

# Table of Contents

Introduction .....	2
<b><u>NJDOT</u></b>	
Bridges .....	3
Roadway Preservation.....	14
Safety .....	21
Congestion .....	24
Bicycle Needs .....	31
Other Needs.....	35
<b><u>NJ TRANSIT</u></b>	
Executive Summary .....	39
Introduction .....	41
The Role and Benefits of Transit in New Jersey .....	42
NJ TRANSIT Today .....	44
Present and Future Demand .....	45
A Vision For A Different Kind of Transit System .....	46
Ten-Year Capital Investment Strategy Overview .....	47
<b><u>STATE-OF-GOOD-REPAIR</u></b> .....	48
Rehabilitate Railroad Infrastructure .....	48
Modernize Bus and Rail Fleet.....	50
Rehabilitate Stations and Terminals.....	51
Improve Customer Service Technology.....	51
<b><u>EXPAND CAPACITY, INCREASE FREQUENCY</u></b> .....	53
Construct a new Trans-Hudson Rail Tunnel.....	53
Expand Park & Ride Capacity .....	54
Expand Rail Fleet .....	54
Coordinate Bus and Highway Investments to Improve Bus Service .....	54
<b><u>EXPAND REACH OF THE TRANSIT SYSTEM</u></b> .....	55
Expand off the Existing System.....	55
<b>CONCLUSION .....</b>	<b>57</b>

# Introduction

Governor McGreevey's Capital Investment Strategy for Fiscal Years 2005 – 2009 lays out capital investment goals for the New Jersey Department of Transportation and the New Jersey Transit Corporation. This report is a companion document to the Governor's Proposed Capital Program for Fiscal Year 2005. The Proposed Capital Program details the projects to be funded during the next fiscal year. The Capital Investment Strategy discusses the goals and longer-term strategy behind those project choices.

This section of the report describes the capital investment strategy for programs funded by the Department of Transportation (NJDOT). The second section describes the capital investment strategy for NJ TRANSIT.

The NJDOT section of the report groups programs into six areas: bridges, roadway preservation, safety, congestion, bicycle needs, and other needs (aviation, goods movement, local aid, capital program support). Most projects and programs funded by NJDOT can be classified into one of these areas, but it is important to note that many projects serve more than one purpose. A highway rehabilitation project may include intersection improvements that relieve congestion bottlenecks. A bridge replacement project may provide improved sight distance and other measures that enhance safety.

For some program areas, NJDOT's capital investment strategy methodology has developed to the point that quantitative assessments can be made of the effect of different funding levels on the future condition of elements of the transportation system. Other areas are subject to a more qualitative analysis.

Every capital program involves the making of choices and tradeoffs. As the Capital Investment Strategy and the Proposed Capital Program both demonstrate, NJDOT is committed in the near future to increased funding for bridge needs, continued high levels of funding for roadway preservation needs, increased funding and new programs for safety, targeting congestion relief funding on relieving key bottlenecks, and continuing funding at or near current levels for other programs. Statutory goals set out in the Congestion Relief and Transportation Trust Fund Renewal Act of 2000 are discussed in detail in the report.

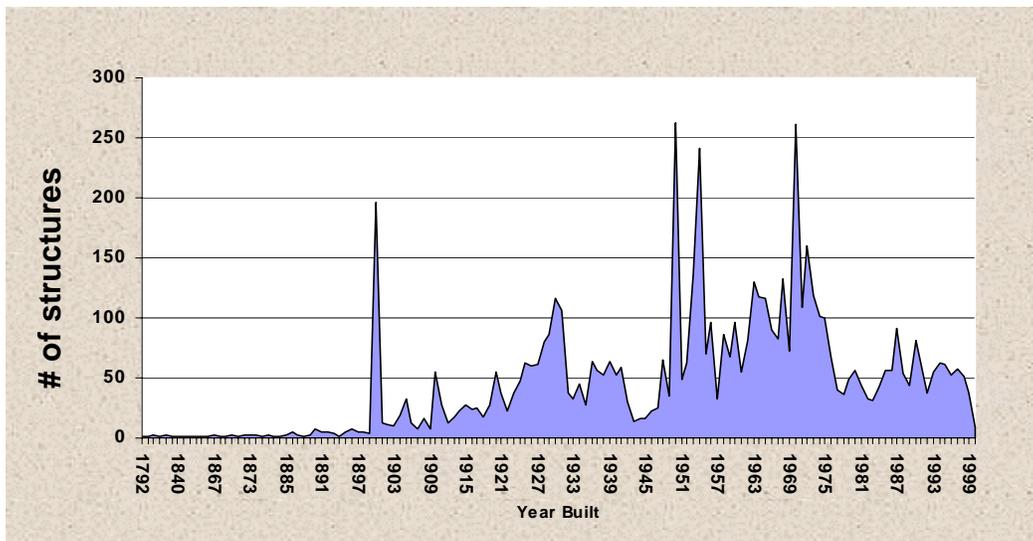
# Bridges

## Introduction

There are 5,162 bridges on the New Jersey state highway system and county and municipal roads, many of which will require replacement or extensive rehabilitation in coming years. The need to rebuild bridges is a function of heavy traffic volume, weather conditions, and structure age. When structures reach 50 years old, the need to replace or rehabilitate becomes more imminent. A considerable number of bridges were added to the state highway system in the 1950s as the interstate system and other new roads were built to support widespread growth and development. These structures are beginning to reach the 50 year-old mark and many are now falling into the structurally deficient category.

[Note: "Structurally deficient" is a term defined by the Federal Highway Administration and is used throughout the United States. Structural deficiency does not necessarily mean that a bridge is unsafe. It mainly relates to the condition of a structure. It means that the condition of a bridge is such that it is unable to handle the vehicle loads for a given traffic volume that would normally be expected on the highway system where the bridge is located.]

## Age of Structures on State Highways

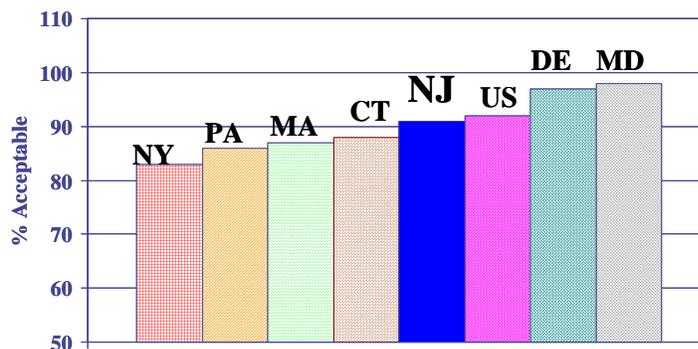


A more extensive wave of new bridge projects is on the horizon and will require major improvements within the next ten years. Beyond this point, it is projected that many more bridge needs will emerge over the next several decades also requiring costly investments. This trend represents more bridge needs than there are actual state and federal funds expected to be available for bridge improvements now and in the future. Obviously, this is a serious dilemma that impacts the state economy. A more innovative investment strategy must be developed to reduce the backlog of structurally deficient bridges and upgrade New Jersey's transportation infrastructure to a higher state of good repair.

## Current status

Currently, 87 percent of New Jersey's bridges are rated in "acceptable" condition. The bridges that carry the heaviest traffic loads are those on the National Highway System (NHS), which includes the Interstate system and other key routes. Bridges on this important segment of the state highway network are 90 percent acceptable. Based on 2001 data, New Jersey compared reasonably well with the national average and with other northeastern states in the NHS category.

### NHS Bridges

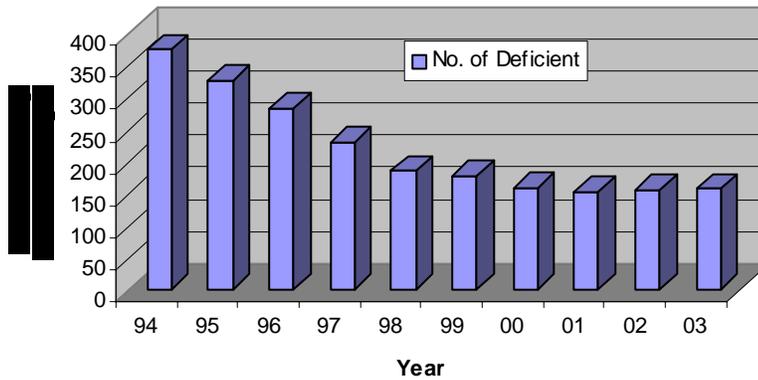


FHWA: 2003 data

[Note: For capital investment strategy purposes, NJDOT defines bridges as "acceptable" if they are not rated as "structurally deficient" (in need of rehabilitation or replacement) under federal guidelines. Bridges which are rated as "functionally obsolete" (unable to carry the current volume of traffic), but not structurally deficient, are not ranked as unacceptable. In calculating system need, NJDOT uses the "deck square footage" of each bridge as a factor, so as to include the size as well as the number of bridges.]

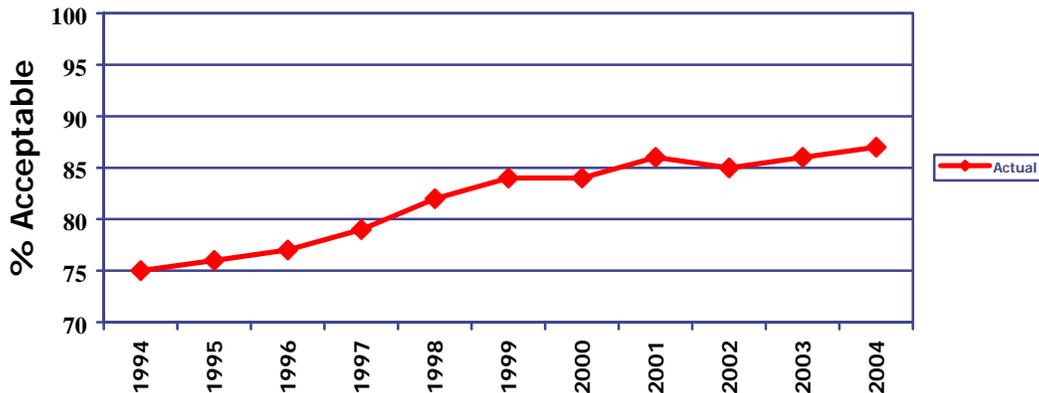
The actual *number* of structurally deficient bridges on the National Highway System has been more than cut in half over the past decade. Further reductions in this number will become increasingly difficult, however, as the current population of deficient bridges includes many which are larger, older, and located in more difficult locations to work in than many of those which were fixed in earlier years.

**Trend of Structurally Deficient State Owned Bridges on NHS System**



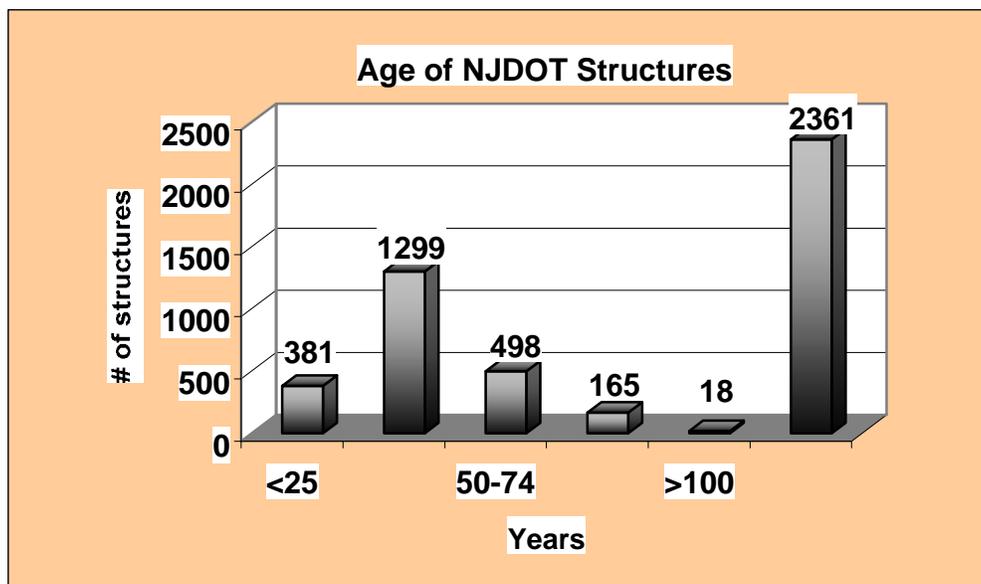
The acceptability rate for the bridge population as a whole (weighted for bridge size, as explained above) has climbed from about 75 percent a decade ago to about 87 percent

**Bridge Condition History**



today. Unfortunately there will be a dip in overall performance in the coming years as a result of the aging of that population, which includes a number of large structures.

Structure age is an important factor in identifying the need to upgrade bridge conditions. The potential for rehabilitation or replacement improvements usually increases after structures reach 50 years old or more. Of the 5,172 state, county and municipal bridges in New Jersey, 2,187 (42 percent) are 50 years old or greater. The average age for the entire bridge population in New Jersey, including toll road authorities is 47 years. Compared to the average age of bridges nationwide, the New Jersey bridge population is 9 years older. On the state-owned system 681 (29 percent) have reached this milestone. Over the next 25 years, 55 percent of the NJDOT bridge population will turn 50 years old or more.



