Prospect Plains Road (CR 614) – M.P. 72.10

This two-lane county road crosses over the Turnpike and provides a link between Cranbury-South River Road to the west and Perrineville Road to the east. The bridge structure spans 190 feet over the Turnpike. Both the eastbound and westbound approaches to the bridge provide additional turning lanes at different commercial driveways located within the Project Corridor. A JCP&L overhead 13 kV electrical service line crosses the Turnpike at this location.

Utility Crossing – M.P. 72.9 to 73.2

A PSE&G 12-inch gas main crosses the Turnpike underground at M.P. 72.9. A second PSE&G gas main (6-inches) crosses the Turnpike underground at M.P. 73.07. A 6-inch sewer force main, operated by the Monroe Township MUA, crosses the Turnpike underground at MP 73.2.

N.J. Route 32/ Forsgate Drive – M.P. 73.42

New Jersey State Highway 32 (N.J. Route 32) is a state highway providing a short one-mile connection between U.S. Route 130 in South Brunswick and the Turnpike at Interchange 8A in Monroe. The dualized roadway continues eastward and becomes Forsgate Drive, which crosses over the Turnpike on two separate and abutting bridge structures (eastbound and westbound mainlines). Each of these bridges spans 400 feet over the Turnpike and provide two travel lanes in each direction. The westbound structure also provides one deceleration lane. Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Local Utility Crossing – M.P. 73.44 and M.P. 73.62

A 16-inch water main, operated by the Monroe Township MUA, crosses the Turnpike at MP 73.44 in a 26-inch underground sleeve located approximately 90 feet north of Forsgate Drive. A JCP&L 4.2 kV electrical service line crosses the Turnpike in an underground conduit at M.P. 73.62.

3.15.3.7 Interchange 8A to Interchange 9

The following utilities and transportation facilities are located in this segment of the Project Corridor.

Northbound Side of the Turnpike

At Interchange 8A on the northbound side, the 30-inch Colonial Petroleum Pipeline is located in close proximity to the Turnpike's existing right-of-way, and continues north to Interchange 9.

From M.P. 75.8 to M.P. 76.6, two Texas Eastern Gas Pipelines (10-inch and 24-inch) run parallel and adjacent to the Turnpike's existing right-of-way. The Texas Eastern pipeline system is a major natural gas pipeline which brings gas from the Gulf of Mexico coast in Texas north through Mississippi, Arkansas, Tennessee, Missouri, Kentucky, Illinois, Indiana, Ohio, and Pennsylvania to deliver gas to the New York City area. It is one of the largest pipeline systems in the United States and is owned by the Texas Eastern Transmission Corporation, a wholly owned subsidiary of Duke Energy Field Services LLC.

A 12-inch gas main, operated by PSE&G, runs parallel to the northbound side of the Turnpike's right-of-way from M.P. 74.39 (just north of Cranbury-South River Road) to M.P. 74.55.

A 12-inch water main, operated by the East Brunswick Department of Public Works and Water Resources, runs parallel to the northbound side of the Turnpike's right-of-way from M.P. 81.1 (just north of Ryders Lane) to M.P. 81.58.

A 4-inch gas main, operated by PSE&G, runs parallel to the northbound side of the Turnpike's right-of-way from M.P. 80.45 (just north of Main Street) to M.P. 80.75.

Southbound Side of the Turnpike

For the entire distance between Interchanges 8A and 9 on the southbound side, the Authority's fiber optic line is located within the existing right-of-way and, in some places, beneath the southbound shoulder. Between M.P. 75.5 and M.P. 76.5, PSE&G's New Freedom-Deans Line (500-kV transmission line) approaches the Turnpike from the southwest, then runs parallel and adjacent to the Turnpike's existing right-of-way before turning northeast at M.P. 76.5 away from the Turnpike.

Crossing the Turnpike

Along this segment of the Project Corridor the Turnpike crosses five county roads, six local roads, one state highway, and two active railroad lines, most of which contain local utilities. In addition, utility crossings exist at ten additional locations unrelated to any roadway or railroad crossings. While other operators of sewer and water mains are discussed below, it should be noted that the Monroe Township MUA provides both water and wastewater services to the community of Monroe. However, none of its sewer or water mains are located within the Project Corridor. These infrastructure crossings are further discussed below.

Utility Crossing – M.P. 74.3

At approximately MP 74.3, PSE&G's New Freedom-Deans Line (500-kV transmission line) crosses the Turnpike.

Railroad/Utility Crossing – M.P. 74.31

The Jamesburg Branch of Conrail Shared Assets Operations is an active freight railroad that crosses underneath the Turnpike in an east-west direction. The Turnpike overpass spans 130 feet over the railroad. Also at this location and along the railroad, some overhead catenary lines cross the Turnpike.

Cranbury-South River Road (CR 535) – M.P. 74.39

This two-lane county road passes under the Turnpike and provides a link between N.J. Route 32 and U.S. Route 130 to the southwest and Ridge Road to the northeast. The roadway crosses underneath the Turnpike at an angle. The Turnpike overpass spans 240 feet over the roadway. A PSE&G 12-inch gas main and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Ridge Road (CR 522) – M.P. 75.55

This two-lane county road crosses over the Turnpike and provides a link between U.S. Route 130 to the west and Cranbury-South River Road to the east. The bridge structure spans 340 feet over the Turnpike and no driveways or roads intersect with the eastbound or westbound approaches to the bridge within the Project Corridor. No utilities cross the Turnpike at this location.

Deans Rhode Hall Road (CR 610) – M.P. 76.1

This two-lane county road crosses over the Turnpike and provides a link between U.S. Route 130 to the west and Cranbury-South River Road to the east. The bridge structure spans 350 feet over the Turnpike and no driveways or roads intersect with the eastbound or westbound approaches to the bridge within the Project Corridor. No utilities cross the Turnpike at this location.

Utility Crossing – M.P. 76.55

At approximately M.P. 76.5, JCP&L's Deans-Smithburg Line (500-kV transmission line) approaches and crosses the Turnpike from the southeast, then runs to the northwest, away from the Turnpike. Approximately 100 feet north of this location, two Texas Eastern Gas Pipelines (10-inch and 24-inch) cross the Turnpike underground and then run northwest away from the Turnpike adjacent to the easement of the Deans-Smithburg Line.

Davidsons Mill Road – M.P. 77.07

This two-lane local road crosses over the Turnpike and provides a link between U.S. Route 130 to the west and Cranbury-South River Road to the east. The bridge structure crosses over the Turnpike at an angle and spans 400 feet. No driveways or roads intersect with the eastbound or westbound approaches to the bridge within the Project Corridor. Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Utility Crossing – M.P 77.08

Approximately 100 feet north of Davidsons Mill Road, a 16-inch underground water main operated by the South Brunswick Utilities Department crosses the Turnpike.

Church Lane – M.P. 78.19

This two-lane local road crosses over the Turnpike and provides a link between U.S. Route 130 to the west and Dunhams Corner Road to the east. The bridge structure spans 400 feet over the Turnpike. A PSE&G 13 kV overhead electrical service line, a PSE&G 8-inch gas main, and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Utility Crossing – M.P. 78.2

On the north side of Church Lane, a 24-inch underground sleeve crosses the Turnpike. This sleeve houses two 12-inch water mains operated by the East Brunswick Department of Public Works and Water Resources.

Hardenburg Lane – M.P. 79.31

This two-lane local road crosses over the Turnpike and provides a link between U.S. Route 130 to the west and Dunhams Corner Road to the east. The bridge structure spans 420 feet over the Turnpike at a slight angle. The bridge structure carries a 12-inch water main operated by East Brunswick Department of Public Works and Water Resources. A PSE&G 13 kV overhead electrical service line, a PSE&G 12-inch gas main, and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Dutch Road – M.P. 79.80

This two-lane local road crosses over the Turnpike and provides a link between Fresh Ponds Road to the west and Dunhams Corner Road to the east. The curved bridge structure spans 350 feet over the Turnpike. Two PSE&G 3 kV electrical service lines and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Utility Crossings – M.P. 79.82 to M.P. 80.35

Within this segment of the Project Corridor, several gas, water, and sewer facilities cross the Turnpike underground, including:

- A 24-inch underground sleeve at M.P. 79.82, containing two 12-inch water mains operated by the East Brunswick Department of Public Works and Water Resources;
- A PSE&G 10-inch gas main at M.P. 80.09;
- A PSE&G 42-inch gas main at M.P. 80.11; and
- Both a 24-inch stormwater sewer and a 10-inch sanitary sewer operated by the Milltown Department of Utilities at MP 80.35.

