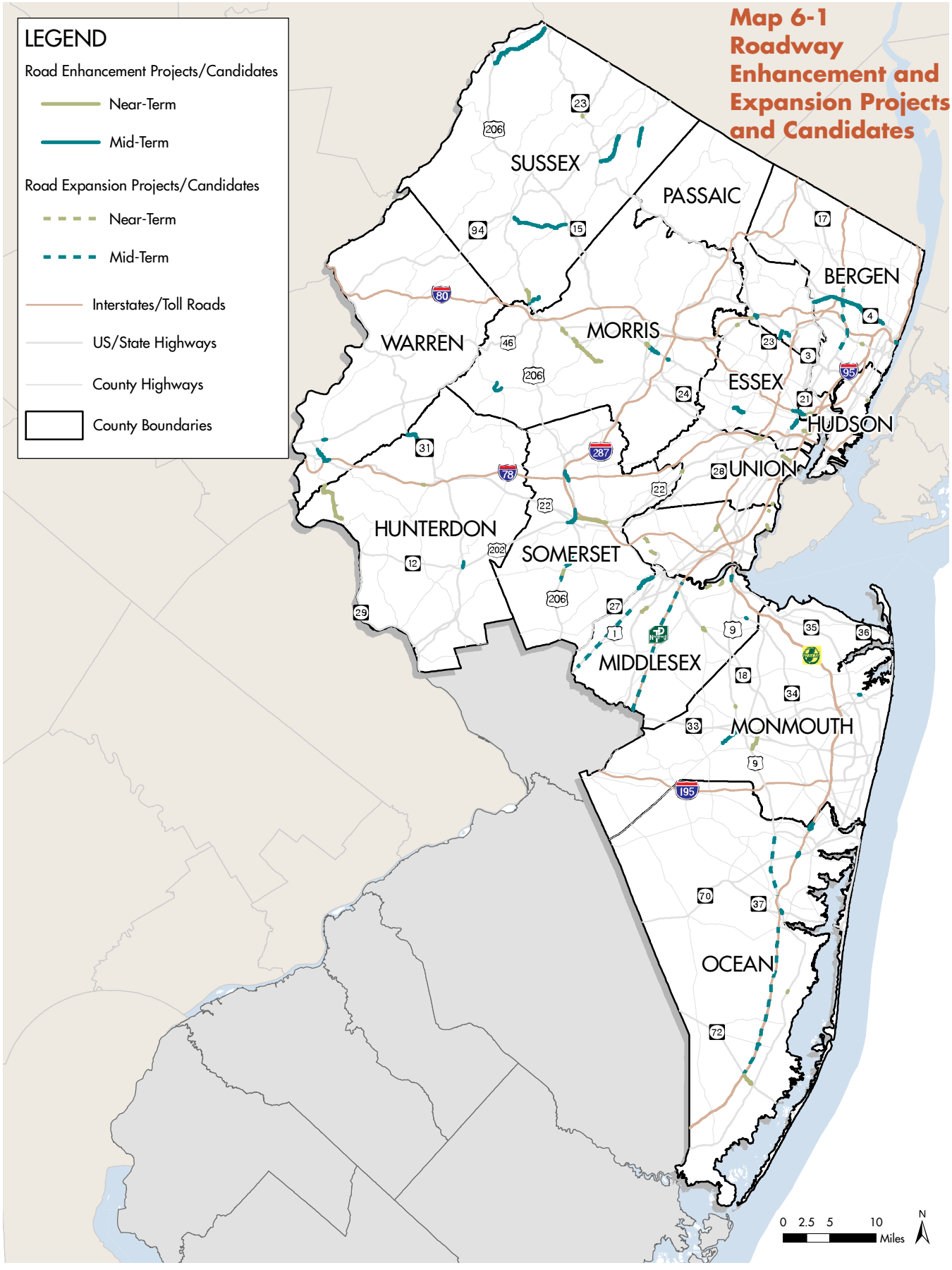
Table 6-3
Sample Roadway Enhancement Projects

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

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.

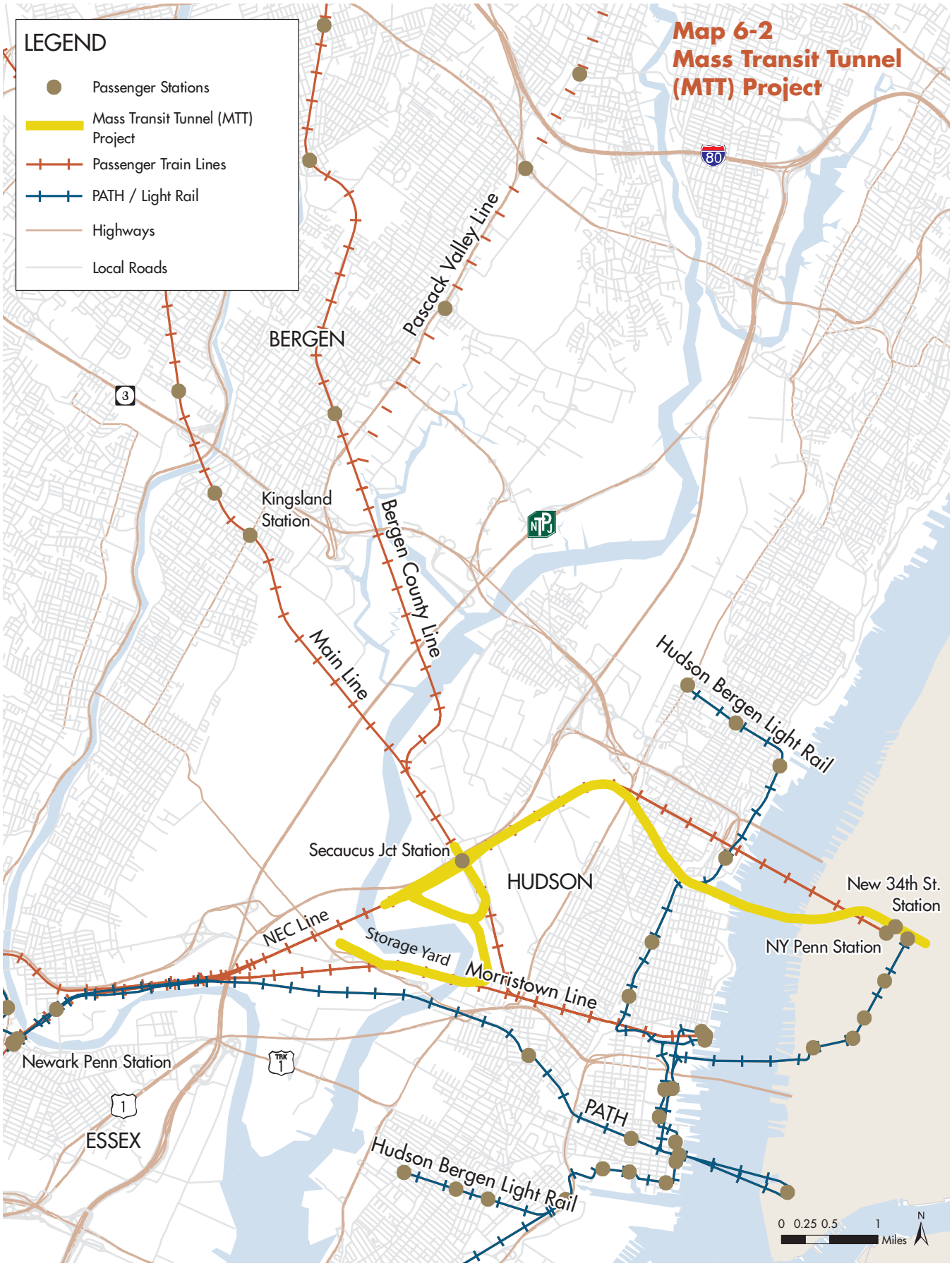
Dual Mode Locomotives

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
BERGEN
Pascack Valley Line
Kingsland Station
Bergen County Line
Main Line
Hudson Bergen Light Rail
Secaucus Jct Station
HUDSON
New 34th St. Station
NY Penn Station
NEC Line
Storage Yard
Morristown Line
Newark Penn Station
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.

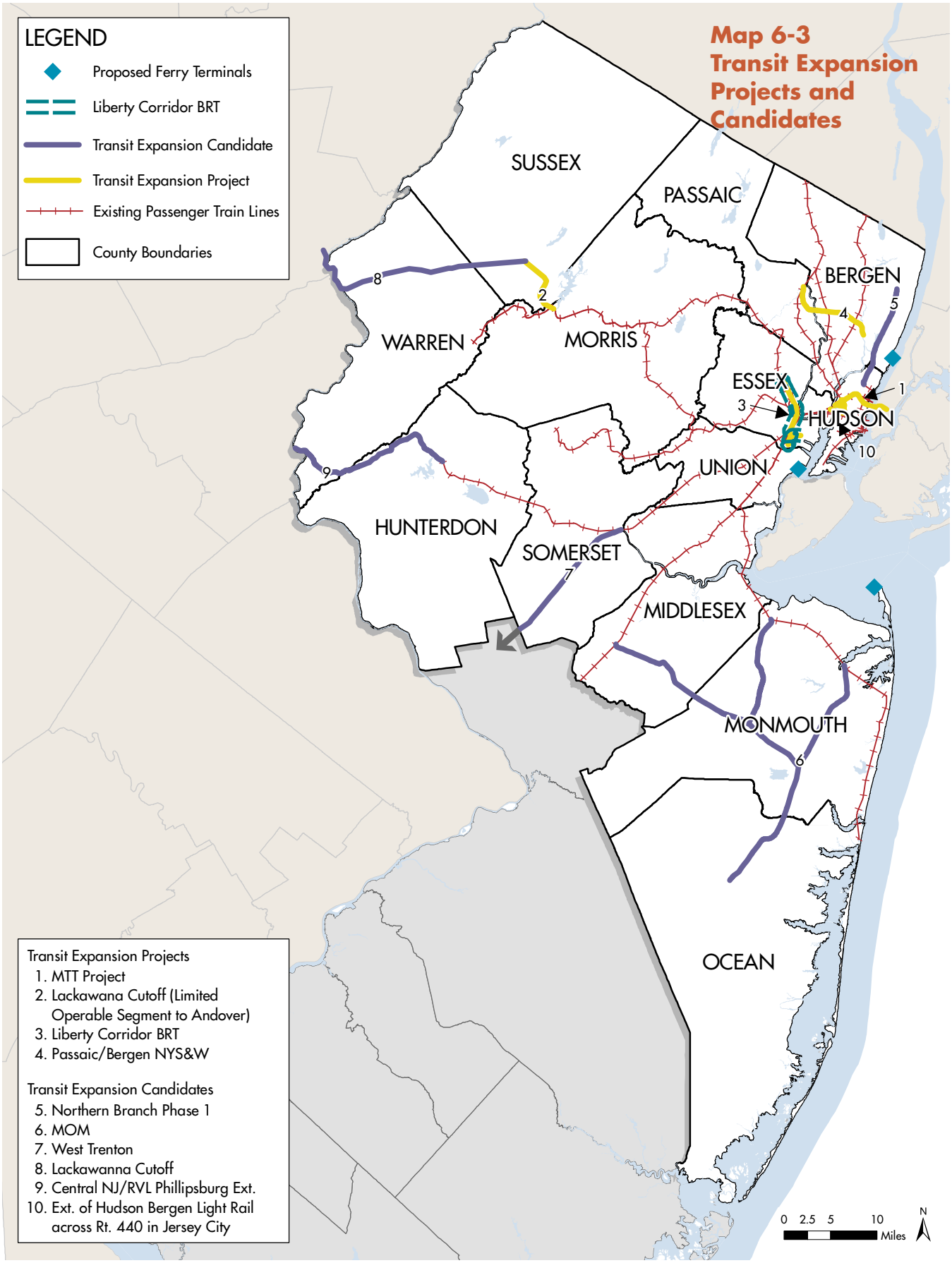
In studying proposals, consideration must be also given to limiting costs through phased implementation. This might involve constructing segments that stand the greatest prospect of attracting riders and serving regional needs while leaving other segments for future consideration based on the performance 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.

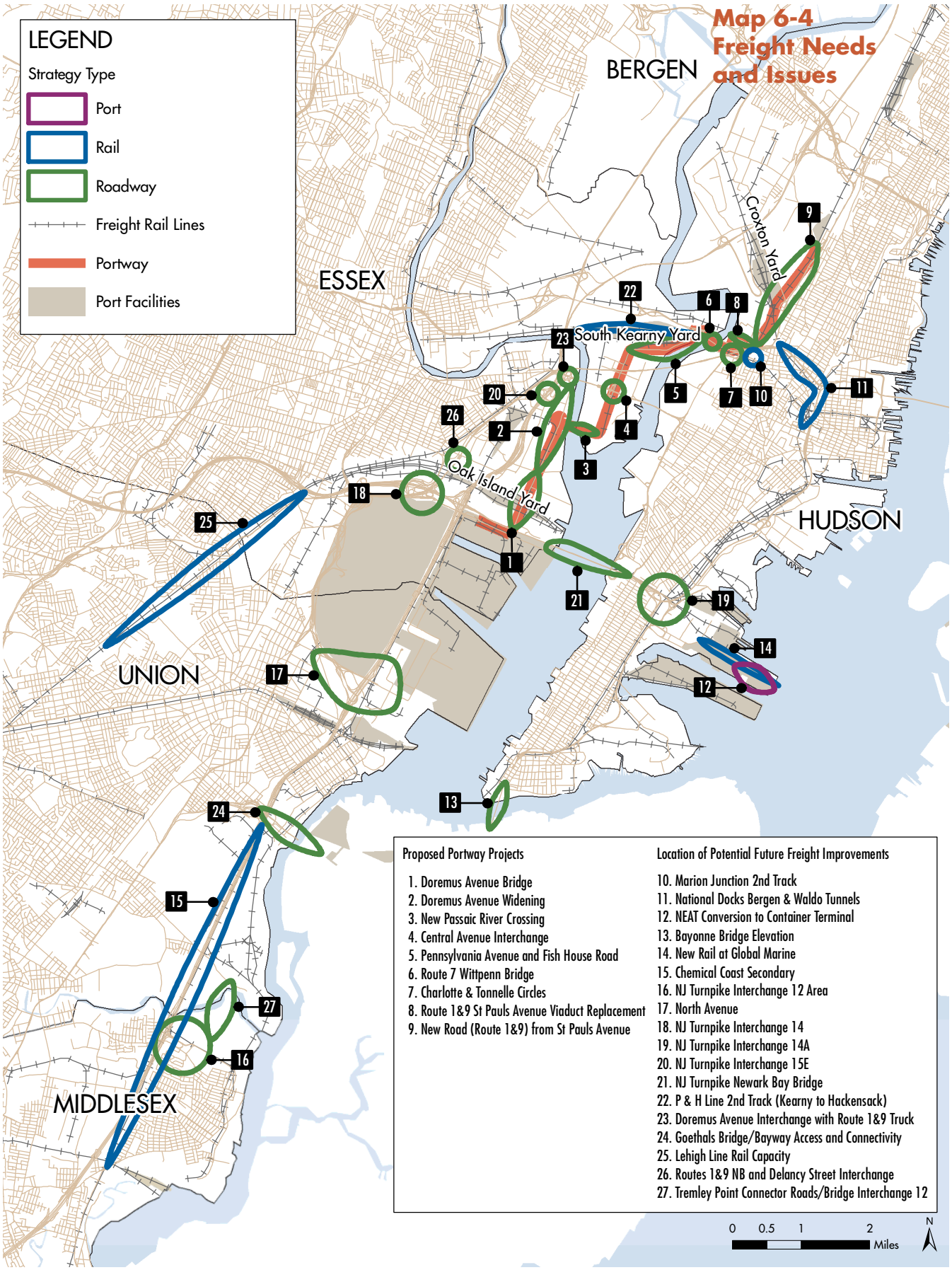
As discussed in Chapter 3 (Context and Trends), despite the current downturn which has dramatically reduced some freight movement activity, over the long term, Plan 2035 foresees a significant increase in regional freight activity. For example, the volume of containers handled at the port is projected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

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

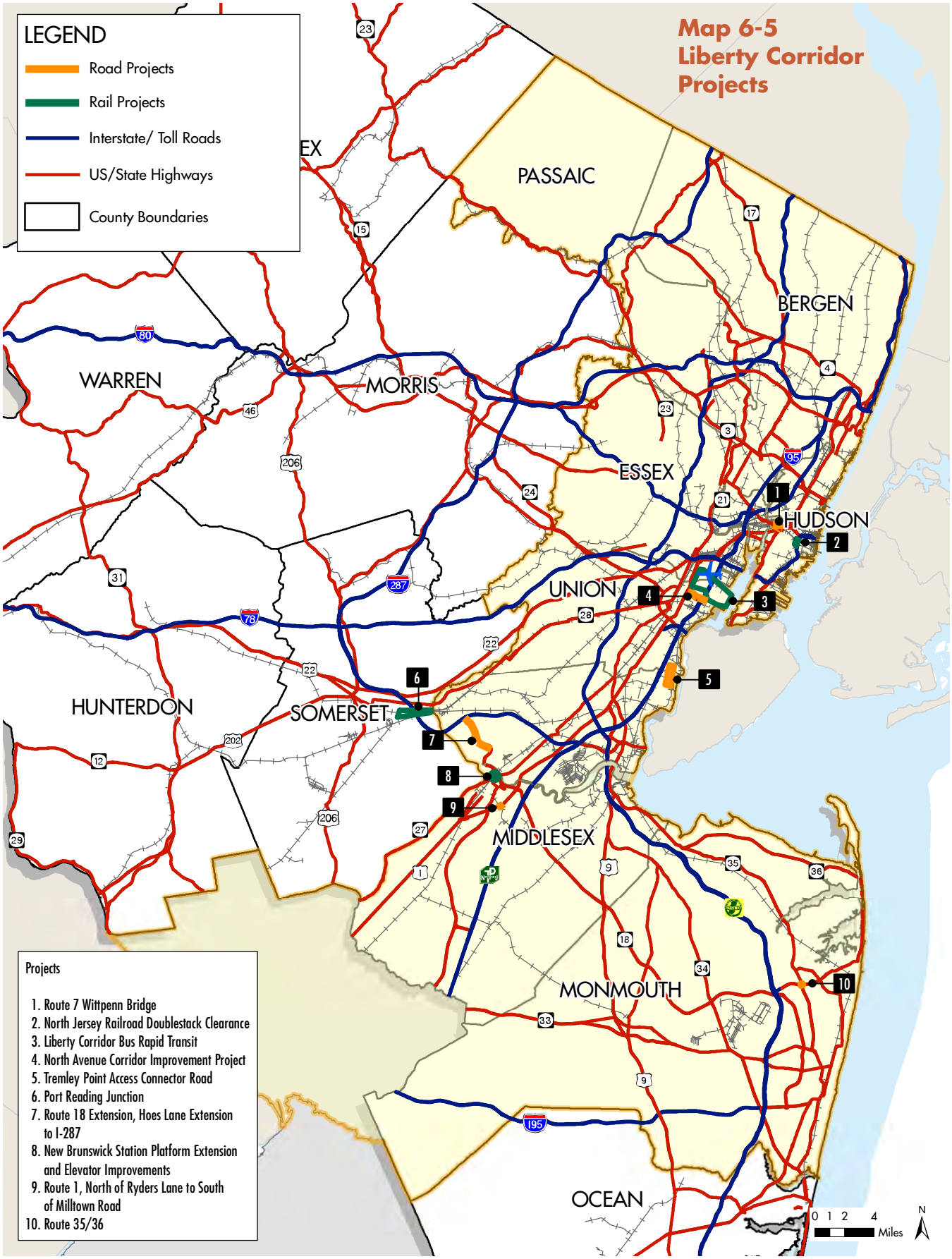
The Liberty Corridor is a congressionally designated economic development and transportation zone that encompasses major port facilities, roadways, rail lines, an international airport, brownfield development sites, universities, corporate campuses and research and development facilities. The corridor 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 chokepoint 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
0 1 2 4
Miles
N

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

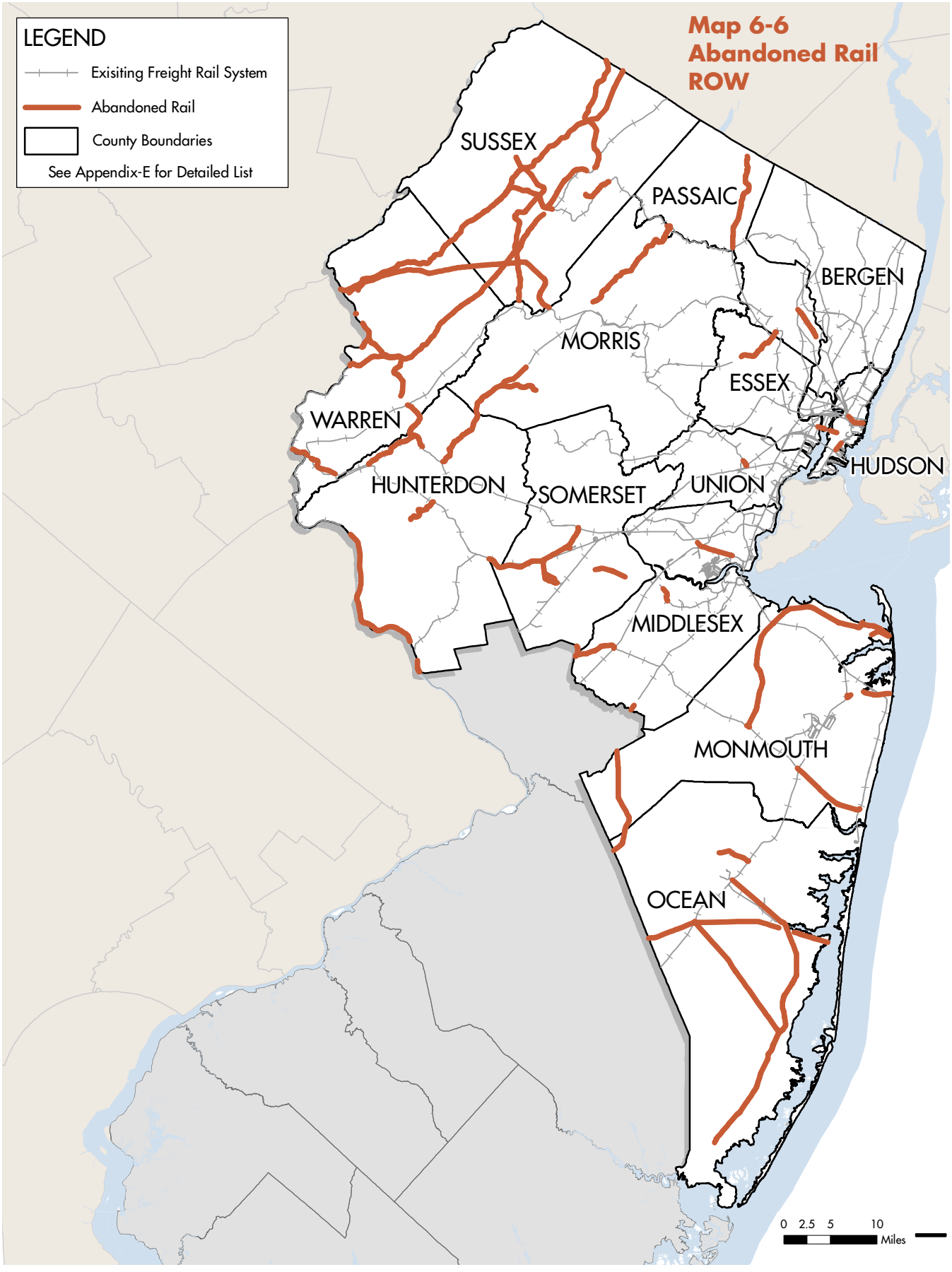
Transportation planning and investment in the region must make travel safer and more secure. Over the life of this plan, safety and security measures should, whenever possible, be included in the planning, design and implementation of all projects. The region also will look to increase spending on direct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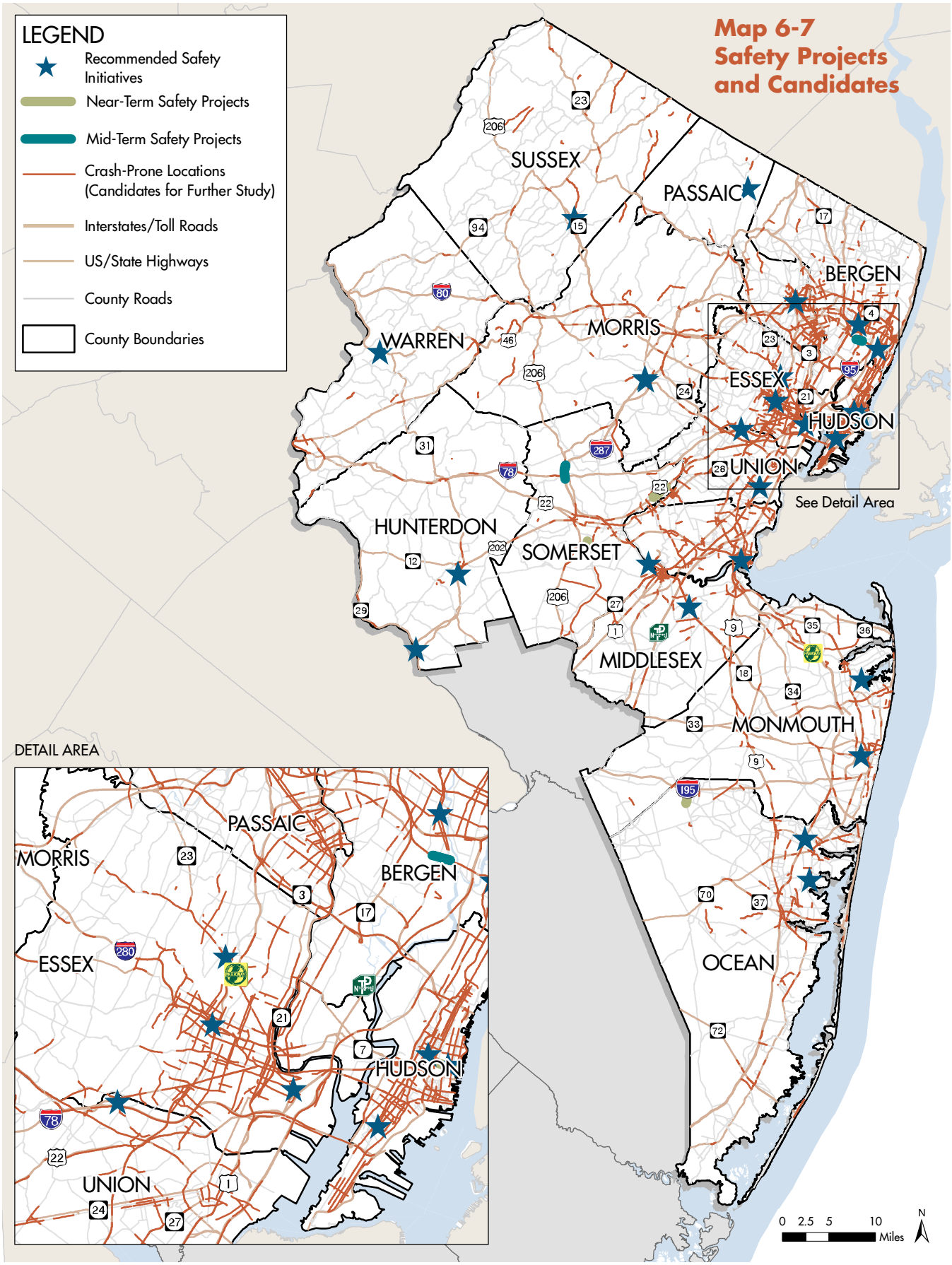

Map 6-7
Safety Projects
and Candidates
LEGEND
Recommended Safety Initiatives
Near-Term Safety Projects
Mid-Term Safety Projects
Crash-Prone Locations (Candidates for Further Study)
Interstates/Toll Roads
US/State Highways
County Roads
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
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.