## The High-Cost Bridge Problem

The need to restore our bridges to a state of good repair has been a consistent NJDOT theme for several years. In the current period, many large-scale NHS bridge replacement and rehabilitation projects are maturing, reaching final design and construction phases. NJDOT has been calling attention to the problem of **high-cost bridges**, those costing more than \$50 million in construction costs. The fact that very large bridge projects are anticipated for construction after

emerging from the very long study and development cycles gives new urgency to the need to attach the backlog of bridge deficiencies. These “high-cost” bridge projects, however, will require a very ambitious funding effort beyond our normal federal and state funding allocations.



**Proposed Route 52 Causeway**

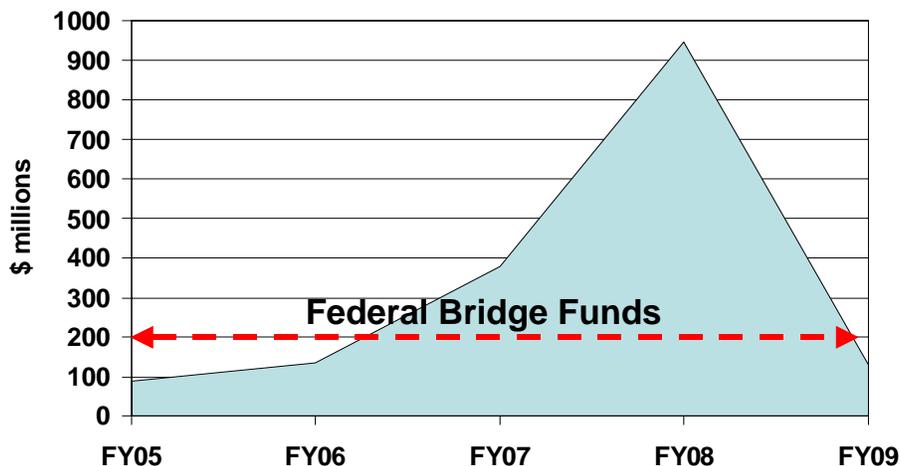
There are currently 10 bridges on the high-cost list, with a total future construction need of about \$1.7 billion:

- Route 1&9, Elizabeth River, Union County, Capital Program FY05-09, \$72 million
- Route 1&9, Pulaski Skyway, Essex and Hudson counties, status to be determined, \$350 million (approximate; project not yet developed)
- Route 1&9T, St. Paul's Avenue, Hudson County, Capital Program FY05-09, \$151 million
- Route 3 over the Passaic River, Bergen and Passaic counties, Capital Program FY05-09, \$217 million
- Route 7 over the Hackensack River (Wittpen Bridge), Hudson County, status to be determined, \$404 million
- Route 36 Highlands Bridge, Monmouth County, status to be determined, \$74 million
- Route 52 Causeway, Atlantic and Cape May counties, Capital Program FY05-09, \$243 million

- Route 72 over Manahawkin Bay, Ocean County, status to be determined, \$200 million (approximate; project not yet developed)
- Route 139 viaducts, contract #2, Hudson County, Capital program FY05-09, \$60 million
- Route 139 viaducts, contract #3, Hudson County, Capital program FY05-09, \$114 million

To put these costs into perspective, New Jersey receives about \$200 million a year in federal funds targeted for bridge projects. If all the high-cost bridge projects were to be fully funded at their best possible schedule, these projects would consume virtually the full amount of federal bridge funding—leaving nothing for the needs of all the other bridges.

## Projected Costs- 10 High-cost Bridges



### Other bridge needs

While rehabilitation or replacement of structurally deficient bridges is by far the largest and most expensive activity of the NJDOT bridge program, there are other needs as well. These needs must be fully funded if we are to maintain our bridges in a safe condition and manage them efficiently. As part of our bridge preservation investment plan, these programs include:

- Bridge rehabilitation

The Department is planning to implement bridge rehabilitation improvements where appropriate as opposed to bridge replacements

alternatives in order to address structural deficiency problems. Since the unit costs for rehabilitation improvements tend to be less expensive short-term solutions, this strategy may provide a more economical approach to reducing the backlog of structurally deficient bridges over the next ten years.

- Bridge deck placement and rehabilitation

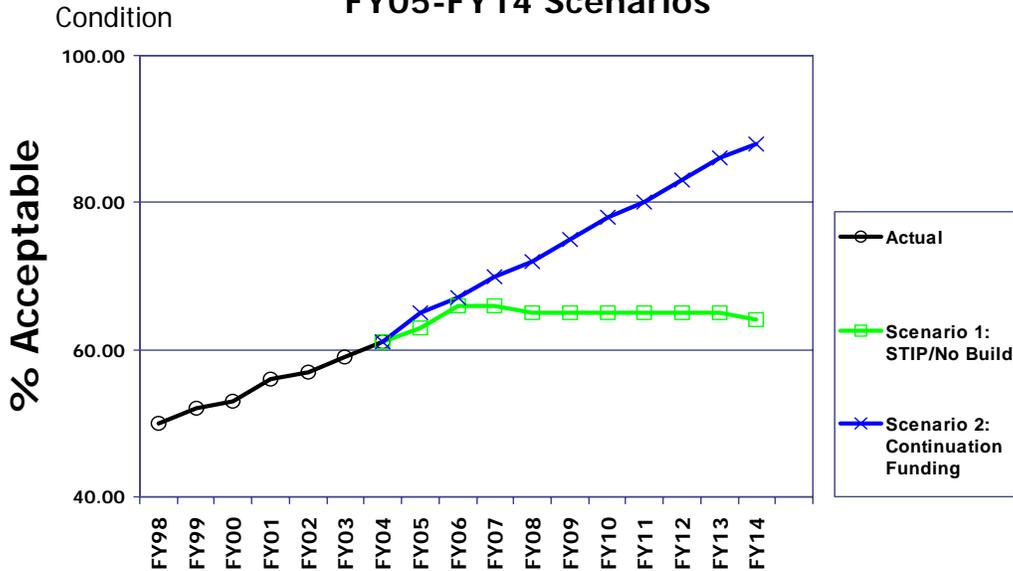
NJDOT is pursuing an innovative program to develop “fast track” projects to improve bridges that require replacement of the bridge deck (that portion of the bridge that supports the traffic) without change to the supporting structure of the bridge itself.

- Bridge painting

Steel bridges require coating with weather resistant paint to prevent corrosion. Bridge painting has become significantly more expensive in recent years with the requirement that older lead-based paints be replaced with more environmentally friendly coatings. This process involves the use of containment systems and the removal and disposal of old material as well as the application of new paint.

Slightly less than half the bridges on the state highway system still require replacement of lead-based paint. To accomplish this, a higher level of funding will be required. In the proposed capital program, bridge painting is funded at an average level of \$11.5 million per year using federal funds for the first two years and no funding in fiscal year 2007. If no investment is made throughout the rest of the ten-year period, a status quo condition level is expected with a declining trend to begin in fiscal year 2014. Shown below is a performance analysis illustrating alternative condition levels generated by two funding scenarios. Scenario 1 invests at the proposed capital program level (\$11.5 million for FY05 and 06) and then assumes no funding for the remaining years through 2014. The projection shows that two years of steady funding yields an improvement in the rate of acceptability, from 59% currently to about 64% in 2006 and then begins a slight declining trend through 2014. However, constant funding of \$11.5 million per year over the next ten years produces a condition level that far exceeds the current level climbing to about 88% acceptable. It should be noted that after a 15-year life cycle, there is approximately 10% per year accruing or incoming deterioration that occurs.

## Bridge Painting Performance FY05-FY14 Scenarios



- Bridge Inspection

This program provides regular structural inspection of state highway and NJ TRANSIT highway-carrying bridges as required by law.

- Bridge Scour Evaluation Program

This is a program mandated by the FHWA (Technical Advisory T5140.20 dated Sept. 16, 1988) under the National Bridge Inspection Standards (NBIS) to evaluate the susceptibility of bridges to collapse during 100 to 500 year super floods. Countermeasures consist of rip-rap, gabion mattresses, concrete slabs or other elements installed in the waterway adjacent to the foundations designed to limit the amount of potential scour at the bridge.

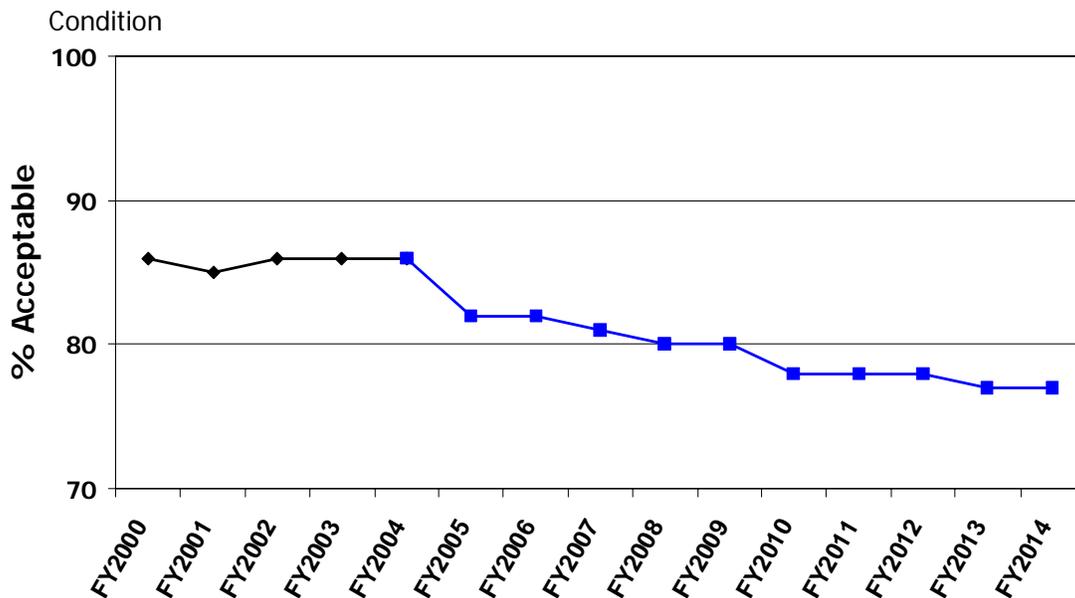
- Bridge Betterments

Bridge capital maintenance implements minor repairs and preventive maintenance activities. Transportation experts agree that the most economical way to preserve infrastructure is to provide adequate and timely preventive maintenance. The rule of thumb is that one dollar in

maintenance costs can save four dollars in capital costs. Nevertheless, in the past 20 years, state and federal funding for transportation capital improvements in New Jersey has increased significantly, while funding for maintenance has not.



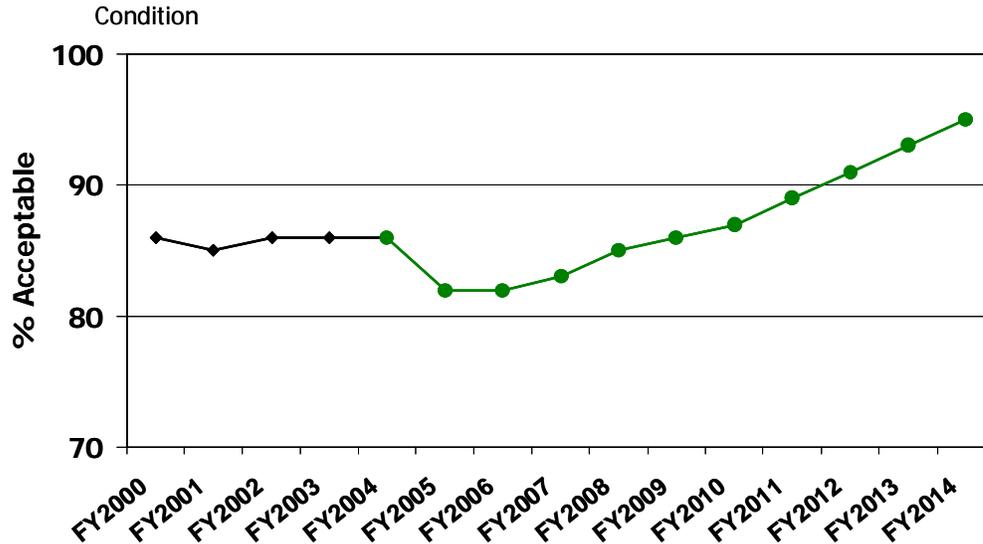
## State Bridge Condition Trend



## Capital investment strategy for bridges

NJDOT's capital investment strategy for bridges is aimed at achieving its statutory goal of cutting the backlog of structurally deficient bridges in half. At currently projected ("Trend") funding levels, overall bridge condition will decline. The most aggressive, yet reasonable, financing scenario that can be adopted for bridges assumes that funding will stay constant through fiscal years 2005 and 2006 and will be increased to a "significant improvement" level (doubling bridge investment to about \$700 million per year) beginning in fiscal 2007. Under this scenario, the acceptable rate will reach 93 percent (up from 86 percent in 2000) in 2013.

