

4

REGIONAL TRANSPORTATION NEEDS & STRATEGIES

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

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



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

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



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

Maintenance and Repair— Asset Management

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

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

Many key facilities in northern New Jersey were built 50 years ago or more and are due for major overhaul or replacement. Maintaining and improving the condition of our roads, bridges, and public transit facilities is compli-

cated by the vast amount of travel in the region. Not only does the heavy travel increase wear on roads, bridges and other facilities but it increases repair costs as work has to be conducted in ways to avoid disruptions to key travel routes. The following summarizes some key maintenance issues in the region.

Bridge Maintenance, Repair & Replacement

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

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

**Table 4-1
NJTPA Bridge Conditions bu Number of Bridges**

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

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

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

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

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

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

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

County Bridge Needs

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

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

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

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

**Table 4-4
County Bridge Conditions Within the
NJTPA Region**

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

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

Pavement Maintenance & Repair

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

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

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

The region’s ability to address these accruing bridge

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

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

Drainage Management System

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

Transit Maintenance

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

Elements of the rail system that must be maintained include:

- Track—Upgrading and replacement of rail, ties,

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

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

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

- Rolling Stock—NJ Transit is replacing many of its buses including the ongoing purchase of 1,145 transit-style buses (approximately 200 buses per year over six years).
- Equipment Overhaul—The useful life of buses can exceed 12 years, if properly maintained and overhauled.
- New Minibus Equipment—Smaller buses are being

purchased for the Access Link Para-Transit service.

- Private Carrier Improvement Program—NJ Transit has provided private carriers over 500 cruiser buses as part of cruiser bus procurement. Private carriers also receive funding for rehabilitation of vehicles, facility improvements, and vehicle purchases.
- Environmental Friendly Bus Purchases—New buses being purchased are designed to reduce emissions through use of compressed natural gas, ultra-low sulfur fuel or hybrid-electric power.
- Passenger Facilities, Bus Terminals and Shelters—NJ Transit must maintain and rehabilitate a large number of bus passenger facilities.
- Park-Ride Locations—Numerous park-and-ride facilities and bus stops must be kept in safe condition including attending to lighting, pavement and/or shelters.

In addition to these maintenance needs, there is an ongoing need to address “core system capacity needs.” These involve upgrading and improving rail lines to address capacity, reliability and other shortfalls. One major project is replacement of the Portal Bridge on the Northeast Corridor. On the bus side, these needs include expanding garage space and places to stage buses for the evening rush hours.

Looking towards the future, investment in information technology will improve the system’s efficiency and improve the passenger travel experience. Better and more integrated information about transit and highway delays or service disruptions, along with multi-modal fare integration,

will allow transit riders to make informed decisions about their trips and to move seamlessly between the many options available in the region. In addition, purchase of new vehicles and related systems will allow the implementation of Bus Rapid Transit systems, such as the GoBus operating in Newark and Irvington, as discussed in Chapter 6.

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



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

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

Safety Needs—A Performance Priority

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

To address safety needs, the NJTPA participates in a statewide Safety Management Task Force and was a founding leader of the state’s nationally recognized Safety Conscious Planning efforts. In 2007 the Task Force worked with NJDOT to develop New Jersey’s Comprehensive Strategic Highway Safety Plan (CSHSP) which addresses eight emphasis areas and identifies strategies, responsibilities and timelines for each. The eight emphasis areas are: prevent and minimize roadway departure crashes; improve the design and operation of intersections; curb aggressive driving; reduce impaired driving; reduce young driver

crashes; sustain senior safe mobility; increase driver safety awareness; and reduce pedestrian, bicycle, rail and vehicular conflicts.