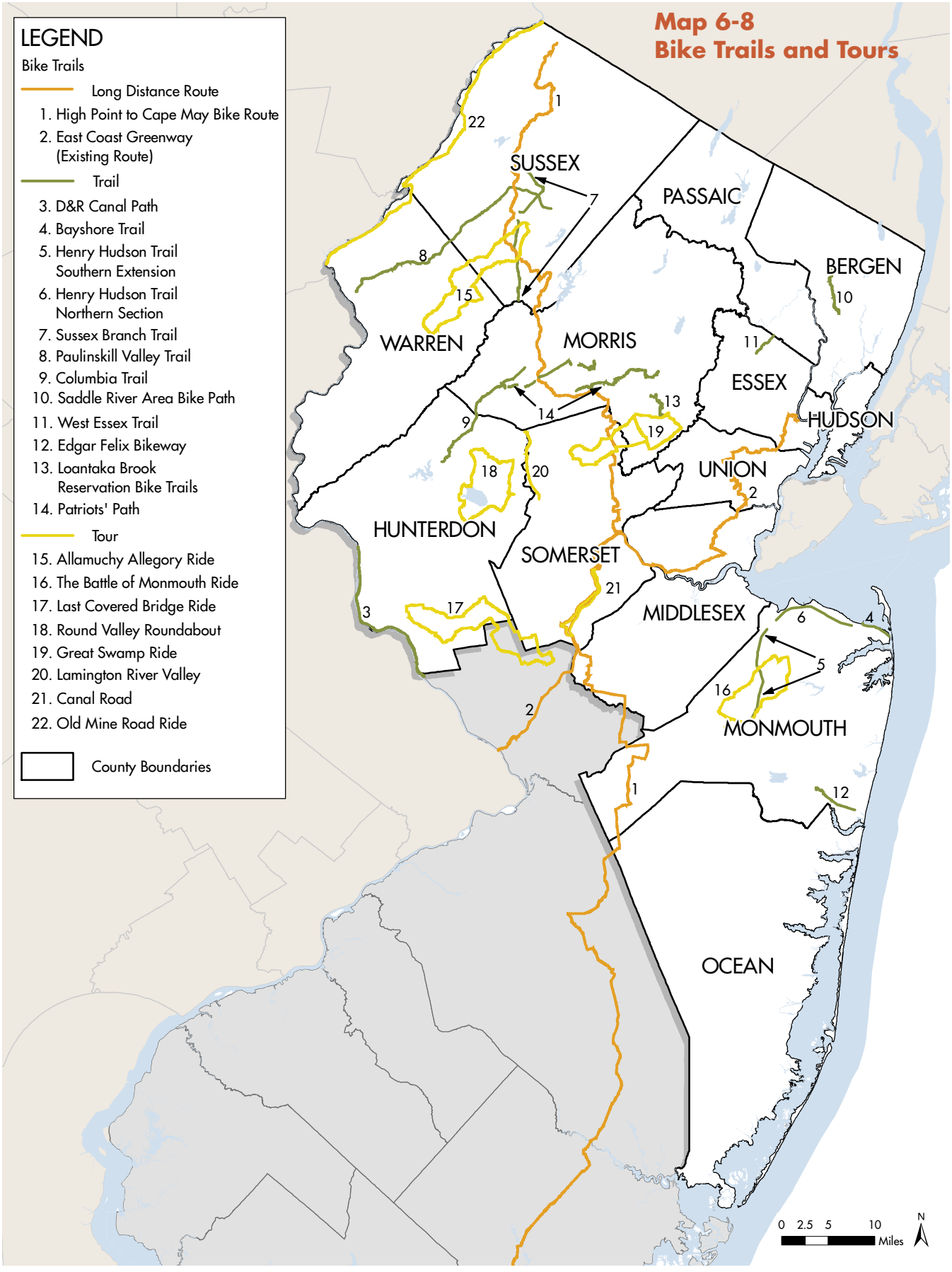
At the regional scale, several larger inter-county paths, routes and trails are in various stages of planning, development or construction, supporting regional bicycle and pedestrian connections. Although a number of these regional trails use the shoulder of existing roadways, others are designed as 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
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- 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.

7

TRANSPORTATION, LAND USE, & THE ENVIRONMENT

Transportation, land use, and the environment are inextricably linked. Even the most basic transportation feature—a naturally worn footpath—affects land use and the environment.

The NJTPA considers many factors when deciding how to invest transportation funds. How well the investment supports smart growth and environmental goals are two critical considerations. This chapter outlines the relationship between land use and transportation and provides guidance on how the region can best manage these factors to grow wisely over the life of Plan 2035. The chapter also contains information on the NJTPA's efforts to address greenhouse gas emissions and to promote environmental mitigation activities in its planning efforts.

Transit-oriented development can encourage ridership and help combat sprawl. Bradley Beach, Monmouth County.

Reversing Sprawl

Long-standing development patterns in the region have led to heavy reliance on the automobile. Route 10, Morris County.

In the NJTPA region, decades of low-density residential and commercial development, mainly on previously undeveloped land, have had significant impacts on the transportation system. Supported by a variety of government policies, the low density development in suburban areas has allowed large numbers of citizens to own homes and fostered an auto-oriented lifestyle often seen as part of fulfilling the American Dream for families. Yet as low-density settlement patterns and segregated land uses have taken over greater expanses of the landscape, their costs have become all too apparent. Such "sprawl" development generates greater dependency on the automobile, subjecting many roads and bridges to far more traffic than they were designed to handle. At the same time, sprawl settlement patterns leave too few people per square mile to support cost-effective public transit services and make it more expensive to provide homes with power, sewer, water and other public utilities.

Sprawl also has drastic impacts on the environment. Sprawl increases the number and distance of automobile trips, eroding the region's air quality and adding to the release of carbon dioxide, a greenhouse gas that contributes to global warming. Sprawl development consumes large portions of the region's landscape, converting agricultural land and woodlands into low-density development while negatively affecting water quality and wildlife habitat.

Reversing the trend towards increasing sprawl was one reason the New Jersey Legislature in 1985 enacted the State Planning Act, which led to the creation of a State Development and Redevelopment Plan. This "State Plan" went through updates in subsequent years and became a guide for smart growth investment strategies pursued by the NJTPA and other agencies.

Smart growth principles outlined in the State Plan encourage development in designated centers with existing infrastructure. In keeping with this smart growth approach, the NJTPA supports compact development in areas already served by transportation infrastructure, including redevelopment of urban areas. Compact development and redevelopment reduces development pressure on rural and exurban land and helps preserve open space and protect the environment. It also creates more walkable, transit-friendly communities, helping improve the efficiency of the transportation system. Among the transportation benefits:

- Reducing the overall number trips of auto to help relieve region-wide congestion;
- Reducing the length of trips to remove a large number of trips from highways that now can be made locally;
- Increasing accessibility to a greater number of destinations in less travel time for residents;
- Providing centralized pick-up and drop-off locations for buses that boost ridership levels and make possible frequent, cost-effective services;
- Providing the population density needed to support expanded rail service.

Beyond these transportation impacts, there are more far-reaching effects of smart growth:

Energy Efficiency - Smart growth reduces reliance on fossil-based fuels. Not only are fewer autos burning gasoline, but walkable communities lend themselves to more energy-efficient buildings. Mixed-use buildings are generally more energy efficient, because shared walls are better insulators than exposed walls.

Healthier living - Living in walkable and bike-able communities is also healthier than living in a car-dependent neighborhood. In New Jersey, more than 20 percent of

ådults and 16 percent of children are obese, reflecting a "nationwide obesity epidemic," according to the Centers for Disease Control. Physical activity is key to a healthy lifestyle, and smart growth planning principles can encourage walking and cycling for local trips instead of traveling by automobile. Planners measure a neighborhood's "walkability" in terms of how far a resident must walk between destinations. A 5 to 10-minute walk, or a quarter to half-mile, is considered the standard for how far a person will normally walk to get to transit or run an errand. Programs that support smart growth, like the Urban Hub Tax Credit, use a half-mile radius around a center to determine eligibility. A 2006 study published in the Journal of the American Planning Association found that a "modest 5 percent increase in neighborhood walkability was associated with a 32.1 percent increase per week in physically active travel (and) approximately a one-quarter point lower BMI (about 1.5 pounds)." There is also evidence that a reduction in vehicle miles traveled leads to a corresponding decrease in harmful air pollution.

Improved Social Capital - A new and growing field of study into social capital—the relationships and bonds between people in a community—tells us that walkable, compact development enhances connections between residents and their communities, as reflected by surveys on civic engagement. It is estimated that every 10 minutes of commuting reduces social capital by 10 percent. That means those with long commutes interact less with their neighbors and are less likely to join community groups or local teams.

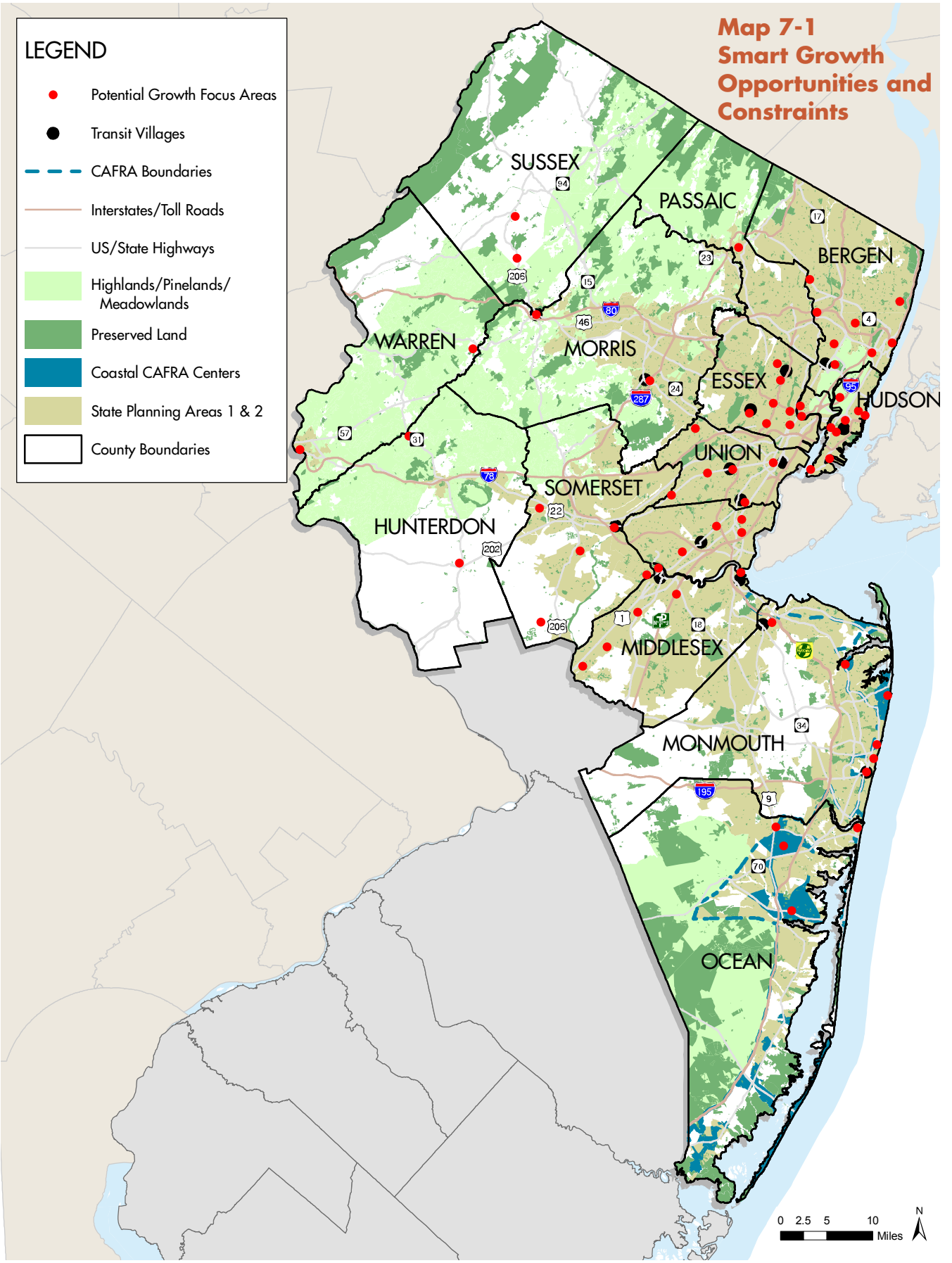
Reducing Greenhouse Gas Emissions - Smart growth strategies for reducing auto dependence can also cut greenhouse gas emissions. In 2007, the Intergovernmental Panel on Climate Change declared that "Most of the observed increase in global average temperatures since the mid-20th century is very likely due to observed increase in anthropogenic GHG concentrations." New Jersey has been a leader in taking steps to reduce greenhouse gases. In 2007, the Legislature passed the Global Warming Response Act, which sets targets for greenhouse gas reduction in the state. Transportation-related sources make up the largest portion of New Jersey's greenhouse gas emissions and are growing. In order to reduce these emissions, the region's dependence on automobile use—specifically single occupancy vehicles—must be reduced through changes in land use policy, as well as improvements in technology and expansion of non-auto travel options.

Recognizing these benefits, increasing numbers of residents, elected officials and planners are coming to embrace smart growth policies. This increase in support follows a number of developments in recent years:

- Emergence of new and better data on the causes of climate change;
- Increased realization of the importance of wetlands and open space;
- Greater awareness of the geopolitical ramifications of oil consumption after the run-up in prices in 2008;
- Deeper knowledge of the health and social effects of a motorized lifestyle;
- Market acceptance of compact communities with urban lifestyles

Progress on smart growth is being made in northern New Jersey. For example, in the last five years two of the region's urban areas have expanded their light rail service with great success. And more and more communities are developing smart growth agendas, Complete Streets ordinances, and sustainability plans.

Plan 2035 encourages sustainable transportation approaches such as alternate fuels and higher-efficiency vehicles.


Map 7-1
Smart Growth
Opportunities and
Constraints
LEGEND
Potential Growth Focus Areas
Transit Villages
CAFRA Boundaries
Interstates/Toll Roads
US/State Highways
Highlands/Pinelands/
Meadowlands
Preserved Land
Coastal CAFRA Centers
State Planning Areas 1 & 2
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
SOMERSET
HUNTERDON
MIDDLESEX
MONMOUTH
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NJTPA Land Use & Environmental Strategies

Environmental stewardship is central to the transportation planning process. Federal and state regulations (discussed later in this chapter) require careful assessment and mitigation of the potential negative environmental impacts of transportation improvements. Wherever possible, the NJTPA seeks to avoid negative impacts—and the need to mitigate them—through the application of smart growth planning principles in transportation investment decisions. The following sections discuss some key approaches Plan 2035 will pursue to encourage smart growth land use, attend to environmental and climate needs and promote a sustainable transportation system. Map 7-1 shows smart growth opportunities and constraints.

Place-Based Planning

Transportation infrastructure is an especially important determinant of how places develop. From the interstate highways of the 1950s to the new light rail lines of recent years, development and redevelopment has followed transportation. To help identify investments that will both support appropriate development and address mobility needs, the NJTPA uses a system of "place types."

The region's 384 municipalities (and, in some cases, parts of municipalities), were assigned place types, creating 397 "places" in the region for the purpose of identifying needs (see Map 7-2). This approach helps the NJTPA consider the varying needs of different sorts of communities when making investment decisions. For example, a new highway off-ramp in a rural area would have the potential to change the character of the area by encouraging sprawl development. The same type of investment in a place identified as "Metropolitan with Industry" could encourage continued industrial growth or redevelopment while diverting heavy truck traffic from local roads.

Linking Investment With Smart Growth

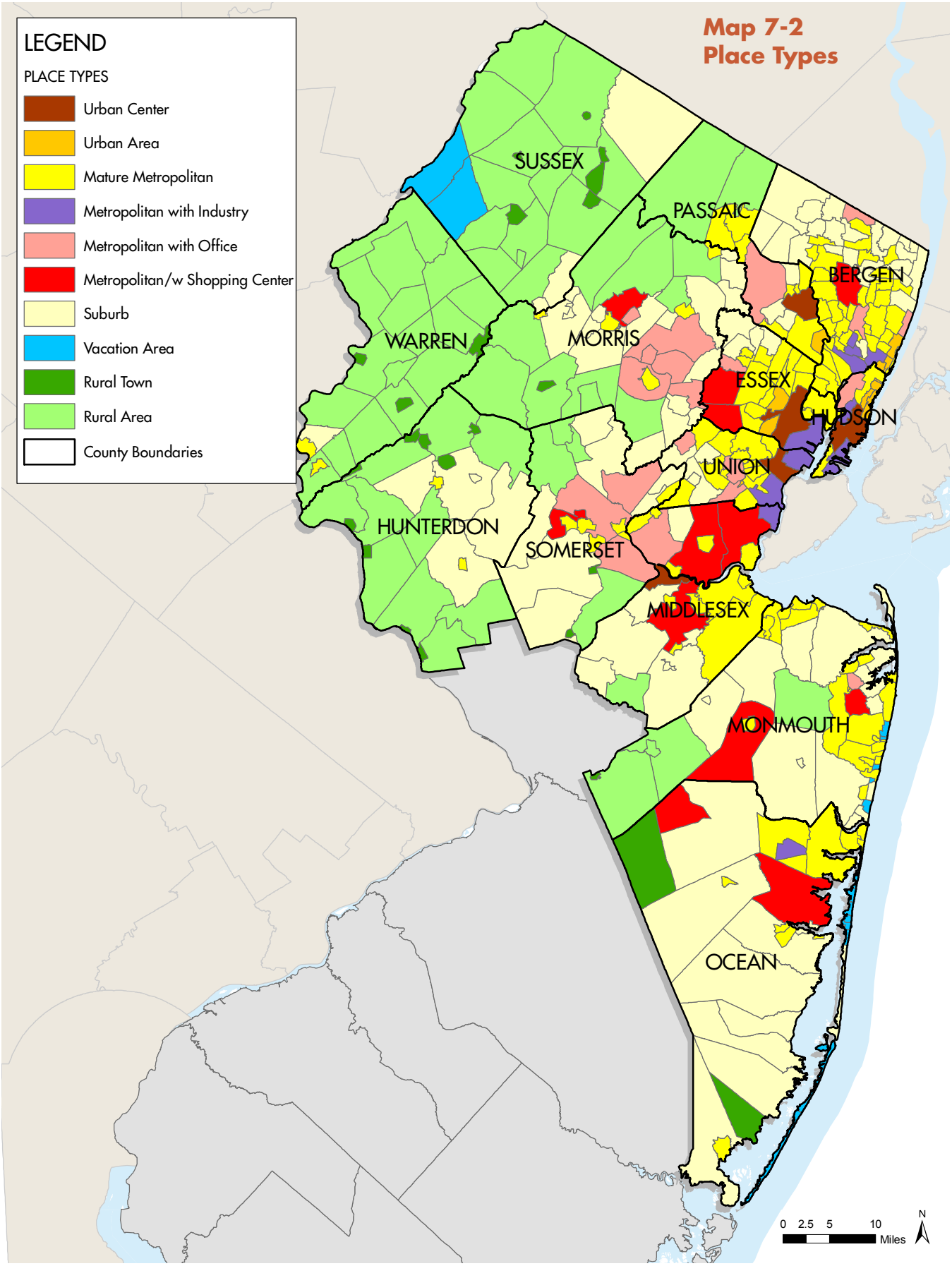
The NJTPA is positioned to support smart growth and transit-oriented development through its funding decision making process. NJTPA's project prioritization criteria, which are used to score and rank proposed projects for possible funding, take into account direct land use and environmental issues such as the redevelopment of brownfields, the protection of special environmental districts, reduction of noise pollution, and the improvement of air quality. The criteria consider the effect projects may have in reducing automobile use, such as increasing access to rail stations and segregating bike and pedestrian facilities from auto traffic.

The next 25 years will undoubtedly see changes in land use regionwide. In addition, advances in technology, such as the potential widespread adoption of electric cars, promise to create new options for transportation systems. NJTPA will work to improve current criteria as well as develop new criteria to respond to new technologies and development patterns. Future re-examination of the NJTPA's criteria would include consideration of various issues related to smart growth, including agriculture, open space preservation and conservation.

Complete Streets

The National Complete Streets Coalition is a group dedicated to advancing the concept that streets do not only belong to automobiles. The group advocates inclusive roadway design that is accessible to all users, including cyclists and pedestrians of all mobility levels. The Coalition's belief is that the streets belong to everyone, not just the people who are able to or choose to use an automobile. For the millions of Americans who cannot drive—including children, the elderly, and the disabled—complete streets offer transportation independence. Complete Streets can have a wide range of effects in a variety of ways. For instance, walkable communities lend themselves to extensive use of shade trees, which also play an important role in reducing the effects of climate change.

They also offer cleaner air, increased social capital, congestion relief, reduced dependency on imported oil, and many other social, economic, health, and environmental benefits. Many of North Jersey's roads are notoriously dangerous for pedestrians. Incomplete and poorly maintained sidewalks, too many curb cuts, along with wide and poorly controlled crossings reduce the opportunity to walk safely for even short distances. Building complete streets is a part of NJDOT's greenhouse gas reduction plan, and the NJTPA supports the use of these methods and other pedestrian-friendly projects through its planning and project prioritization criteria.