Main Street (CR 606) – M.P. 80.45

This two-lane county road crosses over the Turnpike and provides a link between U.S. Route 1 to the west and Ryders Lane to the east. The bridge structure crosses the Turnpike at a 45-degree angle and spans 400 feet. The following utilities cross the Turnpike at this location:

- Two PSE&G 4-kV electrical service lines in conduits;
- A 12-inch PSE&G gas main;
- Verizon fiber and coaxial telephone cables (overhead and underground); and
- An 8-inch water main operated by the Milltown Department of Utilities.

Utility Crossing – M.P. 80.75

Both a concrete box culvert for stormwater and two 24-inch conduits, operated by the Milltown Department of Utilities, cross beneath the Turnpike at this location. The two 24-inch conduits contain two 4 kV electrical service lines, a 10-inch water main, and a 12-inch sewer main, all of which are also operated by the Milltown Department of Utilities.

Conrail Railroad (Sayreville Secondary) – M.P. 80.99

Conrail Shared Assets Operations' Sayreville Secondary is an active freight railroad that crosses over the Turnpike in an east-west direction. The railroad bridge spans 280 feet over the Turnpike.

Ryders Lane (CR 617) – M.P. 81.09

This four-lane county road crosses over the Turnpike and provides a link between New Brunswick and U.S. Route 1 to the northwest and East Brunswick to the southeast. The bridge structure crosses the Turnpike at a 45-degree angle and spans 650 feet. A PSE&G 13 kV electrical service line, a PSE&G 6-inch gas main, and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Tices Corner Road – M.P. 81.58

This two-lane local road crosses beneath the Turnpike and provides a link between Ryders Lane to the west and N.J. Route 18 to the east. The Turnpike overpass spans 110 feet over this local road. The following utilities cross the Turnpike at this location:

- A PSE&G 4 kV electrical service line (overhead);
- An 8-inch PSE&G gas main; and
- Two water mains (12-inch and 24-inch) operated by the East Brunswick Department of Public Works and Water Resources.

Utility Crossing – M.P. 81.66

A 14-inch sewer main operated by the East Brunswick Sewerage Authority crosses beneath the Turnpike at this location.

Utility Crossing – M.P. 82.13

An abandoned 12-inch water main, owned by the East Brunswick Department of Public Works and Water Resources, crosses beneath the Turnpike at this location.

Sullivan Way – M.P. 82.15

This two-lane local road crosses over the Turnpike and provides a link between Ryders Lane to the west and an East Brunswick's residential community to the east. The bridge structure spans 320 feet over the Turnpike. A PSE&G 4 kV electrical service line (overhead) and Verizon fiber and coaxial telephone cables (overhead and underground) cross the Turnpike at this location.

Utility Crossing – M.P. 82.55

A 10-inch sanitary sewer main operated by the East Brunswick Sewerage Authority crosses beneath the Turnpike at this location.

Utility Crossing – M.P. 82.95

A PSE&G 24-inch gas main crosses beneath the Turnpike at this location.

N.J. Route 18 – M.P. 82.97

New Jersey State Highway 18 (N.J. Route 18) links the city of New Brunswick with the shore communities of southern Monmouth County. In the vicinity of the Project Corridor, N.J. Route 18 provides a link to the Turnpike at Interchange 9 and U.S. Route 1 to the west and Milltown Road in East Brunswick to the east. The highway crosses over the Turnpike on a six-lane bridge structure at a 45-degree angle (north-south direction). It spans 850 feet, not only over the Turnpike, but also over local roads on either side of the Turnpike. The following utilities cross the Turnpike at this location:

- A PSE&G 13 kV electrical service line (overhead);
- Verizon fiber and coaxial telephone cables (overhead and underground); and
- A 16-inch water main operated by the East Brunswick Department of Public Works and Water Resources.

3.15.4 Existing Utility Demand

Considering the four existing Turnpike service areas located along this Project Corridor, the existing utility demand associated with the current maintenance and operation activities of those New Jersey Turnpike facilities was evaluated. The four facilities include: Service Areas 6S (Richard Stockton) and 6N (Woodrow Wilson) at MP 58.70, Service Area 7S (Molly Pitcher) at MP 71.70, and Service Area 8N (Joyce Kilmer) at MP 78.70. The average daily utility usages for natural gas, electric, water, and sewerage services for a typical service area along the Project Corridor were derived from the information gathered at Service Area 6S (Richard Stockton) as summarized in Table 3.60 below.

Table 3.60
Annual and Average Daily Utility Demand at Service Area 6S

	Gas (Dekatherms)	Electric (Kilowatt hours)	Water (Cubic Feet)	Sewerage (Cubic Feet)
Annual	12,798.6	1,187,080	1,453,776	707,366
Daily	35.1	3,252.3	3,908	1,938

Sources:
N.J. Regional Office of HMS Host Corporation, Turnpike service area operators.
Electric/gas consumption was compiled from the monthly PSE&G invoices for 2005.
Water consumption was compiled from the monthly Aqua New Jersey invoices between November 2004 and December 2005.
Sewerage consumption was compiled from the 2005-2006 invoices of Hamilton Township and based upon the 2006 fiscal year sewer service charge.

3.16 Solid Waste

3.16.1 Introduction

The New Jersey Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.) has provided the framework for the collection, transportation and disposal of solid waste in the State of New Jersey for over thirty years. During this period, the Act has been amended many times, as circumstances have dictated, in order to delineate the responsibilities of municipal, county and state government in these endeavors. Under the structure in place for the last 28 years, the 21 counties and the New Jersey Meadowlands District have been responsible for (among other things) the development of plans for disposal facility siting and recycling, subject to state review. Municipalities are responsible for the collection and disposal of solid waste in accordance with those county plans. Since 1987, municipalities have also been responsible for seeing that recycling programs are available for commercial, institutional and residential generators, thus meeting the mandatory recycling goals established in the Act. Since its inception, the Act has resulted in the development of millions of tons of environmentally protective solid waste disposal capacity, and established a statewide recycling program that provides convenient and economically sustainable curbside recycling opportunities.

On April 13, 2002, New Jersey Department of Environmental Protection Commissioner Bradley M. Campbell signed Administrative Order No. 2002-10, which required, among other things, that NJDEP revise, update and readopt the Statewide Solid Waste Management Plan (SSWMP). The new SSWMP was released in 2006 with significant revisions due to a different landscape of solid waste management in New Jersey since the last Plan update in 1993. Data show that in 2003, New Jersey generated 19.8 million tons of solid waste. As a critical first step in achieving a recycling goal, each county will have to adopt a new plan within one year of adoption of this SSWMP, which is intended to provide the

framework and vision necessary for all levels of government in the state to understand the current challenge and fulfill their responsibilities under the New Jersey Solid Waste Management Act.

A county's Solid Waste Management Plan (SWMP) can be defined as those physical and institutional arrangements necessary to plan, operate, maintain, and control the entire spectrum of solid waste in an effective, cost-efficient, and environmentally-sound manner. The SWMP is an active and dynamic document which analyzes the present solid waste situation in each county, and addresses future solid waste management needs. A SWMP guides the logical sequence of uncovering, defining, and evaluating alternatives for the management of all solid wastes generated by residents and businesses in the respective counties. After their completion, the plans serve as continuing sources of planning and other decision-making information, and are regularly and comprehensively reevaluated. New Jersey's 21 counties have a vital role to play in solid waste management with primacy in source reduction, recycling and disposal capacity planning. For the purpose this analysis, the following sections discuss the SWMPs, enforcement/regulating agencies, existing solid waste facilities, and the current solid waste generation and recycling data for each of the Project Corridor counties, as well as provides the historical and current solid waste management strategies implemented by those three counties.

3.16.2 Data Sources and Methodology

For this evaluation, the Project Corridor is defined as the New Jersey Turnpike and its respective service and maintenance facilities between Assiscunk Creek, south of Interchange 6, and Interchange 9 in order to evaluate the solid waste management practices of the Authority. However, no specific Project Corridor was defined when evaluating the county-wide solid waste management plans.

Data sources reviewed included the current solid waste management practices of the Authority as well as the respective Solid Waste Management Plans of Burlington, Mercer, and Middlesex Counties, and New Jersey's 2006 Statewide Solid Waste Management Plan.