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

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

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

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

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



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



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

Accessibility, Mobility and Congestion— Strategy Evaluation

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

Traffic congestion is one of these complex problems. Sometimes the cause and solution may appear

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

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

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

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

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

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

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

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

The resulting assessments about where transportation strategies will work best were mapped in Geographic Information Systems (GIS) with multiple data layers. The findings of the Strategy Evaluation are used to suggest possible future improvement projects that deserve further investigation. Chapter 6 (Implementation) discusses 30 project concepts identified through a “Strategy Refinement” effort—a follow-up to the latest round of Strategy Evaluation. It is important to note that the strategy locations (represented on maps in the remainder of this chap-

ter) do not represent all needed improvements in the region. While the Strategy Evaluation analysis discussed in this section is an essential tool for identifying transportation needs, project needs are also identified through the management systems discussed earlier, as well as additional corridor and subregional studies and other analysis by the NJTPA and its member agencies. Strategy Evaluation findings are used by the NJTPA to assess and screen proposals for transportation improvement projects. Strategy evaluation findings will be regularly updated as new needs are identified or strategies are reassessed in the planning process.

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

Roadway Improvements

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

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

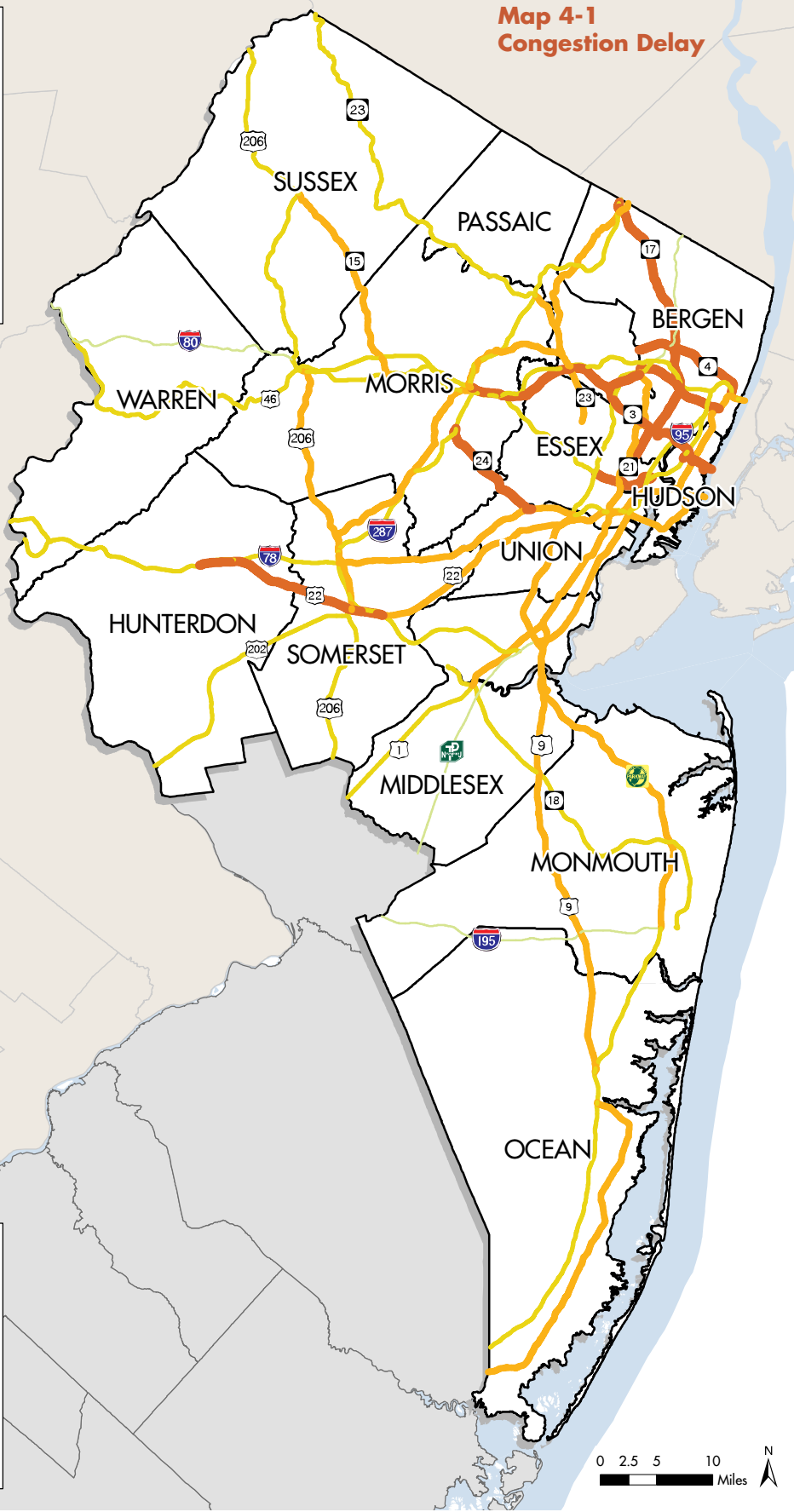
One approach to addressing roadway delays is to directly improve roadway operations or capacities. Based on the analysis of congestion and other variables around the