Map 7-2
Place Types
LEGEND
PLACE TYPES
Urban Center
Urban Area
Mature Metropolitan
Metropolitan with Industry
Metropolitan with Office
Metropolitan/w Shopping Center
Suburb
Vacation Area
Rural Town
Rural Area
County Boundaries
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
UNION
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
0 2.5 5 10
Miles
N

Transit-Oriented Development

Mixed-use development around rail stations and other public transportation hubs is called transit-oriented development, or TOD. TOD creates compact mixed-use communities adjacent to transit infrastructure with the goal of increasing transit use and reducing automobile commuting trips. There are more than 100 commuter rails stations in the region, as well as dozens of major bus facilities, PATH, and light rail stations. Many of these could potentially serve as locations for future transit-oriented development.

In New Jersey, the state's Transit Village program supports these efforts. Acceptance into this program makes a municipality eligible for state funding and technical assistance, and gives it access to grant programs from NJDOT. There are 19 designated Transit Villages in New Jersey, 15 of them within the NJTPA region.

The NJTPA supports transit-oriented development and the state's Transit Village program as part of the overall effort to increase transit accessibility, and to guide infrastructure investment where it is appropriate and can have the greatest effect.

Goods Movement and Brownfields Redevelopment

Trends in the goods movement industry also have had serious impacts on land use in the region. As discussed in Chapter 6, Plan 2035 continues NJTPA's efforts to encourage freight-related development on brownfield and other under-utilized sites close to the port, rather than on distant, undeveloped properties. The New Jersey Economic Development Authority and the Port Authority have identified 17 sites as part of the current "Portfields" program. Most are located in Essex, Hudson, and Union counties, where former industrial uses have left many sites contaminated, and where warehouse and port-related employment is in demand. Working with the State and the Port Authority, the NJTPA will continue to identify transportation investments and policies to encourage eventual redevelopment of these sites for freight-related uses. The redevelopment of these brownfield sites fulfills smart growth goals by encouraging industrial development in the region's urban core, bringing valuable jobs to residents, and limiting the growth of truck travel on the regional transportation network by keeping freight activity close to the port.

Port operations and related commercial activity cause several environmental impacts, some related to their location in riparian areas and wetlands. An ongoing challenge is to promote goods movement while preserving wetland and water quality. The Port Authority has been very active

Union, Union County

Land Use in Plan 2035's Scenario Modeling

The scenario modeling conducted in the development of Plan 2035 (discussed in greater detail in Chapter 5) shows that land use decisions do affect the performance of the transportation system. In each scenario, the region's total population remained the same, but development patterns—along with varying investments in transportation—affected how well people were able to get from place to place.

The Baseline Scenario assumes that current demographic trends in the region will continue, with no new changes in land use to focus residential and job development near transit stations and in urban and regional centers. Even under this scenario, the region is expected to see a greater increase in transit use rather than auto use, largely due to extensive transit investment and existing smart growth trends.

The Plan 2035 Scenario assumes the region will develop improved land use policies and incentives to focus more of the region's growth around existing or planned transit stations and stops, while increasing mixed-use development. Policies and indicators used to develop the scenario included the Urban Hub Tax Credit program, State Plan designations, Transit Village designations, Urban Enterprise Zone designations, local plans, redevelopment zoning and input from the workshops conducted for Plan 2035 (see Chapter 2).

The Aspirational Scenario assumes an even greater concentration of development and redevelopment. It includes more mixed-use centers in urban core areas, centers along transit lines and some in smaller cities and towns. While the total regional growth remained the same in this scenario, county-level projections did not. These growth patterns help fuel further increases in transit ridership and a significant growth in walking and biking as more of the population would live and work in mixed-use centers that cluster housing and jobs closer together. Under this scenario, transit use would increase significantly, as would the number of walking and biking trips in the region.

in addressing the environmental impact of port operations, including seeking emissions reductions for all sources (vessels, cargo handling equipment, harbor craft, rail, and trucks). The NJTPA also supports continuing efforts to pursue measures that will adapt freight facilities to be more environmentally friendly by using clean engine technology, noise reduction measures, architectural improvements, and road and rail network improvements.

Special Planning Regions

The NJTPA region is home to three special environmental districts, natural areas that are crucial to the lives of New Jersey residents and are managed outside of the usual municipal process. Plan 2035 foresees continued coordinated transportation planning with all three districts:

The Highlands

The Highlands Water Protection and Planning Act (The Highlands Act) was enacted in 2004 for the purposes of protecting the source of drinking water for over 5 million New Jerseyans and preserving an area of diverse natural and historic resources. The Highlands Act created a regional council charged with adopting a regional master plan for this 860,000-acre area, which is home to 88 municipalities in seven counties. The regional master plan calls for future growth to take place in designated centers or, in certain areas, as clustered development. The NJTPA supports the efforts of the Highlands Council to protect the area's natural resources and future land use goals.

Providing transportation improvements for designated centers in the Highlands while acting within the spirit and regulations of the Highlands Act presents an ongoing challenge to the NJTPA. While the Highlands plan would slow sprawl in the area, growth is expected to continue. Plan 2035 projects annual population growth of up to 1.6 percent and annual employment growth of up to 2.8 percent through 2035.

Certain types of transportation investment can best encourage development in designated areas in the Highlands. These include efforts to expand transit, ride sharing and non-motorized travel, while presenting options to reduce vehicle miles traveled. This smart growth approach would accommodate the region's growth potential while protecting the environment, reducing infrastructure costs, and maximizing transportation system efficiency.

The Pinelands

In 1978 the Pinelands region was designated as a National Reserve. It was recognized as a United Nations International Biosphere Reserve in 1983. (Other U.N. International Biosphere Reserves in the United States are the Adirondack-Champlain Biosphere Reserve, The Everglades, Sequoia National Park, and Yellowstone National Park.) The Pinelands rests on top of one of the largest and cleanest sources of drinking water in the United States, the Kirkwood-Cohansey Aquifer. The aquifer is estimated to hold 17.7 trillion gallons, enough to supply the United States with water for six months. Development limitations in the Pinelands are intended to protect the land's recharge capacity, as well as rare plants and animals. Much of the Pinelands area falls outside the NJTPA region, but it does include portions of Ocean County. Any transportation projects designated for that part of Ocean County must be

Special planning regions such as the Meadowlands provide planning challenges and opportunities. Lyndhurst, Bergen County.

in accordance with the Comprehensive Management Plan for the area, as overseen by the New Jersey Pinelands Commission.

The Meadowlands

The Meadowlands region also has its own planning agency, the New Jersey Meadowlands Commission. However, unlike the largely untouched ecosystems in the Highlands and Pinelands, the vast majority of the ecosystems in the Meadowlands have been heavily exploited—used as grazing land, a timber resource, and more recently as a landfill. Through its history, there have been numerous attempts to drain and fill it, and often those attempts failed leaving behind environmental damage.

The Meadowlands historically has played a key role in transportation in the region. Crossing the area used to be an exercise in frustration, with travelers facing deep mud, floods and swarms of mosquitoes. After the opening of the Holland Tunnel in 1927, but before the 1932 construction of the Pulaski Skyway, the 13-mile trip from Jersey City to Newark across the Meadowlands took two and a half hours by car over a bumpy wooden plank roadway.

The Meadowlands is unique among the special regions because of its location. The Hackensack Meadowlands Reclamation and Development Act (1969) cites the "strategic location in the heart of a vast metropolitan area with urgent needs for more space for industrial, commercial, residential, and public recreational and other uses." The Act seeks to simultaneously protect the natural and unique resources of the area while promoting large scale economic development. Plan 2035 supports the mission of balancing these objectives in all special planning regions.

Transportation and Climate Change

Research has documented worldwide changes in climate. In the U.S., data generally show that spring is arriving earlier, summers are growing hotter, and winters are becoming warmer and less snowy. These changes reflect global warming, exacerbated by heat-trapping emissions from human activities, including transportation. Projections indicate that if the current trends in emissions continue, New Jersey will experience deteriorating air quality, high ozone levels, increasing temperatures, more winter precipitation (though less snow), rising summer temperatures, more droughts and rising sea levels. Analysis suggests that by 2070, summers in New Jersey could feel like those now experienced in coastal South Carolina and Georgia.

Climate change poses potential threats to the region's physical landscape, built environment, and socio-economic conditions. These include poor air quality, more high ozone days, higher sea levels, more frequent extremes in temperature and precipitation and more frequent incidents of flooding and drought. In turn, these conditions might negatively affect the health of the region's residents—as well as the economy and environment—for generations to come.

These effects of climate change directly pose a very real threat to transportation systems. In addition to diminished air quality, the region faces the very real possibility of flooded roads, rail lines, tunnels, bridges, port facilities, airports, and other low-lying infrastructure. Several major facilities in low-lying areas are especially vulnerable to flooding, including the Lincoln Tunnel, the Holland Tunnel, the PATH system, the Hudson Bergen Light Rail, the MTT project, Newark Liberty International Airport, and port facilities in Newark and Elizabeth. In addition to coastal flooding, inland flooding is a concern—the Delaware River basin has experienced six major floods in the last ten years. All of these extreme events would create human health and safety hazards, disrupt passenger travel and goods movement, and cause economic losses.

Plan 2035 calls for addressing climate change and its threats in two ways—mitigation and adaptation. Mitigation involves reducing emissions of greenhouse gases, while adaptation involves planning to cope with the challenges that climate change will bring.

Mitigation is critical because transportation generates a significant portion of greenhouse gases. Reductions will come from changing technology and changing human behavior, such as by reducing the vehicle miles traveled in the region and using alternate fuels, energy sources and modes of travel. In terms of adaptation, there is a need to minimize the damage and dangers resulting from rising sea levels, severe storms, flooding, intense heat, drought and diminished air quality and to ensure that infrastructure can handle these threats.

Both of these responses—mitigation and adaptation—require an extensive range of policy and planning responses, such as:

- Considering the impacts of climate change in land use, zoning, development and infrastructure planning and investment decisions;

Gen-Set locomotives at Port Elizabeth

The NJTPA has partnered with the PANYNJ and Conrail/CSX/NS Railroads to acquire two "green" locomotives for use – one by Norfolk Southern, and one by CSX – in the Port Elizabeth/Port Newark area. These new switch yard locomotives utilize what is known as Gen-Set technology, which are switcher diesel locomotives that are far cleaner than conventional uncontrolled or Tier 0 diesel locomotives and even cleaner than Tier 2 diesel locomotives. The project will enable railroad yard operations to use equipment that meets EPA Tier 4 emissions standards, making them compliant with EPA standards through 2018. These new locomotives will reduce fuel use and greenhouse gas emissions by 25 percent, reduce ozone precursors (NOx and volatile organic compounds) by 86 percent, reduce particulate emissions by 74 percent and lower maintenance and fuel costs as compared to the locomotives being replaced. This purchase is actually part of a larger acquisition that includes three additional locomotives being acquired through a partnership of NJDEP, PSE&G, and Conrail/CSX/NS.

The $3 million project was funded in part with Congestion Management Air Quality (CMAQ) funds. The Gen-Set locomotives will help achieve PANY&NJ, NJTPA, State and National goals to reduce emissions, lower energy consumption, improve air quality and reduce noise. It will also expedite the conversion of locomotives that meet current regulatory standards to an emission standard not required for existing switching locomotives nor envisioned under the new locomotive rule. The result would be a major reduction in the emission of criteria pollutants – contributing to the improved health and quality of life within Northern New Jersey.

- Identifying long-term goals, policies and strategies to reduce greenhouse gas emissions;
- Increasing public awareness about climate change and garnering public support for policy and planning actions;
- Developing the tools and data needed to make the right planning and investment decisions;
- Identifying high-risk locations and facilities and conducting vulnerability assessments;
- Enhancing infrastructure design, construction and maintenance standards;
- Improving emergency response, evacuation and disaster recovery planning;

The NJTPA has brought this critical issue to the forefront in its development of Plan 2035. Following the fall 2009 roundtable on climate change (see Chapter 2), the NJTPA initiated its Climate Working Group. The group serves as a forum for concerned stakeholders to identify, support and coordinate efforts to reduce greenhouse gas emissions and to prepare the transportation system for the impacts of climate change. The Regional Capital Investment Strategy found at the back of this plan has been modified to reference climate change. The investment principle "Help The Region Grow Wisely" now specifically references New Jersey's Climate Change plan. The related investment guideline now reads as follows:

> Make investments that support the targets of the Global Warming Response Act of 2007, addressing New Jersey's greenhouse gas reduction goals and related NJ State Plan recommendations. Coordinate such investments at state, regional and local levels.

As part of its efforts to implement Plan 2035 and address climate change, the NJTPA will, in 2010, develop a greenhouse gas inventory for the region to determine a baseline for future reduction goals and strategies, as well as the identification of key emission sources.

Another key initiative to reduce emissions of greenhouse gases and pollutants in the region is the NJTPA's work in the area of Transportation Clean Air Measures. In 2007, the NJTPA identified strategies that could significantly reduce pollutants (including greenhouse gases) from mobile sources. A multi-agency working group is forging new partnerships and together implementing action plans throughout the region to make these measures a reality.

In implementing Plan 2035, the NJTPA will put a

The NJTPA's extensive coastal areas have unique transportation and environmental needs. Shark River Inlet, Monmouth County.

greater emphasis on reducing greenhouse gas emissions when making its transportation planning and regional investment decisions. In addition, there will be greater coordination with the state's energy and greenhouse gas reduction plans.

Finally, the NJTPA encourages its member subregions to pursue their own efforts to reduce greenhouse gas emissions, such as a study just underway in Monmouth County.

Coastal Evacuation Planning

In a region with a densely developed coast, evacuation planning is critical. With climate change likely to exacerbate storms and coastal flooding, the need to plan for safe evacuation of low-lying areas is even greater. Evacuation plans for the region must meet the needs of all, including transit-dependent, elderly, disabled and low income residents. In addition, the region could be the destination for millions of transit dependent potential evacuees from New York City.

An important element of successful emergency evacuation planning and implementation is intergovernmental coordination. NJTPA coordinates with and draws upon the work of emergency management staff and agencies responsible for creating emergency evacuation plans to identify evacuation infrastructure needs. For instance, a recent report by the state Assembly Coastal New Jersey Evacuation Task Force identified the possible need for structural modifications and expansions of key roads and bridges leading to and from the Jersey Shore.

The NJTPA also encourages its member subregions to actively plan for evacuation. It provides funding for such studies through its Subregional Studies Program. Monmouth County recently finalized its study which can be used as a model for others to come during the implementation of Plan 2035. As discussed in the Safety and Security section in Chapter 6 (Implementation), the NJTPA also coordinates with NJ Office of Homeland Security and Preparedness on evacuation and other transportation security issues.

Environmental Mitigation

The NJTPA's decision-making process seeks to maintain strong transportation performance without degrading quality of life or the environment. However, some negative environmental impacts are unavoidable.

For example, a new rail project may ease the commute of thousands of people and reduce their greenhouse gas emissions across the region while increasing local noise pollution and encroaching on sensitive water resources or wildlife habitat. Natural assets like wetlands and riparian buffers provide irreplaceable environmental functions directly related to transportation investment, including the management of non-point source pollution and storm water. The NJTPA process ensures that potential negative consequences are discovered in the planning process, and their effects are controlled through the use of a variety of mitigation and adaptation strategies.

Implementation of these strategies can originate in a variety of ways. Federal agencies such as FHWA, FTA or the US Army Corps of Engineers may require that certain measures be taken or commitments made. For example, the Corps of Engineers may require creation of a certain number of acres of wetlands to compensate for wetlands lost during highway construction, in order to comply with the Clean Water Act. A citizens group may bring attention to a local noise issue caused by train horns or speeding trucks,

which might be addressed through Quiet Zone regulations or speed restrictions.

Environmental mitigations called for by Plan 2035 are to be developed in consultation with numerous federal, state and local agencies responsible for and interested in environmental stewardship. The specific types of environmental mitigation activities implemented are ultimately determined by the governing regulatory authority and are dependant upon the resource being impacted and the severity of that impact.

Regional Air Quality

As required, the NJTPA regularly conducts an air quality conformity determination in conjunction with the long-range plan and Transportation Improvement Program development (Appendix G). The NJTPA will continue to ensure that its projects, programs, and plans conform to the New Jersey State Implementation Plan and lead to attainment and maintenance of the National Ambient Air Quality Standards. The NJTPA will also conduct research and implement measures intended to reduce mobile source emissions of one or more pollutants of concern including PM2.5, VOC, NOx, CO, and/or CO2.

Maintaining and improving air quality can be achieved through a variety of mitigation activities in the region. Many of these are encompassed by the plan's key elements—emphasis on smart growth, support for public transit, walking and biking, limiting the addition of new highway capacity, and support for a variety of Transportation Demand Management (TDM) and highway operational improvement initiatives. These approaches seek to significantly curb the growth in vehicle miles traveled and reduce vehicular pollutant emissions.

Other Environmental Concerns

Several other environmental considerations must be taken into account in the planning process. These key areas of concern are discussed in greater detail in Appendix F:

- Water Quality Management Planning Areas
- Freshwater Wetlands, Lakes, Rivers and Streams
- New Jersey Coastal Areas
- Designated "Green Acres" Areas
- Forested Areas
- Flood Hazard Areas
- Historic Districts and Sites
- Rare, Threatened and Endangered Species
- Soil Erosion and Sediment Control

Conclusion

The relationship between land use, transportation, and the environment is incredibly complex. Plan 2035 formalizes the NJTPA's commitment to managing these relationships, simultaneously providing needed transportation for the region while effectively mitigating environmental impacts. Additionally, Plan 2035 strengthens the NJTPA's efforts to deal with and address the regional health, economic and environmental effects of the transportation network by focusing on approaches that emphasize smart growth, place-based planning, transit-oriented development, energy efficiency, greenhouse gas emissions reduction and climate change adaptation.

8

FINANCING PLAN 2035

This plan has outlined the significant infrastructure investment needs currently facing the NJTPA region and has identified a range of highway, transit, and multimodal improvement projects that will address those needs. The Plan 2035 Scenario of investments charts a course between current trends (the Baseline Scenario) and the complete set of projects that would be undertaken were project costs and the availability of funding not an issue (the Aspirational Scenario). But of course, project costs and funding availability must be a consideration in this plan, and this chapter will address the key funding assumptions and expenditures underlying Plan 2035.

Although the benefits of the proposed highway, transit, and multimodal investments in this plan will be great, the projected costs are also great. Major transportation infrastructure projects in northern and central New Jersey are highly challenging, as they occur in a heavily built and environmentally sensitive region.

North Jersey's heavily traveled, aging transportation system poses a difficult funding challenge to the region. Route 22, Springfield, Union County.

These projects take many years from planning through design and engineering to construction and operation, particularly those projects which are seeking federal funding support. Costs for labor and key construction materials (concrete and steel) are expected to rise faster than existing revenue sources, and the NJTPA expects that long-run petroleum costs will also rise faster than inflation, increasing costs further. Finally, right-of-way acquisition for congestion mitigation projects is both time-consuming and expensive in the NJTPA region. All of these issues together mean that the NJTPA region must secure significant and growing revenue sources if it wants to undertake these costly proposed projects.

The situation is exacerbated by both current and long-term fiscal woes. New Jersey's Transportation Trust Fund (TTF) is close to exhaustion. The current recession is driving down revenues, and the credit crunch is making financing of projects difficult. Thus, even when the current economic crisis recedes, the state and the region will be starting from a lower revenue base than had been previously projected. And the long-term projections for growth in gas tax revenues are not strong—a combination of reduced growth in vehicle miles traveled (VMT) and increases in automobile fuel efficiency will continue to prevent gas tax revenues from keeping up with investment needs.

In this environment, NJTPA and its statewide and local partners must carefully establish priorities and must carefully manage limited resources. If the region ends up in an environment like the Baseline Scenario, with funding continuing on its current trend, then the region will face very difficult investment choices and a reduction in the quality of its transportation network. Conversely, if the NJTPA region wants to reach its full Aspirational Scenario goals for investment in highways and transit, then very substantial changes will need to be made about how transportation is funded in the state. The Plan 2035 Scenario offers a path between these two extremes—some worthy projects will have to be deferred, and some pain from additional taxation or other revenue raising measures will still be required, but the region will make progress on its overall transportation goals.

While the funding challenges are great, elected officials in congress and the state legislature have the authority and tools available to address the funding needs. Repeatedly in the past they have done so. The NJTPA is fully confident that, recognizing the state's pressing needs, adequate financing will be provided over the next 25 years.

This chapter of Plan 2035 presents forecasts of future funding. The funding for the recommended improvement projects will come principally from the state and various federal government sources. This chapter presents and discusses the assumptions underlying the federal and state funding projections. In the final section of the chapter, potential new and innovative funding sources for the region are also reviewed.

Toll plaza on New Jersey Turnpike, Middlesex County.

Investment Strategies

In developing the financial assumptions and scenarios that underpin Plan 2035, the NJTPA drew upon two complementary efforts to develop investment strategies to guide long term transportation planning and investment.

The first is the NJTPA Regional Capital Investment Strategy which was initially developed for NJTPA's 2030 Regional Transportation Plan, approved in September 2005. This RCIS has been carried forward into Plan 2035 (with minor modifications regarding environmental issues as noted in Chapter 7, Transportation and Land Use). The RCIS includes eight investment principles and sets goals for levels of investments among broad categories of funding. For example, maintenance and preservation investments are to be allocated 60 percent of available funding. The eight principles are listed in Chapter 2 (Developing the Plan) and the full RCIS is provided in the back of this plan.

° The second source of guidance for long term investment is the 2010 Statewide Capital Investment Strategy (SCIS). This is the product of a collaborative effort in 2009 involving NJDOT, NJ Transit, the New Jersey Turnpike Authority (NJTA), the South Jersey Transportation Authority (SJTA) as well as the state's three Metropolitan Planning Organizations—the NJTPA, the South Jersey Transportation Planning Organization and the Delaware Valley Regional Planning Commission.

The SCIS provides investment recommendations for transportation program categories based upon goals, objectives, and performance measures. The SCIS is a requirement of the Transportation Trust Fund Authority Act of 2000. The goal of the SCIS is to develop an annual spending level that can achieve the performance objectives of the NJDOT, NJT, NJTA and SJTA. Statewide financing scenarios were developed to determine performance levels based on different levels of funding, and these alternative scenarios help to provide a context for New Jersey's overall transportation needs. These statewide SCIS scenarios underpin the three scenarios developed for Plan 2035 as discussed below.

Issues and Uncertainties

Long-term planning in the current environment is difficult, and the nation may be at an "inflection point" regarding surface transportation. There are significant uncertainties regarding transportation policy (at both the federal and state levels); the economy (including petroleum prices and private investment in transportation facilities); and the environment (including climate change and carbon taxes). The upcoming federal surface transportation reauthorization is likely to address some of these uncertainties, leading to major changes in transportation priorities and funding, but this is difficult to predict at the current time. Plan 2035 incorporates the most current thinking on these key issues from NJTPA and its partner agencies, but also recognizes the many unknowns facing the region that will only be resolved over time.

Some of the key funding issues facing the region in creating Plan 2035 include:

- *Stimulus Funding:* On February 17, 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA). The ARRA is a remarkable effort to revive the nation's economy. Its highest priority is to create new jobs and maintain existing ones, while at the same time addressing the needs of the nation's deteriorating transportation infrastructure. For the State of New Jersey, this legislation is providing over $1 billion for the State's transportation infrastructure needs, with approximately $650 million to NJDOT for highway and bridge projects and approximately $425 million for NJ Transit projects.

  Congress included a provision in the legislation that sub-allocated funds to MPO regions for their direct oversight. The NJTPA, as one of three MPOs in New Jersey, distributed $124 million among its 15 member subregions based on the formula already used for annually distributing planning funds to the NJTPA subregions. Congress created strict requirements for all projects receiving ARRA funding. For the NJTPA projects funded through sub-allocation, this means obtaining federal authorization by March 2, 2010. Federal

The American Recovery and Reinvestment Act funded dozens of projects in the region. Lodi, Bergen County.

Transportation creates jobs, from the construction sector to the goods movement industry. Madison, Morris County.

regulations specify that projects must meet environmental requirements, federal design and engineering standards, and be located on roads eligible for federal aid. In order to address these requirements and obtain authorization within one year, these projects must already have environmental clearances and permits in place or be able to quickly secure them.

Meeting all of these requirements and successfully obtaining federal authorization will help position the State to be eligible for future ARRA funds if they become available.