The current solid waste volumes and practices of Burlington, Mercer, and Middlesex Counties and their respective municipalities along the Project Corridor have been evaluated through review of the respective county solid waste management plans, as well as through interviews with county solid waste departments. In addition, the volume of solid waste currently generated by the existing operations and maintenance activities of the Turnpike within the Project Corridor was estimated. Similarly, the current solid waste management practices of the Authority, as well as any existing agreements or coordination efforts between the Authority and the respective county solid waste management plans, were identified and evaluated.

3.16.3 County Solid Waste Management Plans and Practices

3.16.3.1 Burlington County

The Division of Solid Waste Management, which is part of the Burlington County Resource Conservation Department, has been designated by the County's Board of Chosen Freeholders to supervise the implementation of the Burlington County Solid Waste Management Plan (SWMP). The office of Solid Waste Management and Recycling is actually located on the 2nd floor of the Rutgers University EcoComplex, located on Columbus-Florence Road adjacent to the southbound Turnpike at M.P. 49.15 in Mansfield Township. Working through this office, the County has partnered with Rutgers to create the EcoComplex, which is an environmental research and extension center for the environmentally sound management of residential and commercial solid waste, the recycling and reuse of tires, construction material, and old appliances and the processing of sewage sludge into compost fertilizer.

Discussions with the County's Solid Waste Director have indicated that the County's SWMP is to be revised in the near future. In addition to implementing the SWMP and overseeing the County's recycling program, the Division of Solid Waste Management is also responsible for the operation of the 522-acre Burlington County Resource Recovery Complex, which includes a landfill, bulky waste transfer capabilities, a household hazardous waste collection center, recycling facilities (wood and soils, metal, and glass), a co-composting facility, and the EcoComplex research center. The general site plan of the EcoComplex, which situated in both Mansfield and Florence Townships, is provided in Figure 3-22. The facility is a Class I sanitary landfill which may accept all types of non-hazardous solid waste, including Type 10, Type 13, Type 13C, Type 23, Type 25, Type 27, and Type 27I. The landfill is comprised of two major fill areas known as Landfill No. 1 and Landfill No. 2. Landfill No. 1, which is located directly adjacent to the southbound Turnpike right-of-way and has a fill area of 54 acres, has been closed and capped since 2002. Landfill No. 2, which is located further west and has a fill area of 69.8 acres, has been active since 1998 and is currently receiving approximately 400,000 tons of solid waste per year. According to restrictions contained in its permit, the final elevation of Landfill No. 2 will not exceed 152 feet above mean sea level. Based on current rates, it is currently expected that Landfill No. 2 has a remaining capacity of approximately nine years. The County is currently evaluating the option to utilize the vacant area between the two existing landfills as a third landfill, which would provide an additional capacity of approximately 5.6 years.

Truck traffic accessing the Landfill and Resource Recovery Complex is mandated to utilize Route I-295 to Exit 52A, travel east on County Route 656, turn right at the traffic signal, and travel west on Columbus-Florence Road (County Route 543) to the entrance of the facility. Vehicles hauling materials generated within the Townships of Florence, Mansfield and Springfield are exempted from the mandatory traffic routes.

In 2003, Burlington County generated approximately 1,013,407 tons of solid waste. The County recycled approximately 542,728 tons of this total and disposed of the remaining 470,679 tons, which equates to a 53.6 percent recycling rate for the total waste stream. In contrast, the County's documented municipal waste stream recycling rate was 40.6 percent. In addition to the Burlington County Landfill and Resource Recovery Complex, the county currently has one transfer station, five Class B recycling facilities, and 16 Class C recycling facilities. Table 3.61 summarizes solid waste volumes for Burlington County as a whole and the municipalities located in the Project Corridor.

Table 3.61
Burlington County Solid Waste Data – 2003

Waste Volumes (Tons)	Mansfield	Bordentown	Chesterfield	Burlington County
Waste Disposed	6,509	19,543	4,578	470,679
Waste Recycled	13,856	18,431	2,601	542,728
Total Waste Generated	20,365	37,974	7,179	1,013,407
Recycling Rate	68.0%	48.5%	36.2%	53.6%

3.16.3.2 Mercer County

In 1983, the Mercer County Board of Chosen Freeholders gave the Mercer County Improvement Authority (MCIA) the responsibility of implementing the County's Solid Waste Management Plan as well as the County's recycling program under the New Jersey Solid Waste Management Act. In spite

of earlier efforts, Mercer County has neither a resource recovery center nor a landfill, and disposes of all of its solid waste out-of-state. The County's solid waste is moved through the MCIA transfer station, located in Ewing Township, to the Tullytown/GROWS Landfill, located in Falls Township, Pennsylvania and operated by Waste Management, Inc.

According to the MCIA, Mercer County generated approximately 774,152 tons of solid waste in 2003. The County recycled approximately 414,519 tons of this total and disposed of the remaining 359,633 tons, which calculates to a 53.5 percent recycling rate for the total waste stream. In contrast, the County's documented municipal waste stream recycling rate was 29.3 percent. In addition to the MCIA transfer station, Mercer County currently has five Class B recycling facilities and seven Class C recycling facilities. It should be noted that curbside collection of recyclable materials in East Windsor Township is entirely provided by a private collector, rather than by the MCIA, as in the townships of Hamilton and Washington. Table 3.62 summarizes solid waste volumes for Mercer County and the municipalities located in the Project Corridor.

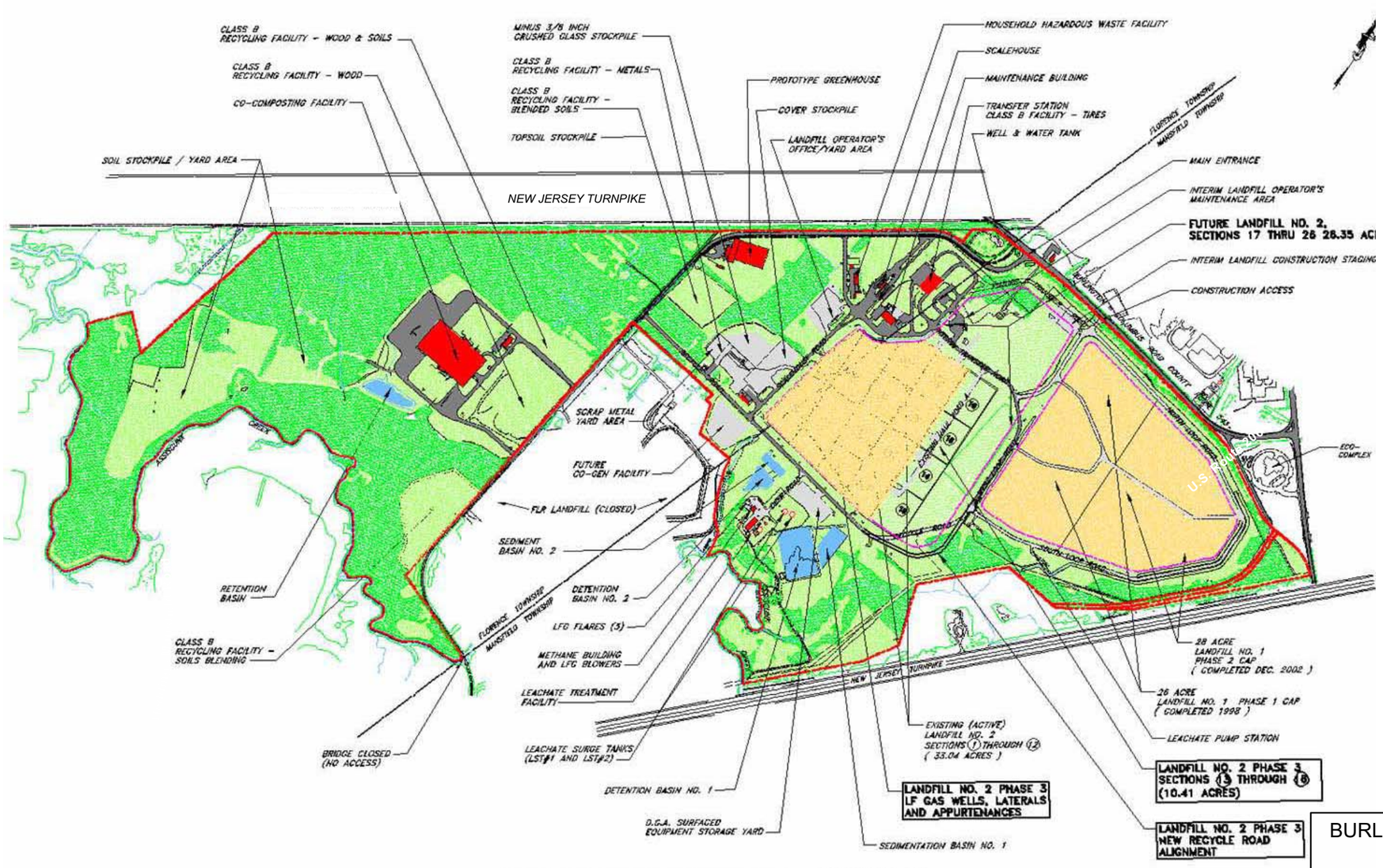
Table 3.62
Mercer County Solid Waste Data – 2003