**Map 4-1
Congestion Delay**

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Delay Ratio

- > 75%
- 50% to 75%
- 25% to 50%
- < 25%
- County Boundaries







Delay Ratio

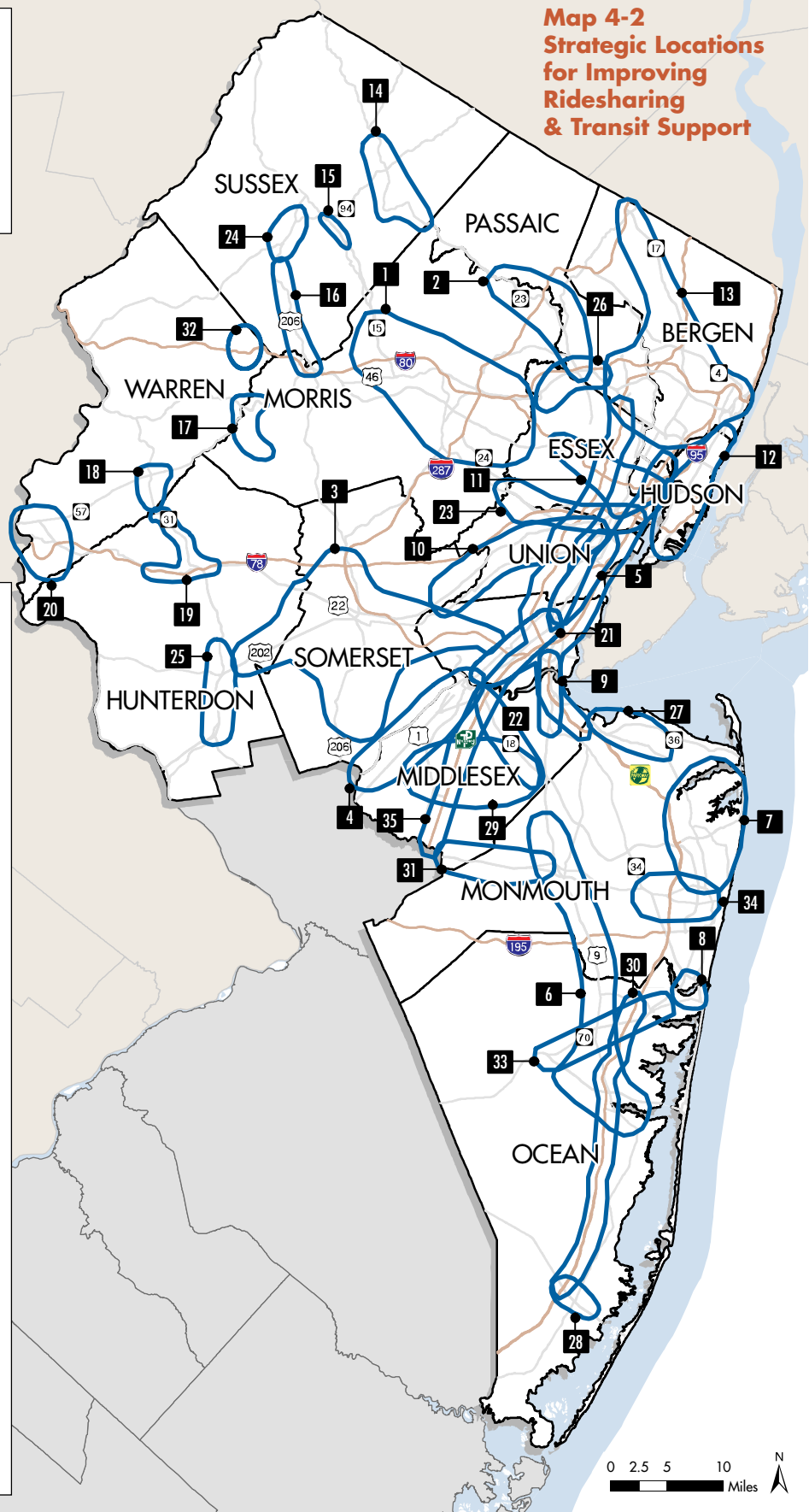
Delay is the added travel time that results from traveling in congested conditions. The delay ratio is the amount of delay experienced while traveling on a road, as a percentage of total travel time on that road. This map shows the delay ratio for travel in the peak period.