- *High Speed Rail:* The ARRA legislation also included an $8 billion allocation for High Speed Rail investment. While the Northeast Corridor is not designated as a high-speed rail corridor, improvements to the line are eligible for ARRA funding under the intercity passenger rail and congestion programs. At the time of Plan 2035's development, these funds had not yet been applied for; however, the plan can and will be amended if ARRA funds are received for projects in the North Jersey region.

- *SAFETEA-LU Reauthorization:* Reauthorization of the federal surface transportation legislation is one of the major challenges facing the current Congress. The National Surface Transportation Policy and Revenue Study Commission had many sweeping suggestions for changing federal transportation funding, including:
  - a complete reorganization of federal funding programs;
  - a significant increase in the federal fuel tax, plus indexing the fuel tax to inflation;
  - significant new flexibility for utilization of tolling and congestion pricing;
  - increased use of public-private partnerships for project delivery; and
  - examination of a vehicle miles traveled (VMT) fee as a supplement or even long-term replacement for the fuel tax.

  It is difficult to predict whether such recommendations will ultimately become part of the new legislation, and thus what federal revenues can be expected to flow to the NJTPA region. Given this uncertainty, the three plan scenarios make different assumptions regarding the total growth in federal transportation funding. In the Baseline Scenario, which has very conservative assumptions, federal program funding growth is well below inflation, meaning funding declines substantially in real terms; in the Plan 2035 Scenario, available funding grows somewhat faster than inflation and is in line with the overall funding increase during the previous reauthorization (from TEA-21 to SAFETEA-LU); and in the Aspirational Scenario, optimistic program changes are assumed and federal funding grows significantly faster than inflation. It is also difficult to predict how much federal funding will be available for major transit investments. This plan assumes that the current Federal Transit Administration (FTA) New Starts program continues in essentially its current form, but the three scenarios project different levels of New Starts funding for North Jersey.

- *Economic growth, demographics and travel demand:* Relative to other states, New Jersey has an aging population and a relatively high overall tax burden. The aging population may cause existing revenue sources to grow more slowly than in other states, while the tax burden may make it more politically difficult to cap-

ture any new revenue streams for transportation. However, New Jersey continues to derive economic strength from its position as a focal point for international trade and domestic goods movement, as well as being a destination for immigrants to the United States. These factors should help with sustained revenue growth. NJTPA has utilized the most recent demographic projections for population and employment in Plan 2035. While the uncertainty accompanying these projections must be acknowledged, as discussed in Chapter 2 increases in travel demand on all aspects of the transportation network are a reasonable expectation for the future, requiring the region to address potentially greater congestion, wear to roads and bridges, requirements for expanded transit, etc. These increasing needs provide the context for the scenarios considered in this chapter—that is, any level of future funding will have to address a steadily growing agenda of needed investments.

- *Mass Transit Tunnel (MTT):* The MTT is the single most crucial transit investment for the NJTPA region's long-term success. Its completion will not only provide critical redundancy for the existing 100-year-old tunnel under the Hudson River to Manhattan, but it will also allow for significant improvements to existing rail service and the introduction of new services. The local funding for the construction of the MTT, which matches the federal New Starts funding, is being provided not only by NJ Transit and NJDOT, but also by the Port Authority of NY and NJ and the New Jersey Turnpike Authority. In May, 2007, the NJTPA Board of Trustees approved a resolution to reallocate $1 billion over 10 years (2008-2017) to the MTT. This would be accomplished by flexing federal highway dollars to the transit portion of the TIP. An equal amount of state transportation funds would be allocated to NJDOT from NJ Transit. Completion of the project is projected to help create a substantial increase in transit trips under all three scenarios. However, once the MTT project is completed, significant additional annual operating funds will be required to support the new and expanded rail services.

The economic downturn and more fuel-efficient vehicles have led to less revenue from the state and federal motor fuels taxes.

Revenue Assumptions and Projections

The NJTPA region currently has approximately $2.5 billion in state and federal capital funding available for transportation purposes each year, although in 2009 the region also received one-time stimulus (ARRA) funding as discussed above. The region also receives more than $600 million in additional state and federal funds to support its portion of the operating costs of NJ Transit. The NJTPA has worked closely with NJDOT and NJ Transit to assess the long-term funding and expenditure needs for the region and to determine the appropriate assumptions about future transportation funding. Separate funding assumptions have been developed for each scenario (Baseline, Plan 2035, and Aspirational), and these varying levels of funding then support varying levels of capital and operating investment in each scenario.

It is important to note that new federal regulations adopted in 2007 require that MPO long range transportation plans show financial projections in year-of-expenditure (YOE) dollars. That is, MPOs must now explicitly account for expected future inflation and its impacts on both their forecasted revenues and the costs of their future projects. In accordance with the regulations, this plan provides revenue and cost estimates in YOE dollars, in contrast to previous plans which showed financial projections in current year dollars.[1] However, in areas where it may assist comprehension, both YOE and current year (2009) dollars may be presented and discussed in this Plan.

[1] The Plan assumes an average annual inflation rate of 3 percent when converting current year expenses and revenues to year-of-expenditure figures (and vice versa). There is of course uncertainty regarding the rate of future long-run inflation, and projections both above and below 3 percent have been put forward by various economic forecasting bodies. However, this Plan's assumption matches the assumption of core inflation at 3 percent per year from the Mass Transit Tunnel financial plan submitted to the Federal Transit Administration (FTA) as part of the New Starts grant application process, and NJTPA believes it to be a reasonable planning assumption.

Funding Assumptions Common to All Three Scenarios

The Mass Transit Tunnel (MTT) project has been included in all three scenarios, meaning that Plan 2035 assumes that NJ Transit will be awarded the approximately $3 billion in federal discretionary funding (through a Full Funding Grant Agreement, or FFGA, with the Federal Transit Administration) that is included in NJ Transit's most recent MTT financial plan. Other contributions to the MTT will include $3 billion in capital funding from the Port Authority of New York and New Jersey (PA-NYNJ) and $1.25 billion from the New Jersey Turnpike Authority.

All three plan scenarios also assume that state capital funding will remain flat through 2012 (less any one-time stimulus funding) as a result of the current economic crisis. State funding in the three scenarios then diverges after 2012. All three scenarios assume that some level of New Starts funding would become available for transit initiatives following the opening of the MTT in 2017.

Baseline Capital Funding Assumptions

In the Baseline Scenario, which assumes a continuation of recent funding trends, state capital funding remains flat through 2012 and then increases 3 percent annually through the plan horizon of 2035. (This results in an average annual growth rate over the entire plan period of 2.7 percent.) With inflation projected at approximately 3 percent per year during the plan period, the 2.7 percent average annual increases in state funding in the Baseline Scenario will be consumed by inflation, and the purchasing power of the state capital funding will remain essentially flat throughout the plan.

Similarly, the Baseline Scenario assumes very minimal increases in federal funding through the existing surface transportation legislation. This scenario assumes that federal program funding is flat in the upcoming reauthorization, but that the region receives a 10 percent increase every six years starting in 2017 (matching the federal reauthorization cycle). At 3 percent annual inflation, this translates into a reduction in spending power for the region. This increase is well below the approximately 40 percent increase (in year-of-expenditure dollars) in average annual funding that occurred for New Jersey between TEA-21 and SAFETEA-LU. The assumption that federal funding will be flat in the near-term and then grow only at 10 percent each reauthorization is conservative and matches the assumptions about federal funding in the SCIS. In addition, following the receipt of the New Starts funds for the MTT, the Baseline Scenario assumes very minimal additional discretionary transit funding for North Jersey—only an average of $30 million per year, most likely for the support of Small Starts projects such as bus rapid transit (BRT).

The total capital funding available under the Baseline Scenario (for the period 2010 to 2035) in year-of-expenditure dollars is $92 billion. Assuming 3 percent annual inflation, this translates into slightly less than $63 billion in current year (2009) dollars. Tables 8-1A and 8-1B show these funding levels in comparison to the Plan 2035 and Aspirational funding scenarios, as described below.

Plan 2035 Capital Funding Assumptions

The Plan 2035 Scenario envisions more transportation funding from both the state and the federal government as compared to the trends embodied in the Baseline Scenario. The average annual funding increases in the Plan 2035 Scenario are intended to be robust but reasonable—fulfilling critical regional requirements while remaining politically feasible. In this scenario, capital funding will increase at an average rate of 1.2 percent annually between 2009 and 2035 in 2009 dollars. With inflation assumed at 3 percent per year, this will require average annual YOE spending increases of 4.2 percent per year. At the same time, federal program funding is projected to increase by 35 percent in YOE terms every six years, which is more in line with the prior funding increase from TEA-21 to SAFETEA-LU. [2] This translates to 2.0 percent average annual growth in real terms, or 5.0 percent in year-of-expenditure terms—again, a feasible rate of growth if transportation becomes a national priority. Finally, North Jersey is assumed to still be in competition for additional significant New Starts transit funding in this scenario, and to receive $100 million per year beginning in 2018 (following the completion of the MTT), which will grow with inflation.

The total capital funding available under the Plan 2035 Scenario (for the period 2010 to 2035) in year-of-expenditure dollars is $141 billion. Assuming 3 percent annual inflation, this translates into

[2] Federal funding growth for New Jersey between TEA-21 and SAFETEA-LU was not the same for highways and transit. Highway program funding increased approximately 30 percent, while transit funding increased approximately 50 percent. For the Plan 2035 Scenario, it seems more reasonable to assume an overall funding increase (35 percent) toward the lower end of that range.

approximately $91 billion in current year (2009) dollars. The total increase in funding in the Plan 2035 Scenario over the Baseline Scenario is approximately 46 percent.

It should be noted that this 46 percent increase over the life of Plan 2035 will need to be phased in over time. Thus, the earlier years of the plan will see a lower annual average funding, which is then offset in the later years of the plan.

Aspirational Capital Funding Assumptions

Achieving the proposed investments in the Aspirational Scenario will require a very substantial increase in both federal and state funding. State funding will need to grow by an average of 4.8 percent annually in 2009 dollars across the entire plan period, or by approximately 7.9 percent annually in YOE dollars. This would need to be matched by increases in federal program funding of 50 percent every six years in YOE terms (or 6.9 percent annually), providing a average annual increase of 3.8 percent in 2009 dollars, and by the post-MTT New Starts funding of $100 million growing at 5 percent annually rather than only at the 3 percent rate of inflation.

The total capital funding available under the Aspirational Scenario (for the period 2010 to 2035) in year-of-expenditure dollars is $209 billion. Assuming 3 percent annual inflation, this translates into approximately $130 billion in current year (2009) dollars. The total increase in funding in the Aspirational Scenario over the Baseline Scenario is approximately 107 percent.

Tables 8-1A and 8-1B summarize the capital funding assumptions in each of the three scenarios over the plan period from 2010 to 2035 in 2009 dollars and Year of Expenditure dollars. Table 8-1A shows the cumulative totals of funding for each scenario over 25 years, starting with the $2.6 billion available in 2010 and adding in the assumed state and federal funding increases over the period. The YOE totals also include a 3 percent increase each year for inflation. Table 8-1B shows the average annual growth rates under each scenario. Figures 8-1 through 8-3 graph annual funding levels and include funding received from various sources. The large bump represents the MTT project, which makes up a significant fraction of overall funding. When the MTT is completed by 2017, total funding levels return to their underlying trend values in each scenario.

Operating Funding Assumptions

While capital funding is critical for the repair and replacement of the existing transportation network and the completion of new capacity investments, NJDOT and NJ

Table 8-1A
Summary of Capital Funding Assumptions:
Cumulative Total of Funding Available 2010-2035 (Billions of Dollars)

	Baseline	Plan 2035	Aspirational
Year-of-Expenditure Dollars	$92.0	$141.1	$209.2
2009 Dollars	62.6	91.4	129.6
Increase Over Baseline		46%	107%

Table 8-1B
Summary of Capital Funding Assumptions:
Average Annual Growth Rates

Year-of-Expenditure Dollars	Baseline	Plan 2035	Aspirational
State	2.7%	4.2%	7.9%
Federal	1.1%	5.0%	6.9%
Total	**2.0%**	**4.7%**	**7.4%**
2009 Dollars	**Baseline**	**Plan 2035**	**Aspirational**
State	-0.2%	1.2%	4.8%
Federal	-1.9%	2.0%	3.8%
Total	**-1.0%**	**1.6%**	**4.3%**

Note: Federal program growth shown is an average annual rate, although funding increases occur every six years

Figure 8-1A
Annual Capital Funding for NJTPA Region:
Baseline Scenario (Base Year 2009 Dollars)

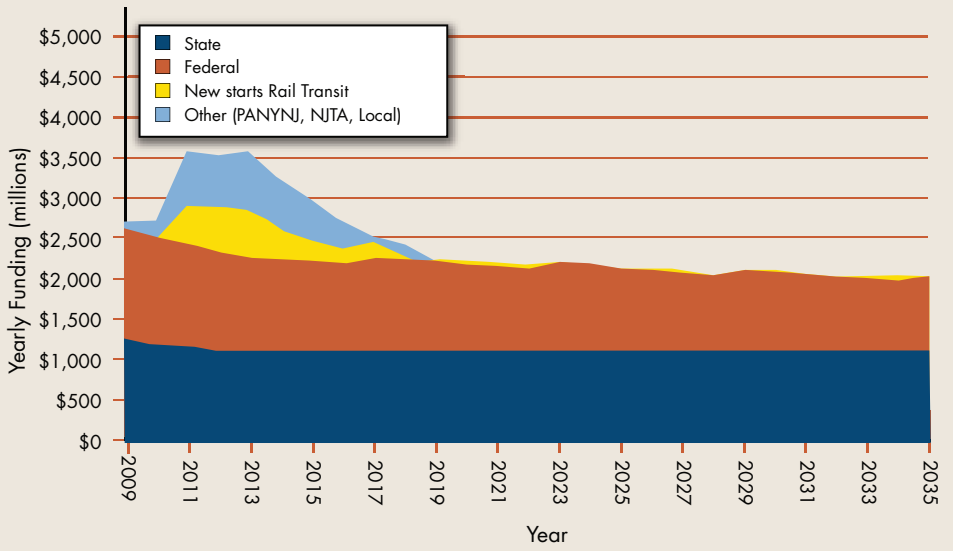


Figure 8-1B
Annual Capital Funding for NJTPA Region:
Baseline Scenario (Year of Expenditure Dollars)

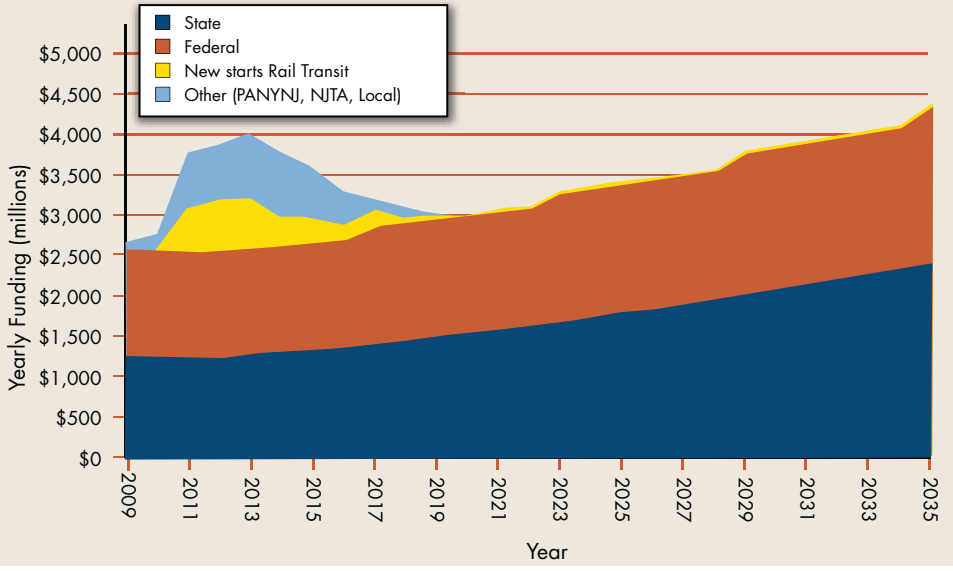


Figure 8-2A
Annual Capital Funding for NJTPA Region:
Plan 2035 Scenario (Base Year 2009 Dollars)

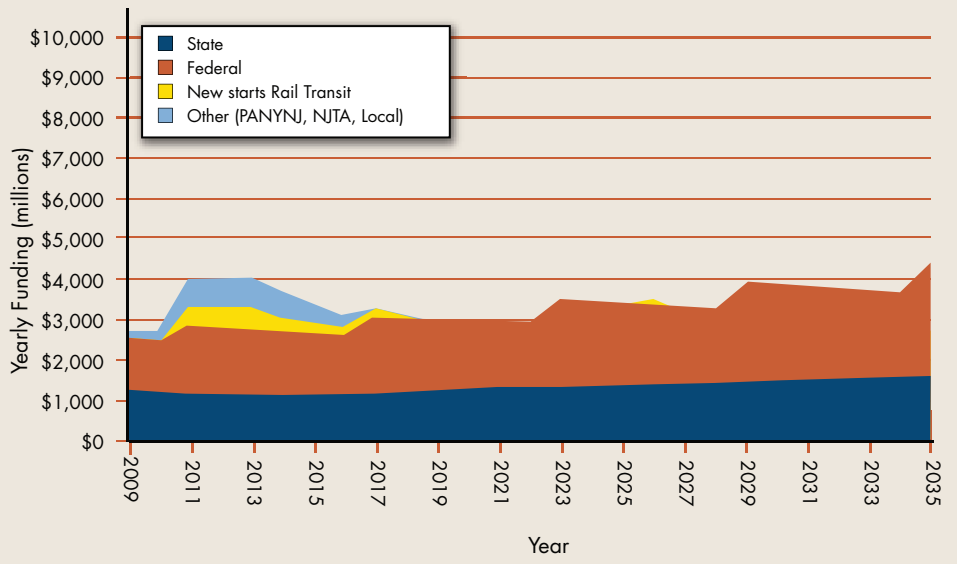


Figure 8-2B
Annual Capital Funding for NJTPA Region:
Plan 2035 Scenario (Year of Expenditure Dollars)

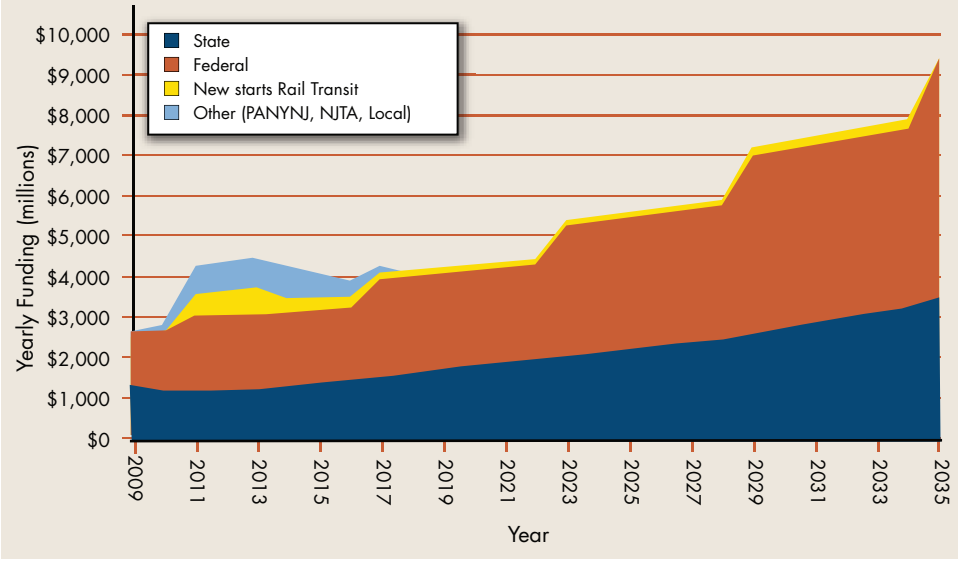


Figure 8-3A
Annual Capital Funding for NJTPA Region:
Aspirational Scenario (Base Year 2009 Dollars)

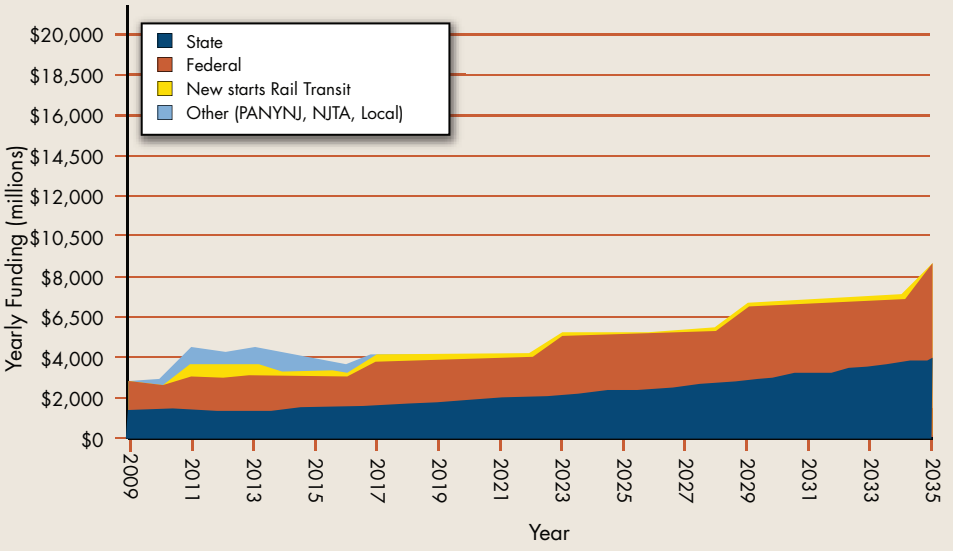
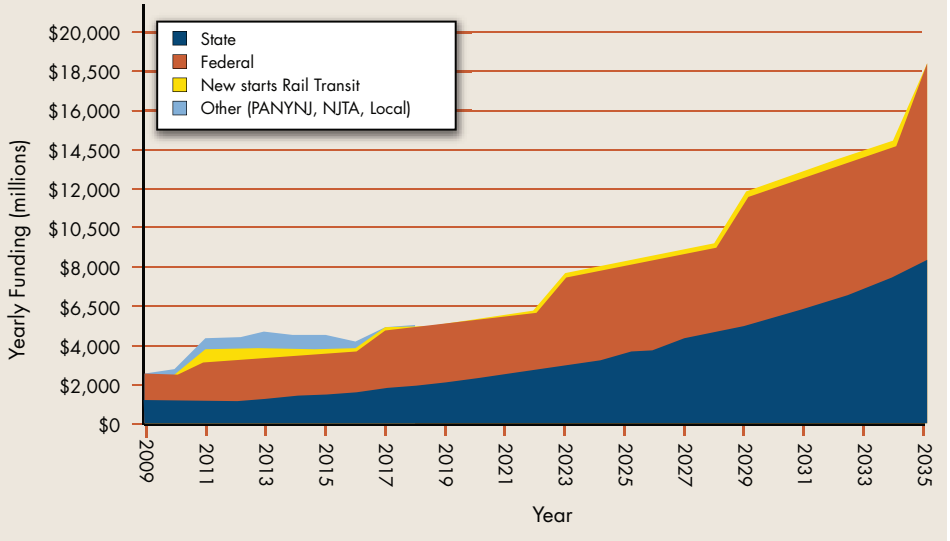


Figure 8-3B
Annual Capital Funding for NJTPA Region:
Aspirational Scenario (Year of Expenditure Dollars)



Transit also require and receive significant state appropriations for on-going operations.

For NJDOT, this funding covers a variety of critical areas such as snow removal, pothole filling, maintenance of roadside lighting and vegetation, inspections, technical studies, and general administrative costs. The 2008 appropriation for NJDOT operations was approximately $100 million, a relatively small amount compared to capital expenditures, but NJDOT continues to face cut-backs in its operating support, and over time these cuts will begin to have a negative impact on the ability of NJDOT to monitor and maintain the roadway and bridge networks. This reduction in monitoring and regular maintenance leads to higher long-term capital costs.

For NJ Transit, operating funding comprises a much larger share of its total expenditures, and operating funding gaps are a much greater long-term concern. NJ Transit is one of the largest public transit agencies nationwide, and, one of the most efficient, with over 51 percent of its operating budget supported by passenger fares and other system-generated revenues (such as advertising and parking fees). NJ Transit's 2009 projected operating budget is over $1.7 billion, and the NJTPA region accounts for approximately 80 percent of that total, or $1.4 billion. The expenses which are not covered by system revenues are supported by yearly appropriations from the state and by various federal funding sources, and the NJTPA region receives over $600 million of that funding annually.