### State Bridge Condition Goal



The capital investment strategy for bridges will be pursued through the following steps:

1. Continue to demonstrate the need for higher funding levels for bridges.
2. Seek special funding for high-cost bridges in Congress.
3. Program all eligible, affordable bridge projects in fiscal 2005 and fiscal 2006. (Construction funding for the Route 52 Causeway project and Contract 3 of the Route 139 project cannot be fit into the two-year funding window.)
4. Continue to advance future bridge projects through the study and development program so that they will be ready for future funding.

5. Pursue more economical solutions such as bridge rehabilitations and deck rehabilitation and replacements as opposed to full bridge replacements when appropriate.
6. Provide full support for all other bridge needs.
7. Continue to demonstrate the need for additional funding for bridge maintenance.

# Roadway Preservation

## Introduction

As the state highway system's 2,344 centerline miles of roadway infrastructure continues to age and as traffic volume continues to grow, pavement deterioration is becoming an increasing problem. A significant backlog of deficient pavements in poor to fair condition has resulted. In fact, a recent study of New Jersey's interstate highway system found that our network is in dire need of major improvements to bring it into a state of good repair.

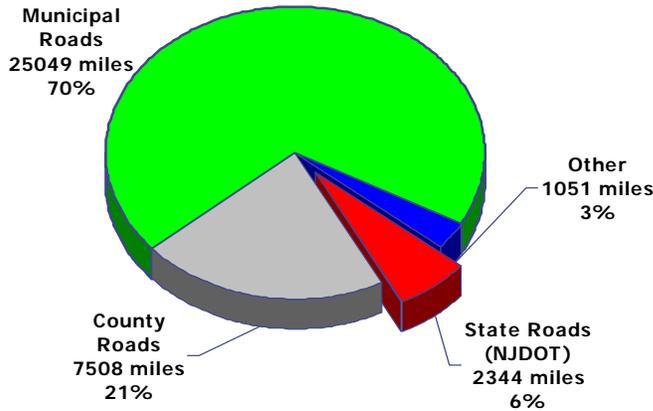
NJDOT's pavement management system assesses the condition of the pavement on the state highway system every two years. Several types of data are collected to evaluate surface distress, roughness, and rutting. These indices are combined in the pavement management system to produce a "final pavement rating," an overall performance measure for pavement condition.

NJDOT has adopted different standards for deficiency for different classifications of highways. There are very high standards for the interstate highway system and freeways (which carry the highest traffic volumes and higher volumes of truck traffic), medium standards for other state highways on the National Highway System, and lower standards for those state highways which are not part of the National Highway System.

These performance measures, which are similar to those used in other states, do not predict or account for major rehabilitation/reconstruction needs. The Department's ongoing pavement management research is actively developing an additional performance measure that will analyze the "structural integrity" of the pavement. This measure is referred to as "Structural Adequacy Index" (SAI). NJDOT is now using Falling Weight Deflectometer (FWD) equipment for the purpose of gathering data for this index. FWD data is currently being collected and is being used to analyze the structural performance of all segments of the state highway system.

## Current conditions

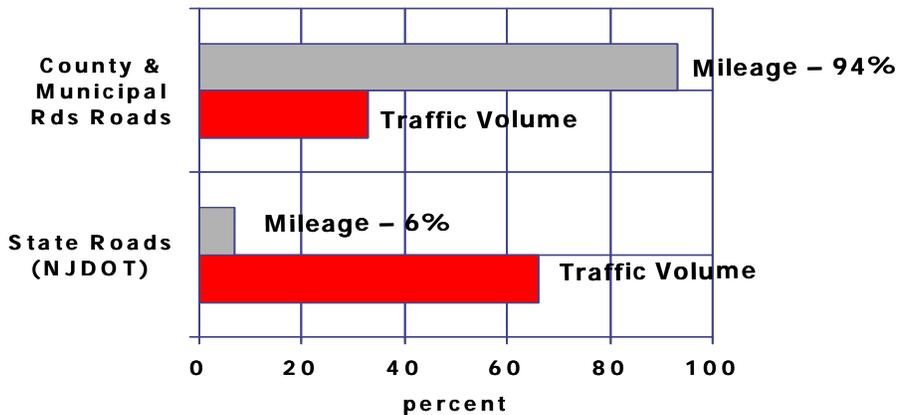
There are approximately 36,000 centerline miles of roadways in New Jersey. NJDOT maintains slightly more than 2,300 centerline miles of state-owned highways. Most of the remaining mileage is under the jurisdiction of county and municipal governments.



“Other” includes toll road and bridge authorities and parks

Although NJDOT jurisdiction represents only about 6% of the total statewide mileage, approximately two-thirds of all traffic, including high percentages of heavy trucks, is carried on state-owned roads. In addition to other factors, heavy traffic loads have a significant impact on pavement deterioration. Over the last several decades, traffic loads have doubled every ten years. New Jersey’s aging pavements were not structurally designed to handle these increased traffic loads.

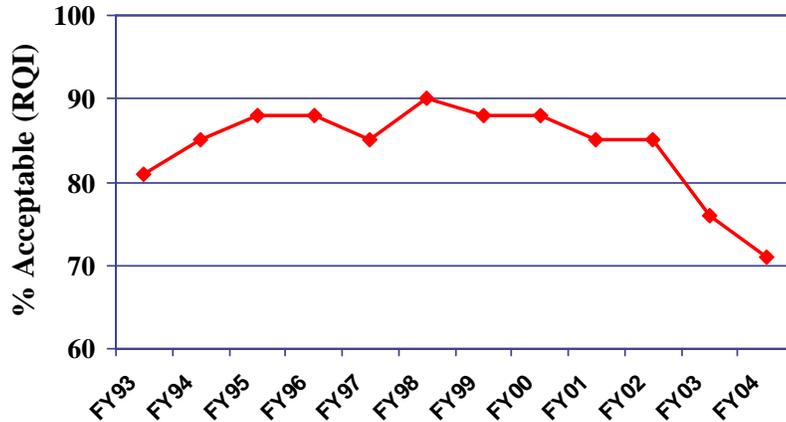
**State & Local Roads:  
Mileage vs Traffic Volume**



Using the ride quality rating (roadway surface roughness) as a performance measure (with varying standards for different classifications of roadway), today about 71 percent of New Jersey’s state highway system is rated “acceptable.” As shown below, the acceptability rating for pavement smoothness has declined from 81 percent to 71 percent over the last ten years. State highways in New Jersey carry very high volumes

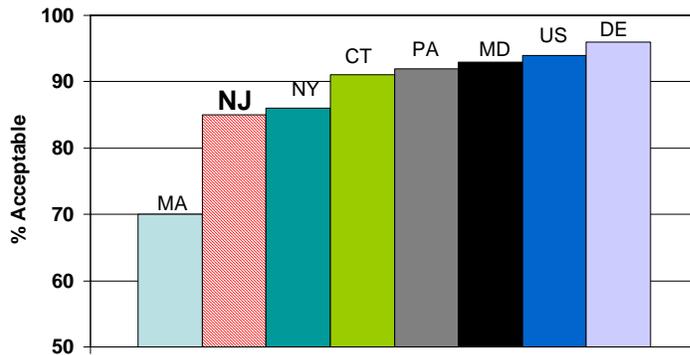
of traffic. Due in large part to underfunding of repair and maintenance work over many years, pavements now require larger investments to improve their ability to carry heavy loads and to provide a smooth ride to motorists. This historical trend is projected to continue in the future if funding allocations are not substantially increased.

### Ride Quality History (Smoothness)



Although smoothness or roughness is only one part of the final pavement rating used in New Jersey's pavement management system, it is the one factor for which data is collected by most states and is required by FHWA. By comparing roughness data (using the federal International Roughness Index) for highways on the National Highway System (the interstate highways and other major routes) New Jersey can benchmark the condition of its system compared to the system condition in similar northeastern states. On the NHS, based on 2001 data, 84 percent of the network had an acceptable level of pavement quality. As shown in the accompanying chart, with regard to ride quality, New Jersey does not compare well with the national average and with other northeastern states. However, this performance measure does not take into account the structural integrity of the roadway. From a capital investment standpoint, NJDOT makes decisions that are based on structural integrity as well as ride quality. A more complete comparison will be interesting when structural data becomes available for each of these states.

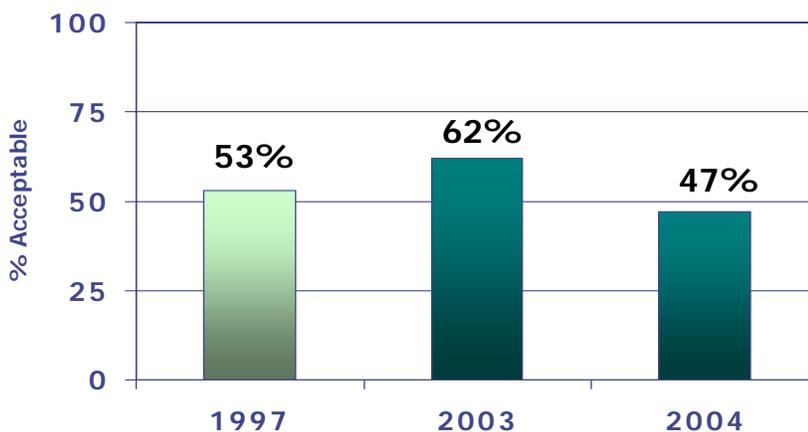
### Ride Quality-NHS (Smoothness)



FHWA 2002

Currently, about 62% of the state roadway network is in structurally acceptable condition. This estimate is derived from a needs analysis conducted of the structural integrity (subsurface condition level) of New Jersey’s interstate highways using Falling Weight Deflectometer (FWD) technology. Data was collected for the mainline, shoulders, and ramps. In addition to measuring the structural performance of the interstate system, the data also is being used to develop a structural adequacy index (SAI). This type of analysis was also extended to non-interstate highways using statistical methodologies. The results of the study concluded that over the next 10 years, the total state jurisdiction network needs are projected to cost approximately \$10 billion or \$1 billion per year.

### Roadway Structural Condition



NJDOT recently conducted an inventory of the entire county road system measuring the ride quality (smoothness) throughout the statewide network. The analysis does not include a structural evaluation. The results indicate that the county network is

approximately 64% percent acceptable with regard to pavement smoothness. It should be noted that this evaluation does not include the municipal road system.

The NJDOT Roadway Preservation Committee, which oversees and recommends pavement management activities and programs, has recently adopted an innovative Pavement Management Plan. This plan reflects an emphasis on preventive maintenance. It will move the Department away from a “worst first” outlook and toward a multiyear prioritization mode of operation.

The activities in the plan include the following “mix of fixes”:

- Diamond Grinding
  - Ultra Thin Overlays
  - Longitudinal Crack Repair
  - Crack and Joint Sealing
- } preventive maintenance, a wide range of lower-cost and often innovative repair techniques.
- Resurfacing and Milling: less expensive resurfacing projects that extend roadway life and improve smoothness
  - Reconstruction and Rehabilitation: relatively expensive rehabilitation and reconstruction projects for serious problems

The plan is pursuing a more cost effective, optimization approach to pavement management in New Jersey than has been implemented in the past. Life cycle cost analysis is used to map out a strategy for implementing: “The Right Treatment, At the Right Time, At the Right Place, At the Right Cost”. This course of action promotes the most efficient use of available funding based on timing, treatment selection, and priority locations as opposed to the more traditional “worst first” program. The ability to selectively fast track projects through a new project development pipeline will play a significant role in implementing this investment strategy.

Preventive maintenance activities are funded out of both the operating budget and capital program. In fiscal year 2003, a new interstate pavement preservation program was begun, consisting of a number of pavement treatments, ranging from crack sealing to minor repairs, using both contractors and NJDOT personnel to extend the life of our interstate highway system.

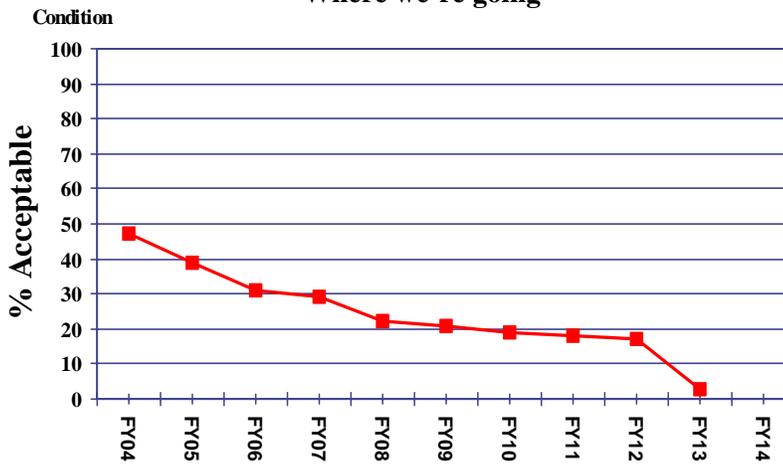
Preventive maintenance retards future deterioration, preserves the system, and improves or maintains the functional condition of the system. This extends the life of the pavement in a cost-effective, budget-sensitive manner. For example, in Michigan, since 1996 the average remaining pavement life increased by 21 percent from 6.8 years to 8.2 years due to increased investment in preventive maintenance activities. Research has shown that pavement quality drops 40 percent within the first 75 percent of the

pavement's life cycle. Generally, a two-year delay in pavement repair beyond this point can increase repair costs four to five times. Ideally, crack sealing should begin on a full bituminous section of roadway three years after resurfacing. Pavement life is shortened when water is permitted to infiltrate the surface and reach the sub-base of the road. With early treatment, the pavement may survive longer without major rehabilitation or reconstruction, therefore saving the Department's budget millions of dollars.