**Map 4-2
Strategic Locations
for Improving
Ridesharing
& Transit Support**

LEGEND

-  Roadway Improvement Strategy Area
-  Interstates/Toll Roads
-  US/State Highways
-  County Boundaries



ID Strategy Area

1. I-80, Rts. 10, 15, 206, Northern Morris County
2. Rt. 23, Pequannock/Wayne/Little Falls
3. Rts. 22, 28, 202, 206, I-287, Somerville – Piscataway
4. Rts. 1, 27, South Brunswick – New Brunswick
5. Rts. 1, 27, GSP – Elizabeth
6. Rt. 9, Freehold – Toms River
7. Redbank-Eatontown – Asbury Park Area
8. Point Pleasant – Manasquan Area
9. Rt. 9 Old Bridge – Woodbridge
10. Rts 22, 24, 28, I-78 into Newark & Elizabeth
11. Rt 21, I-280, Downtown Newark Area
12. Jersey City – Northern Hudson County
13. Rts 3, 4, 17, I-80, Eastern Passaic – Southern Bergen
14. Rt 23 Hamburg – Franklin
15. Rt 15, Sparta – Lafayette
16. Rts 183, 206, Andover – Netcong
17. Hackettstown – Long Valley Area
18. Rt 31 Washington
19. Clinton Area: Rt. 31 and I-78
20. Phillipsburg Area
21. Rts. 1, 27, New Brunswick-GSP
22. Rt 18, East Brunswick
23. I-78 Rt 24 Essex & Union Counties
24. Rt 206, Newton
25. Flemington Area
26. Rt 46 Caldwell – Wayne
27. Rts 35, 36, Keyport – Hazlet
28. Rts 9, 72, Manahawkin
29. Middlesex County: Cross County Connection
30. Garden State Parkway, Ocean County
31. Rt 33 Freehold – Exit 8
32. I-80 at Alphano Rd.
33. Rts 70/88 Lakewood – Point Pleasant
34. Rts 33/66, GSP – Monmouth County
35. NJTPK GSP Corridor

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

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

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

notification of delays. Some technologies include traffic control centers, high speed toll plazas, electronic incident notification networks, roadside traffic monitors and computerized traffic signaling. “Smart” traffic signaling, where the signal timing changes depending on traffic conditions, are also an option. Statewide and regional traffic coordination will play an increasingly important role.