The primary concern facing NJ Transit in the long-term is continued support for operations. In recent years, NJ Transit has also periodically been required to impose fare increases to make up for shortfalls in operating funds. It has also had to divert a portion of capital funds each year to support its operations. When the MTT project is completed and a new and expanded rail operating plan is fully in place, NJ Transit's operating budget will need to increase by an additional 20 percent over current levels, not including any inflationary increases. (This equates to slightly less than a 1 percent average annual increase in real or base year costs.) When the effects of inflation are included, operating costs will double by the end of the plan period. Despite the benefits of a robust regional transit system, and despite the fact that MTT services are projected to have a modestly positive fare box recovery ratio (i.e., that added fare revenues will exceed incremental operating costs), the current trend in operating funding support will not be sufficient to support the post-MTT transit system. Without significant additional funding for operations, the agency may need to adopt a slower incremental approach to implementing service changes and improvements and continue to allocate some capital funds, as allowed under Federal law, to cover major maintenance needs, in order to keep the trains and buses running. Plan 2035 calls for state action to provide adequate and stable operating funding for both NJ Transit and NJDOT.

Assessment of Funding Scenarios

As described above, the NJTPA region will require a substantial and sustained funding increase over current trends in order to move from the Baseline to the Plan 2035 or Aspirational Scenarios. The Plan 2035 Scenario, the NJTPA asserts, is a realistic basis for future transportation investment. The substantial increase it includes represents the fundamental funding needs of the region. In the past, the state and the federal government have stepped up to support those needs, and the NJTPA expects the them to continue to do so in the future. In particular, at the federal level, given the recent high-profile efforts of groups such as the National Surface Transportation Policy and Revenue Study Commission (noted above), as well as the renewed focus on infrastructure following the 2007 collapse of the I-35W bridge in Minneapolis, NJTPA believes it is reasonable to assume that the upcoming reauthorization will identify new revenue sources for transportation and allow for program funding growth that increases purchasing power and begins to address the major infrastructure needs facing the nation.

At the state level, the Plan 2035 funding assumptions also require a significant increase in funding over current trends. The final section of this chapter reviews specific revenue options that might be pursued to achieve this level of funding, but the broader need for a new commitment to transportation funding has been well established, going back to New Jersey's 2003 Blue Ribbon Transportation Commission Report and many earlier studies. Put simply, the revenue assumptions in the Plan 2035 Scenario do not represent funding for a "wish list" of extravagant new projects, but instead represent a necessary correction to years of under-funding of the existing transportation network. Even in the Plan 2035 Scenario, revenues will overwhelmingly be used simply to maintain, rehabilitate, and replace key transportation assets in the North Jersey region, and to plan for less will result in highway and transit networks that cannot keep up with the needs of the region's residents and businesses. Moreover, without a sustained commitment to increased funding, the region will face very difficult

choices which may include the need to restrict or limit use of infrastructure and ration the limited funds available among desired investments.

Expenditures & Investments

The state and federal funding that NJTPA projects to be available under the three scenarios will provide the means to implement the planned highway, transit, and multimodal improvement projects included in Plan 2035. As stated previously, all three scenarios assume that the MTT will be completed as planned. The next section will outline some of the potential policies and new revenue sources that will need to be implemented to achieve the assumed levels of funding. This section will summarize the investment level in each scenario and the expected performance outcomes—greater detail is available in Chapter 5 (Scenario Planning) and the plan appendices.

Baseline Expenditures

The Baseline assumes an investment level for both highways and transit below what is needed to maintain the condition level of the existing networks, so network performance worsens and the backlog of needed investment will grow—for example, the number of deficient bridges in the NJTPA region will increase. The Baseline also reflects no new bus or fixed guideway transit services in the region other than those already programmed, and it assumes that effective highway capacities are reduced by 5 percent over their current levels due to reduced levels of infrastructure maintenance and preservation.

Plan 2035 Expenditures

As noted earlier, the Plan 2035 Scenario is intended as a "middle ground" scenario requiring some additional new funding which then allows the region to maintain its existing infrastructure while also improving capacity and system performance. There is some capital available within the Plan 2035 Scenario to allow transit or highway improvement to advance in an incremental way. Transportation investment in the existing network in the Plan 2035 Scenario is modeled as a mid-point between the Baseline and Aspirational Scenarios. This investment level allows the region to maintain and slightly improve existing system performance, depending on the particular asset category or program area.

The Plan 2035 Scenario includes the completion of the MTT and a modest (5 percent) increase in bus services in the region (representing investments such as in new shuttles or connectors, increased frequency on bus routes or the implementation of bus priority treatments or BRT on critical corridors). However, the rail transit system (commuter rail and light rail) assumed for travel demand modeling purposes to evaluate the Plan 2035 Scenario is identical to that of the 2035 Baseline Scenario. A number of other future rail projects in the region are now undergoing planning and environmental analysis and may be candidates for federal funding. It is expected that at least the initial operating segments, if found justified and feasible through detailed study, could be accomplished under the level of funding assumed for the Plan 2035 Scenario. However, since neither mode, alignment, specific technol-

Table 8-2
Comparison of Investment in RCIS Categoriess
(Average annual millions of 2009 dollars)

RCIS Summary Category	RCIS%	Baseline		Plan 2035		Aspirational	
Bridges	15%	$539	22%	$682	19%	$826	17%
Road Preservation & Enhancement	20%	516	21%	808	23%	952	19%
Road Expansion	3%	43	2%	98	3%	98	2%
Transit Preservation & Enhancement	40%	1,038	43%	1,313	37%	1,928	39%
Transit Expansion	16%	143	6%	323	9%	744	15%
Freight, ITS, TDM, Safety, Bike/Ped	7%	125	5%	282	8%	422	8%
Total		**$2,404**		**$3,506**		**$4,970**	

ogy to be used and other factors are determined at this point, the travel demand modeling for the Plan 2035 Scenario did not include these possible rail investments. Additionally, under this scenario, modest congestion mitigation efforts will occur on the highway network in the region, which will have the effect of holding capacity constant at current 2009 conditions (in contrast to the Baseline Scenario, this scenario does not assume any degradation of highway capacity due to the effects of not maintaining highway pavements and bridges at a State of Good Repair).

Aspirational Expenditures

The Aspirational Scenario marks the upper bound for the region—that is, what investments could potentially (but still feasibly) be made if significant new funding were realized. In this scenario, in addition to significantly improving existing system performance, a major investment would be made in new services. Effective highway capacities would increase by 5 percent, and major transit improvements would occur—a 25 percent increase in frequency on non-NYC buses; added peak hour frequencies on Hoboken-bound rail services; and a doubling of off-peak rail service network-wide. Additional new transit services, currently under study, may become sufficiently defined during the life of the Plan to be implemented under the Aspirational Scenario. Significantly more highway congestion relief (in the form of intersection improvements and selective widenings) occurs in the Aspirational Scenario, and major fixed guideway transit corridor investments are assumed, although the exact alignments and modes are not determined.

Comparison to RCIS

Table 8-2 compares the three plan scenarios above to the NJTPA's strategic preferences for investment as expressed in its Regional Capital Investment Strategy (RCIS). As noted at the beginning of this chapter, the RCIS expresses the NJTPA's long-term preferences for how regional transportation dollars should be allocated across major program areas. In this case, the comparison of the scenarios to the RCIS makes it clear how critical near-term needs can sometimes be in tension with long-term desires.

It is clear from the Baseline that current trends in funding and infrastructure condition have shifted investment away from transit expansion and into bridges and preservation of transit infrastructure. Despite the expressed preferences within the NJTPA region, the maintenance of the existing system (particularly bridges) must take precedence over expansion. In the Plan 2035 Scenario, there is significant growth in all areas as compared to the Baseline, but the shares have shifted. Bridge investment is reduced as a share of the total, reflecting better bridge conditions and investment in the smaller categories of freight, ITS, safety, TDM, and bike/ped has more than doubled. Transit expansion funding has also more than doubled, raising its share, but it remains below the RCIS goal, again reflecting the need to attend to maintenance and other needs in response to the performance impacts estimated through the scenario modeling. Road expansion investment, while still modest overall, is larger than the preference expressed by the NJTPA Board of Trustees in the RCIS, highlighting the difficulty of balancing so many competing needs in the region. Finally, in the Aspirational Scenario, we see investment shares that are nearly identical to those expressed in the RCIS, as transit expansion becomes a major piece of the investment.

Thus, the Plan 2035 Scenario serves as a realistic approach to allocating the region's limited funding, by balancing the needs of the existing system with modest expansion efforts. If regional funding turns out to be much worse than expected (for example, if the current recession persists for many years), then the Baseline Scenario can guide the region. Conversely, if the funding situation turns around and becomes much more positive, as in the Aspirational Scenario, then the region can undertake a broad reallocation of funding and truly achieve the goals as laid out in the RCIS.

Table 8-3 demonstrates federally required "fiscal constraint" for Plan 2035. It shows that the projects and programs included in the Project Index can be fully funded under the revenues in the Plan 2035 Scenario. These projects and programs will be implemented over the near, mid and long-term. It also indicates that the remaining funding capacity will be allocated according to the priorities established in the NJTPA RCIS and the Plan 2035 Scenario.

The level of remaining funding capacity is reasonable as many long term project needs have yet to be determined. The current list of projects in the Plan 2035 Project Index have gone through extensive planning and project development and have project costs and limits that are known. The next generation of projects has yet to be determined but will fit into these RCIS categories as scopes and future costs of projects take form.

Table 8-4 demonstrates that very significant amounts of new operating funding are going to be needed to support

Table 8-3
Fiscal Constraint of the Plan 2035 Scenario
(Millions of Year of Expenditue dollars)

	Plan 2035		NJTA Expeditures Already Specified[1]				
Program Category	Total Revenue	% of Total	Near-Term[2]	Mid-Term[3]	Long-Term[4]	Total Specified	Remaining Capacity
Bridges	$27,456	19%	$2,497	$9,293	$13,868	$25,658	$1,798
Road Preservation & Enhancement	32,521	23%	1,839	3,923	9,426	15,187	17,334
Road Expansion	3,948	3%	389	1,653	481	2,524	1,424
Transit Preservation & Enhancement	52,816	37%	191	9,427	22,074	31,693	21,124
Transit Expansion	12,982	9%	45	9,291	1,062	10,398	2,584
Freight, ITS, TDM, Safety, Bike/Ped	11,366	8%	1,130	2,706	7,155	10,992	374
Total (2010-2035)	**$141,089**	**100%**	**$6,091**	**$36,293**	**$54,067**	**$96,452**	**$44,637**

1 - Projects with associated cost estimates listed in the Project Index.
2 - Projects that can be completed within 1-4 years and contained in the 4-year Transportation Improvement Program and Authority projects.
3 - Projects scheduled to be completed within a 5-10 year period. This includes the six out-years of the State's 10-year Capital Construction Program and those in the final phase (Preliminary Design) of the Project Development Work Program and Authority projects.
4 - Project and program estimates during the final 15 years of the Plan.

Table 8-4
Comparison of Annual Operating Cost Requirements for NJ Transit in Each Scenario
(Millions of YOE Dollars)

	2009	2035		
Annual Operating Expenses	Existing	Baseline	Plan 2035	Aspirational
Existing Services				
Rail	$551	$1,416	$1,416	$1,416
Bus	470	1,179	1,179	1,179
Light Rail	62	605	605	605
Administration	281	605	605	605
Baseline New Services				
Committed Rail Service Initiatives		40	40	40
Access to the Region's Core		237	237	237
Plan 2035 & Asirational Services				
New Bus & Rail Services			59	648
Total	**$1,364**	**$3,699**	**$3,758**	**$4,347**
Cost Increase vs. Baseline ($)			$59	$648
Cost Increase vs. Baseline (%)			2%	189%

2009

NJ Transit's operations. Just to support the continuation of existing services plus the MTT and a few already committed rail service initiatives (e.g., Meadowlands Rail Link, Lackawanna Cutoff MOS to Andover) will require YOE operating funding to grow at an average of 3.9 percent annually, almost a full percentage point above inflation. (This assumes that the proportion of expenses covered by passenger fares stays roughly constant across the years of the Plan.) The increased expenses and revenues associated with the bus service added in the Plan 2035 Scenario are fairly modest (only 2 percent above the Baseline), but the Aspirational Scenario—with its significant non-NYC bus service increases and improvements to both peak and off-peak rail—requires another 18 percent boost in funding compared to the Baseline. As stated previously, additional operating funds will be needed to support important bus and rail initiatives currently under study,

Potential Revenue Sources

A range of statewide transportation funding options was presented as part of Plan 2035's public outreach process. Table 8-5 shows a modified version of those funding options, and the table assumes that the NJTPA region would receive approximately 75 percent of any funding source that was implemented statewide, in keeping with the estimates used for allocating highway and transit funding.

The figures in Table 8-5 are intended only as rough guides. The gas tax, VMT tax, and sales tax figures assume minimal demand elasticity—that is, that automobile travel or retail purchases would not drop significantly in response to any of those tax changes. A demand elasticity of -.10 is assumed for the New Jersey toll road system (meaning that a 10 percent toll increase would cause a 1 percent decrease in toll road patronage), and an elasticity of -0.20 is assumed for NJ Transit services. Significant study would of course be required before the actual implementation of any of these sources could proceed, and if the likely traveler response is more elastic, then revenue generation will be significantly more difficult. Finally, it should be noted that the revenues from future transit fare increases are likely to go overwhelmingly to support transit operations (as existing fare revenues do), rather than to support major capital investments.

The Plan 2035 Scenario requires approximately $1.1 billion immediately in additional average annual funding for the region (in 2009 dollars), as noted above. If the state were responsible for providing half this new funding, the additional revenue could be achieved in a number of ways, based on the options in Table 8-5. A phase-in of a 10- to 15-cent increase in the gas tax plus a moderate toll increase, for example, could likely provide that level of new state funding, if those increases were then also indexed to inflation. However, there are a number of other funding combinations that might prove feasible based the economic outlook and the particular projects being supported.

Achieving the Aspirational Scenario requires almost $2.5 billion in additional revenues per year. If the state were responsible for providing half this new funding, there is no way to achieve this level of new funding without major changes to current tax and toll levels. A combination package of a 10-cent gas tax increase, a 1-cent-per-mile VMT charge, and a 0.5 percent sales tax would generate the annual state funding needed for the Aspirational Scenario (again, also assuming indexing to inflation).

Toll facilities are just one way the region can generate revenue for transportation investments. Helix approach to Lincoln Tunnel, Weehawken, Hudson County.

Table 8-5
Options for Additional Transportation Revenues

Option	Base	Action Needed to Raise Given Amount of NJTPA Regional Funding Per Year (2009 Dollars)	
		$400 Million	$800 Million
Gas/Carbon Tax Increase	14.5¢ state gas tax generates approximately $50 million per penny statewide	Increase by 10¢ per gallon	Increase by 20¢ per gallon
Baseline Toll Increase	$750 million in GSP and NJ Turnpike toll revenue in 2008 (statewide)	Increase tolls by approx. 80%	Increase tolls by approx. 160%
Transit Fare Increase	$700 million in transit fare revenue last year (statewide)	Raise fares by 2.4x	Not feasible*
VMT Tax	$146 million daily VMT in NJTPA region, growing to 182 million in 2035	Institute roughly 1¢ per mile tax	Institute roughly 2¢ per mile tax
Sales Tax	7% total sales tax generates revenues of $8.5 billion statewide	Slightly less than 0.5% (half penny)	Slightly less than 0.5% (half penny)

*Assuming a -0.20 elasticity, ridership will decline too much to generate $800 million at the required fare levels.

Assessment of Revenue Options

The Baseline Scenario assumes that state funding will increase 3 percent per year after 2012. In the past, given population growth and steady increases in vehicle miles traveled (VMT), annual increases in funding of this scale could be achieved relatively easily. In the current environment, however, sustained growth in gas tax revenues cannot simply be assumed. For the Baseline Scenario, the state may need to examine indexing the existing gas tax to inflation, in order to protect the current purchasing power of that revenue source.

Plan 2035 Scenario will require significant legislative and executive action by the state in order to achieve the assumed funding. The assumptions for the Plan 2035 Scenario and for the Aspi-

Urban centers face their own transportation funding challenges. Downtown Newark.

Fare box revenues are just one component of the funding needed for a robust transit system. Belmar Station, Monmouth County.

rational Scenario, should conditions make them possible, show funding growing smoothly over time, but of course the actual implementation of new funding sources in the future may mean that revenues plateau for a period and then jump significantly. However, most of the sources discussed above could be modified so that the revenue stream becomes more predictable once implemented, and in most cases this means indexing to inflation. For example, a VMT tax which starts at one cent per mile could be indexed, meaning that by the plan horizon in 2035, the rate would rise to a little over two cents per mile. Similarly, toll increases, transit fares, and any new gas taxes could also be indexed to inflation. (In fact, many transit agencies have already adopted formal or informal policies of linking fare increases to inflation, precisely to protect the purchasing power.) Finally, a sales tax is implicitly linked to inflation, since it takes a fixed percentage of a tax base which generally increases with overall price inflation. However, economic forecasters have recently expressed some concerns about the long-term growth prospects for sales taxes, as the Baby Boom generation ages and shifts more of its purchasing dollars to un-taxed services and away from taxable goods. If New Jersey considers a transportation-supporting sales tax, this changing relationship will be an important consideration.

Other Funding for Transportation

The state and federal investments in transportation discussed in this chapter are supplemented by additional investments by a number of transportation authorities in the region—principally, the Port Authority of New York & New Jersey, New Jersey Turnpike Authority and Delaware River Joint Toll Bridge Commission. Their investments will continue over the life of this plan. Key projects planned by the authorities are included in the Project Index. The jurisdiction of these authorities is as follows:

- *Port Authority of New York & New Jersey:* Key facilities operated by the PANY&NJ include Newark Liberty International Airport; Teterboro Airport; the PATH rail system; the Port complex in Newark and Elizabeth; and major interstate New York-New Jersey crossings—Outerbridge Crossing, Goethals Bridge, Bayonne Bridge, Holland and Lincoln tunnels, and the George Washington Bridge. The agency has built passenger ferry facilities, maintains roadways within its facilities and contributes to other key infrastructure elements that access its facilities and aid the movement of goods and people throughout the region. Details of future investment strategies are provided in the Port Authority's 2007-2016 capital program.

  Over seventy-five percent of the Port Authority's funding comes from revenue collected largely from its toll facilities and rental properties and from bonds and notes issued. Its regional transportation projects to 2016 are projected to total over $5 billion, which includes a $3 billion commitment towards the MTT. Other investments that benefit the NJTPA region include the purchase of New PATH cars, dredging near the Port, modernization efforts and Newark Liberty International Airport.
- *New Jersey Turnpike Authority:* Legislation to combine the New Jersey Turnpike Authority with the Garden State Parkway Authority was signed in 2003. The Authority operates and maintains both of these tolled highways. The Turnpike is 146 miles (56 miles in the NJTPA region) and includes 27 interchanges, nearly 500 bridges and 12 service areas. The Garden State

Parkway is 173 miles (121 miles within the NJTPA region) and includes 90 interchanges, approximately 300 entrance and exit ramps and nearly 500 bridges.

The NJ Turnpike Authority's funding comes from bonds and from toll collection. In 2008, tolls were raised, which allows for the widening of the Garden State Parkway between interchanges 63 and 80 and the Turnpike between interchanges 6 and 9, reconstruction of Exit 14A, as well as a contribution of $1.25 billion towards the MTT and other important capital improvements. This investment is outlined in the Authority's 2009—2018 capital plan, as part of its $9.8 billion ten year capital program (in 2008 dollars). Funding for the MTT will come from the Supplemental Capital Fund.

- *Delaware River Joint Toll Bridge Commission:* This Commission maintains and operates seven toll bridges over the Delaware River, stretching 139 miles from northern Burlington County, New Jersey and Bucks County, Pennsylvania northward to the New York State Line. All the DRJTBC Toll bridges are in the NJTPA region except for the Trenton-Morrisville Bridge. They are responsible for the repair and maintenance of the first seven miles of Route I-78 in Warren County, and have recently repaved this section.

  The Commission is supported primarily through toll revenue, which was approximately $85.5 million in 2007, an increase of almost 7 percent due to increased tolls on commercial vehicles. While most of the improvements funded by the DRJBTC are bridge repair, rehabilitation and reconstruction, they are investing in technology to improve bridge and highway traffic flow. They are planning to install open road tolling on the I-78 bridge. In addition, there is a security initiative in place, consisting of cameras, an improved communications network, and an access control system for the agency's facilities. The cameras and communications can also be used as part of a future ITS system, and will currently be used to assist first responders to accidents at DRJTBC facilities.
- *The Private Sector:* Private funding also makes substantial investments that enhance the regional transportation system. In particular, developers are frequently called upon to construct local streets as part of the development process and often will construct or improve county or state facilities impacted by their developments. Also, private operators of ferries and bus lines help supplement or offer alternatives to public transit operators. In the freight sector, private companies are engaged in nearly every aspect of goods movement including private port operations, trucking companies, rail lines and brokering/forwarding firms. All these private operations depend on government-supported infrastructure investments. As a result, this plan calls for continued cooperation and coordination by the NJTPA with private sector interests, as well as the region's transportation authorities, in it's year-to-year investments of state and federal funding.

SUPPORTING DOCUMENTS

PROJECT INDEX

The following Project Index contains current and future candidate projects that have been identified through the metropolitan planning process in Northern New Jersey and whose costs can be accommodated based on the 25-year funding assumptions as set forth in Chapter 8.

The Index arrays projects by the county in which they are located. They are further arrayed by Highway/Bridges; Transit and Authority categories as well as by timeframe. Near- term projects are those that can be completed within one to four years. This would include projects contained in the 4-year Transportation Improvement Program. Mid- term projects are scheduled to be completed within five to 10 years. They include the six out-years of the State's 10-year Capital Construction Program as well as projects in the final phase (Preliminary Design) of the Project Development Work Program. Long-term projects are estimated to be completed during the final 15 years of the Plan, which include years 11 to 25. Projects are listed in their respective timeframe category based on the year they will be completed (near, mid, or long-term).

The DBNUM designations in the RTP Index refer to distinct database numbers assigned to all projects that allow them to be electronically tracked. The index also includes the appropriate Regional Capital Investment Strategy (RCIS) category for each project. The RCIS is described in Chapter 2 of Plan 2035 and can be found following this index. Projects are classified and grouped within eight investment principles covering the following categories: Bridges, Roads, Transit, Freight, ITS, Travel Demand Management, Safety and Bike/Pedestrian.

All costs and revenues for Plan 2035 are presented in Year of Expenditure (YOE) dollars, as required by federal regulations for MPO long-range plans. This method allows for financial consistency as both costs and revenues are in comparable dollars. Year of Expenditure dollars are adjusted for inflation. Cost estimates for projects in the Index were developed by the sponsoring agency (NJDOT, NJ Transit and member subregions). Additional up-to-date financial and project status information can be obtained through the NOTIS program available on the NJTPA website (www.njtpa.org).

Also included in the Index are authority projects with estimates provided by the sponsoring authorities (NJ Turnpike Authority, Port Authority of NY & NJ, DRJTBC, NJ Meadowlands Commission, AMTRAK and the Palisades Interstate Parkway).

Cost estimates for NJDOT and NJ Transit on-going programs were developed by these agencies for the near and mid-term periods in YOE dollars. NJTPA estimated the cost of these programs for the remainder of the Plan (Long-Term) also using YOE dollars. Programs include a variety of improvement types (generally, where locations are not currently known) such as: resurfacing, milling and repaving; drainage and traffic signal repair or replacement; etc.). These programs are listed at the end of the Project Index.

Projects in the early stages of the Project Development Work Program - Concept Development (CD) and Feasibility Assessment (FA) phases of work - are included in the "Projects under Study" category of the Index for NJDOT and NJ Transit. Projects under study are in various phases of planning and project development and generally do not have available cost estimates as the project scope and limits have not been finalized.

Projects funded with federal earmarks reflect the initial federal appropriation that has been allocated to each project. However, it does not necessarily reflect the total cost of implementation of the projects. These earmarked projects are shown with an asterisk in the Index.