Waste Volumes (Tons)	Hamilton	Washington	East Windsor	Mercer County
Waste Disposed	88,978	11,017	21,492	359,633
Waste Recycled	8,363 (MCIA) 21,418 (Hamilton)	1,514 (MCIA) 7,898 (Washington)	11,575	414,519
Total Waste Generated	118,759	20,429	33,067	774,152
Recycling Rate	25.1%	46.1%	35.0%	53.5%

3.16.3.3 Middlesex County

The Middlesex County Division of Solid Waste Management (MCDSWM) has been designated by the Board of Chosen Freeholders to supervise the implementation of the County's Solid Waste Management Plan. The SWMP includes: a county-wide inventory of the sources, composition, and quantity of solid waste and recyclables generated; projections of future amounts and composition of solid waste and recyclables; an inventory of all solid waste and recycling facilities; and an analysis of solid waste and recycling collection systems and programs. Solid waste planning in the County is also conducted in cooperation with the Health Department's Solid Waste Enforcement Group, the Middlesex County Utilities Authority (MCUA) and the Middlesex County Improvement Authority (MCIA).

The MCUA is a public entity charged with the management of the County's wastewater and solid waste collection and disposal services, and it is responsible for the operation of the only County landfill – the 315-acre Middlesex County Landfill, located on Edgeboro Road in East Brunswick. This state-of-the-art facility features 44-groundwater monitoring wells, a double liner system, leachate and methane gas collection systems, and high-tech monitoring systems. Each person in the county generates approximately 11 pounds of waste each day, which amounts to approximately 4,000 pounds per person annually. Based on 2003 averages, every day approximately 325 trucks transport approximately 2,200 tons of solid waste to the landfill. This equates to over 690,000 tons of solid waste every year. Only trucks registered with the NJDEP and carrying solid waste collected in Middlesex County's 25 towns



BURLINGTON COUNTY RESOURCE RECOVERY COMPLEX
GENERAL SITE PLAN

BURLINGTON COUNTY LANDFILL & RESOURCE RECOVERY COMPLEX SITE PLAN

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-22

are permitted to dispose of solid waste at the Middlesex County Landfill. In 2006, the tipping fee at the landfill is $49 per ton for contracted haulers and $58 per ton for those haulers without a contract. The types of waste permitted in the landfill include Type 10, Type 13, Type 13C, Type 23, Type 25, Type 27, and Type 27A wastes, with Type 13C and Type 23 wastes including construction and demolition waste, as well as vegetative waste. The waste at the landfill is managed by applying organic cover material daily at intermediate levels, and enclosing the landfill with a final cap cover when it reaches capacity. Based on Middlesex County's population, recycling efforts, and market trends, it is anticipated that the landfill will be able to accept 20 million cubic yards of solid waste for disposal, operating beyond 2015. The Middlesex County Landfill will cover over 300 acres of land and reach its permitted maximum height of 165 feet above sea level. Once the landfill is capped, the MCUA will continue monitoring the site for 30 years.

The MCIA operates the County's recycling program. The MCIA conducts curbside recycling in 16 of the County's 25 municipalities. At the remaining nine municipalities, curbside recycling is conducted by either private collectors or the municipality itself.

According to the MCDSWM, Middlesex County generated approximately 2,196,324 tons of solid waste in 2003. The County recycled about 1,274,808 tons of this total and disposed of the remaining 921,516 tons, which equates to a 58 percent recycling rate for the total waste stream. In contrast, the County's documented municipal waste stream recycling rate was 34.7 percent. In addition to the Middlesex County Landfill, there are currently eight transfer stations, fifteen Class B recycling facilities, five Class C recycling facilities, and one Class D recycling facility operating within the County. Table 3.63 summarizes solid waste volume in Middlesex County and the municipalities located in the Project Corridor.

Table 3.63
Middlesex County Solid Waste Data – 2003

Waste Volumes (Tons)	Cranbury	East Brunswick	Milltown	South Brunswick	Middlesex County
Waste Disposed	20,710	57,757	7,155	32,308	921,516
Waste Recycled	28,081	68,340	12,671	101,957	1,274,808
Total Waste Generated	48,791	126,097	19,826	134,265	2,196,324
Recycling Rate	57.6%	54.2%	63.9%	67.5%	58.0%

3.16.4 Current Solid Waste Volumes and Practices of the New Jersey Turnpike Authority

Considering the four existing service areas located along this Project Corridor, the currently generated volume of solid waste for the maintenance and operation activities of those NJ Turnpike facilities was evaluated. The four facilities include Service Areas 6S (Richard Stockton) and 6N (Woodrow Wilson) at MP 58.70, Service Area 7S (Molly Pitcher) at MP 71.70, and Service Area 8N (Joyce Kilmer) at MP 78.70. The annual volumes collected at the waste and cardboard compactors for each service area are summarized in Table 3.64 below.

Table 3.64
Annual Volume of Solid Waste Generated
at the Service Areas between Assiscunk Creek and Interchange 9
2005

Volume of Generated Waste (Tons)	Waste Compactor	Cardboard Compactor
Richard Stockton (6S)	242.33	41.74
Woodrow Wilson (6N)	330.17	47.50
Molly Pitcher (7S)	656.46	103.70
Joyce Kilmer (8N)	385.40	56.03
Total	***1,614.36***	***248.97***

Sources:
All information was provided by the NJ Regional Office of HMSHost Corporation that holds and operates concessions at all of the service areas along the Project Corridor.

3.17 Contaminated Materials

3.17.1 Introduction

This section presents the findings of a Contaminated Materials Screening Study prepared for the properties located within the Project Corridor. The purpose of this screening is to assess, at a preliminary level, each property's potential to impact specific components of the Proposed Project (e.g., location of interchange ramps, storm water detention basins, etc.) or the Proposed Project's construction schedule. This screening is the first step in an evaluation process to determine this potential, and to characterize possible future steps (e.g., property acquisition, remediation), as appropriate, and their associated costs.

3.17.2 Data Sources and Methodology

The Project Corridor for the analysis of contaminated properties is defined as the area within 500 feet of either side of the existing Turnpike mainline right-of-way between the southern terminus located south of Interchange 6 and the northern terminus near Interchange 9. The Project Corridor also generally includes an equivalent distance around the Turnpike interchanges, except the area around Interchange 8, where an expanded area was considered to incorporate potential toll plaza relocation alternatives that have been studied. In order to determine if there are potential contamination issues within the corridor, a review of a database of federal and state regulatory agency records provided by a commercial vendor was undertaken. Information on sites with documented environmental concerns was recorded and each site was located within the Project Corridor and mapped. Where appropriate, NJDEP case files and the Authority's files (in the cases of Authority-owned property) were also reviewed.

A field reconnaissance of the Project Corridor was conducted to verify sites identified in the commercial database report. The identified sites were observed to assess the presence of: above-ground storage tanks (ASTs); storage of containers or drums; staining of pavement or soil; stressed vegetation; and surface indications of underground storage tanks (USTs) such as fill pipes or vents. The reconnaissance was conducted from public rights-of-way only.

3.17.3 Description of Properties

Much of the property along the Project Corridor was developed subsequent to the construction of the Turnpike. Prior to Turnpike construction, the Project Corridor was comprised mainly of farmland and low-density residential properties.

Fifty-seven potential sites located within the Project Corridor were identified through the methodology described above, although 40 of these are of a very minor nature or were previously remediated and closed. The remaining 17 sites have either the potential for soil and/or groundwater contamination or confirmed contamination that could potentially affect the Proposed Project's subsurface construction activities. These 17 sites, or *Areas of Concern* (AOCs), were identified based on their potential to affect Turnpike construction activities due to environmental impact. These 17 AOCs are depicted in Figures 3-23a through 3-23f, and are discussed below by Turnpike segment.

Assiscunk Creek to Interchange 6

There are no AOCs located between Assiscunk Creek and Interchange 6.

Interchange 6 to Interchange 7

There are no AOCs located between Interchanges 6 and 7.