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

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

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

Public Transit Enhancement







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

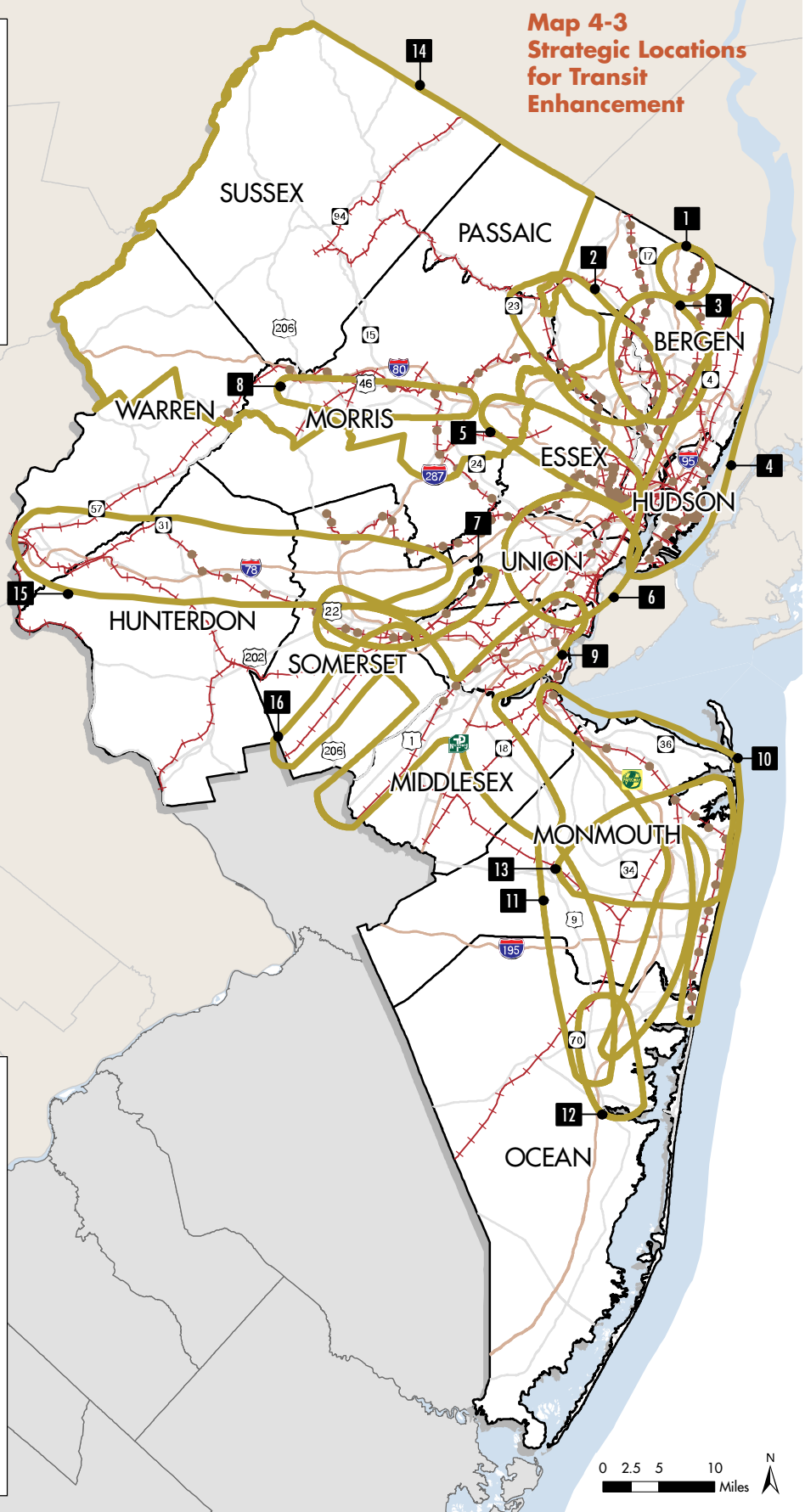
Strategy Evaluation assessed needs and strategies for public transit enhancement by considering a host of measures. These included current patterns of bus and rail usage, residential densities around the region that can support bus and rail transit, and the current ability of residents to access destinations—such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

As discussed in more detail in Chapter 6 (Implemen-

**Map 4-3
Strategic Locations
for Transit
Enhancement**

LEGEND

-  Public Transit Enhancement Strategy Area
-  Passenger Train Stations
-  Passenger Train Lines
-  Interstates/Toll Roads
-  US/State Highways
-  County Boundaries