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)

BERGEN

Highway/Bridges

Near-Term

Court Street, Bridge over the Hackensack River	FS09393	Bridges	26.00
*Hackensack River Walkway	07368	Bike/Ped	1.46
*Market Street/Essex Street/Rochelle Avenue	98546	Road Enhancement	3.84
*Rochelle Park and Paramus, Bergen County	09346	Road Enhancement	1.29
Route 3, Hackensack River (eastbound and westbound) Rehabilitation	99417	Bridges	54.92
Route 3, Passaic River Crossing	799	Bridges	239.50
Route 4, Pedestrian Mobility Improvements, Teaneck	065A	Bike/Ped	4.00
Route 5, Rock Slope Stabilization	94032	Road Preservation	2.61
Route 17, Northbound over I-80, Bridge Deck Replacement	04386	Bridges	12.43
Route 17, Railroad Avenue, Drainage Improvements	93174	Road Preservation	2.00
Route 46, Hackensack River Bridge	06371	Bridges	19.59
Route 46, Little Ferry Circle, Operational and Safety Improvements	93287	Road Enhancement	15.92
Route 287, Glaser's Pond, Long-term Drainage Improvements	02399	Road Preservation	5.10
*Teaneck Pedestrian Overpass	09347	Bridges	0.50

Mid-Term

Route 1&9, NYS&W RR Bridge (23)	9240	Bridges	29.75
Route 4, Bridge over Palisade Avenue, Windsor Road and CSX Railroad	065C	Bridges	48.20
Route 4, Flat Rock Brook Bridge	93136	Bridges	6.00
Route 4, Grand Avenue Bridge	08410	Bridges	24.00
Route 4, Hackensack River Bridge	02346	Bridges	48.00
Route 4, Jones Road Bridge	94064	Bridges	14.00
Route 4, South Van Brunt Street Intersection	08411	Road Enhancement	6.00
Route 4, Teaneck Road Bridge	93134	Bridges	13.00
Route 17, Arbor Drive, Drainage Improvement	05312	Road Preservation	4.20
Route 17, Central Avenue Bridge, Rochelle Park	94056	Bridges	7.50
Route 17, East Passaic Street Bridge Reconstruction and Roadway Widening	NS9601	Road Enhancement	38.50
Route 17, North of Essex Street to Garden State Parkway	103A1	Road Expansion	197.00
Route 17, NYS&W Bridge	94057	Bridges	14.50
Route 46, Main Street to Vicinity of Frederick Place, Safety Improvements	93287A	Safety	13.12
Route 80, Elmwood Park/Rochelle Park/Saddle Brook, Noise Walls	00370	Road Enhancement	10.99
Route 80, North Street, Drainage Improvements	02412	Road Preservation	5.30
Route 287, Truck Weigh Station, Bergen County	858	Road Preservation	23.75
Projects Under Study			
Route 17, Williams Avenue to I-80	103A2	Road Expansion	

NJ Transit

Near-Term

ADA--Platforms/Stations	T143	Transit Enhancement	32.03
* North Arlington Senior Citizen Transportation Vehicles (Earmark)	T563	Transit Enhancement	0.10
Passaic/Bergen NYS&W Project	TN05004	Transit Expansion	163.50

** denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
NJ Transit Projects Under Study			
Comprehensive Bergen-Passaic Bus Study	TN08008	Transit Enhancement	
MeadowlandsTransit Expansion, Bus & Rail Improvements, Harrison/Kingsland Restoration	TN08015	Transit Expansion	
Northern Branch Project Draft Environmental Impact Statement	TN08002	Transit Expansion	
West Shore Region Major Investment Study (MIS) /Envir. Impact Statement (EIS)	TN05002	Transit Expansion	
Authority Projects			
Near/Mid-Term			
New Jersey Meadowlands Commission			
Carlstadt / Moonachie Public Shuttle Service	MC09031_T	Transit Enhancement	4.20
Carlstadt Bike/Pedestrian Improvements	MC09038_B	Bike/Ped	0.73
East Rutherford Bike/Pedestrian Improvements	MC09039_B	Bike/Ped	0.29
Lyndhurst/Rutherford Public Shuttle Service	MC09027_T	Transit Enhancement	8.20
Meadowlands Adaptive Signal System for Traffic Reduction (MASSTR)	MC09001_R	Road Preservation	3.00
Meadows Path (B12) Bike/Pedestrian Improvements	MC09050_B	Bike/Ped	0.10
Meadows Path (B5) Bike/Pedestrian Improvements	MC09047_B	Bike/Ped	0.19
Meadows Path (B6) Bike/Pedestrian Improvements	MC09048_B	Bike/Ped	0.20
Meadows Path (B8) Bike/Pedestrian Improvements	MC09049_B	Bike/Ped	0.54
Moonachie Ave & Grand St Intersection Improvements	MC09020_R	Road Enhancement	0.30
Moonachie Ave & VicinitySafety improvements	MC09037_P	Safety	0.12
Moonachie Bike/Pedestrian Improvements	MC09041_B	Bike/Ped	0.09
Murray Hill Parkway & East Union Ave Intersection Improvements	MC09006_R	Road Enhancement	0.40
Murray Hill Pkwy & East Union Ave Intersection Improvements	MC09021_R	Road Enhancement	0.30
Paterson Plank Rd Bike/Pedestrian Improvements	MC09035_P	Bike/Ped	0.81
Polito Ave & Rutherford Ave Intersection Improvements	MC09017_R	Road Enhancement	0.54
Rt 46 & Industrial Ave Operational Improvements	MC09004_R	Road Enhancement	0.61
Rutherford Bike/Pedestrian Improvements	MC09042_B	Bike/Ped	0.93
Teterboro Bike/Pedestrian Improvements	MC09043_B	Bike/Ped	0.21
Valley Brook Av & Clay Av Intersection Improvements	MC09018_R	Road Enhancement	0.15
Valley Brook Av & Orient Way Intersection Improvements	MC09024_R	Road Enhancement	0.30
Valley Brook Av & Vicinity Bike/Pedestrian Improvements	MC09032_P	Bike/Ped	0.60
New Jersey Turnpike Authority			
Bridge Painting Phase I	TPK1007	Bridges	100.00
Bridge Painting Phase II	TPK1016	Bridges	150.00
Bridge Preservation and Security	TPK1006	Bridges	265.00
Deck Reconstruction Phase I	TPK0508	Bridges	150.00
Deck Reconstruction Phase II	TPK1015	Bridges	350.00
Drainage Improvements	TPK1011	Road Preservation	50.00
Facilities Improvements	TPK1014	Road Preservation	300.00
Facilities Improvements Phase II	TPK1017	Road Preservation	275.00
Improvements to Roadway Appurtenances (Safety Improvements)	TPK1010	Safety	30.00
Median Barrier Improvements	TPK1013	Road Preservation	85.00
Parkway Mainline Shoulder Improvements	GSP1007	Road Preservation	250.00
Parkway Substructure Repairs	GSP1008	Bridges	20.00
Sign Replacements	TPK1012	Road Preservation	100.00

** denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Sign Replacements Phase II	TPK1018	Road Preservation	175.00
Turnpike Specialized Bridge Structure Work	TPK1008	Bridges	15.00
Port Authority of NY & NJ			
Palisades Interstate Parkway Connector Ramp To George Washington Bridge	CB04-161	Road Enhancement	73.10

ESSEX

Highway/Bridges

Near-Term

Berkeley Avenue Bridge	NS9810	Bridges	4.20
* Bridge St., Clay St., Jackson St. Bridges; Essex County	09339	Bridges	0.98
* CARGOMATE	HP01015	Freight	0.75
* Clay St. Reconstruction	09340	Road Preservation	0.49
Delancy Street, Avenue, Avenue I to Avenue P	NS0504	Road Enhancement	13.20
* Edison National Historic Site, Traffic Improvements	08447	Road Enhancement	0.18
* Irvington Center Streetscape	08443	Bike/Ped	0.73
* Livingston Pedestrian Streetscape	08376	Transp. Enhancements	0.66
* Millburn Townwalk, adjacent to the west Branch of the Rahway River	07329	Bike/Ped	0.55
* Newark Access Variable Message Signage System	08442	Safety	0.37
Passaic River-Newark Bay Restoration and Pollution Abatement Project, Route 21, River Road, CR 51	06325	Environment/Air Quality	1.10
* Rahway River Corridor Greenway Bicycle and Pedestrian Path	04390	Bike/Ped	1.37
Route 1&9, Haynes Ave. Operational Improvements	94047	Bridges	16.63
Route 1&9, Pulaski Skyway Interim Repairs (deck, paint,Safety…)	08370	Bridges	154.00
Route 1, North Avenue to Haynes Avenue, Resurfacing	09306	Road Preservation	4.40
Route 21, Southbound Viaduct Chester Avenue (8)	9145	Bridges	56.30
Route 46, Hollywood Avenue	9111B	Road Enhancement	11.83
Route 46, Passaic Avenue to Willowbrook Mall	9233B3	Road Enhancement	7.60
Route 78, Union/Essex Rehabilitation, Contract B	00373B	Road Preservation	62.27
* West Orange Twp., Streetscape and Traffic Improvements	08435	Road Enhancement	2.04

Mid-Term

EWR Southern Access Roadway	94047A	Road Preservation	27.00
McClellan Street Underpass	NS9812	Road Enhancement	13.65
Portway, Passaic River Crossing	97005D	Freight	504.00
Route 1&9, Pulaski Skyway Bridge Replacement	08388	Bridges	4,600.00
Route 1&9, Pulaski Skyway Ongoing Rehabilitation	03356	Bridges	387.50
Route 21, Newark Needs Analysis, Murray Street to Edison Place	99381	Road Enhancement	178.00
* Route 21, Newark Waterfront Community Access	98540	Bike/Ped	5.32
Route 23/80, Long-term Interchange Improvements	9233B6	Road Enhancement	50.60
Route 80, Noise Barriers, Parsippany-Troy Hills to Fairfield, Baldwin Road to Passaic River	94004	Road Enhancement	14.30
Route 280, Route 21 Interchange Improvements	00314	Road Enhancement	84.00
Route 78, Newark, Drainage	08368	Road Preservation	0.35
South Orange Avenue, Traffic, Operational and Roadway Improvements,CR 510	NS0102	Road Enhancement	22.10
Two Bridges Road Bridge and West Belt Extension	NS9801	Bridges	19.60

Projects Under Study

Route 78, PA State Line to NJ Turnpike, ITS Improvements	06360	ITS
Route 280, Exit 10 to Passaic River, ITS Improvements	06357	ITS

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
Near-Term			
* Bloomfield Intermodal Improvements (Earmark)	T561	Transit Enhancement	1.90
Near/Mid-Term			
Light Rail Infrastructure Improvements	T95	Transit Preservation	79.11
Light Rail Vehicle Rolling Stock	T550	Transit Preservation	882.15
Newark Penn Station	T81	Transit Preservation	108.63
Authority Projects			
Near/Mid-Term			
New Jersey Turnpike Authority			
Bridge Painting Phase I	TPK1007	Bridges	100.00
Deck Reconstruction Phase I	TPK0508	Bridges	150.00
Newark Bay Hudson County Extension (NBHCE) Bridge Redecking	TPK1001	Bridges	250.00
Parkway Interchange 142 Improvements	GSP140	Road Expansion	45.00
Parkway Substructure Repairs	GSP1008	Bridges	20.00
Port Authority of NY & NJ			
Corbin Street Flyover	CP05-195	Freight	23.00
Corbin Street Intermodal Facility--Phase1B	CP05-129	Freight	43.00
Corbin Street Intermodal Facility--Phase2A	CP05-148	Freight	21.00
Corbin Street Intermodal Facility--Phase2B	CP05-149	Freight	21.00
Permanent WTC PATH Terminal	CR12-001	Transit Preservation	2,221.00
Port Newark Intermodal Administration Building	CP05-196	Freight	3.00
HUDSON			
Highway/Bridges			
Near-Term			
14th Street Viaduct	NS0311	Bridges	45.00
69th Street Bridge	02311	Bridges	45.00
* 6th Street Viaduct Pedestrian and Bicycle Pathway	06322	Bike/Ped	1.46
* Baldwin Avenue, Intersection Improvements, Weehawken	98551	Road Enhancement	4.02
* Cross-HarborFreight Movement Project	09338	Freight	30.00
East Coast Greenway, Belleville Pike/Route 7	04327A	Bike/Ped	5.40
* Hoboken Observer Highway Operational and Safety Improvements	08441	Safety	1.83
* Hudson County Pedestrian Safety Improvements	08450	Safety	0.73
* Intermodal Access Improvements to the Peninsula at Bayonne	09344	Freight	1.46
* McGinley Square Parking Facility	06321	TDM	0.77
* Newark and First Street Improvements, Hoboken	08446	Road Enhancement	0.22
North Jersey Railroad Doublestack Clearance	06318C	Freight	20.53
* Riverbank Park Bike Trail	08440	Bike/Ped	1.83
Route 1&9, Pulaski Skyway Interim Repairs (deck, paint, Safety…)	08370	Bridges	154.00
Route 1&9T, St. Paul's Avenue/Conrail Bridge (25)	051	Bridges	115.40
Route 3, Hackensack River (eastbound and westbound) Rehabilitation	99417	Bridges	54.92
Route 7, Hackensack River (Wittpenn) Bridge, Contract 1	075A	Bridges	94.46

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Route 280, Harrison Township Operational Improvements	04305	Road Enhancement	14.16
* Route 440, NJ Turnpike Interchange Upgrade, Jersey City	09350	Road Enhancement	2.38
Route 440/1&9T, Jersey City Bicycle/Pedestrian Improvements	01318	Bike/Ped	6.30
Route 495, Route 1&9/Paterson Plank Road Bridge	06373	Bridges	50.65
* Transportation Critical Incident Mobile Data Collection Device	07367	Safety	0.88
* Union City, Street Improvements & Traffic Signal Replacement	08436	Road Enhancement	0.58
Mid-Term			
Portway, Fish House Road/Pennsylvania Avenue, CR 659	97005B	Freight	9.55
Portway, Passaic River Crossing	97005D	Freight	504.00
Route 1&9, NYS&W RR Bridge (23)	9240	Bridges	29.75
Route 1&9, Pulaski Skyway Bridge Replacement	08388	Bridges	4,600.00
Route 1&9, Pulaski Skyway Ongoing Rehabilitation	03356	Bridges	387.50
Route 1&9T, Extension	97005C	Freight	88.13
Route 1&9T, Secaucus Road to Little Ferry	97005E	Freight	138.00
Route 3 over Northern Secondary & Ramp A	08346	Bridges	16.00
Route 7, Hackensack River (Wittpenn) Bridge, Contract 2	075B	Bridges	112.52
Route 7, Hackensack River (Wittpenn) Bridge, Contract 3	075C	Bridges	90.80
Route 7, Hackensack River (Wittpenn) Bridge, Contract 4	075D	Bridges	176.90
Route 7, Kearny, Drainage Improvements	93186	Road Preservation	16.30
Route 139, Contract 3 (Hoboken and Conrail Viaducts)	053C	Bridges	195.28
Route 280, Route 21 Interchange Improvements	00314	Road Enhancement	84.00
Projects Under Study			
Bergen Arches through Jersey City Palisades	98537	Bridges	
Route 139, Jersey City, Drainage	08365	Road Preservation	
Route 280, Kearny Drainage	08363	Road Preservation	
Route 440/1&9, Boulevard through Jersey City	06307	Road Enhancement	
Secaucus Connector	98552	Road Enhancement	
NJ Transit			
Near-Term			
Hudson-Bergen Light Rail 8th Street Extension	T533	Transit Expansion	29.00
Near/Mid-Term			
Light Rail Vehicle Rolling Stock	T550	Transit Preservation	882.15
Plan 2035 Project Index Page 9 of 39			
Mid-Term			
Mass Transit Tunnel (MTT - formerly Access to Region's Core)	T97	Transit Expansion	8,700.00
Hudson-Bergen LRT System, Capital Asset Replacement	T87	Transit Expansion	112.01
Portal Bridge	T539	Transit Preservation	713.00
NJ Transit			
NJ Transit Projects Under Study			
Comprehensive Hudson County Bus Study	TN08009	Transit Enhancement	
* Hudson County LRT Rail Extension Route 440 (Earmark)	T565	Transit Expansion	
Northern Branch Project Draft Environmental Impact Statement	TN08002	Transit Expansion	
West Shore Region Major Investment Study (MIS) /Environmental Impact Statement (EIS)	TN05002	Transit Expansion	

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)

Authority Projects

Near/Mid-Term

AMTRAK

Portal Bridge	AK09001	Transit Preservation	715.00
American Way & Meadowlands Pkwy Intersection Improvements 1.28	MC09014_R	Road Enhancement	
County Av & Center Av Intersection Improvements	MC09009_R	Road Enhancement	0.09
County Av & Paterson Plank Rd Intersection Improvements	MC09010_R	Road Enhancement	1.05
County Av & Secaucus Rd Intersection Improvements	MC09008_R	Road Enhancement	0.70
Harrison Av & VicinityBike/Pedestrian Improvements	MC09033_P	Bike/Ped	0.07
Kearny Public Shuttle Service	MC09026_T	Transit Enhancement	8.20
Meadowland Parkway Reconstruction	MC09002_R	Road Enhancement	1.85
Meadowland Pkwy & Harmon Plaza Intersection Improvements	MC09012_R	Road Enhancement	0.53
Meadowland Pkwy & Seaview Dr Intersection Improvements	MC09016_R	Road Enhancement	0.77
Meadowlands Adaptive Signal System for Traffic Reduction (MASSTR)	MC09001_R	Road Preservation	3.00
Meadowlands Pkwy & Rt 3 eastbound ramp improvements	MC09019_R	Road Enhancement	1.16
Meadowlands Pkwy & Rt 3 westbound ramp improvements	MC09025_R	Road Enhancement	0.30
Plan 2035 Project Index Page 10 of 39			
Meadows Path (B4)Bike/Pedestrian Improvements	MC09046_B	Bike/Ped	0.54
New County Rd, County Rd Extension & Vicinity, Bike/Pedestrian Improvements	MC09036_P	Bike/Ped	0.58
Paterson Plank Rd & 1st St Intersection Improvements	MC09013_R	Road Enhancement	0.28
Paterson Plank Rd & Harmon Meadow Blvd Inters. Improvements	MC09007_R	Road Enhancement	0.61
Paterson Plank Rd & Humboldt St Intersection Improvements	MC09011_R	Road Enhancement	0.15
Paterson Plank Rd & Terminal Rd Intersection Improvements	MC09022_R	Road Enhancement	0.30
PatersonPlank Rd & Westside Av Intersection Improvements	MC09005_R	Road Enhancement	4.03
Rt 3 eastbound Service Road & Plaza Dr Operational improvements	MC09023_R	Road Enhancement	0.30
Rt 7 East & the Newark-Jersey City Turnpike to Wittpenn Bridge (MASSTR)	MC09003_R	Road Preservation	3.00
Secaucus - North Bergen Loop Shuttle	MC09030_T	Transit Enhancement	8.20
Secaucus Greenway (B11)Bike/Pedestrian Improvements	MC09045_B	Bike/Ped	0.95
Secaucus Greenway (B3)Safety improvements	MC09040_B	Safety	0.21
Secaucus Greenway (B9)Bike/Pedestrian Improvements	MC09044_B	Bike/Ped	0.94
Secaucus Junction Loop Shuttle	MC09028_T	Transit Enhancement	4.20
Secaucus Outlet Loop Shuttle	MC09029_T	Transit Enhancement	8.20
Secaucus Rd & Harts Way Intersection Improvements	MC09015_R	Road Enhancement	0.26
Westside Ave Bike/Pedestrian Improvements	MC09034_P	Bike/Ped	1.02

New Jersey Turnpike Authority

Bridge Painting Phase II	TPK1016	Bridges	150.00
Bridge Preservation and Security	TPK1006	Bridges	265.00
Deck Reconstruction Phase I	TPK0508	Bridges	150.00
Deck Reconstruction Phase II	TPK1015	Bridges	350.00
Drainage Improvements	TPK1011	Road Preservation	50.00
Facilities Improvements	TPK1014	Road Preservation	300.00
Facilities Improvements Phase II	TPK1017	Road Preservation	275.00
Improvements to Roadway Appurtenances (Safety Improvements)	TPK1010	Safety	30.00
Median Barrier Improvements	TPK1013	Road Preservation	85.00
Sign Replacements	TPK1012	Road Preservation	100.00
Sign Replacements Phase II	TPK1018	Road Preservation	175.00
Turnpike Hackensack Easterly Bridge Rehabilitation	TPK1002	Bridges	135.00
Turnpike Interchange 14A Reconstruction	TPK1005	Road Enhancement	500.00
Turnpike Interchange 16E – 18E Bridge Improvements	TPK1003	Bridges	15.00

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Turnpike Specialized Bridge Structure Work	TPK1008	Bridges	15.00
Turnpike Widening Int. 16W – Int. 18W	TPK1019	Road Expansion	200.00
Port Authority of NY & NJ			
Permanent WTC PATH Terminal	CR12-001	Transit Preservation	2,221.00
Projects Under Study			
Port Authority of NY & NJ			
Bayonne Bridge Elevation	CP10-001	Bridge	
NEAT Conversion to Container Terminal	CP10-002	Freight	
New Rail at Global Marine	CP10-003	Freight	

HUNTERDON

Highway/Bridges

Near-Term

Church Street Bridge, CR 579	NS9806	Bridges	4.73
Milford-Warren Glen Road, CR 519	NS9703	Road Enhancement	4.70
Rosemont-Raven Rock Road Bridge over Lockatong Creek	NS0209	Bridges	1.25
Route 31, Raritan Valley Line Bridge Replacement (8P)	9102	Road Preservation	13.69
Route 78, Edna Mahan Frontage Road	9137A	Road Enhancement	10.36
Route 78, Pittstown Road (Exit 15), Interchange Improvements (CR 513)	NS0309	Road Enhancement	0.73
Stanton Station Road Bridge over South Branch of Raritan River	NS0501	Bridges	2.18
Wertsville Road Bridge (E-174) over Tributary of Back Brook, CR 602	NS9906	Bridges	3.40
White Bridge Road Bridge	NS9805	Bridges	1.73

Mid-Term

Route 29/179, Lambertville Gateways	00362A	Bike/Ped	11.05
Route 31, Raritan Valley Line Bridge, Roadway Operational Improvements	9102A	Road Enhancement	13.10
Route 31, River Road to vicinity of Church St.	08327	Road Enhancement	6.00
* Route 31/202, Flemington Circle	403B	Road Enhancement	3.64
Route 78, Oldwick Road Interchange, (CR 523)	9341	Road Enhancement	11.40

Projects Under Study

Multi-modal Transportation Center, Hunterdon County	95052	Transit Expansion	
Route 29, Stockton Gateway and Traffic Calming Study	00362E	Road Enhancement	
Route 31, Integrated Land Use & Transportation Plan	403A	Road Expansion	
Route 78, Interchange Study at Route 31	93141	Road Enhancement	
Route 78, PA State Line to NJ Turnpike, ITS Improvements	06360	ITS	

NJ Transit

NJ Transit Projects Under Study			
Central NJ/Raritan Valley Transit Study	TN08016	Transit Expansion	

Authority Projects

Near/Mid-Term

Delaware River Joint Toll Bridge Commission

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
ITS improvements	DB08008	ITS	4.00
Pedestrian Bridge @ Lumberville-Raven Rock	DB05012	Bike/Ped	2.20
Rehabilitation of Upper Black Eddy Bridge	DB08006	Bridges	7.00

MIDDLESEX

Highway/Bridges

Near-Term

* Carteret Ferry Service Terminal	06316	Transit Expansion	1.53
* Carteret Industrial Road	98547	Road Enhancement	2.08
* Carteret, International Trade and Logistics Center Roadway Improvements	06344	Freight	2.01
East Coast Greenway, Middlesex/Union Counties	04327B	Bike/Ped	9.38
Main Street Bypass, Sayreville	06393	Road Expansion	4.00
New Brunswick Bikeway	NS0301	Bike/Ped	3.45
* Plainsboro Traffic Calming Project	09348	Road Enhancement	0.69
* Robert Wood Johnson University Hospital Parking Facility	08449	Transp. Enhancements	1.46
Route 9, Green Street Interchange, Woodbridge	95115	Road Preservation	25.40
Route 9, Pavement Rehabilitation, Middlesex/Monmouth Counties	09307	Road Preservation	19.20
Route 9, Pavement Rehabilitation, Middlesex/Monmouth Counties (Rank #5)	09358	Road Preservation	9.05
Route 18 Ext., Hoes Lane Extension to I-287 (3A)	115B	Road Expansion	35.78
Route 18, Interchange of CRs 516/527	9394	Road Enhancement	18.47
Route 18, Pavement Rehabilitation	09313	Road Preservation	18.72
Route 18, Raritan Riverfront Multipurpose Trail	03349	Bike/Ped	4.80
Route 27, Six Mile Run Bridge (3E)	146	Bridges	5.46
Route 27, South Plainfield Branch (Lake Avenue Bridge)	95102	Bridges	8.32
Route 27, Wood Avenue	93227C	Road Enhancement	18.90
Route 35, Cheesequake Creek Bridge	06368	Bridges	34.00
Route 35, Greenwood Drive to Prospect Avenue	177A	Road Preservation	15.86
Route 130, Adams Lane (16)	9155	Road Enhancement	10.23
Route 184, Pavement Rehabilitation	09315	Road Preservation	1.42
Route 440, High Street Connector	99379	Road Expansion	3.04
Schalks Station Road Bridge, CR 683	00321	Bridges	4.54
* Veterans Field Pedestrian Walkway / Bike Path	09318	Bike/Ped	0.62