Interchange 7 to Interchange 7A

There are three AOCs located between Interchanges 7 and 7A, as discussed below.

AOC 1 – Maintenance District 3

The Maintenance District 3 site is a Turnpike maintenance facility located at M.P. 56.5 on the northbound side of the Turnpike in Chesterfield Township (Figure 3-23b). This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case Nos. 95-10-13-1012-16 and 95-09-07-0833. Former UST contents and the extent of impact were not provided in the commercial database report.

A review of the Authority's files was conducted. A "*Supplemental Remedial Investigation Report*" (PS&S, December 1999) described the removal of a 3,000-gallon heating oil UST located on the west side of the building, adjacent to the Turnpike. The discharge was assigned case No. 95-09-07-0833. Residual petroleum soil contamination remained at the time of the report, as did groundwater contamination, consisting of base neutral organic compounds. The depth to groundwater in this area is approximately 12 feet. No documentation details were noted during the review process for case No. 95-10-13-1012-16.

AOC 2 – Woodrow Wilson Service Area 6N

The Woodrow Wilson Service Area 6N is a Turnpike service facility located at M.P. 58.7, on the northbound side of the Turnpike in Hamilton Township (Figure 3-23b). This service area was constructed in the 1950s and has been a gasoline dispensing facility since that time. The site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP BUST (currently Bureau of Southern Case Management) under Case No. 88-03-28-2024.

According to a report prepared by The Louis Berger Group, Inc. (*Conceptual Approach for Remediation*, January 2004), multiple UST systems over time have discharged petroleum products, resulting in soil and groundwater contamination. Several consultants conducted investigations between 1987 and 2001 to determine the extent of the petroleum contamination. Gasoline and diesel-related compounds were detected in soil and groundwater above applicable NJDEP standards. Limited remedial actions included the removal of approximately 109,000 gallons of free product/groundwater from excavations during UST upgrades in 1994 and free product recovery efforts via hand bailing and passive skimmer oil pumps from on-site monitoring wells.

Soil and groundwater contamination in excess of NJDEP standards exist at the site, located predominantly at the pump islands and USTs, and south and east of these areas. It has been determined that shallow groundwater flows toward the nearest surface waters, which are generally south of the site.

AOC 3 – Richard Stockton Service Area 6S

The Richard Stockton Service Area 6S is a Turnpike service facility located at M.P. 58.7, on the southbound side of the Turnpike in Hamilton Township (Figure 3-23b). This service area was constructed in the 1950s and has been a gasoline dispensing facility since that time. This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case No. 88-08-12-1654. Additionally, a former sewage treatment plant existed in the southwestern portion of the site.

According to a report prepared by The Louis Berger Group, Inc. (*Conceptual Approach for Remediation*, January 2004), multiple UST systems over time have discharged petroleum products, resulting in soil and groundwater contamination. In 1988, free-phase product was observed in a utility vault located approximately 40 feet south of the gasoline UST field. The product was removed from the vault and a discharge investigation was initiated. Subsequent UST integrity testing was performed that identified several leaks in the product lines. The investigation resulted in the design and installation of a groundwater "pump and treat" system to prevent the migration of dissolved phase contaminants in groundwater. In June of 1990, a recovery system was installed to treat contaminated groundwater via activated carbon. In May of 1993, the treatment system was upgraded to a low-profile air stripper. In 1995 and 1997, remediation equipment was replaced or repaired to improve system performance. Remedial system operations have been ongoing to date.

The shallow groundwater table encountered between 2.0 and 8.0 feet below ground surface has been measured to have a bi-directional flow to the northwest (toward Blacks Creek) and southwest (toward Doctor's Creek). Groundwater contamination is present at the former UST system and east of the current pump islands, in the direction of the Turnpike mainline. It appears that the methyl tertiary butyl ether (MTBE) and tertiary-butyl alcohol (TBA) plumes extend to the Turnpike and have not been delineated.

Interchange 7A to Interchange 8

There are three AOCs located between Interchanges 7A and 8, as discussed below.

AOC 4 – Unnamed Abandoned Farm

This site is located at the intersection of Walters and Gordon Roads near M.P. 62.3 on the northbound side of the Turnpike in Washington Township (Figure 3-23c). An unknown amount of liquids and

Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

0 500 1,000 2,000 Feet

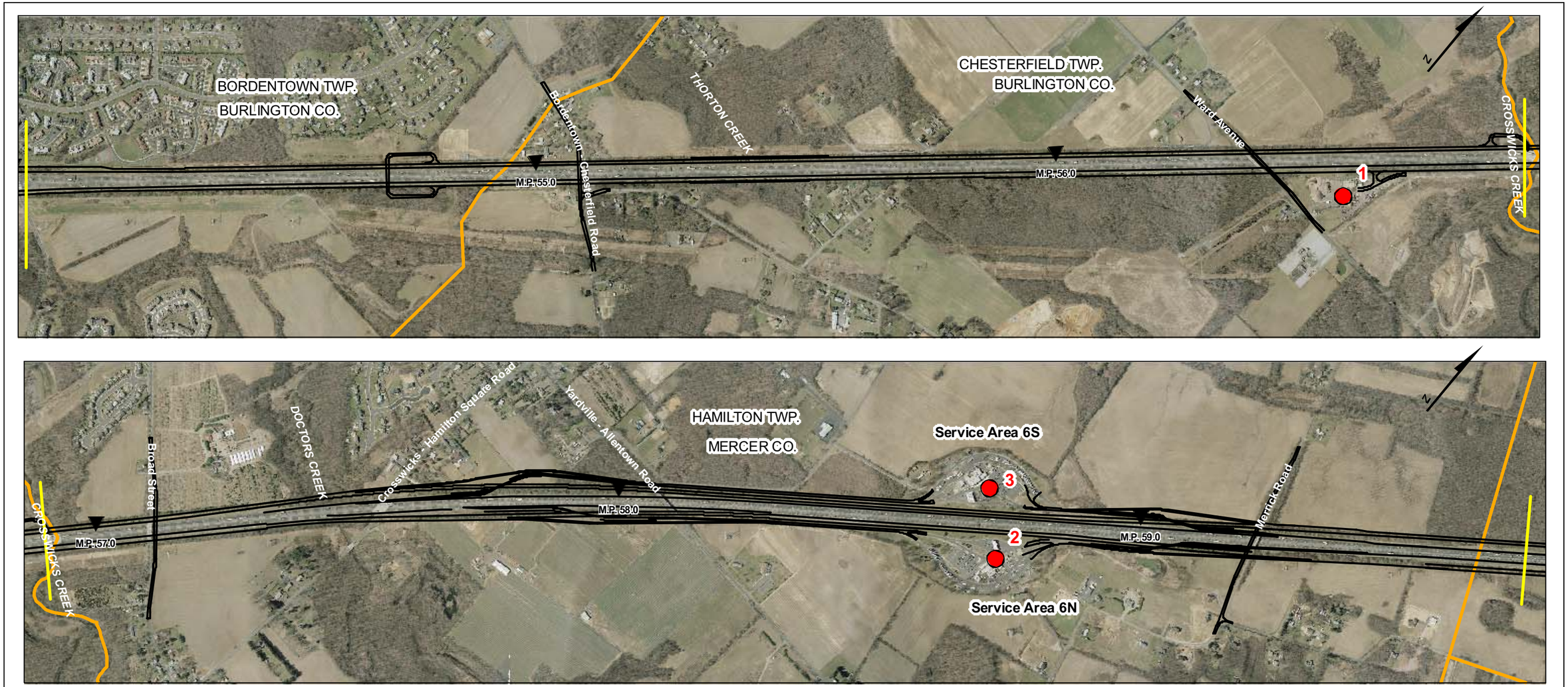
HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23a

Source: Digital Orthophotos - 2006 Aerial Photography.



Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

0 500 1,000 2,000 Feet

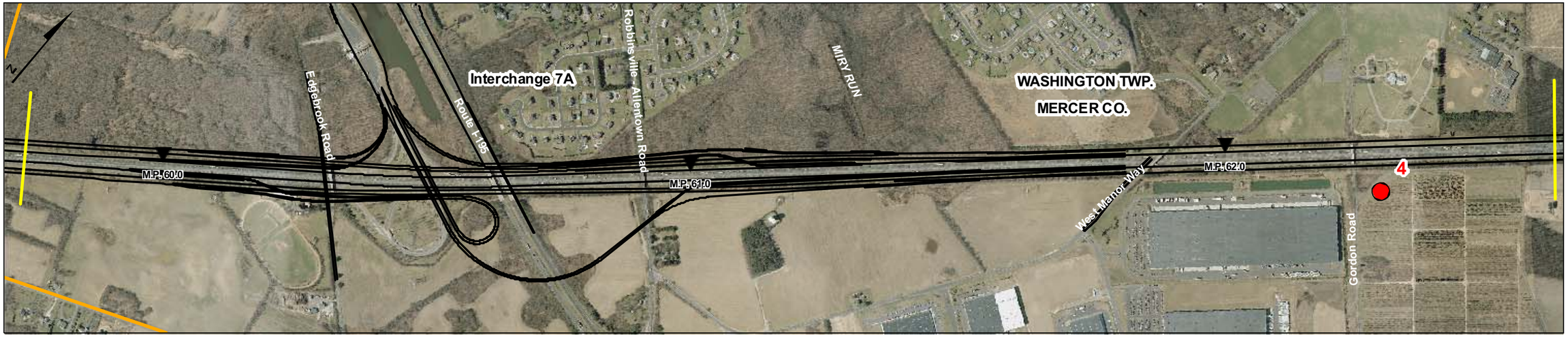
HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23b

Source: Digital Orthophotos - 2006 Aerial Photography.



Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

0 500 1,000 2,000 Feet

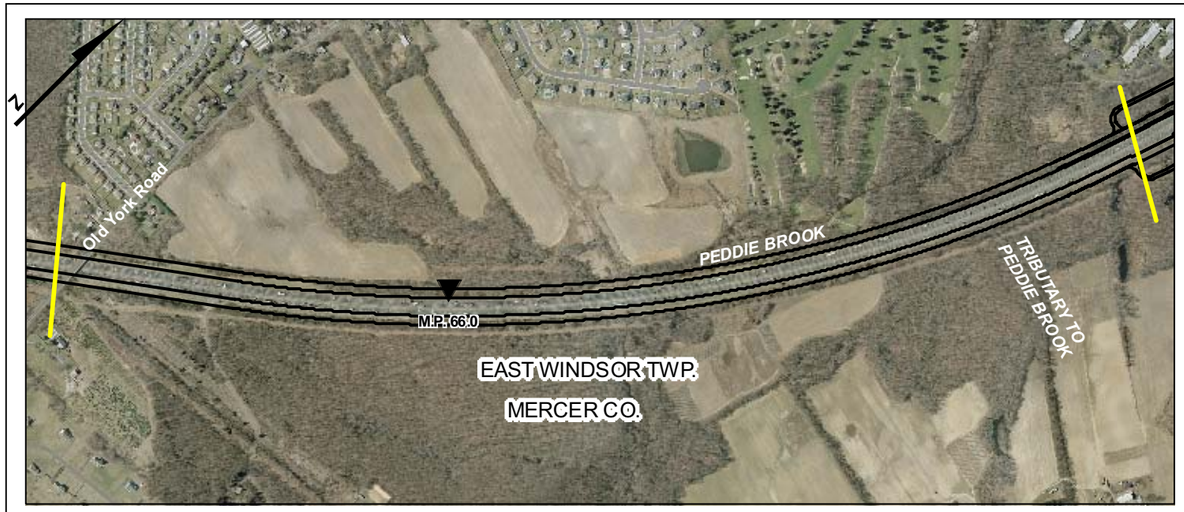
Source: Digital Orthophotos - 2006 Aerial Photography.

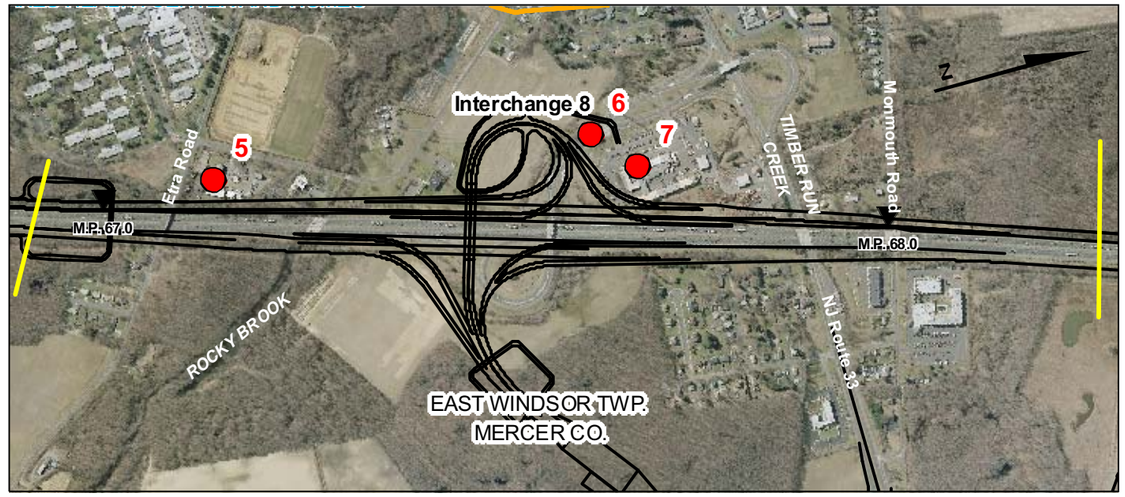
HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

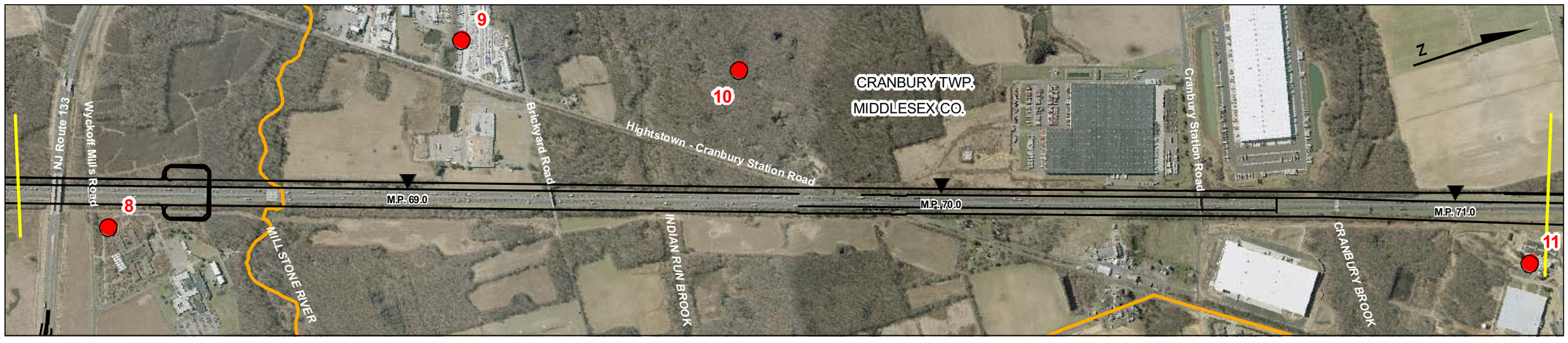
New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23c







Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

0 500 1,000 2,000 Feet

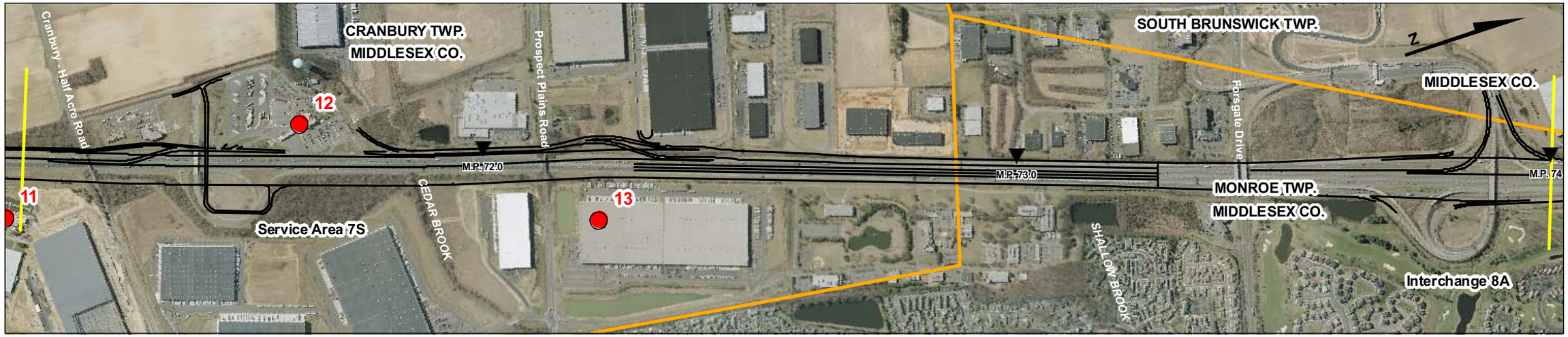
Source: Digital Orthophotos - 2006 Aerial Photography.

HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23d



Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

0 500 1,000 2,000 Feet

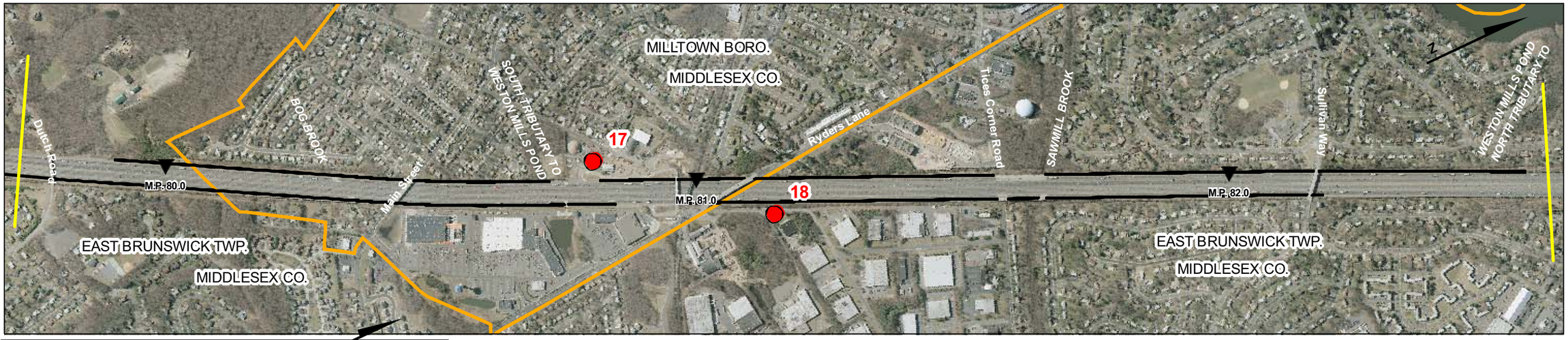
Source: Digital Orthophotos - 2006 Aerial Photography.

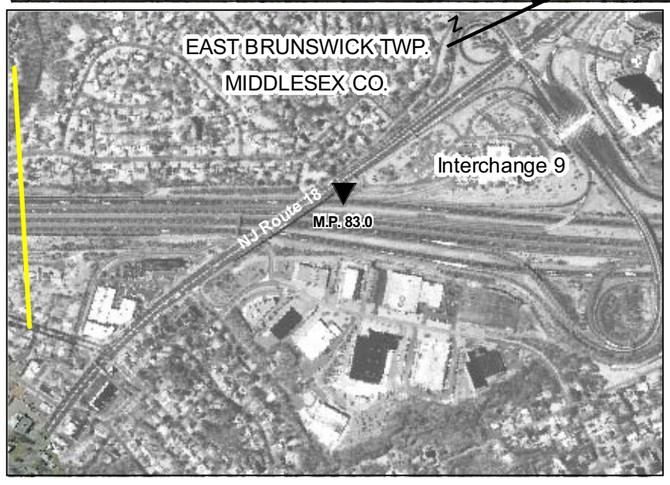
HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23e





Legend

- Matchline
- Municipal / County Boundary
- Areas of Concern

Source: Digital Orthophotos - 2006 Aerial Photography.

0 500 1,000 2,000 Feet

HAZARDOUS MATERIALS SITES AND CONTAMINATED PROPERTIES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-23f

solids were identified in abandoned containers at the site in the early 1990s. In 1994, amounts of chlordane were reportedly stored on the property. Chlordane is a manufactured chemical that was used as a pesticide in the United States from 1948 to 1988. It is a thick liquid whose color ranges from colorless to amber, and has a mild, irritating smell. Until 1983, chlordane was used as a pesticide on crops like corn and citrus and on home lawns and gardens. Because of concern about damage to the environment and harm to human health, the U.S. EPA banned all uses of chlordane in 1983 except to control termites. In 1988, EPA banned all uses.

Chlordane can affect the nervous system, the digestive system, and the liver in people and animals. Headaches, irritability, confusion, weakness, vision problems, vomiting, stomach cramps, diarrhea, and jaundice have been known to occur in people who breathed air containing high concentrations of chlordane or accidentally swallowed small amounts of chlordane. Large amounts of chlordane taken by mouth can cause convulsions and death in people.

AOC 5 – East Windsor Department of Public Works

The East Windsor Department of Public Works is located at the intersection of Ward Street and Etra Road, near M.P. 67.1 on the southbound side of the Turnpike in East Windsor (Figure 3-23d). This site has had various petroleum product discharges from its UST systems. The discharges were assigned to the NJDEP Bureau of Southern Case Management under Case No. 96-04-24-0951-41.

A review of NJDEP files was conducted. The "*Site Investigation Report and Remedial Investigation Work Plan Report*" (Adams, Rehmann & Heggan Associates Inc., July 1996) discussed multiple UST systems and petroleum product discharges, resulting in soil and groundwater contamination.

According to the site's UST Facility Certification Questionnaire, dated June 2003, six registered USTs (3,000-gallon diesel, 2,000-gallon unleaded gasoline, 1,000-gallon leaded gasoline, 550-gallon leaded gasoline, 275-gallon waste oil, and 275-gallon waste oil) had petroleum product discharges during their active stage and were removed in 1996. Previous investigations and associated documents demonstrate incomplete information related to the listed USTs and related discharges. No information about existing USTs was noted during the document review process.

The "*Remedial Investigation Report*" (JCA Associates, September 2002) was based on the study of six monitoring wells located near the above-mentioned tanks. Based on the available site map, USTs are located within 500 feet of the Turnpike. Groundwater flow contours show a general groundwater flow toward the Turnpike. The site-specific seasonal groundwater study indicates high groundwater table (4 to 5 feet below grade). The site received a No Further Action letter based on a reduction of contamination levels below the Ground Water Quality Criteria.

AOC 6 – Interchange 8 Toll Plaza

The toll plaza at Interchange 8 is located near M.P. 67.6 on the southbound side of the Turnpike in East Windsor (near Hightstown, Figure 3-23d). This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case No. 95-11-02-1228-19.

A review of the Authority's files confirmed that discharges from USTs occurred at the toll plaza where two 3,000-gallon No. 2 fuel oil tanks were removed in 1990 and 1992. A discharge was reported as case No. 92-08-21-0932-54. No further information was available as to the status of this discharge. In addition, a 290-gallon diesel UST was removed in 1995 and a discharge reported as Case No. 95-11-02-1228-19. A letter of No Further Action was issued by the NJDEP for this discharge on October 29, 1996.

Interchange 8 to Interchange 8A

There are six AOCs located between Interchanges 8 and 8A, as discussed below.

AOC 7 – Central Shops

The Central Shops is a Turnpike facility located at M.P. 67.6 on the southbound side of the Turnpike adjacent to Interchange 8 in East Windsor (near Hightstown, Figure 3-23d). This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case No. 94-08-29-1625. The former USTs contained waste oil, heating oil, and unleaded gasoline and were removed from the site between 1993 and 1995. Specific contaminants of concern are petroleum hydrocarbons and volatile organic compounds (VOCs), which include aromatic compounds such as BETX and MTBE. Groundwater can become contaminated with VOCs and vapors can be released, especially during excavation activities. In addition, some VOCs can be flammable if the vapors are confined. Three unleaded gasoline USTs are reported to be in use at the site under UST Facility ID No. 013180.

A review of the Authority's files was conducted. At least three discharges were reported for leaking USTs at the Central Shops: Case No. 94-08-29-1625; Case No. 95-09-15-0936-48; and Case No. 95-11-06-1459-25. The depth to groundwater varies between 3 to 9 feet due to the clayey nature of the subsurface soils beneath the site. There was no further information available as to the status of these discharges.

AOC 8 – Elementis Specialties, Inc. /NL Industries

Elementis Specialties, Inc. /NL Industries is an industrial facility located on Wycoffs Mill Road near M.P. 68.5 on the northbound side of the Turnpike in East Windsor (Figure 3-23d). This site has had petroleum discharges from its UST systems that have potential for impacting soil and groundwater quality. The case has reportedly been closed with a Classification Exception Area (CEA) institutional control established to address residual groundwater contamination.