## Trends

The current proposed capital program is based on anticipation of "continuation" levels of funding for the next two years, followed by zero funding beginning in the third year. A zero funding level will lead to an even a steep decline in the structural condition of the state highway system, dropping to only 3 percent acceptable by 2013. This "unfunded" scenario does not offset the accruing backlog of deterioration and results in total network failure condition level in ten years. The inability to provide funding to reconstruct, rehabilitate, maintain, and preserve our roadway infrastructure can prove to be an extremely expensive endeavor in the future. The need to improve the structural integrity and smoothness of the state's highway network continues to be a challenging objective.

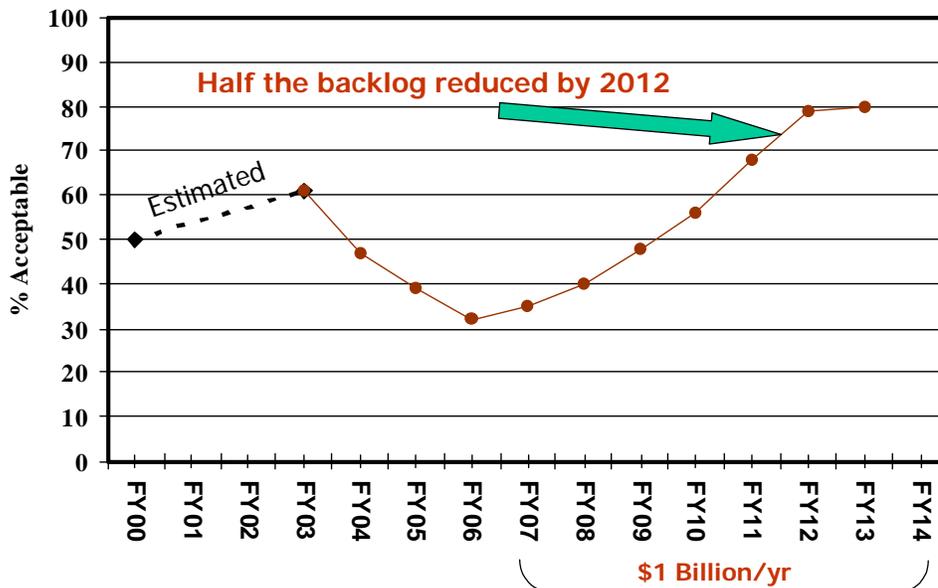
**Projected Roadway Condition**  
**Where we're going**



## Capital investment strategy for roadway preservation

NJDOT's capital investment strategy for preservation of the state highway system is aimed at achieving its statutory goal of cutting the backlog of roadway structural deficiencies in half. The most aggressive, yet reasonable, financing scenario that can be adopted for roadways assumes that funding will stay constant through fiscal years 2005 and 2006 and will be increased to a "significant improvement" level (dramatically increasing investment to about \$1 billion per year) beginning in fiscal 2007. Under this scenario, the acceptable rate will reach 75 percent (up from 50 percent in 2000) by 2012.

### Roadway Condition Plan to Reduce Half the Backlog



The capital investment strategy for roadway preservation will be pursued through the following steps:

1. Continue to demonstrate the need for higher funding levels.
2. Program all eligible, affordable roadway preservation projects in fiscal 2005 and fiscal 2006.
3. Continue to advance future roadway preservation projects through the study and development program so that they will be ready for future funding.
4. Operate a pavement management system that pursues an optimization/life cycle-cost approach to selecting and implementing pavement preservation improvements.

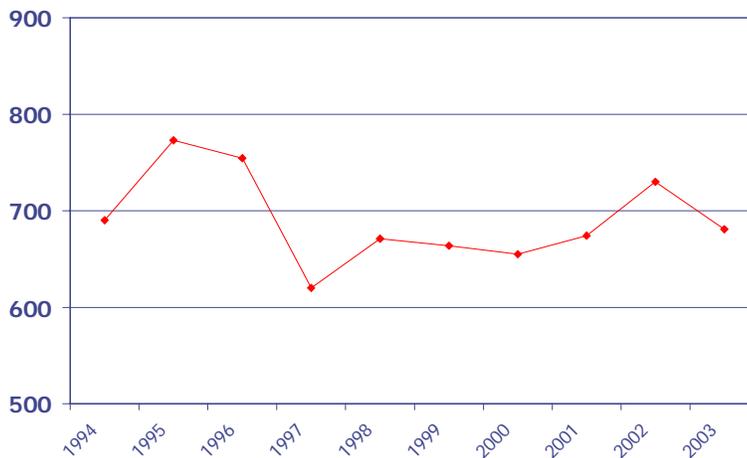
# Safety

## Introduction

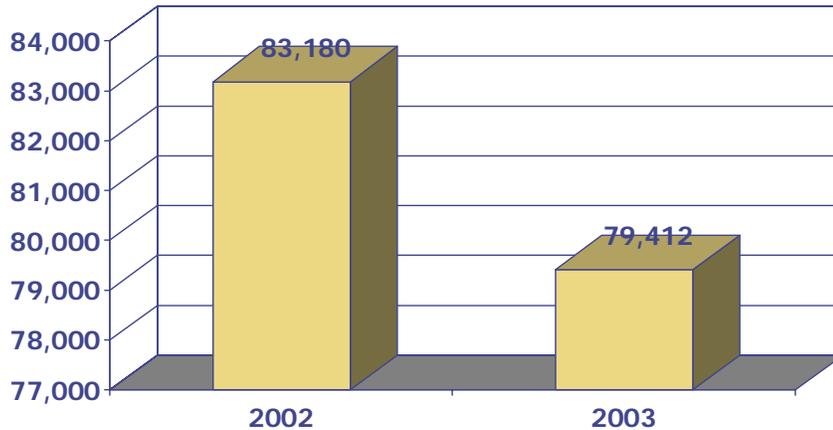
New Jersey has over 36,000 miles of roadway and is the most densely populated state in the nation. Vehicular crashes on our roadways are a major source of death, injury, and economic loss. In 2003, there were 746 deaths on our roads (including 147 pedestrians) and 79,412 injury crashes.

Under the leadership of Governor McGreevey, NJDOT has begun a comprehensive campaign—called “Safety First”—to reduce these numbers. This initiative has already borne fruit, as the 2003 figures for both total deaths and pedestrian deaths were reduced over the previous year.

## Fatal Vehicular Crashes



## Injury crashes



“Safety First” is an initiative developed by a Highway Safety Task Force, appointed by Governor McGreevey, that includes NJDOT, the State Police, other state agencies, and a variety of public and private groups interested in promoting safety. The initiative pursues all aspects of the highway safety: Engineering (road), Education (drivers), and Enforcement. At the recommendation of the task force, the Legislature enacted a “Safe Corridors” bill which increases fines for traffic violations on highway segments with serious safety problems.

Current NJDOT programs funded under “Safety First” include:

- Accident reduction program—Specific countermeasures, such as raised pavement markers and skid-resistant pavement treatment, which are implemented at high-crash locations.
- Fixed object safety treatment—Installation of reflectors and protective devices on fixed objects, such as utility poles, to help motorists avoid crashes with them.
- Intersection improvement program—Low-cost, fast-track improvements at intersections identified by the safety management system as having the worst problems.
- Median crossover crash prevention program—Installation of guiderail or cable in grass highway medians to prevent out-of-control vehicles from crashing head on into opposing traffic.
- Motor vehicle crash record processing—Entry of all New Jersey crash data into a computerized database for analysis.
- Safe streets to school program—Support for municipal projects to improve sidewalks and street crossings to provide safer access to schools for walking students.
- Safety management system—A computerized system for analyzing crash data and identifying highway segments and specific types of crashes that warrant attention.

It has been estimated that an increase in safety funding to a level of \$90 million a year would be needed to address safety needs. The proposed capital program for fiscal year 2005 does not reach that level but does allocate an average of more than \$50 million a year for safety programs, an increase of 44 percent over previous funding. (It is important to note that these funding levels address only programs which are specifically targeted for safety. Most highway projects, even those designed primarily to address infrastructure or operational needs, improve safety. NJDOT practices “safety conscious” planning and design throughout the project development process.)

New programs funded in the proposed program include:

- Local Federal Safety Program—Safety improvements on local roads prioritized by metropolitan planning organizations.
- Safe corridors program—Implementation of improvements recommended by safety impact teams in high-hazard locations.
- State Police safety patrols program—An experimental program of significantly increased patrolling on highways with high crash rates.

**Capital investment strategy for safety**

1. Continue to demonstrate the need for great funding levels for safety.
2. Continue to work with the Highway Safety Task Force to address all aspects of the safety problem.
3. Continue to pursue innovative programs to improve safety.

# Congestion

## Introduction

In simple terms, roadway congestion occurs when too many vehicles try to pass through the same location at the same time. New Jersey's state highway system operates under congested conditions for continually longer and longer periods and, in many locations, does not have the capacity to accommodate future growth. Financial, environmental, and quality of life issues prevent us from "building" our way out of congestion. Unfortunately, congestion is likely here to stay.

A recent study of New Jersey traffic has shown that there are approximately 261 million person-hours lost to congestion annually, resulting in \$4.7 billion in lost time and \$400 million in wasted fuel. About 35 percent of New Jersey's peak period vehicle-miles of travel (VMT) take place under congested conditions. "Non-recurring" congestion, that is, congestion stemming from crashes, construction work, and other events, further exacerbates the overall congestion problem and reduces the reliability of the system.

Although new highway construction and highway expansion have not kept pace with population growth, the primary source of congestion in recent decades has been the rapid pace of sprawl development. Congestion results from growth policies developed within a land use system that encourages sprawl and auto dependency. As development occurs in a low-density and homogeneous pattern, connectivity between neighborhoods is reduced, travel distances are increased, transit and other options become less effective, and users pay only the marginal costs of additional infrastructure needs. Growing distances between homes, shops, work, and recreation facilities generate more travel that can be met with limited highway resources and public transit.

NJDOT is pursuing a variety of strategies to mitigate the congestion problem.

## Highway operational improvements

Delays in highway traffic are often caused or exacerbated by problems at "bottleneck" locations. Planning studies identify locations where specific improvements can offer significant relief. These range from complicated and expensive projects, such as untangling the Route I-295/Route 42 interchange, to simpler intersection improvements. A typical intersection improvement project may involve the acquisition of right-of-way to accommodate right-turn or left-turn lanes, environmental studies, community involvement, and other preparatory work which sometimes takes years to accomplish. To provide more relief more quickly, NJDOT has initiated a Congestion Relief, Operational Improvements ("Fast Move") program, which identifies spot congestion problems which can be improved through low-cost, fast-turnaround projects. These

may involve better striping and signing to guide motorists or improved traffic signal timing to accommodate the traffic problems at particular intersections.

It has been estimated that funding this program at the level of \$110 million per year would fund all critical bottleneck relief projects (including the Route I-295/42 interchange) as well as smaller intersection improvements, relieving congestion at more than 100 critical locations over the 10-year period. Through strict controls on funding for more expensive highway capacity increases, NJDOT has been able to propose funding for highway operational improvements above this level, at least in the short term. The proposed capital program shows \$170 million in funding for this program in fiscal year 2005 and \$140 million in fiscal year 2006. As discussed elsewhere, no funding is currently available beyond these two years.

## Highway capacity increases

The traditional solution for highway congestion is to expand the capacity of existing roads by adding new lanes or to build new roads which bypass older congested facilities. These projects are often expensive and controversial and can take many years to go from planning to construction. For these reasons, as well as for policy reasons, NJDOT has limited investment in highway capacity increases to no more than 4% of the total transportation capital program. This investment level is far lower than that provided by most states.

Projects funded for implementation (final design, right-of-way acquisition, or construction) within the next two years are Route 1 in Middlesex County, a short segment of Route 10 in Morris County, the Route 18 connector between New Brunswick and Route I-287, Route 21 (McCarter Highway) in Newark, and the Route 440 High Street connector in Perth Amboy. Projects which are or will be ready for implementation shortly, but are not funded within the two-year window of the proposed capital program, are the Route 33 Washington Township Bypass in Mercer County, segments of Route 46 near the Route 46/23/I-80 interchange, and Route 206 (including a bypass section) in Somerset County. All of these projects have been carefully reviewed to ensure that their scope and design is fully compatible with Smart Growth principles and will not promote sprawl development.

NJDOT is currently conducting studies of several congested highway corridors which may yield recommendations for highway widening or construction of bypasses. These include Route 9 in Middlesex County south of the Raritan River crossings, Route 9 in Ocean County south of Lakewood, Route 15 in Sussex County, Route 17 in Bergen County, and Route 31 in the Flemington area. In each case, NJDOT will work with local partners to ensure that any highway improvements are made only in the context of a comprehensive Smart Growth land-use strategy. In many cases, these collaborative planning efforts will yield proposals for quicker, lower-scale improvements rather than traditional capacity increases. If capacity increases are selected as an appropriate option, they may be recommended as a long-term option, only after several years of smaller-scale improvements and Smart Growth planning. This strategy will ensure that

funding for capacity increase projects remains manageable, while promoting comprehensive approaches to congestion which address land use planning as well as infrastructure.