ID Strategy Area

1. Montvale Area: Transit Stations & GSP
2. Southeast Passaic: Stations, Rt.23 & Employers
3. Central Bergen: Stations & Employers
4. Jersey City & Secaucus
5. Morris, Essex & Hudson: Employers Exchange
6. Union: RVL, NEC Line & Employers
7. Bridgewater: RVL Station to Employers
8. Mount Olive to Parsippany: Commuter Exchange
9. New Brunswick/Rt. 1 BRT Study
10. Shore Points: GSP, NJCL Rail Line & Stations
11. Rt. 9 Corridor: NYC to Freehold
12. Lakewood/Toms River: Major Attractors
13. Major Shore Points to Freehold
14. NW NJ Bus Study/Lackawanna Cut-Off
15. I-78 Corridor Study/RVL Extension
16. West Trenton Line

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

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

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

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

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

Ridesharing and Transit Support

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







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

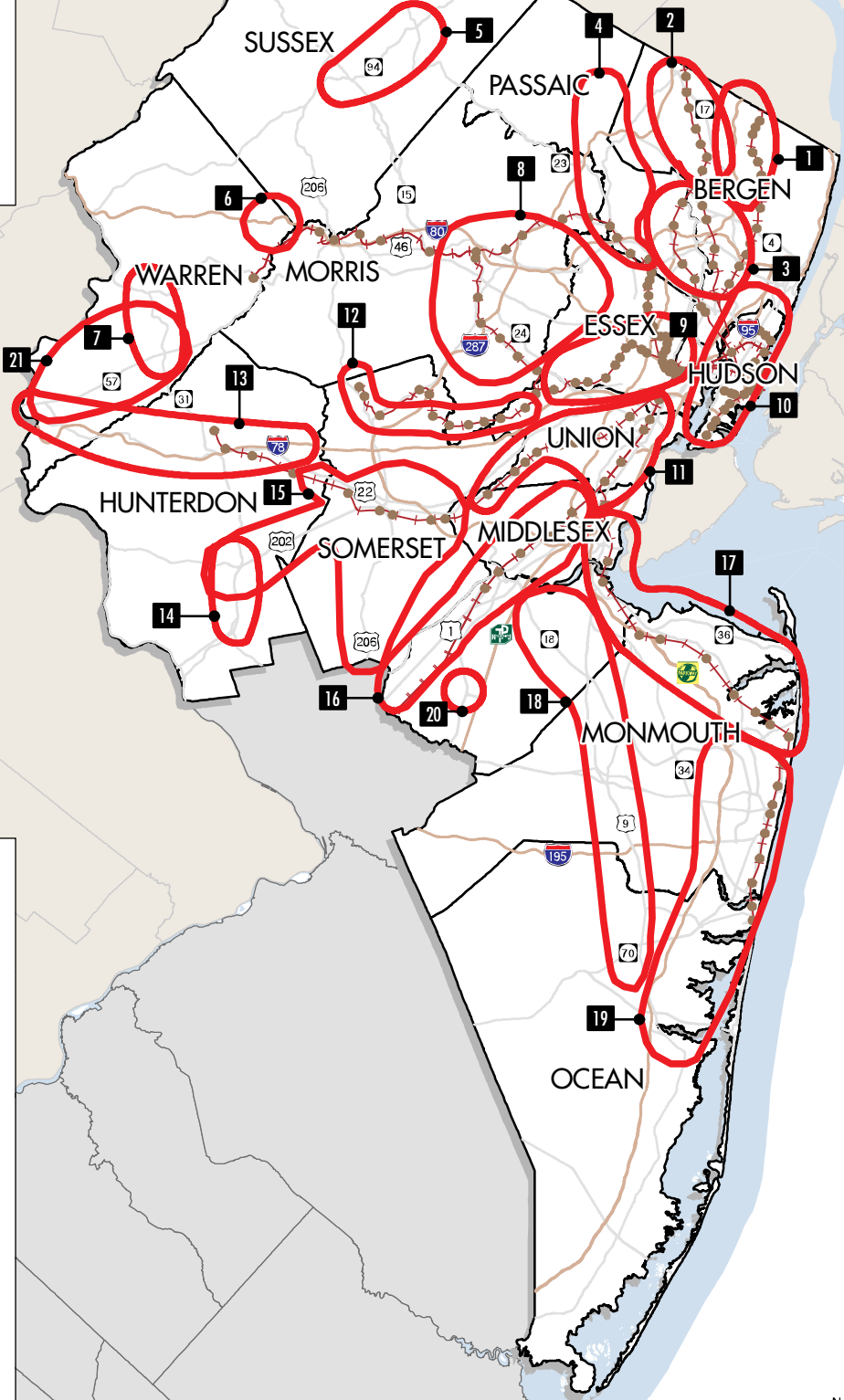
- **Improve Pedestrian and Bicycle Facilities Near Transit:** Well-designed pedestrian and bicycle facilities around transit stations and stops can expedite trips, enable travelers to make efficient travel connections, reduce the need for parking facilities and result in enhanced public transit service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