Mid-Term

Oak Tree Road Bridge, CR 604	99316	Bridges	16.75
Route 1, Forrestal Road to Aaron Road Widening	08417	Road Expansion	301.22
Route 1, New Brunswick Pedestrian Crossing	06383	Bike/Ped	0.50
Route 1, South Brunswick, Drainage Improvements	93253	Road Preservation	8.30
Route 27, Renaissance 2000, Bennetts Lane to Somerset Street	97079	Road Enhancement	9.27
Route 34, Amboy Road/Morristown Road (5)	9227	Road Enhancement	6.11

Projects Under Study

Raritan Industrial Railroad Track	06394	Freight	
Route 1&9, Woodbridge/Rahway Drainage	08374	Road Preservation	
Route 1, Middlesex County Operational Improvements	93146	Road Expansion	
Route 9, Bordentown Road Interchange Operational Improvements	08418	Road Enhancement	
Route 9/35, Main Street Bridge	079A	Bridges	
Route 18, East Brunswick Drainage	08373	Road Preservation	

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Route 18, Route 1 to Edgeboro Road, proposed Operational Improvements	X221B	Road Enhancement	
Route 287, Interchange 10 Ramp Improvements	9169Q	Road Enhancement	
Route 287, Interchange 10, Easton/Davidson Avenue Intersection Road Enhancement	9169P	Improvements	
Route 287, River Road (CR 622), Interchange Improvements	9169R	Road Enhancement	
Route 287, Route 440 and NJ Turnpike Interchange to I-78, Improvements	06359	ITS	

NJ Transit

Near-Term

Metropark Platform Rehabilitation/Expansion	T538	Transit Enhancement	1.00
South Amboy Intermodal Facility	T530	Transit Enhancement	2.63
* South Brunswick Transit System (Earmark)	T522	Transit Expansion	0.38

NJ Transit

NJ Transit Projects Under Study

Monmouth – Ocean – Middlesex Corridor Project	TN05001	Transit Expansion	

Authority Projects

Near/Mid-Term

New Jersey Turnpike Authority

Bridge Painting Phase I	TPK1007	Bridges	100.00
Bridge Painting Phase II	TPK1016	Bridges	150.00
Bridge Preservation and Security	TPK1006	Bridges	265.00
Deck Reconstruction Phase I	TPK0508	Bridges	150.00
Deck Reconstruction Phase II	TPK1015	Bridges	350.00
Drainage Improvements	TPK1011	Road Preservation	50.00
Facilities Improvements	TPK1014	Road Preservation	300.00
Facilities Improvements Phase II	TPK1017	Road Preservation	275.00
Improvements to Roadway Appurtenances (Safety Improvements)	TPK1010	Safety	30.00
Median Barrier Improvements	TPK1013	Road Preservation	85.00
Parkway Interchange 125 (Phase I)	GSP1003	Road Enhancement	40.00
Parkway Mainline Shoulder Improvements	GSP1007	Road Preservation	250.00
Parkway Substructure Repairs	GSP1008	Bridges	20.00
Sign Replacements	TPK1012	Road Preservation	100.00
Sign Replacements Phase II	TPK1018	Road Preservation	175.00
Turnpike Interchange 6 – 9 Widening	TPK0501	Road Expansion	2,500.00
Turnpike Interchange 8A to Route 130 Connection	TPK1004	Road Expansion	100.00
Turnpike Specialized Bridge Structure Work	TPK1008	Bridges	15.00

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)

MONMOUTH

Highway/Bridges

Near-Term

County Bridge MN-10 Reconstruction and Rehabilitation of Millhurst Dam	FSN09437	Road Preservation	4.30
County Bridge S-31, Priority 1 Structural Steel Repairs	FSN09438	Bridges	1.30
Halls Mill Road	HP01002	Road Enhancement	7.50
* Holmdel Twp., Road Improvements to Reduce Flooding	09343	Road Preservation	0.10
Route 9, Craig Road/East Freehold Road, Intersection Improvements	97071	Road Enhancement	12.60
Route 9, Pavement Rehabilitation, Middlesex/Monmouth Counties	09307	Road Preservation	19.20
Route 9, Pavement Rehabilitation, Middlesex/Monmouth Counties (Rank#5)	09358	Road Preservation	9.05
Route 35, Greenwood Drive to Prospect Avenue	177A	Road Preservation	15.86
Route 36, Highlands Bridge over Shrewsbury River	185	Bridges	53.23
Route 36, Rumson Road to Union Avenue	09305	Road Preservation	6.51
Route 71, Sea Girt Avenue to Route 35	09304	Road Preservation	8.90
West Front Street Bridge (S-17) over Swimming River, CR 10	NS0006	Bridges	11.00

Mid-Term

County Route 6 Bridge (MA-14)	NS9811	Bridges	13.50
County Route 537 Corridor, Section A, NJ Rt. 33 Business and Gravel Hill Roadl	NS0403	Road Enhancement	31.00
* Laurel Avenue Bridge Replacement	08379	Bridges	0.73
Monmouth County Bridge S-31 (AKA Bingham Avenue Bridge) over Navesink River, CR 8A	NS9603	Bridges	58.00
Monmouth County Bridges W7, W8, W9 over Glimmer Glass and Debbie's Creek	NS9306	Bridges	23.96
Ocean Avenue, Monmouth, Streetscape	02361	Bike/Ped	2.00
Route 9, Bus Rapid Transit	07350	Transit Enhancement	10.30
* Route 34, Colts Neck, Intersection Improvements (CR 537)	96040	Road Enhancement	0.25
Route 36, Many Mind Creek/Wagner Creek, Drainage Improvements	93252	Road Preservation	3.40
Route 71, Wyckoff Road, CR 547	HP01001	Road Enhancement	4.56
Rumson Road over the Shrewsbury River, CR 520	NS9706	Bridges	52.00
Sunset Avenue over Deal Lake (O-10)	NS0106	Bridges	9.00

Projects Under Study

Route 35, Eatontown Borough Downtown Redevelopment	98539B	Economic Development	
Route 35, Eatontown Borough Intersection Improvements	98539A	Road Enhancement	

NJ Transit

NJ Transit Projects Under Study

Monmouth – Ocean – Middlesex Corridor Project	TN05001	Transit Expansion	

Authority Projects

Near/Mid-Term

New Jersey Turnpike Authority

Parkway Mainline Shoulder Improvements	GSP1007	Road Preservation	250.00

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)

MORRIS

Highway/Bridges

Near-Term

Berkshire Valley Road Bridge over Rockaway River	NS0206	Bridges	2.80
* Great Swamp National Wildlife Refuge Road	09342	Road Enhancement	0.18
Intersection Improvements, Morris County	FSN09434	Road Enhancement	0.35
Landing Road Bridge Over Morristown Line, CR 631	NS9708	Bridges	8.13
Middle Valley Road Bridge over South Branch of Raritan River	NS0503	Bridges	3.68
Newburgh Road Bridge over Musconetcong River	NS9909	Bridges	3.75
NY Susquehanna and Western Rail Line Bicycle/Pedestrian Path	NS9803	Bike/Ped	9.50
Prospect Street Bridge over Morristown Line, CR 513	98528	Bridges	3.78
Route 10, Commerce Boulevard Improvements	089A1	Road Enhancement	9.25
Route 10, Route 53 Interchange (2L 3J)	089	Road Enhancement	13.00
Route 183/46, NJ TRANSIT Bridge/Netcong Circle	95077	Road Preservation	18.97
Sussex Turnpike, CR 617	L070	Road Enhancement	6.50
Union School House Road over North Branch of the Raritan River, Bridge Replacement	NS0604	Bridges	3.63

Mid-Term

* Long ValleySafety Project	NP0301	Road Enhancement	0.73
Openaki Road Bridge	NS9802	Bridges	5.50
Route 10, Jefferson Road	00312	Road Enhancement	9.20
Route 10/202, NJ 53 to Johnson Road, Operational Improvements	98338C	Road Enhancement	15.50
Route 23, Bridge over Pequannock River / Hamburg Turnpike	08347	Bridges	41.00
Route 46, I-80 to I-80/280, ITS Improvements	06366	ITS	20.00
Route 80, Noise Barriers, Parsippany-Troy Hills to Fairfield, Baldwin Roadto Passaic River	94004	Road Enhancement	14.30
Route 80, Parsippany-Troy Hills Roadway Improvement	00371B	Road Preservation	94.10
Two Bridges Road Bridge and West Belt Extension	NS9801	Bridges	19.60
Waterloo Road over Musconetcong River	NS0107	Bridges	3.50

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Projects Under Study

Rockaway River Greenway	03348	Bike/Ped	
Route 57/182/46, Hackettstown Mobility Improvements Study	9237	Road Enhancement	
Route 78, Corridor	08416	Road Enhancement	
Route 80, Interchange 27, Drainage	08367	Road Preservation	
Route 80, Route 46 to West of Change Bridge Road, ITS Improvements	06361	ITS	
Route 80/15 Interchange	93139	Road Enhancement	

NJ Transit

Near-Term

Lackawanna Cutoff MOS Project	T535	Transit Expansion	14.12
Morristown/Montclair Booton Commuter Rail Intermodal Improvements (Earmark)	T562	Transit Enhancement	0.95
** Northern NJ Intermodal Stations and Park and Ride (Earmark)	T555	TDM	8.00

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
NJ Transit Projects Under Study			
Lackawanna Passenger Rail Study – Northeast Pennsylvania-Northwest New Jersey – Lackawanna cut-off passenger restoration (from Andover to PA)	TN05006	Transit Expansion	
Northwest New Jersey Bus Study	TN08007	Transit Expansion	

OCEAN

Highway/Bridges

Near-Term			
Beach Boulevard Bridge, Replacement, Ocean County	FSN09419	Bridges	5.41
Beaver Dam Bridge Painting, Ocean County	FSN09430	Bridges	0.58
County Route 571 at Francis Mills	NS0601	Safety	4.50
Route 9, Lacey Road Intersection Improvements	97080A	Road Enhancement	8.49
Route 9, Pohatcong Lake Dam	93270	Road Preservation	11.53
Route 9, Westecunk Creek Bridge (34)	94022	Bridges	5.85
Route 35, Restoration, Mantoloking to Point Pleasant (MP 9 - 12.5)	9147D	Road Preservation	13.59
Route 72, East Road	94071A	Road Enhancement	11.56
Route 72, Westbound, CR 539 to Nautilus Drive, Evacuation Route	06323	Road Expansion	1.50
Route 88, Pavement Rehabilitation, Ocean County	09312	Road Preservation	3.17
Safety Upgrade Replacement of Bridge Guiderail End Treatments at 8Bridges, Ocean County	FSN09564	Safety	0.93
Mid-Term			
Garden State Parkway Interchange 91 Improvements and Burnt Tavern Road	NS0414	Road Enhancement	30.20
Route 9, Bus Rapid Transit	07350	Transit Enhancement	10.30
Route 9, Green Street Intersection Improvements, Tuckerton (CR 539)	97080M	Road Enhancement	0.50
Route 9, Lakewood/Toms River, Congestion Relief	076C	Road Expansion	692.00
Route 35, Restoration, Berkeley Twp. to Toms River Twp. (MP 0-4)	9147A	Road Preservation	46.55
Route 35, Restoration, Toms River Twp. to Mantoloking (MP 4-9)	9147C	Road Preservation	59.47
Route 37, Mathis Bridge Eastbound over Barnegat Bay	06369	Bridges	73.00
Route 37, Tunney Bridge Westbound over Barnegat Bay	08391	Bridges	44.00
Route 72, Manahawkin BayBridges	00357	Bridges	207.20
Route 72, Ship Bottom	93265	Road Enhancement	15.25
Route 166, Toms River Twp., Highland Parkway to Old Freehold Road, operational improvements	9028	Road Enhancement	10.23
Projects Under Study			
Route 9, Bridge over Waretown Creek	08316	Bridges	
Route 9, Mizzen Avenue and Washington Avenue, Intersection Improvements	97080N	Road Enhancement	
Route 9, West Creek, Drainage Improvements	96017	Road Preservation	
Route 70, Duquesne Boulevard to Route 88, ILUTP	05383	Road Enhancement	
Route 88, Bridge over Beaver Dam Creek	09322	Bridges	

NJ Transit

Near-Term

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
* Lakewood Bus Service and Parking Facilities (Earmark)	T517	Transit Enhancement	1.02

NJ Transit

NJ Transit Projects Under Study

Monmouth – Ocean – Middlesex Corridor Project	TN05001	Transit Expansion	
Authority Projects			
Near/Mid-Term			
New Jersey Turnpike Authority			
GSP Interchange 67 Improvements (Bay Avenue)	GSP9704	Road Enhancement	50.00
Parkway Interchange 88 Improvements	GSP030	Road Enhancement	50.00
Parkway Interchange 91 Improvements	GSP098	Road Enhancement	50.00
Parkway Mainline Shoulder Improvements	GSP1007	Road Preservation	250.00
Widening of GSP Int. 63 – Int. 80	GSP0509	Road Expansion	200.00

PASSAIC

Highway/Bridges

Near-Term

* Belmont Avenue Gateway Community Enhancement Project	07356	Road Enhancement	0.37
Eighth Street Bridge	NS0109	Bridges	8.35
Fifth Avenue Bridge (aka Fair Lawn Avenue Bridge) over Passaic River	NS9606	Bridges	10.20
NY Susquehanna and Western Rail Line Bicycle/Pedestrian Path	NS9803	Bike/Ped	9.50
* Pompton Lakes Downtown Streetscape	07331	Bike/Ped	1.37
Route 3, Passaic River Crossing	799	Bridges	239.50
Route 46, Broad Street Bridge Replacement and Operational Improvements	98364	Bridges	5.61
Route 46, Passaic Avenue to Willowbrook Mall	9233B3	Road Enhancement	7.60
* Union Boulevard Revitalization and Streetscape Enhancements	07354	Bike/Ped	0.37
West Brook Road Bridge over Wanaque Reservoir	NS9607	Bridges	19.15

Mid-Term

Clove Road/Long Hill Road Improvements, CR 620/631	NS0412	Road Enhancement	8.84
Route 3, Route 46, Valley Road and Notch/Rifle Camp Road Interchange	059	Road Enhancement	165.65
Route 23, Bridge over Pequannock River / Hamburg Turnpike	08347	Bridges	41.00
Route 23/80, Long-term Insterchange Improvements	9233B6	Road Enhancement	50.60
Route 46, Van Houten Avenue to Broad Street, Drainage Improvements	9029A	Road Preservation	4.80
Route 80, Noise Barriers, Parsippany-Troy Hills to Fairfield, Baldwin Road o Passaic River	94004	Road Enhancement	14.30
Two Bridges Road Bridge and West Belt Extension	NS9801	Bridges	19.60
Projects Under Study			
Route 20, Paterson Drainage	08372	Road Preservation	

NJ Transit

Near-Term

* NW NJ Intermodal Transit Improvements (Earmark)	T556	TDM	0.71

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Passaic/Bergen NYS&W Project	TN05004	Transit Expansion	163.50

NJ Transit

NJ Transit Projects Under Study

Comprehensive Bergen-Passaic Bus Study	TN08008	Transit Enhancement	
Northwest New Jersey Bus Study	TN08007	Transit Expansion	
West Shore Region Major Investment Study (MIS) /Environmental Impact Statement (EIS)	TN05002	Transit Expansion	

SOMERSET

Highway/Bridges

Near-Term

Camp Meeting Avenue Bridge over Trenton Line, CR 602	99405	Bridges	12.25
* Great Swamp National Wildlife Refuge Road	09342	Road Enhancement	0.18
Hillsborough Road and Homestead Road Bridges	08375	Bridges	4.50
* Lehigh Rail Line Separation	08445	Safety	0.77
* Port Reading Junction	06318B	Freight	4.59
Route 22, Chimney Rock Road Interchange Improvements	98542	Road Enhancement	35.32
Route 22, ITS Closed Loop System, Somerset County	03317E	ITS	2.22
Route 22, Park Avenue/Bonnie Burn Road	9189	Road Enhancement	12.04
Route 22, Sidewalk Improvements, Somerset County	03317D	Safety	4.93
* Route 22, Sustainable Corridor Short-term Improvements	03319	Road Enhancement	6.79
Route 22, Traffic Signal Improvements/Signal Coordination, Somerset County	03317A	Road Enhancement	4.32
Route 27, Six Mile Run Bridge (3E)	146	Bridges	5.46
Route 206 Bypass, Contract A, Hillsborough Road to Amwell Road (CR 514)	779A	Road Expansion	80.00
Route 206, Crusers Brook Bridge (41)	94060	Bridges	8.78
Route 206, CSX Bridge Replacement	94059	Bridges	19.10
Route 287, Vicinity of Main Street to South of I-78, Resurfacing	98438	Road Preservation	24.16

Mid-Term

Route 22, Crab Brook, Drainage Improvements	93151	Road Preservation	4.70
Route 27, Renaissance 2000, Bennetts Lane to Somerset Street	97079	Road Enhancement	9.27
Route 202/206 and Route 22 Interchange, North Thomson Street to Commons Way, Operational and Safety Improvements	02372	Road Enhancement	17.50
Route 202/206, Local Improvements	93121A	Road Enhancement	23.50
Route 206 Bypass, Mountain View Road to Old Somerville Road (Sections 779 14A & 15A)		Road Expansion	87.50
Route 206, Old Somerville Road to Brown Avenue (15N)	780	Road Expansion	102.60
Route 287/78, I-287/202/206 Interchange Improvements	04389	Safety	47.70

Projects Under Study

Davenport Street Extension	06378	Road Expansion	
Orchard Road Connector	06381	Road Expansion	
Route 22, Sustainable Corridor Long-term Improvements	03318	Road Enhancement	
Route 78, Corridor	08416	Road Enhancement	
Route 78, PA State Line to NJ Turnpike, ITS Improvements	06360 ITS		
Route 202, First Avenue Intersection Improvements	02372B	Road Enhancement	
Route 206, Cherry Valley Road Intersection Improvements	01320	Road Enhancement	

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Route 206, Hillsborough-Montgomery Gateway	08351	Road Enhancement	
Route 206, Southbound Merge Improvements with I-287 Ramp	02372A	Road Enhancement	
Route 287, Interchange 10 Ramp Improvements	9169Q	Road Enhancement	
Route 287, Interchange 10, Easton/Davidson Avenue Intersection Improvements	9169P	Road Enhancement	
Route 287, Route 440 and NJ Turnpike Interchange to I-78, ITS Improvements	06359	ITS	

NJ Transit

Near-Term

ADA--Platforms/Stations	T143	Transit Enhancement	32.03

NJ Transit

NJ Transit Projects Under Study

West Trenton Line Initiative	TN05003	Transit Expansion	

SUSSEX

Highway/Bridges

Near-Term

Route 23, Bridge over Branch of Wallkill River	08348	Bridges	3.50
Route 23, Hardyston Twp., Silver Grove Road to Holland Mountain Road	96039	Road Preservation	8.05
Route 23, Sussex Borough Realignment & Papakating Creek Bridge	9044	Road Enhancement	25.36
Route 206, Waterloo/Brookwood Roads (CR 604)	407A	Road Enhancement	28.54

Mid-Term

County Route 515, Vernon Township, Phases II, III, IV	NS0002	Road Enhancement	16.76
County Route 517, Route 23 to Route 94	NS0505	Road Enhancement	26.98
County Route 653, Sussex County	NS0202	Road Enhancement	31.30
Newton-Sparta Road,Safety and operational improvements (CR 621 to Rt 181).	NS0112	Road Enhancement	11.00
Sussex County Route 605 Connector	NS9911	Road Enhancement	83.46

Projects Under Study

Route 15, Bridge over Beaver Run	09319	Bridges	

NJ Transit

Near-Term

Lackawanna Cutoff MOS Project	T535	Transit Expansion	14.12
* NW NJ Intermodal Transit Improvements (Earmark)	T556	TDM	0.71

** Denotes projects with congressional earmark funding which does not necessarily reflect the full cost of projects, nor the YOE amount.*

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
NJ Transit Projects Under Study			
Lackawanna Passenger Rail Study – Northeast Pennsylvania			
Northwest New Jersey – Lackawanna cut-off passenger restoration (from Andover to PA)	TN05006	Transit Expansion	
Northwest New Jersey Bus Study	TN08007	Transit Expansion	
UNION			
Highway/Bridges			
Near-Term			
* Broad Street Streetscape, Elizabeth	08438	Road Enhancement	0.51
* CARGOMATE	HP01015	Freight	0.75
East Coast Greenway, Middlesex/Union Counties	04327B	Bike/Ped	9.38
* Elizabeth River Bicycle/Pedestrian Path	08378	Bike/Ped	0.37
Gordon Street over "Out of Service" Conrail Branch, Replacement	NS0408	Bridges	6.00
Morris Avenue Bridge over Morristown Line	93259	Bridges	8.10
* New Providence Downtown Streetscape Enhancements	09341	Transp.	0.25
North Avenue Corridor Improvement Project (NACI)	06318F	Road Enhancement	184.44
* North Avenue, Elizabeth Pedestrian and Bicycle Project	08439	Bike/Ped	0.05
* Prospect Avenue Culvert, Summit	08377	Road Preservation	0.29
* Rahway Streetscape Replacement	07330	Bike/Ped	0.37
Route 1, North Avenue to Haynes Avenue, Resurfacing	09306	Road Preservation	4.40
Route 22, Liberty Avenue & Conrail Bridge	95116	Bridges	36.88
Route 22, Pedestrian Improvements, Union/Springfield Townships	02374	Bike/Ped	2.80
Route 78, Garden State Parkway, Interchange 142	98545	Road Enhancement	40.60
Route 78, Union/Essex Rehabilitation, Contract B	00373B	Road Preservation	62.27
Springfield Avenue, Intersection Improvements, Union County	FSN09406	Road Enhancement	0.51
* St. Georges Avenue Improvements	08434	Road Enhancement	0.37
Terrill Road Corridor Signalization-Somerset County Line to Martine Avenue, Union County	FSN09403	Road Enhancement	1.42
Tremley Point Access Local Roadway Improvements	9324A	Road Expansion	48.75
Mid-Term			
Route 22, Bloy Street to Liberty Avenue	658C	Road Preservation	7.63
Route 22, Chestnut Street Bridge Replacement (CR 626)	04361	Bridges	14.00
Route 22, Garden State Parkway/Route 82 Interchange Improvements	658A	Road Preservation	9.00
Route 22, Hilldale Place/Broad Street	658E	Bridges	8.75
Projects Under Study			
Route 1&9, Woodbridge/Rahway Drainage	08374	Road Preservation	
Route 22, Westbound, Vicinity of Vauxhall Road to West of Bloy Street	658B	Road Preservation	
Route 78, Corridor	08416	Road Enhancement	
Route 78, PA State Line to NJ Turnpike, ITS Improvements	06360 I	TS	
Route 82, Rahway River Bridge	94019	Bridges	

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
NJ Transit Projects Under Study			
Union County Light Rail System Authority Projects	TN05007	Transit Expansion	
Near/Mid-Term			
New Jersey Turnpike Authority			
Bridge Painting Phase I	TPK1007	Bridges	100.00
Bridge Painting Phase II	TPK1016	Bridges	150.00
Bridge Preservation and Security	TPK1006	Bridges	265.00
Deck Reconstruction Phase I	TPK0508	Bridges	150.00
Deck Reconstruction Phase II	TPK1015	Bridges	350.00
Drainage Improvements	TPK1011	Road Preservation	50.00
Facilities Improvements	TPK1014	Road Preservation	300.00
Facilities Improvements Phase II	TPK1017	Road Preservation	275.00
Improvements to Roadway Appurtenances (Safety Improvements)	TPK1010	Safety	30.00
Median Barrier Improvements	TPK1013	Road Preservation	85.00
Parkway Interchange 142 Improvements	GSP140	Road Expansion	45.00
Parkway Substructure Repairs	GSP1008	Bridges	20.00
Sign Replacements	TPK1012	Road Preservation	100.00
Sign Replacements Phase II	TPK1018	Road Preservation	175.00
Expenditure amount.			
Tremley Point Connector Road	TPK0210	Road Expansion	125.00
Turnpike Specialized Bridge Structure Work	TPK1008	Bridges	15.00
Port Authority of NY & NJ			
Goethals Bridge Replacement	CB09-001	Bridges	1,100.00
Expenditure amount.			
WARREN			
Highway/Bridges			
Near-Term			
Cemetery Road Bridge over Pequest River	NS9314	Bridges	1.76
Newburgh Road Bridge over Musconetcong River	NS9909	Bridges	3.75
Route 46, Beaver Brook Bridge Replacement (WB)	03304A	Bridges	4.07
Route 80, Truck Weigh Station, Eastbound, Knowlton Township	285A	Road Preservation	15.21
Mid-Term			
Route 22, Belvidere Road Vicinity to I-78	9136	Road Enhancement	58.50
Route 57, CR 519 Intersection Improvement	97062B	Road Enhancement	10.03
Projects Under Study			
Route 31, Bridge over Furnace Brook	09325	Bridges	
Route 57/182/46, Hackettstown Mobility Improvements Study	9237	Road Enhancement	
Route 78, PA State Line to NJ Turnpike, ITS Improvements	06360	ITS	
Route 173, Bridge over Pohatcong Creek	09320	Bridges	