## **Park-and-ride**

Park-and-ride locations offer motorists a means of transferring out of single occupancy vehicles and into more efficient transportation modes, including carpools, vanpools, buses, and trains. NJDOT and NJ TRANSIT develop park-and-ride projects out of a variety of planning studies. Two years ago, Governor McGreevey announces a bold initiative to create 20,000 Park & Ride spaces throughout the State over the next five years. To date, more than 7,000 spaces have been created. In 2005 and 2006, NJDOT and NJ TRANSIT will spend \$19.5 million to create additional spaces.

## **Intelligent Transportation Systems**

NJDOT operates two traffic operations centers which constantly monitor traffic conditions, provide information to motorists, operate emergency service patrols to help disabled vehicles, and alter traffic signal patterns to respond to traffic problems. As more advanced technology comes on line, NJDOT plans to use these tools to make a “smarter” transportation system. A recommended funding level of \$100 million per year would enable NJDOT to “wire” 1,000 miles of the state highway system, including installation of the latest technology for traffic management and traveler information. At projected funding levels for the next two fiscal years, NJDOT will continue to make modest, incremental improvements in the system, including expanding emergency service patrol coverage and building a connection between the northern and southern fiber optic cable networks.

## **Smart Growth**

Governor McGreevey has also initiated new approaches to relieve congestion through “Smart Growth” related improvements. These can be summarized as:

- **Urban investments**—Access and circulation improvements in our cities can promote urban redevelopment while improving mobility. NJDOT is investing in improvements in all of our major historic cities, working with local governments and NJ TRANSIT to promote multimodal access and circulation.
- **Transit Villages**—High quality commercial and residential development around transit stations can reduce automobile trips while offering New Jerseyans more mobility and a better quality of life. NJDOT is working with several municipalities to help them undertake planning for this kind of redevelopment.
- **Suburban corridors**—New Jersey’s older suburban “strips” have multiple problems of traffic congestion, aging infrastructure, economic insecurity, inefficient use of land, and visual pollution. NJDOT is working with counties and municipalities to link roadway improvements with corridor redevelopment

- plans, so that these strips can become revitalized activity centers for the 21<sup>st</sup> century. The most advanced corridor in this category is Route 130 in Burlington County, where NJDOT is developing highway projects that support the redevelopment plans of the county and the municipalities.
- Rural corridors—Many of New Jersey’s rural corridors are in danger of losing their rural character through sprawl development, which in turn creates traffic congestion. NJDOT is working with Warren County and its municipalities, and with other state agencies, on a pilot project on Route 57 to acquire scenic easements in order to curtail sprawl, to support redevelopment efforts in Washington Borough, and to identify “traffic calming” and pedestrian improvements in the villages along the corridor. NJDOT has also worked with Mercer and Hunterdon counties and their municipalities to make Route 29 a “scenic byway,” which will help to preserve its scenic and recreational assets.

A recommended funding level of \$135 million annually would fund significant access and circulation improvements in key urban areas, support for transit villages at all suitable candidate locations, support for redevelopment of several suburban highway corridors, and support for preservation of mobility on several rural corridors. In fiscal years 2005 and 2006, NJDOT will continue to address these needs on a project-by-project basis.

## Ten congested locations

In addition to the statewide programs discussed above, NJDOT has targeted ten high-congestion locations for comprehensive anti-congestion approaches. These locations are:

1. Route 1, Lawrence and West Windsor townships, Mercer County

This 7-mile segment of Route 1 experiences significant congestion. There are multiple projects in various stages of development located within this stretch of roadway. These include improvements in the Quakerbridge Road area, the Penns Neck area (currently in the Environmental Impact Statement phase), and a new Bus Rapid Transit proposal.

2. Route 1 and 1&9, Edison, Woodbridge, and Rahway, Middlesex and Union counties

A severe congestion problem is clearly evident within this 11-mile segment of Route 1 and 1&9 in Middlesex and Union counties. A variety of improvements are scheduled over the next five years and beyond. These include major investments in the reconstruction and widening of the roadway, including replacing or upgrading substandard bridges and interchanges.

3. Route 3, Hudson, Bergen, and Passaic counties

The entire length of Route 3 is included in this corridor, where significant traffic delays occur regularly. The major project in this area is replacement of the Route 3 bridge over the Passaic River, with related operational and safety improvements, which will relieve this bottleneck. This project is programmed for final design in the proposed capital program for fiscal year 2005.

4. Route 4, Bergen County

This congestion location incorporates the entire Route 4 corridor traversing several municipalities including Englewood Park, Fair Lawn, Paramus, River Edge, Hackensack, Teaneck, and Fort Lee. A Route 4 needs assessment study has identified several congestion and safety issues related to substandard bridges and interchanges. Eleven bridges are under study for rehabilitation or replacement.

5. Route 9, Dover and Lakewood, Ocean County

This 7-mile section of Route 9 is an urban principal arterial that experiences serious traffic delays. It is one lane in each direction and the most severely congested segment of the 136-mile facility. An EIS has been initiated for possible significant improvements. A Smart Growth study will be incorporated into the work.

6. Route 17, Bergen County

Throughout the entire length of Route 17, congestion is an ongoing problem. The center segment, approximately 5.5 miles in length, from Route 46 to the Garden State Parkway, was the subject of a recently completed planning study. Long-term recommendations of this study include potential widening to a consistent six-lane cross section and replacement or rehabilitation of structures and interchanges.

7. Route 21, Newark, Essex County

Major traffic delays are most common on the urban arterial link of Route 21 as it extends through the city of Newark south of the freeway section. Various connections such as Routes I-280, 22, and 1&9 all provide access into downtown Newark. Several extensive projects are under construction, programmed, or under study, all incorporating "context sensitive design" features to complement the urban setting. Also under study is a new pedestrian linkage over Route 21, connecting the Performing Arts Center with the waterfront.

8. Route I-80 and Route I-287 interchange and approaches, Morris County

This regional bottleneck has resulted in significant traffic congestion on the interstate system. Critical operational deficiencies are clearly apparent. This is

the confluence area of two major interstate routes that serve high-volume, area-wide through traffic as well as providing direct access to commercial and industrial land uses in Denville, Parsippany—Troy Hills, Hanover, and Morristown. Improvements to the Route I-287/Route 24 interchange will be under construction in calendar year 2004 and improvements to the Route I-287/Route I-80 interchange are in preliminary design.

9. Route I-295/I-76/42/55 interchange area, Gloucester and Camden counties

This is a major confluence area of several high-volume interstate highways and limited access highways. It services commuter and recreational traffic in the Philadelphia/Atlantic City corridor. This is a critical regional bottleneck that experiences the worst congestion in South Jersey. The Route I-295 “missing moves” project, to build new ramps between Route I-295 and Route 42, is programmed for construction in fiscal year 2006 in the proposed capital program. The major “direct connection” project, to realign the mainline of Route I-295 through the area, is undergoing an Environmental Impact Study.

10. Shore Access, Atlantic and Cape May counties

During the summer months, severe traffic delays into the shore areas of Atlantic and Cape May counties have become a serious concern. Recreational traffic experiences heavy congestion on Routes 9, 30, 40/322, 47, 49, 50, 55, the Garden State Parkway, and the Atlantic City Expressway. NJDOT is implementing a wide variety of short-term and long-term improvements to the roadway network in this area.

## **Congestion Buster Task Force**

The Congestion Buster Task Force was created by the Congestion Relief and Transportation Trust Fund Renewal Act of 2000 to make recommendations for reducing traffic congestion in the state. The task force made its report to the Legislature in October 2002, including a wide variety of recommendations, strategies, and initiatives. NJDOT has formed a Congestion Buster Implementation Team, with partners from the public and private sector, to implement these recommendations. As a first priority, the team is in the process of identifying “quick fix” solutions to be implemented at congestion hotspots throughout the state.

## Capital investment strategy for congestion

NJDOT will move forward on several fronts to combat congestion:

1. Continue to fund highway operational improvement projects to relieve key bottlenecks on the highway network.
2. Continue to pursue low-cost, fast-track improvements.
3. Pursue select highway capacity increase projects within a funding cap of 4 percent of the total transportation capital program.
4. Work with counties, municipalities, and metropolitan planning organizations to develop long-term strategies for congested corridors, linking Smart Growth planning with infrastructure improvements.
5. Continue to fund expansion of park-and-ride locations.
6. Pursue additional funding and new technology for Intelligent Transportation System programs.
7. Pursue additional funding to expand Smart Growth investments in urban areas, suburban corridors, and rural corridors.
8. Continue to develop comprehensive attacks on congestion in the ten high-congestion locations.

# Bicycle Needs

## Introduction

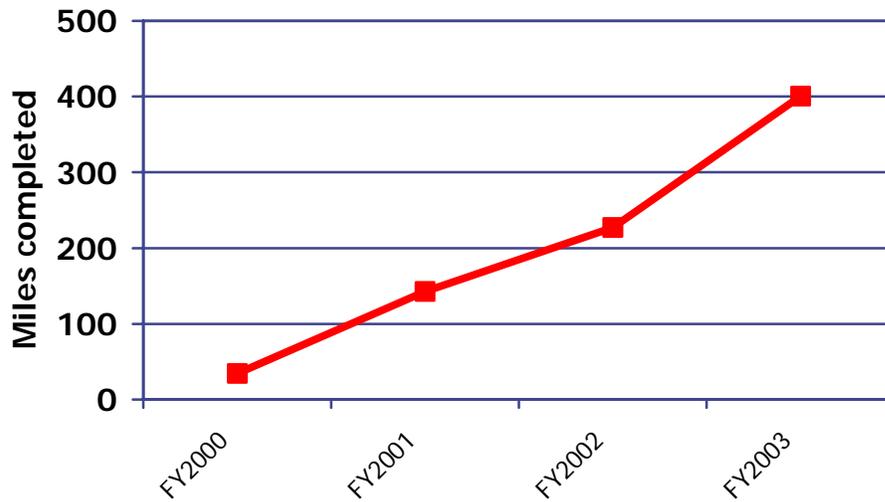
Improved bicycle mobility provides an alternative to automobile travel both for commuting and recreational purposes. In an effort to promote and support bicycle travel, NJDOT develops and pursues programs that provide funding for bicycle accommodation projects. These types of projects include the development of bikeways, bike routes, bike lanes, bike paths and the construction of shared use, bicycle compatible roadways. NJDOT bicycle programs accommodate both state and locally initiated projects. Funding for these improvements are provided through the following capital program items:

- Bicycle & Pedestrian Facilities/Accommodations
- Bicycle Projects, Local System
- Transportation Enhancements

Implementing a “bicycle path” program was one of the centerpieces of the Congestion Relief and Transportation Trust Fund Renewal Act of 2000. An aggressive target of building 1,000 miles of bike paths in five years was adopted. This target is strictly directed towards the implementation of “bike paths” as opposed to bike routes, bike lanes, or bikeways. “Bike path” has been defined as a bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right of way or within an independent right of way.

The objective of building 1,000 miles of bike paths is being achieved through projects established or being planned by various levels of government statewide. For example, independent bike path projects have been initiated at the local or county level, by NJDOT, or other State agencies such as NJ TRANSIT or the Department of Environmental Protection. All bike path mileages accumulated through these sponsors help to achieve this objective.

## Bike path mileage completed since 2000



### Current status

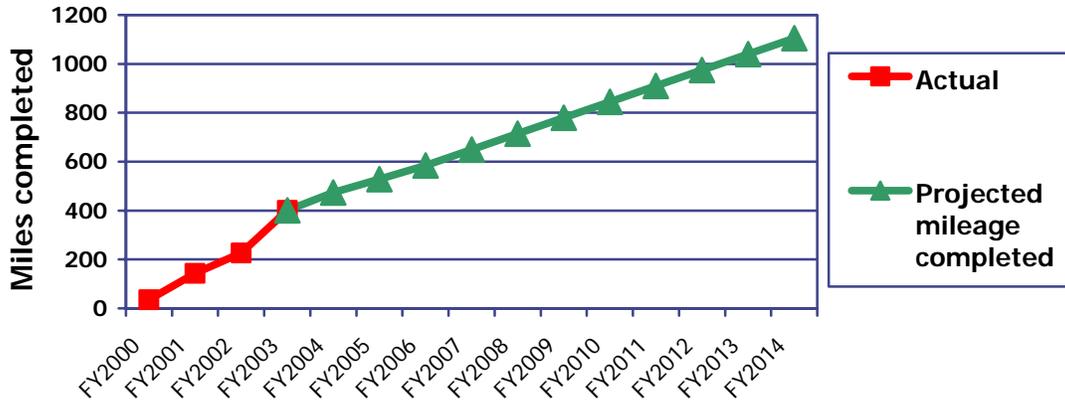
There are currently more than 1,300 miles of bicycle facilities in the capital program or in study and development. Since 2000, bicycle program investments have resulted in the construction of about 400 miles of bike paths over the last four years.