Map 4-4 identifies priority locations in the region

**Map 4-4
Strategic Locations
for Ridesharing and
Transit Support**

LEGEND

-  Ridesharing & Transit Support Strategy Area
-  Passenger Train Stations
-  Passenger Train Lines
-  Interstates/Toll Roads
-  US/State Highways
-  County Boundaries



ID Strategy Area

1. Pascack Valley Line/GSP: Montvale to Oradell
2. Bergen County Line/Rt. 17: Mahwah to Ridgewood
3. Bergen County, Main & Pascack Valley/ GSP & I-80
4. Totowa/Wayne/Ringwood
5. Rt. 206: Rt.23 to Rt. 57
6. Hackettstown – Netcong
7. Rt. 31: Rt.46 to Rt. 57
8. Boonton & Morristown Lines/I-80, I-280 & I-287
9. Morristown Line/I-280, I-78 & GSP
10. Jersey City – Fort Lee
11. Raritan Valley & NEC Lines/GSP & NJTPK
12. Gladstone Line: Murray Hill to Gladstone Station
13. RVL/Rt. 22: Phillipsburg to Readington
14. Rt. 31: Rt. 202 to Rt. 179
15. RVL/Rt. 22, I-78, I-287, Rts 206, 202, 27, 28, 514
16. NEC Line/I-287 & NJTPK
17. NJCL/GSP & Rt. 36 & Rt. 35
18. Rt. 18 & Rt. 9: East Brunswick to Freehold
19. Toms River– Asbury Park
20. Rt. 130 – Exit 8A Park & Ride
21. Phillipsburg/Belvidere/Washington

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

Freight Movement

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

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

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

Beyond the port area, the map highlights a broad "Core Freight Facilities Area" representing the concentration of cargo facilities, warehouses, custom firms, intermodal facilities and railyards in Bergen, Essex, Hudson, Middlesex, and Union Counties. Improvements here

should focus on meeting future freight movement and warehousing needs through enhanced network connectivity, intermodal freight facilities improvement and development, intelligent transportation systems and warehouse expansion.