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
NJ Transit			
Near-Term			
* NW NJ Intermodal Transit Improvements (Earmark)	T556	TDM	0.71
NJ Transit			
NJ Transit Projects Under Study			
Central NJ/Raritan Valley Transit Study	TN08016	Transit Expansion	
Lackawanna Passenger Rail Study – Northeast Pennsylvania NorthwestNew Jersey – Lackawanna cut-off passenger restoration (from Andover to PA)	TN05006	Transit Expansion	
Northwest New Jersey Bus Study	TN08007	Transit Expansion	
Authority Projects			
Near/Mid-Term			
Delaware River Joint Toll Bridge Commission			
Delaware Water Gap ORT and One Auxiliary WB Lane	DB08003	ITS	65.00
Interstate 78 Bridge over Delaware River	DB05001	ITS	90.50
ITS improvements	DB08008	ITS	4.00
Rehab of Easton-Phillipsburg Toll Bridge	DB08002	Bridges	19.30
Riegelsville Bridge @ Riegelsville	DB05006	Bridges	7.00
US 46 @ Portland-Columbia line	DB05003	Bridges	6.30

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ONGOING PROGRAMS

Highway/Bridges

Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Acquisition of Right of Way	X12	ALL	29.16
Accident Reduction Program	X242	Safety	107.30
Airport Improvement Program	08415	Aviation	204.10
Asbestos Surveys and Abatements	04311	ALL	39.57
Betterments, Bridge Preservation	X72A	Bridges	1,719.96
Betterments, Dams	01335	Road Preservation	12.52
Betterments, Roadway Preservation	X72B	Road Preservation	291.57
Betterments, Safety	X72C	Safety	204.10
Bicycle & Pedestrian Facilities/Accommodations	X185	Bike/Ped	204.10
Bridge Deck Patching Program	06385	Bridges	145.78
Bridge Deck Replacement Program	03304	Bridges	1,295.06
Bridge Inspection, Local Bridges	X07E	Bridges	229.58
Bridge Inspection, State NBIS Bridges	X07A	Bridges	348.74
Bridge Management System	X70	Bridges	14.84
Bridge Painting Program	X08	Bridges	354.88
Bridge Replacement, Future Projects	08381	Bridges	6,878.41
Bridge Scour Countermeasures	98316	Bridges	181.16
Bridge, Emergency Repair	98315	Bridges	1,171.77
Capital Contract Payment Audits	98319	ALL	43.74
Clean Cities Program X190 Environment/Air Quality	3.22		
Community Notification of Construction Projects	07339	ALL	2.92
Congestion Relief, Intelligent Transportation System Improvements (Smart Move Program)	02379	ITS	116.63
Congestion Relief, Operational Improvements (Fast Move Program)	02378	Road Enhancement	145.78
Construction Inspection	X180	ALL	237.16
Construction Program IT System (TRNS.PORT)	05304	ALL	37.65
Culvert Inspection Program, Locally-owned Structures	99322A	Road Preservation	131.21
Culvert Inspection Program, State-owned Structures	99322	Bridges	30.57
Culvert Replacement Program	09316	Road Preservation	58.31
DBE Supportive Services Program	X142	ALL	14.58
Design, Emerging Projects	X106	ALL	192.44
Design, Geotechnical Engineering Tasks	05342	ALL	25.18
Disadvantaged Business Enterprise	X197	ALL	2.92
Drainage Rehabilitation & Improvements	X154D	Road Preservation	58.31
Drainage Rehabilitation and Maintenance, State	X154	Road Preservation	87.47
Electrical and SignalSafety Engineering Program	X147	ALL	1.29
Electrical Facilities	X241	ALL	51.02
Electrical Load Center Replacement, Statewide	04324	Safety	71.89
Emergency Service Patrol	X181	ITS	207.01
Environmental Investigations	X75	Environment/Air Quality	91.84
Environmental Project Support	03309	Environment/Air Quality	11.66
Equipment Purchase (Vehicles, Construction,Safety)	X15	ALL	291.57
Ferry Program	00377	Transit Enhancement	145.78
Freight Program	X34	Freight	294.07
HighwaySafety Improvement Program Planning	09388	Safety	134.16
Intelligent Transportation Systems	03305	ITS	58.31
Intersection Improvement Program	98333	Road Enhancement	29.16
Interstate Service Facilities	X151	Road Preservation	2.92
Legal Costs for Right of Way Condemnation	X137	Overhead	46.65
Local Aid for Centers of Place	X161	ALL	29.16

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Local Aid Grant Management System	06327	ALL	2.92
Local Aid, Infrastructure Fund	X186	ALL	510.25
Local Bridges, Future Needs	08387	Bridges	728.92
Local CMAQ Initiatives	X065	TDM	58.31
Local County Aid, NJTPA	X41B1	ALL	1,583.93
Local Municipal Aid, NJTPA	X98B1	ALL	1,588.03
Local Municipal Aid, Urban Aid	X98Z	ALL	145.78
Local Project Development Support	06326	ALL	21.87
LocalSafety/ High Risk Rural Roads Program	04314	Safety	87.47
Maintenance & Fleet Management System	X196	Road Preservation	29.16
Maritime Transportation System	01309	Freight	58.31
Metropolitan Planning	X30A	ALL	421.30
Minority and Women Workforce Training Set Aside	07332	ALL	37.90
Motor Vehicle Crash Record Processing	X233	Safety	116.63
National Boating Infrastructure Grant Program	01342	Freight	46.65
New Jersey Scenic Byways Program	X200C	Environment/Air Quality	14.58
NJ Underground Railroad	09345	ALL	0.32
NJTPA, Future Projects, Local Scoping/Local Lead	N063	ALL	1,589.41
Orphan Bridge Reconstruction	99372	Bridges	87.47
Park and Ride/Transportation Demand Management Program	X28B	TDM	262.41
Pavement Preservation	X51	Road Preservation	58.31
PedestrianSafety Corridor Program	06401	Bike/Ped	14.58
PedestrianSafety Improvement Design and Construction	06403	Bike/Ped	30.26
Physical Plant	X29	ALL	189.52
Planning and Research, Federal-Aid	X30	ALL	747.52
Planning and Research, State	X140	ALL	87.47
Pre-Apprenticeship Training Program for Minorities and Females	X135	ALL	14.58
Program implementation costs, NJDOT	X10	ALL	4,109.26
Project Development, Feasibility Assessment	X32	ALL	290.57
Project Development, Preliminary Design	99321	ALL	5.00
Project Enhancements	05341	ALL	5.83
Radio Communications System Replacement	09317	ALL	10.00
Rail-Highway Grade Crossing Program, Federal	X35A1	Safety	106.20
Rail-Highway Grade Crossing Program, State	X35A	Safety	83.07
Recreational Trails Program	99409	Bike/Ped	37.79
Regional Action Program	X144	Road Preservation	29.16
Restriping Program & Line Reflectivity Management System	X03A	Safety	227.42
Resurfacing Program	X03E	Road Preservation	2,038.06
Resurfacing, Federal	99327A	Road Preservation	4,205.70
Right of Way Database/Document Management System	05339	ALL	2.92
Right of Way Full-Service Consultant Term Agreements	05340	ALL	8.75
Rockfall Mitigation	X152	Road Preservation	58.31
Safe Corridors Program	04313	Safety	1,633.42
Safe Routes to School Program	99358	Safety	146.16
Safe Streets to Transit Program	06402	Bike/Ped	29.16
Sign Structure Inspection Program	X239	Road Preservation	55.81
Sign Structure Rehabilitation Program	X239A	Road Preservation	87.47
Signs Program, Statewide	X39	ITS	58.31
Smart Growth Initiatives	X186A	Economic Development	14.58
State Police Enforcement andSafety Services	X150	Safety	291.57
State PoliceSafety Patrols	04312	Safety	48.31
Statewide Incident Management Program	X230	ITS	230.34
Statewide Traffic Management/Information Program	06324	ITS	117.83
TMA-NJTPA	X43K	TDM	119.54
Traffic and Safety Engineering Program	09389	Safety	116.63
Traffic Monitoring Systems	X66	ITS	476.31

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Project Name	DBNUM	RCIS Category	Estimated YOE- (in $millions)
Traffic Operations Center (North)	X99	ITS	202.44
Traffic Operations Center (South)	X82	ITS	18.85
Traffic Signal Replacement	X47	ITS	233.26
Traffic Signal Timing and Optimization	04320	ITS	49.57
Training and Employee Development	X244	ALL	52.48
Transit Village Program	01316	Economic Development	58.31
Transportation and Community System Preservation Program	02393	Road Enhancement	4.00
Transportation Demand Management Program Support	X43	TDM	6.71
Transportation Enhancements	X107	Transp. Enhancements	311.07
Unanticipated Design, Right of Way and Construction Expenses, State	X11	ALL	671.68
Underground Exploration for Utility Facilities	X101	ALL	5.83
University Transportation Research Technology	X126	ALL	58.31
Utility Reconnaissance and Relocation	X182	ALL	116.63
Youth Employment and TRAC Programs	X199	ALL	7.29

NJ TRANSIT

ADA— Equipment	T70	Transit Enhancement	53.85
Bridge and Tunnel Rehabilitation	T05	Transit Preservation	1,315.08
Building Capital Leases	T32	Transit Enhancement	116.34
Bus Acquisition Program	T111	Transit Preservation	2,449.28
Bus Maintenance Facilities	T93	Transit Preservation	74.22
Bus Passenger Facilities/Park and Ride	T06	TDM	77.76
Bus Support Facilities and Equipment	T08	Transit Preservation	130.32
Bus Vehicle and Facility Maintenance/Capital Maintenance	T09	Transit Preservation	712.30
Capital Program Implementation	T68	ALL	655.06
Casino Revenue Fund	T515	TDM	699.68
Claims Support	T13	Transit Enhancement	53.89
Environmental Compliance	T16	Transit Preservation	80.84
Immediate Action Program	T20	Transit Preservation	370.53
Job Access and Reverse Commute Program	T199	Transit Expansion	163.28
Locomotive Overhaul	T53E	Transit Preservation	226.57
Major Bridge Program	T501	Transit Preservation	796.06
Miscellaneous	T122	Transit Enhancement	10.20
NEC Improvements	T44	Transit Preservation	952.98
New Freedom Program	T552	Transp. Enhancements	65.42
* New Jersey Intermodal Facilities and Bus Rolling Stock (Earmark)	T536	Transit Preservation	0.76
Other Rail Station/Terminal Improvements	T55	Transit Enhancement	2,375.93
Physical Plant	T121	Transit Preservation	52.80
Preventive Maintenance-Bus	T135	Transit Preservation	2,038.24
Preventive Maintenance-Rail	T39	Transit Preservation	4,409.93
Private Carrier Equipment Program	T106	Transit Preservation	87.47
Rail Capital Maintenance	T34	Transit Preservation	1,730.84
Rail Fleet Overhaul	T53G	Transit Preservation	330.39
Rail Park and Ride	T117	TDM	182.59
Rail Rolling Stock Procurement	T112	Transit Preservation	7,571.64
Rail Support Facilities and Equipment	T37	Transit Preservation	607.06
Section 5310 Program	T150	Transit Enhancement	172.32
Section 5311 Program	T151	Transit Enhancement	316.52
Security Improvements	T508	Security	53.26
Signals and Communications/Electric Traction Systems	T50	Transit Preservation	748.56
Small/Special Services Program	T120	Transit Enhancement	26.53
Study and Development	T88	ALL	133.80
Technology Improvements	T500	Transit Enhancement	529.37
Track Program	T42	Transit Preservation	735.47

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Project Name	DBNUM	RCIS Category	Estimated YOE (in $millions)
Transit Enhancements	T210	Transit Enhancement	4.41
Transit Rail Initiatives	T300	Transit Expansion	1,222.15

NJ TRANSIT

NJ Transit Programs Under Study

Bus Rapid Transit Planning and Development	TN08004	Transit Expansion	
County Human Services Transportation (CHST) Coordination Projects Development – Interactive Provider Database System and Management Information	TN08006	Transit Expansion	
Greater Newark Area Bus System Study	TN08001	Transit Enhancement	
Market Research and Forecasting	TN05009	Transit Enhancement	
New Start Planning	TN05011	Transit Expansion	
Station and Parking Planning	TN05008	Transit Enhancement	
System-wide transit capacity and infrastructure planning	TN05010	Transit Expansion	
Transit Oriented Development	TN08005	Transit Enhancement	

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THE REGIONAL CAPITAL INVESTMENT STRATEGY FOR THE NJTPA REGION

The following is the NJTPA's Regional Capital Investment Strategy (RCIS). This strategy, which informs the project selection and policy direction of Plan 2035, was initially developed for NJTPA's 2030 Regional Transportation Plan, approved in September 2005. This RCIS has been carried forward into Plan 2035 with modified language. The investment principle "Help The Region Grow Wisely" now specifically references New Jersey's Greenhouse Gas plan. The modified language is identified in italics.

Investment Principles

Help Northern New Jersey Grow Wisely

Transportation investments should encourage economic growth while protecting the environment and minimizing sprawl in accordance with the *state's* Smart Growth plan, *Energy Master plan, and Greenhouse Gas plan*.

Make Travel Safer

Improving safety and security should be explicitly incorporated in the planning, design and implementation of all investments.

Fix it First

The existing transportation system requires large expenditures for maintenance, preservation and repair, and its stewardship should be the region's highest priority.

Expand Public Transit

Investment to improve the region's extensive transit network should be a high priority, including strategic expansions to serve new markets.

Improve Roads but Add Few

Road investments should focus on making the existing system work better, and road expansion should be very limited without compromising the tremendous accessibility provided by the existing highway system.

Move Freight More Efficiently

Investments should be made to improve the efficiency of goods movement because of its importance to the region's economy and quality of life.

Manage Incidents and Apply Transportation Technology

Investments should be made to improve information flow, operational coordination and other technological advances that can make the transportation system work smarter and more efficiently.

Support Walking and Bicycling

All transportation projects should promote walking and bicycling wherever possible.

Investment Principles and Guidelines

[Text in italics was modified for Plan 2035]

Help Northern New Jersey Grow Wisely

Transportation investments should encourage economic growth while protecting the environment and minimizing sprawl in accordance with the state's Smart Growth plan, *Energy master plan, and Greenhouse Gas plan*.

Investment Guidelines

- Make investments that fulfill Smart Growth goals, including supporting development in cities, planned growth areas, distressed areas, centers, redevelopment areas, brownfield and grayfield sites and other places with existing infrastructure.
- Scrutinize investments outside of areas targeted by state growth policies, to ensure that alternatives are examined, that they are justified by economic and community needs, and that sprawl-inducing impacts are minimized.
- Fund investments that encourage compact, mixed-used development, that supports transit use ("transit oriented development"), walking/biking, and cost-effective use of existing or planned public infrastructure.
- Protect the character of communities and the natural environment through context-sensitive design, traffic calming, historical preservation and roadway beautification.
- Encourage fewer motor vehicle trips, especially those involving single-occupancy vehicles through continued support (about 0.5 percent of transportation funds) for demand management including the programs of Transportation Management Association programs.
- Develop transportation improvements that distribute benefits and burdens equitably and serve all communities, including low-income residents, minority populations, senior citizens, the disabled, children and other groups.
- *Make investments that support the targets of the Global Warming Response Act of 2007, addressing New Jersey's greenhouse gas reduction goals and related NJ State Plan recommendations. Coordinate such investments at state, regional and local levels.*

Make Travel Safer

Improving safety and security should be explicitly incorporated in the planning, design and implementation of all investments.

Investment Guidelines

- Allocate approximately 2.5 percent of overall spending to direct safety improvements, while also fully incorporating safety enhancements in other investments.
- Enhance safety in areas with high fatality and injury rates, with particular attention to pedestrian travel and safety for seniors.
- Develop improved safety measures at at-grade rail crossings along heavily traveled corridors.
- Consider national security and disaster response issues in facility designs.

Fix it First

The existing transportation system requires large expenditures for maintenance, preservation and repair, and its stewardship should be the region's highest priority.

Investment Guidelines

- Invest 60 percent of overall spending in maintenance and preservation, with about 35 percent going to transit, 15 percent to bridges, and 10 percent to roads.
- Maintain, preserve, rehabilitate and replace infrastructure according to objective measures such as facility condition, level of use and projected service life ("life cycle").

Expand Public Transit

Investment to improve the region's extensive transit network should be a high priority, including strategic expansions to serve new markets.

Investment Guidelines

- Allocate about 21 percent of total spending to enhancing and expanding public transportation (about 5 percent dedicated to enhancing the public transit system—projects such as station and operational improvements—and 16 percent for expansion—new bus routes, new or extended rail lines, etc.)*
- Focus enhancements on improving the speed and reliability of trips, facilitating access to the system, incorporating pedestrian and bicycle facilities, integrating bus and rail services and achieving new intermodal connectivity.
- Expand the system in measured steps based on the ability to attract new riders and achieve cost-effective operations.

** Maintenance, technological and safety/security improvements are addressed in other guidelines.*

- Build a new passenger rail tunnel under the Hudson River, which is the region's top transit expansion priority, by obtaining additional dedicated funding (beyond normal allocations that are subject to this regional capital investment strategy).

Improve Roads but Add Few

Road investments should focus on making the existing system work better, and road expansion should be very limited without compromising the tremendous accessibility provided by the existing highway system.

Investment Guidelines

- The investment mix should allot about 10 percent of spending to physically enhance roadways (such as renovating intersections or adding turning lanes).*
- Limit expanding roadway capacity (new roads or widening) to about 2.5 percent of funding.
- Use management systems and objective criteria to target roadway investments to congested hotspots and bottlenecks.
- Make improvements that strengthen parallel routes and network redundancy.
- Complement road improvements with transit, ridesharing and pedestrian/bicycle projects to help limit auto trips.
- Avoid roadway expansion in environmentally sensitive areas or away from planned growth areas.

Move Freight More Efficiently

Investments should be made to improve the efficiency of goods movement because of its importance to the region's economy and quality of life.

Investment Guidelines

- Support the transport of goods with improvements in roadway operation and efficiency, giving priority to transportation facilities with heavy freight traffic (such as major interstates and highways).
- Allocate about 1.0 percent of spending to dedicated freight improvements (such as freight rail facilities and intermodal infrastructure).
- Fund investments that separate truck traffic from passenger autos and pedestrian movement wherever possible.

** Particular road improvements, including technological, direct safety improvements, and creating dedicated freight facilities are addressed separately*

- Focus transportation investments on encouraging freight related redevelopment of brownfield sites and similar Smart Growth strategies particularly in and around the port.
- Make investments that promote intermodal options where possible, including rail and waterborne freight movement via barges or ferries.

Manage Incidents and Apply Transportation Technology

Investments should be made to improve information flow, operational coordination and other technological advances that can make the transportation system work smarter and more efficiently.

Investment Guidelines

- About 1.5 percent of funding should be dedicated to incident/emergency management projects and intelligent transportation systems.
- Fund development of systems that provide real-time scheduling and connection information on travel conditions to public transit customers, roadway travelers and freight movers.
- Invest in information systems that support information flow within and among operating agencies including those responsible for addressing roadway incidents.
- Invest in technological improvements in accordance with the region's intelligent transportation system standardized architecture.
- Invest in improved and standardized electronic fare and toll payment systems.
- Focus initial ITS investments on demonstration projects to evaluate potentially beneficial new technologies and systems.

Support Walking and Bicycling

All transportation projects should promote walking and bicycling wherever possible.

Investment Guidelines

- Enhance or create pedestrian and bicycle facilities, including sidewalks, bike lanes and bike paths, which improve their connectivity for walking and biking trips and also complement other transportation improvements.
- About 1.25 percent of funding should be applied to build and redesign facilities for walking and biking.
- Coordinate roadway and transit projects with pedes-

trian and bicycle improvements made by counties and municipalities.

- Target improvements to areas with existing, growing, or strong potential for walking and bicycle travel.
- Invest in improvements that support walking by children (such as Safe Routes to School) and others with limited motor vehicle travel options.

ACRONYM GUIDE

The following acronyms appear in Plan 2035:

ARRA—The American Recovery and Reinvestment Act

ARC—Access to the Region's Core, former name for the **MTT**—Mass Transit Tunnel

BMI—Body Mass Index

BMS—Bridge Management System

BRT—Bus Rapid Transit

CAFRA—Coastal Area Facility Review Act

CMAQ—Congestion Mitigation and Air Quality

CMP—Congestion Management Process

CSHSP—New Jersey's Comprehensive Strategic Highway Safety Plan

CHSTP—The NJTPA's Regional Coordinated Human Services Transportation Plan

CO—Carbon Monoxide

CO2—Carbon Dioxide

DMU—Diesel Multiple Units

DMS—Drainage Management System

DRJTBC—Delaware River Joint Toll Bridge Commission

DVRPC—Delaware Valley Regional Planning Commis sion

EJ—Environmental Justice

EOC—Emergency Operation Center

EPA—U.S. Environmental Protection Agency

EWR—IATA code for Newark Liberty International Air port

FIRE—Finance, Insurance and Real Estate Sector

FHWA—The Federal Highway Administration

FTA—The Federal Transit Administration

GDP—Gross Domestic Product

GHG—Greenhouse Gas

GIS—Geographic Information Systems

HAWK—High-Intensity Activated Crosswalk Signal

HBLR—Hudson Bergen Light Rail

HOT——High Occupancy Toll Lanes

HRRRP—High Risk Rural Roads Program

IATA—International Air Transport Association

ITS—Intelligent Transportation Systems

JARC—Job Access and Reverse Commute

MOS—Minimum Operating Segment

MPO—Metropolitan Planning Organization

MTT—Mass Transit Tunnel, formerly ARC—Access to the Region's Core

MUTCD—Manual on Uniform Traffic Control Devices

NEC—Northeast Corridor

NJAC—New Jersey Association of Counties

NJDEP—New Jersey Department of Environmental Pro tection

NJDOT—New Jersey Department of Transportation

NJDVCC—The New Jersey Deer Vehicle Crash Coali tion

NJTA—New Jersey Turnpike Authority

NOx—Nitrogen Oxides (Nitrates)

NS—Norfolk Southern

NYMTC—New York Metropolitan Transportation Council

NYS&W—The New York Susquehanna & Western

OHSP—Office of Homeland Security and Preparedness

PATH—Port Authority Trans-Hudson

PANYNJ—Port Authority of New York and New Jersey

PM2.5—Particulate matter 2.5

PMS—Pavement Management System

PONYNJ—Port of New York and New Jersey

PDWP—Project Development Work Program

PSEG (or **PSE&G**)—Public Service Electric & Gas Company, one division of PSEG

RCIS—Regional Capital Investment Strategy

RRFB—Rectangular Rapid Flashing Beacon

RTP—Regional Transportation Plan

RQI—Road Quality Index

SAFETEA-LU—The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

SDI—Surface Distress Index

SDRP—State Development and Redevelopment Plan

SCIS—State Capital Investment Strategy

SJTA——South Jersey Transportation Authority

SRTS—Safe Routes To School

TCAM—Transportation Clean Air Measures

TDM—Transportation Demand Management

TRANSCOM— Transportation Operations Coordinating Committee

TEU—Twenty-foot Equivalent Units

TTF—New Jersey's Transportation Trust Fund

TEA-21—Transportation Equity Act for the 21st Century

TIP—Transportation Improvement Program

TMA—Transportation Management Association

TOD—Transit-Oriented Development

VHT—Vehicle Hours Traveled

VMT—Vehicle Miles Traveled

VOC—Volatile Organic Compounds

XBL—Lincoln Tunnel Exclusive Bus Lane

YOE—Year of Expenditure

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