In 1995 NJDOT completed Phase One of the Statewide Bicycle and Pedestrian Master Plan. In Phase One, a vision, goals and objectives were created for the future of bicycling and walking in New Jersey. Currently, Phase Two of the Master Plan is nearing completion, and will update the 1995 plan. As Phase Two matures, future bike path projects as well as other bicycle facility improvements will be identified and prioritized. The Phase 2 Plan will contain an action plan to achieve the original plan's goals and objectives.

### Trends

Based on current funding levels for the bicycle program, as provided in the proposed capital program (\$11.5 million per year), projections indicate that the 1,000-mile bike path goal can be reached by 2014.

## Projected Bike Path Mileage Completed @ current funding levels (\$11.5 M)



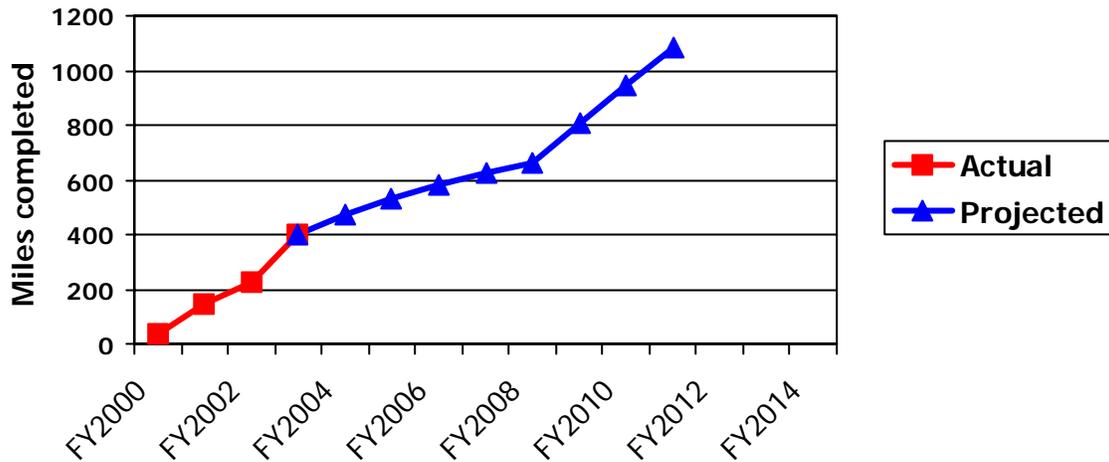
The Transportation Trust Fund legislation requires the development of a Capital Investment Strategy (CIS) that includes the goal of constructing 1,000 miles of bicycle paths in 5 years. Using only bicycle path mileage, projections indicate that the 1,000-mile goal will be met by the year 2014. This estimate assumes the same rate of progress as experienced in the last several years. With a greater level of resources, the target could be met sooner than 2014.

It is important to note that if all bicycle accommodations (paths, lanes, routes, compatible roadways, bridges) are included, the 1000-mile goal can be met by 2006. Although bicycle lanes, routes, and bicycle compatible roadways provide for on-road rather than off-road accommodation, they provide an acceptable level of accommodation for most bicyclists and contribute just as much to the ultimate goal of an interconnected network of bicycle facilities. All of these accommodations will need to be implemented to achieve the vision of a bicycle-friendly state.

### Capital investment strategy for bike paths

NJDOT's capital investment strategy for bike paths is aimed at achieving its statutory goal of building 1,000 miles. The most aggressive, yet reasonable, financing scenario that can be adopted for bike paths assumes that funding will stay constant through fiscal years 2005 and 2006 and will be increased to a "significant improvement" level (\$14 million per year) beginning in fiscal 2007. Under this scenario, 1,000 miles is projected to be reached in 2010 or 2011.

## Projected Bike Path Mileage @ Increased Investment Levels



The New Jersey Bicycle and Pedestrian Master Plan Update, due out in the spring of 2004, will be a key resource for developing additional bicycle projects. With the state's first inventory of bicycle facilities, as well as lists of priority bicycle corridors, the Plan Update creates an analytical framework that the state, MPOs, counties and municipalities can use to develop new facilities.

# Other Needs

## Aviation

New Jersey is home to a diverse and active system of airports which support the state's passenger and cargo demands and serve as gateways to the regional, national, and global economy. The state's air carrier and general aviation airports (non-military, non-airline) play a key role in the retention and attraction of major businesses and industrial firms, especially high value and time sensitive industries such as finance, pharmaceuticals, and professional and corporate headquarters operations. High-tech and high value businesses tend to locate their headquarters or plants near airports. New Jersey's network of airports is an important element of its overall transportation system as well as a major contributor to its economy.

New Jersey has 48 public use airports (including Newark-Liberty) and more than 4,000 based civil aircraft. A very unusual characteristic of New Jersey's public use airports is that 30 of the 48 are privately owned. These privately owned airports are often economically marginal and are frequently targeted for conversion to non-transportation purposes by residential and shopping mall developers. In recent years, airports have been closing and converting to non-transportation purposes at a rate of about one every 18 months.

Of the 48 public use airports, 32 are designated in the State Airport Systems Plan as "core" airports and handle 90 percent of New Jersey based aircraft. Of the 32 core airports, 15 are in public ownership and 17 are in private ownership. Privately owned airports handle more than 50 percent of New Jersey based aircraft.

New Jersey's state Airport Safety Fund program, established in 1983, concentrates on preserving and rehabilitating airports. Airport preservation is done either by outright public purchase or by purchase of airport development rights. New Jersey is the only state with an airport development rights purchase program. NJDOT is also actively involved in airport acquisition as specific airports become threatened with conversion to non-airport use. It is estimated that about \$200 million will be required to preserve the core airport system through acquiring ownership or development rights at all 17 privately held core system airports. A critical rehabilitation priority for New Jersey aviation is increasing the ground aircraft storage and parking capacity at airports.

New Jersey receives federal-aid for airports through the Federal Aviation Administration, most of which are spent at larger publicly owned airports.

It has been estimated that about \$34 million per year would be needed to meet all preservation and rehabilitation needs over the next ten years. The proposed capital program allocates \$27 million per year in state and federal resources for aviation.

## Capital investment strategy for aviation

1. Continue to fund basic airport rehabilitation needs.
2. Identify resources to meet critical core system preservation requirements.

## Goods movement

An efficient multimodal goods movement network is an essential underpinning of New Jersey's economy. Goods move mainly by truck, rail, and water. Infrastructure for trucks is provided mainly by the Interstate and state highway system and the toll roads. Rail and waterborne infrastructure is mainly provided by private companies (such as the freight railroads) and by other agencies (such as the Port Authority of New York and New Jersey). NJDOT plays a partnership and supporting role in these areas.

The key capital investment challenges for NJDOT for the next ten years are providing support for short-line railroads, working with Class 1 railroads to improve their infrastructure and capacity, building the Portway intermodal system, and supporting maritime infrastructure needs.

NJDOT provides support for reconstruction and rehabilitation needs of the state's 14 short-line railroads through the State Rail Program to ensure that local freight rail service is available and viable. The proposed capital program fully funds this need.

The Class 1 (major) railroads serving New Jersey have proposed, with NJDOT's collaboration, a rail freight improvement plan to eliminate bottlenecks in the system and serve the growing needs of the economy. Full funding for this \$160 million multiyear plan has not been identified, but most of it should be provided by the carriers themselves and by other public agencies.

Portway is a planned series of improvements which will tie together the ports of Newark and Elizabeth with rail and trucking terminals and reduce truck traffic on city streets in the port area. Some Portway projects (such as rehabilitation or replacement of deficient bridges) would be needed in any event. Later projects in the program are specifically designed to meet the needs of the Portway interconnection. The proposed capital program for fiscal years 2005 and 2006 fully funds the needs of Portway projects during the two-year time period. However, additional resources will be needed for the later phases.

NJDOT supports a number of programs vital to New Jersey's \$50 billion maritime industry, including channel dredging, ferry infrastructure, the National Boating Infrastructure program, and the Port Inland Distribution Network. Most of the needs of these programs are met from other sources. The proposed capital program allocates about \$4 million per year to finance NJDOT's partnership role in these areas.

## Capital investment strategy for goods movement

1. Continue to provide funding for short-line railroad needs under the State Rail Plan.
2. Seek funding sources to support the rail freight improvement plan for the Class 1 railroads.
3. Continue to provide near-term funding and seek additional resources for long-term funding for Portway.
4. Continue to provide funding for NJDOT's partnership role in meeting maritime needs.

## Local needs

Counties and municipalities have jurisdiction over 25,000 miles of road and 2,472 bridges in New Jersey. Unlike many states, New Jersey's state highway system covers a relatively small fraction of total roadway miles. The secondary road system is mostly under county jurisdiction (mainly the "500" series roads) and carries very large amounts of traffic. Counties also have responsibility for most bridges off the state highway system. Municipalities are responsible for the local street networks.

Counties and municipalities meet many of their own needs out of their own resources. Additional resources are provided through NJDOT's capital program and from state bond funds. Local aid in a rebounding economy takes on new importance because it preserves property tax relief. Some of the key programs are:

- The Trust Fund local aid program—Funding is allocated under the Trust Fund act to counties and municipalities to meet basic needs. The proposed capital program for fiscal years 2005 and 2006 continues funding at the level of \$62.5 million per year for counties and \$62.5 million for municipalities.
- The Bridge Bond program—The 1999 bridge bond bill provided \$250 million for local bridge needs, which has helped to reduce the backlog of deficient local bridges.
- Federal programs—Counties and municipalities also receive assistance from a variety of federal programs, including targeted funding under the Surface Transportation Program. Federal funding is allocated by the state's metropolitan planning organizations.

The proposed capital program for fiscal years 2005 and 2006 provides about \$200 million a year for all local assistance programs.

## Capital investment strategy for local needs

1. Fully fund the Trust Fund local aid program and expand the program as additional funds become available.

2. Continue to work with counties, municipalities, and metropolitan planning organizations to target investments with the greatest benefit.

## **Capital program support**

Planning, designing, and delivering a large capital program such as NJDOT's requires a large investment in various capital program support functions. Because many of these programs support the entire capital program, rather than a specific area such as bridges, they are grouped for budgeting and capital investment strategy purposes as "capital program support."

In fiscal years 2005 and 2006 about \$160 million a year is allocated for capital support programs that directly serve the "pipeline" for the planning, design, and delivery of projects. These programs include: advance acquisition of right-of-way, construction inspection, design (emerging projects), planning and research, preliminary design, program implementation costs, project development, state policy enforcement and safety services, traffic monitoring system, unanticipated expenses, and utility exploration.

An additional \$15 million to \$20 million per year is allocated for other capital program support functions, such as mandatory requirements (disadvantaged business enterprise support), NJDOT capital requirements (equipment and physical plant), and emergency programs.

In the past two years NJDOT has made a major effort to streamline the project development and delivery "pipeline." Instead of a "one size fits all" approach to project development, there are now four separate project development paths that projects can be assigned to, so that smaller needs can be addressed more quickly and more cheaply. The new procedures are shrinking project schedules for many projects and reducing engineering and administrative costs.

## **Capital investment strategy for capital program support**

1. Continue to advance streamlining of the project development and implementation process.

# NJ TRANSIT

## Executive Summary

When it was established twenty-five years ago, NJ TRANSIT inherited a collection of bankrupt railroads and bus companies. The Corporation's initial capital programs focused on melding these disparate services into one system and improving reliability, after years of disinvestment by private enterprise.

Governor McGreevey's inauguration of Secaucus Junction in 2003 marked a key milestone in NJ TRANSIT's efforts to integrate the private sector services it inherited into a single, intermodal network. The goal of NJ TRANSIT's Capital Investment Strategy (CIS) is to improve the reliability, frequency and geographic reach of this network to increase transit ridership, promote smart growth and drive the state's economy.

- First, the Ten-Year Capital Investment Strategy calls for continued investment in the state's transit infrastructure to achieve and maintain a state-of-good-repair. This improves reliability of the transit network and ensures continued satisfaction of existing customers. The CIS targets infrastructure rehabilitation, bus and rail equipment replacements and technology improvements to modernize customer information and fare collection systems.
- Second, there is a tremendous need to grow core transit system capacity to serve ambient market growth and new customers. As NJ TRANSIT approaches the end of an era characterized by investments to integrate its predecessor railroads into one rail system, capacity improvements are becoming more critical.

Increasing rail capacity along the Northeast Corridor into Midtown Manhattan is the keystone of future capacity. This corridor, as no other, exemplifies the success of transit and its future potential. The Northeast Corridor necks down from four or more tracks to two tracks as it approaches Penn Station in Midtown Manhattan. This portion of track must be improved to accommodate more train service to Manhattan and throughout New Jersey, and to allow the number of rail lines providing direct service to Manhattan to increase above the current five lines.

In addition to increased capacity of rail and bus right of way, the Capital Investment Strategy calls for expanded commuter parking and the creation of new regional inter-modal park & rides.

- Finally, the CIS also calls for selective service expansions that work with and fully complement prior investments.

NJ TRANSIT's Capital Investment Strategy will guide transit investments in New Jersey for the next ten years. Implementing the CIS will deliver an improved transit system to the state, one of greater reach, reliability and level of service.