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

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

From Strategies to Projects

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

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

**Map 4-5
Strategic Locations
for Freight
Improvements**

LEGEND

Intermodal Facility Types

- ★ Air & Truck
- ★ Rail & Truck
- ★ Truck & Truck
- ★ Truck/Port/Rail

— Truck Corridors

— Freight Rail Corridors

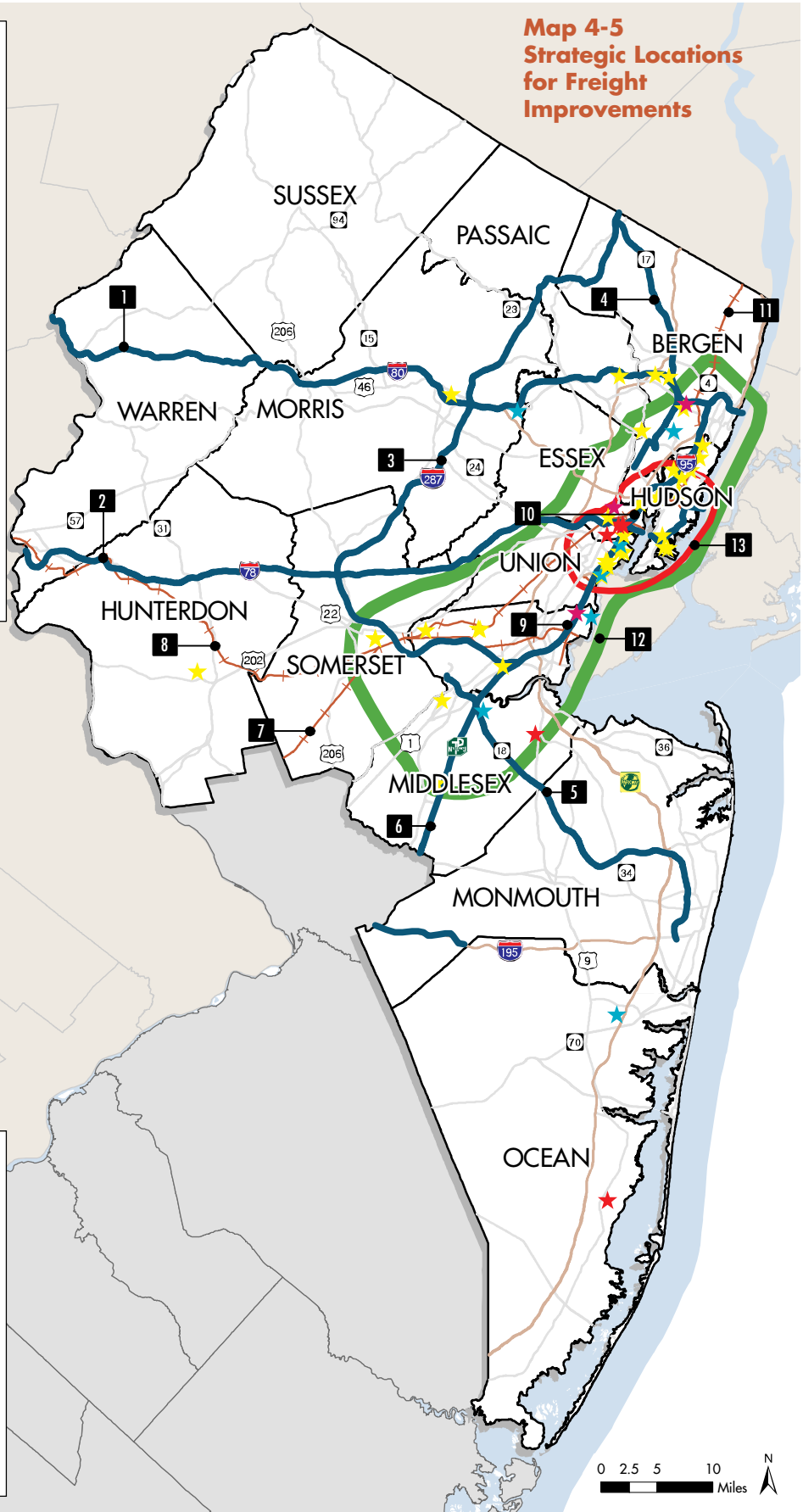
⬭ Port Area

⬭ Core Freight Facilities Area

— Interstates/Toll Roads

— US/State Highways

County Boundaries



ID Strategy Area

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



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

Despite this careful and often lengthy attention to regional needs, a fundamental fact remains—the region’s

needs greatly outstrip the funding available to address them. Hard decisions must be made each year about which needs to address. For this reason, creating long-term plans for financing and guidance for investment decisions is essential. That is the subject of the next chapter, Scenario Planning.