# Introduction

Created by the Public Transportation Act of 1979, NJ TRANSIT was established to acquire, operate and contract for transportation service in the public interest. In 1980, NJ TRANSIT purchased Transport of New Jersey, the State's largest private bus company at that time. Between 1981-85, the services of several other bus companies were incorporated into NJ TRANSIT Bus Operations, Inc. On January 1, 1983, a second subsidiary, NJ TRANSIT Rail Operations, Inc. was launched to assume operations of commuter rail in the State after Congress ordered Consolidated Rail Corporation (Conrail) to cease its passenger operations. A third subsidiary, NJ TRANSIT Mercer, Inc., was established in 1984 when the agency assumed operation of bus service in the Trenton/Mercer County area. In 1992, following a full reorganization, all three subsidiaries were unified and operations were significantly streamlined.

NJ TRANSIT is the nation's third largest provider of bus, rail and light rail transit, providing services to major points in New Jersey, New York and Philadelphia. The agency operates a fleet of 2,027 buses, 711 trains and 65 light rail vehicles. NJ TRANSIT provides nearly 223 million passenger trips each year on 236 bus routes and 11 rail lines statewide and covers a service area of 5,325 square miles.

NJ TRANSIT also administers several publicly funded transit programs for individuals with disabilities, senior citizens and those living in the state's rural areas who have no other means of transportation.

# The Role And Benefits Of Transit In New Jersey

Funding of public transportation is unique among public investments for its wide range of social and economic benefits. Perhaps first among these benefits is the integral role that public transportation plays in supporting the state's economy.

One of New Jersey's most important competitive advantages is its considerable transportation infrastructure. If goods and people cannot flow smoothly throughout the state, New Jersey's long-term economic prospects are considerably diminished. Public transportation is an important component of New Jersey's transportation system because it targets one of its greatest enemies: congestion.

Transit's role in the overall transportation network primarily has been one of demand-side management for highway trip growth. Transit provides the necessary additional peak period capacity to get people to work in the region's dense employment concentrations. Without transit, many of the region's jobs would be virtually inaccessible due to what would be intolerable levels of highway congestion.

Given the high cost of building new roads in densely populated New Jersey, it is less expensive to improve transit in select corridors. For example, if all of New Jersey's New York-bound commuters were to be accommodated on roads, eight more tunnels and two more bridges would need to be constructed across the Hudson. If all of the state's transit riders occupied cars on the Garden State Parkway instead of buses and trains, all lanes of the Parkway would be filled end to end.

Transit has been successful in fulfilling its role of reducing demands on the highway system. According to the 2000 Census, one out of every ten New Jersey workers uses public transportation to get to work, double the national average. In select corridors, like New Jersey crossings to Manhattan, transit's market share is over 80% (including commuter rail, bus, PATH and ferry). New Jersey has the second highest transit use of any state except New York, and is home to five of the top twenty transit cities in the country.

Looking forward, transit's role in accommodating trip growth in New Jersey is increasing. According to the 2000 Census, the percentage of New Jersey workers using transit is increasing for the first time in 40 years. As population increases result in greater trip growth, the transportation network must respond. If highway capacity expansion is constrained, public transportation systems become one of the few viable options for accommodating future trip growth.

In addition to accommodating commuters, public transportation is playing an increasingly important role in carrying off-peak and weekend trips. New Jersey's congestion problem is extending beyond the morning and evening weekday rush hours.

Shore traffic, mall traffic and overall population density have resulted in a state where no time is safe from congestion. Yet congestion in these times threatens industries that are key to the state's economy, such as tourism and retailing.

Public transportation also plays an important role in promoting specific economic development. By their very nature, train stations and other transit hubs concentrate people into a limited area, creating localized markets for retailers and commercial enterprise. This concentration also allows for greater densities in economic development. The economics of large commercial buildings require access by transit to alleviate the real estate costs otherwise associated with parking. In Jersey City, for example, the number of parking spaces required for commercial development can be less than half that for suburban development, due to the city's access to transit. Also, in congested areas, transit provides access to a larger labor market, since workers can commute from greater distances.

Transit also increases local property values. In heavily congested New Jersey, easy access to public transportation results in high demand for area housing. For example, as NJ TRANSIT extended Midtown Direct service to Montclair in 2002, the town had the highest increase in property values of any municipality in the country. Transit can also benefit the local economy of a community, as Midtown Direct service demonstrated, by adding \$60 million in disposable income to the towns served from new people moving in as a result of the new service to New York.

Beyond the benefits to the state's economy, transit investment also has social benefits. Public transportation provides an important safety net for those who cannot drive, whether due to age (both young and old), disability or for economic reasons. Almost 10% of New Jersey's households do not have access to a car. As New Jersey's population ages, more and more people in the state become transit-dependent. NJ TRANSIT provides an important transit service for those who cannot access the highway network.

Transit also promotes smart growth and improves the general quality of life in the communities it touches. Studies have shown that people prefer to live in dense, walkable communities with easy access to public transportation. People use transit because it's faster, more convenient and more pleasurable to use than other means of transportation. Transit builds neighborhoods, reduces urban blight and fosters economic development.

# NJ TRANSIT Today

New Jersey's present rail and commuter bus systems primarily serve New York markets. There is an extensive local bus route network serving the state, focused more on areas where development is concentrated and areas with proportionately more transit dependent population. Over the past ten years, NJ TRANSIT's ridership grew by 30%, mirroring the growth in the State's economy over the same period.

The condition of the transit infrastructure and equipment is much improved from the days of private control, but significant deficiencies still remain. Increases in congestion on the state's highways have shifted auto users to the rails and express bus system, giving rise to severe crowding on the rail network, particularly into Manhattan, and negatively impacting the competitiveness of the bus network as well.

Past investments have focused on integration of what was a hodgepodge of privately controlled railroad and bus lines into a more modern and integrated transit network. As these investments come to fruition, the potential exists for a significant change in the makeup of transit riders in New Jersey.

# Present And Future Demand

Demographers predict that New Jersey's population will increase by 1.4 million between 2000 and 2020, or 16% according to the New Jersey Department of Labor. New Jersey's labor force is also forecast to grow by 0.9 million, or 21%. Since the majority of NJ TRANSIT's ridership is work related, it is possible that travel demand would grow by about 20% over this period.

However, the amount of transit ridership growth over the next 20 years will depend on the pattern and location of future household and employment growth, and the amount of congestion in the state. Implementation of smart growth principles, increased congestion and the aging of the population could significantly boost transit ridership.

## A Vision For A Different Kind Of Transit System



Governor McGreevey's vision for New Jersey is to have a hybrid multi-modal transit system, one with the characteristics of a well-coordinated commuter rail/bus system and a metropolitan rapid transit system with reliable and frequent service.

Increases in trip demand resulting from demographic trends indicate that NJ TRANSIT must change its services to better accommodate trips within New Jersey and to encourage more auto users to switch to transit. While the New York markets represent a strong and growing foundation of the state's transit ridership, there is an increased need to serve existing and new markets within the state for commutation, recreational and other purposes, especially to communities and major employment concentrations consistent with smart growth policies.

In order to make the Governor's vision a reality, the existing network must first be brought to a state-of-good-repair. Service reliability is paramount and is dependent on the condition of the infrastructure. If the backbone of a state-of-the-art, customer-friendly transit system is the existing railroad infrastructure, that infrastructure must be well maintained. Similarly, the condition of the highway and road network must also be well maintained to accommodate bus trips.

Investments must also be made to expand the core capacity of the existing transit system to allow for more frequent service. More parking and improved access are key elements of the makeover, as is better use of technology to produce a fare collection system that is faster and easier to use. Crowded stations and terminals must be expanded and modernized and rail and bus equipment must be overhauled or replaced. Most importantly, key bottlenecks, such as the area under the Hudson River, must be eliminated to allow more frequent service statewide. Finally, the geographic reach of the system must be expanded to make transit more accessible by a wider cross-section of customers.

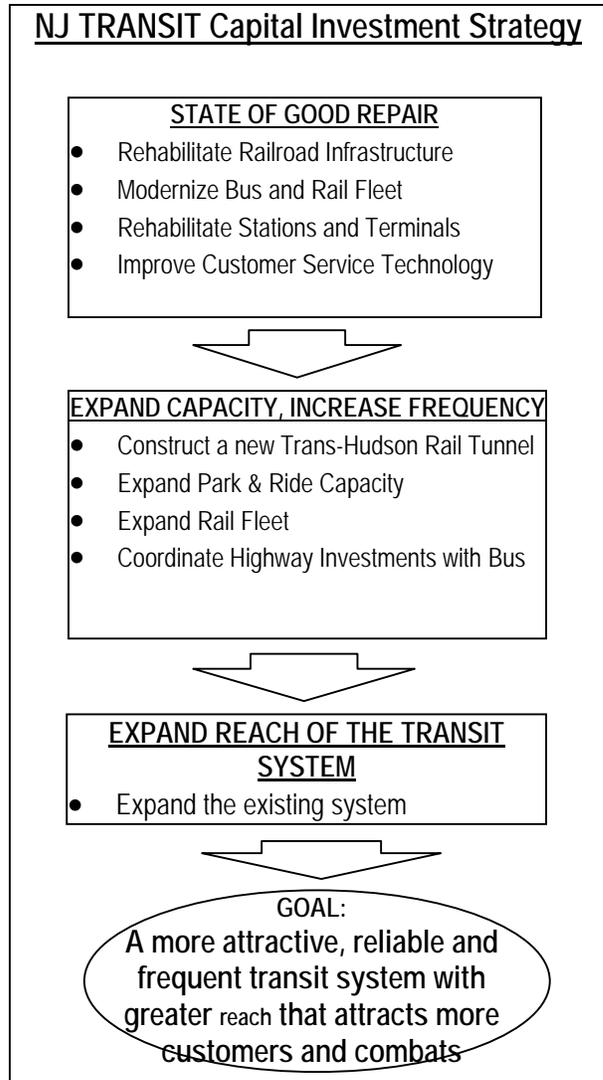
## Ten-Year Capital Investment Strategy Overview

The Ten-Year Capital Investment Strategy calls for continued investment in the state's transit infrastructure to achieve a state-of-good-repair and provide safe and reliable statewide transit service. The CIS allocates \$6.75 billion dollars, or 37% of the total requested funding, to bring the system to a state-of-good-repair and maintain it at that level. It includes the funding necessary to improve NJ TRANSIT's infrastructure, customer service and new technology, and debt on equipment replacement.

There is a tremendous need to grow core transit system capacity to serve ambient market growth. As NJ TRANSIT approaches the end of an era characterized by investments to integrate its predecessor railroads into one rail system, capacity improvements are becoming more critical. \$5.2 billion, or 29% of the Capital Investment Strategy will be used to increase core transit capacity frequency.

There is also a need for selective service expansions that work with and fully complement prior investments. \$3.05 billion, or 17% of the Capital Investment Strategy will be used to expand off the existing core system. It includes the funding debt on light rail and system expansion program.

In addition, another \$3 billion, or 17%, will be required to fund operating expenses.



NJ TRANSIT TEN YEAR CAPITAL INVESTMENT STRATEGY (billions)	
<b>STATE-OF-GOOD-REPAIR</b>	
<i>Infrastructure SOGR .....</i>	<i>\$ 5.0</i>
<i>Customer Service and New Technology .....</i>	<i>\$ 0.5</i>
<i>Debt on Equipment Replacement .....</i>	<i>\$ 1.25</i>
<b>Subtotal .....</b>	<b>\$ 6.75 37%</b>
<b>CAPACITY/FREQUENCY</b>	
<i>Increase Core System Capacity .....</i>	<i>\$ 5.20</i>
<b>Subtotal .....</b>	<b>\$ 5.20 29%</b>
<b>EXPAND OFF THE EXISTING CORE SYSTEM</b>	
<i>Debt on Light Rail Expansion Projects .....</i>	<i>\$ 1.25</i>
<i>System Expansion Program .....</i>	<i>\$ 1.8</i>
<b>Subtotal .....</b>	<b>\$ 3.05 17%</b>
<b>OPERATING SUPPORT .....</b>	<b>\$ 3.0 17%</b>
<b>TOTAL: .....</b>	<b>\$18.0</b>

# State-Of-Good-Repair

The primary goal of the Capital Investment Strategy is to bring the system to a state-of-good-repair. The importance of system expansion projects pales in comparison with the need to maintain the existing system. NJ TRANSIT's existing transit riders rely on the transit system for a consistent level of service. NJ TRANSIT's surveys have shown that riders rank service reliability as one of their top concerns. State-of-good-repair correlates directly with reliable service, which, in turn, correlates directly with customers' decisions to use transit.

Much progress has been made in bringing the transit system to a state-of-good-repair. With such a large system, however, there is still much more work needed to achieve this state system wide. Once state-of-good-repair is reached, there is an ongoing need to maintain the system at that level.

## Rehabilitate Railroad Infrastructure

NJ TRANSIT replaces components of the rail system regularly, based on each component's respective life cycle. "State-of-Good-Repair" is achieved when the infrastructure components are replaced on a schedule consistent with their life expectancy.

- Track – To ensure that it lasts 35 to 50 years, upgrading and replacement of rail, ties, switches and grade crossings must occur as part of a continuous program. Given NJ TRANSIT's 544.9 miles of main line track, 13 miles of track must be replaced every year.
- Structures – With more than 600 bridges, as well as various retaining walls, catenary and signal structures, a regular inspection program is followed to determine those bridges and structures in need of repair or replacement. Because NJ TRANSIT inherited an aged rail infrastructure from several bankrupt railroads, it has a backlog of bridges and other structures overdue for replacement.
- Electric Traction – With many electrified rail lines, overhead catenary wire and power substations must be maintained. Except for certain areas such as auxiliary wire, electric traction systems are at "state-of-good-repair."
- Signaling – Regular programmed maintenance and replacement of grade crossing warning systems, train operation signals as well as switching and interlocking signal devices is needed. NJ TRANSIT is also improving rail safety by installing Automatic Train Control (ATC) and Positive Train Stop (PTS) systems throughout the rail network. ATC systems continuously enforce speed limits for the locomotive engineer, while the PTS systems automatically stop a train before it travels through a stop signal
- Work Equipment – A continuous program of repair and replacement of this equipment is needed to properly maintain the rail system.

## NJ TRANSIT Rail State of Good Repair Annual Capital Needs

Component	System Quantity	Life Expectancy	Annual Requirement
Undergrade Bridge Inspection – 5 yr cycle	585 Bridges	NA	117
Tie Decks	149 Open Deck Bridges carrying 45,000 Track Feet	30 years	1500 track feet
Bridge Painting	278 Steel Bridges carrying 66,000 Track feet	15 years	4400 track feet
Undergrade Bridge Rehab/ Replacement	541 in service	100 years	6
Overhead Bridges	108		2-3
ROW Projects	500 Culverts		2-3
Misc. Structures	Retaining walls, (19 miles) catenary and signal structures (over 2000)		2-3 projects
Component	System Quantity	Life Expectancy	Annual Requirement
Catenary (structure/hardware trolley/Aux./main messenger wire)	240 miles	40 years	6 miles
Signal Power Lines	200 miles	40 years	5 miles
Substations	33 each	50 years	0.5 each
Controls & Navigation lights For Movable Bridges	13 each	30 years	0.3 each
Wayside Power	8 yards	20 years	0.5 yards
Electric Switch Heaters at Interlocking & Yards	770 each	20 years	35 each
Station Lighting	150 each	20 years	7 each

Note: Electric traction and signal power is generally in a state-of-good-repair except for auxiliary wire and substations at West End, South Amboy and Penn Station Newark.

Component	System Quantity	Life Expectancy	Annual Requirement
Interlocking	91	40 years	2
Grade crossing	320	40 years	8
Signal	1,222	40 years	30
Switch	751	40 years	18
Component	System Quantity	Life Expectancy	Annual Requirement
Rail Replacement Equip.	25 pcs.	7 years	3 pcs.
Tie Replacement Equip.	40 pcs.	7 years	5 pcs.
Surfacing Equip.	21 pcs.	7 years	3 pcs.
Cranes	9 pcs.	15 years	1 pcs.
Backhoes, Excavators	24 pcs.	7 years	3 pcs.
Smaller Equipment	800 pcs.	5 years	5 pcs.

Component	System Quantity	Life Expectancy	Annual Requirement
Rail- main line	544.9 miles	35-50 years	13.0 miles
Rail- yards	52.9 miles	60 years	0.9 miles
Ties- main line	1,720,000 each	30-35 years	53,000 each
Ties-yard	115,000 each	50 years	2,300 each
Turnouts	743 each	35 years	20 each
Slip Switches	35 each	10-15 years	3 each
Road Crossings	348 each	17-20 years	22 each
Mitre Rails	80 each	20 years	6 each
Right-of-Way	System surfacing, Undercutting, Ballast Cleaning, Drainage Improvements.		

## Modernize Bus and Rail Fleet

NJ TRANSIT must maintain its fleet of railcars, locomotives, buses and light rail vehicles in good operating condition. In the past three years, the agency has made great strides in replacing what was an aging bus fleet and in expanding its rail fleet. The Capital Investment Strategy provides for lease payments for these past procurements, the purchase of additional bilevel railcars, railcar overhaul and the replacement of older equipment.

- **New Equipment** – In order to retire equipment that has exceeded its useful life, NJ TRANSIT recently purchased 200 Comet V single level rail cars and 1,371 cruiser buses, 85 articulated buses and 33 new diesel locomotives.



- **Equipment Overhaul** – Useful life of rail equipment can exceed 25 years, if properly maintained and overhauled. 160 Comet II coaches are currently being overhauled. NJ TRANSIT's Arrow III self-propelled electric railcars will also

require replacement or another major overhaul within five years. Also, NJ TRANSIT is rehabilitating its fleet of Nova transit buses.

- **New Minibus Equipment** – The Capital Investment Strategy provides for the purchase of smaller buses to replace those that have exceeded their useful lives.
- **Private Carrier Improvement Program** – The Capital Investment Strategy calls for continued investment in private carrier buses. NJ TRANSIT replaces private carrier rolling stock as part of its regular equipment replacement program. Private carriers received over 500 cruiser buses as part of NJ TRANSIT's recent cruiser bus procurement.
- **Environmental Friendly Bus Purchases** – NJ TRANSIT continues to invest in new buses that have reduced emissions of air pollutants. All NJ TRANSIT transit, suburban, articulated and cruiser buses use either compressed natural gas or ultra-low sulfur fuel or are powered by hybrid-electric powerplants. In addition, NJ TRANSIT's recent procurement of articulated buses included soot filters as will all new NJ TRANSIT bus procurements.

## Rehabilitate Stations and Terminals

A key ingredient to attracting more riders to transit is improving the agency's "front door," its train stations and bus terminals. A number of NJ TRANSIT's train stations and bus terminals need improvement. The Capital Investment Strategy calls for significant funding to bring these facilities to a state-of-good-repair. In addition to attracting more people to transit, making train stations into showcases for the community improves quality of life in the towns and cities that host transit facilities.

Improvements will make train stations more accessible to people with disabilities, parents with children in strollers, and the growing population of senior citizens (65+), which is expected to increase by 39%, compared to a population growth of 16% through 2020.

## Improve Customer Service Technology

Although NJ TRANSIT has made great strides in improving interconnectivity of rail, bus and light rail services, ticket collection has not changed in over 100 years. If NJ TRANSIT is to become a system that serves more than commuters, it must have a fare collection medium that is more flexible, quicker and easier to use.

A smart card program will be implemented for the state's transit system. Riders will be able to board any bus, train or light rail vehicle using a common fare card and use it to transfer easily from bus to train and train to light rail. Fares could be deducted from the stored value on the card and the card's value could be replenished automatically from a credit card, like the EZ Pass system.

Smart card technology also makes back office operations more efficient, saving NJ TRANSIT administrative costs. The Capital Investment Strategy anticipates implementation of a smart card system along with other technology improvements designed to improve efficiency and reduce administrative overhead.

# Expand Capacity, Increase Frequency

## Construct a new Trans-Hudson Rail Tunnel

The greatest bottleneck on NJ TRANSIT's rail network is the section of track between Newark and New York. Trains from five feeder lines converge on this section which constricts to two tracks, one inbound and one outbound through the nearly 100 year old tunnels beneath the Hudson River. Over half of all NJ TRANSIT rail riders pass through the existing tunnels, making the lines that serve New York Penn Station among the agency's highest performers. Demand for rail service to Midtown Manhattan has tripled during peak periods since 1983. As demand continues to increase, some time between 2010 and 2020, there will be insufficient capacity to provide for the trans-Hudson commute. The constraint on rail service to Midtown is also restricting intra-state rail service as well since the various lines converge before and after Newark on the approach to the Hudson River Tunnel.

NJ TRANSIT is taking steps to address capacity concerns in the trans-Hudson tunnels. It implemented a new signaling system to increase the throughput of the tunnel and is purchasing bilevel railcars. These efforts can only go so far, however. Once all of these interim efforts are exhausted, the only remaining option is to construct new trans-Hudson rail tunnels.

New tunnels will increase the number of trains into Manhattan, doubling trans-Hudson capacity and providing for a richer rail service in New Jersey. This added capacity will also improve the commuter bus system into Manhattan, by shifting some of the growth in bus riders to rail, thereby providing relief to the Express Bus Lane (XBL) and the Port Authority Bus Terminal (PABT) system. Forecasts for 2020 show that this shift is needed to keep bus travel times the same or better than today.

The Port Authority of NY&NJ is primarily responsible for the XBL and PABT. NJ TRANSIT is working with the Port Authority to provide the necessary trans-Hudson bus capacity on the Route 495 approach to the Lincoln Tunnel, the tunnel itself and the Bus Terminal. Among the issues to be addressed are: where to stage buses for outbound moves, their storage, and movement into the Bus Terminal in the evening.

The Capital Investment Strategy calls for other core capacity investments in the rail system. On the Northeast Corridor, new station capacity will have to be constructed in proximity to the Penn Station New York complex, along with new yard capacity to accommodate a larger rail fleet.

## Expand Park & Ride Capacity

Access is an essential element of any transit system, particularly one constrained by insufficient parking capacity. Parking expansion improvements are targeted toward facilities with the greatest unmet demand.

Use of feeder shuttle buses will also reduce demand for parking and extend the geographic reach of transit.



## Expand Rail Fleet

In order to improve frequency of service, additional equipment must be procured. NJ TRANSIT has taken delivery of 29 new electric locomotives and has ordered 100 Port Authority-funded bilevel railcars. Each bilevel car has up to 20% more seating than conventional single level coaches. 100 additional bilevel railcars will be needed to expand trans-Hudson rail capacity to meet demand in this decade. With the order of the additional bilevel cars, NJ TRANSIT will have sufficient rail equipment on hand to meet its needs for the next ten years.

## Coordinate Bus and Highway Investments to Improve Bus Service

Bus operations are severely impacted by highway congestion. NJ TRANSIT and NJDOT are working to ensure that highway improvements make bus service quicker and more reliable.

# Expand Reach Of The Transit System

## Expand off the Existing System

The Capital Investment Strategy also provides for a limited number of system expansions. These expansions build off the current rail and light rail system in ways that improve efficiency of the network and expand the number of destinations for both existing riders and new riders.

Several projects are currently being advanced through the federally prescribed planning process for possible future investment. They are:

- Hudson Bergen Light Rail Extensions
- Bergen-Passaic Rail Line
- Union County LRT
- Lackawanna Cut-Off
- Monmouth-Ocean-Middlesex (MOM)
- West Shore Line
- West Trenton Line
- New York, Susquehanna and Western (Hawthorne west)

It is expected that they will be through that planning process and able to be implemented within this ten-year period. These projects to varying degrees will increase ridership, geographic coverage and address other needs. The CIS anticipates the advancement of some of these projects.

Planning efforts are also underway for other projects, such as a bus rapid transit system for the Greater Princeton Area and rail service to the NJ Sports Complex and surrounding area.

Critical to advancing the projects listed above are how well they complement NJ Transit's core system and their ability to attract new riders. A few of these projects, such as the West Shore Line, West Trenton Line, Lackawanna Cut-Off and Monmouth-Ocean-Middlesex, fulfill their full potential only if capacity is added to the Northeast Corridor, a new tunnel is built under the Hudson River, and station capacity is added in New York City.

NJ TRANSIT is prepared to advance portions of these projects that meet these general criteria:

- Meet FTA requirements – necessary to be eligible for federal funding
- Generates sufficient ridership – new riders, not just transfers from other transit services which significantly reduces air pollution, congestion and improves accessibility

- Generates sufficient revenue – the combination of farebox and any other possible revenue sources covers enough of the operating costs
- Physically feasible – project can be constructed in accordance with applicable codes and design standards
- Operationally feasible – operating plan makes practical sense and can be implemented
- Benefit/Cost ratio – the projected public benefits exceed the capital and operating cost

Because transit requires concentrations of activity, it almost always is consistent with Smart Growth. However, attention must be paid to whether proposed expansion of transit services will promote development that is inconsistent with the state's policies concerning Smart Growth.

# Conclusion

The investments outlined in The Capital Investment Strategy will deliver on the Governor's commitment to build a substantially enhanced transit system, one with greater reach and richer and more reliable service.

- Continued investment in transit promotes economic development by bringing more of the state's residents to their places of employment and by making it more attractive for businesses to locate in the Garden State.
- It promotes the principles of smart growth by connecting train stations and transit hubs to the communities and businesses that they are a part of – such that transit can serve as an anchor for commercial development in an attractive and livable environment.
- It ensures that the existing transit system achieves a state of good repair.
- It combats congestion by targeting sound and attractive transit alternatives in highway corridors with chronic traffic conditions.

As NJ TRANSIT implements its Capital Investment Strategy, it will attract more people to use transit and encourage those who already use the system to use it more frequently and for more purposes. When transit service becomes more frequent and reliable, and offers more destinations that people want to go to, people will begin to think of using transit for more than simply commuting to work. Implementing the Capital Investment Strategy will make New Jersey's communities more livable, its roads more tolerable and its businesses more profitable. The Capital Investment Strategy will deliver the kind of transit system that New Jersey needs to prosper in the 21<sup>st</sup> Century.