Based on the information reviewed, the facility was a research and development laboratory for NL Industries. The site had six USTs, five containing No. 2 heating oil and one containing gasoline. Earth Technology Corporation prepared a "*Revised Sampling Plan for Groundwater Remediation*" in June 1989 which confirmed contamination near Tank No. 4. In addition, there were four above-ground storage tanks, three containing propane, and one containing diesel fuel. An inactive privately-owned wastewater treatment plant and discharge lines are also present on the property. The treatment plant discharged into the Millstone River north of the property. The groundwater table is less than five feet and groundwater flow is north-east toward the Millstone River. Previous investigations indicate that a hazardous waste storage area was located approximately 500 feet from the Turnpike. According to the NJDEP, NL Industries disposed of solid waste and drums to the east of the waste treatment plant. No information related to waste removal or drums was available during the records review. A "*Remedial Investigation Study*" was completed by Environ in March 1996.

AOC 9 – Plant Food Company, Inc.

The Plant Food Company, Inc. manufactures phosphatic fertilizers at their facility located at 38 Hightstown-Cranbury Station Road, near M.P. 69.1 on the southbound side of the Turnpike in Cranbury Township (Figure 3-23d). A 4,000-gallon gasoline UST is located within 500 feet of the Turnpike at the center of the property. This gasoline UST had poor integrity, which resulted in petroleum discharges; the discharges have been assigned to the NJDEP's Bureau of Southern Case

Management under Case No. 92-03-02-1628-18. The site also has one 1,000-gallon above-ground storage tank located to the west of the Turnpike within 220 feet.

Since this site is proximate to the Turnpike, a review of NJDEP's files was conducted to identify the potential extent of soil and groundwater contamination at this site. Groundwater in this area is at a depth of 6.5 feet. Investigation documents confirm soil contamination and remedial actions. After initial soil removal, an additional 115 tons of soil was removed. Based on the "*Remedial Investigation Report*" (Hudson Environmental Services, December 1994), post-excavation sampling results complied with soil cleanup criteria. The file review also identified a detention lagoon located within 200 feet of the Turnpike.

AOC 10 – Former Unexcelled Chemical Corp. Site

This 374-acre undeveloped property is located on the north side of Brickyard Road and the west side of Hightstown-Cranbury Station Road near M.P. 69.5 on the southbound side of the Turnpike in Cranbury (Figure 3-23d). An 85-acre portion of the property near U.S. Route 130 is the former site of the Unexcelled Chemical Corp., a manufacturer of military ordnance. After a fire and explosion in 1954, the plant was razed and the property left vacant. A Preliminary Assessment conducted in 2000 confirmed the presence of unexploded ordnance. In early 2006, a developer purchased the property with the intention of cleaning it up and turning it into 2.8 million square feet of commercial space, mostly warehouses. The developer has proposed a $12 million cleanup of the 85-acre portion of the property to allow for the construction of nine buildings.

AOC 11 – Former Carter-Wallace Site

The former Carter-Wallace site is an industrial facility located on Cranbury-Half Acre Road on the northbound side of the Turnpike near M.P. 71.1 in Cranbury (Figure 3-23d). Carter-Wallace, acquired by MedPointe Inc. in October 2001, was engaged in the manufacture and sale of a diversified line of consumer and health care products, notably aerosol antiperspirant products at this location. The site has had numerous reported releases and spills from No. 2 fuel oil USTs as well as hazardous material discharges to a variety of destinations, including air, on-site soils, groundwater, Cedar Brook (located approximately 1/8 mile southeast of the site), and Cranbury Brook via storm drains. The discharges have been assigned to the Bureau of Field Operations under Case No. 94-09-23-1345 and No. 91-09-18-1610 (closed). Numerous spill cases (Nos. 90-08-31-1638; 93-06-28-1303; 96-07-31-1554-43 and 96-08-30-1056-39) from various hazardous material process units and storage areas were noted in correspondence documents (January 2005) between NJDEP and Earth Technology (Carter Wallace's consultant).

Since this site is proximate to the Turnpike, a review of the NJDEP's files was conducted to identify potential soil and groundwater contamination. The facility has six registered and two unregistered No. 2 fuel oil USTs. In January 2005, Earth Technology was working on a comprehensive groundwater study. Although some USTs located within 500 feet of the Turnpike have soil and groundwater contamination, the extent of contamination is unknown. Other potential areas of concern include retention basins, discharge lagoons, and sludge drying beds. A retention basin is located within 200 feet of the Turnpike.

AOC 12 – Molly Pitcher Service Area 7S

The Molly Pitcher Service Area 7S is a Turnpike service facility located at M.P. 71.6, on the southbound side of the Turnpike in Cranbury (Figure 3-23e). This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case No. 90-11-09-1612. Specific contaminants of concern are gasoline constituents, primarily BTEX, MTBE, and TBA.

Soil and groundwater remedial systems are in place at the site. The systems include air sparging and soil vapor extraction, which have been active for several years. The groundwater in the water table is believed to flow in a westerly direction, away from the Turnpike.

A review of the Authority's files was conducted. The "*Remedial Action Progress Report*" (Hatch Mott MacDonald, August 2005) confirmed that there is groundwater contamination in the Pennsauken Formation with a water table approximately 25 to 30 feet below ground surface. Groundwater is contaminated and flows toward the west, away from the Turnpike.

AOC 13 – Former General Foods Site

The former General Foods site was located on Prospect Plains Road on the northbound side of the Turnpike near M.P. 72.2 in Cranbury (Figure 3-23e). The site is now occupied by a new industrial facility.

Several discharges from USTs have occurred at the site and soil and groundwater contamination has been reported. The site has reported NJDEP Case Nos. 90-07-06-1354 and 96-01-23-1320-19. The extent of soil and groundwater contamination is unknown at this time.

A review of NJDEP's files with regard to the site was performed to identify the potential for soil and groundwater contamination. No documents demonstrating soil contamination or remediation actions were noted during the review. Based on an available site map, one 280-gallon UST was located approximately 300 feet from the Turnpike. The entire site had eight USTs of varying capacities from 200 to 30,000 gallons. The entire site had underground waste oil pipelines, oil waste manholes, and catch basins heading to an oil-water separator.

Interchange 8A to Interchange 9

There are five AOCs located between Interchanges 8A and 9, as discussed below.

AOC 14 – Former BASF Wyandotte Facility

The former BASF Wyandotte plant was located at 1065 Cranbury-South River Road on the southbound side of the Turnpike near M.P. 74.5 in South Brunswick (Figure 3-23e). All on-site buildings have recently been demolished and the site has been cleared. This site has had several petroleum and pesticide discharges that have potentially impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Northern Case Management under Case Nos. 92-8-25-0921; 96-8-31-1425; 96-8-31-1553 and 02-04-02-1135.

AOC 15 – Former JIS Landfill

The former Jones Industrial Services (JIS) landfill is located on Cranbury-South River Road on the northbound side of the Turnpike near M.P. 75.0 in South Brunswick (Figure 3-23e). The approximately 24-acre site was originally a borrow pit excavated during construction of the Turnpike. During the 1960s and 1970s, unknown quantities of bulk liquid chemicals, industrial solvents, paint sludge, and other wastes were buried at the site. Disposal operations ceased in 1980, and the owner of the landfill installed a clay cap over the waste fill. The site was placed on the National Priorities List (Superfund) on September 1, 1983. In 1986, NJDEP began a Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of the contamination at the site, identify cleanup alternatives, and evaluate the cap that had been placed on the landfill. During the RI/FS, NJDEP and USEPA determined that contaminated groundwater was migrating off-site. Groundwater flows in a southeasterly direction from the site, away from the Turnpike. Groundwater contamination is present in

two distinct plumes emanating from the site; the primary plume extends approximately 2,000 feet to the southeast of the site and contains elevated levels of metals and VOCs, while a secondary plume exists approximately 5,000 feet southeast of the site and extends approximately 8,500 to the southeast toward Manalapan Brook.

In 1995, after the RI/FS was completed, USEPA issued a Record of Decision that required installation of an on-site remediation system to extract and treat the contaminated groundwater, and installation of a modified hazardous waste cap to replace the cap installed by JIS. A group of Responsible Parties is conducting this work under the supervision of NJDEP's Division of Responsible Party Site Remediation.

AOC 16 – Joyce Kilmer Service Area 8N

The Joyce Kilmer Service Area 8N is a Turnpike service facility located at M.P. 78.7, on the northbound side of the Turnpike in East Brunswick (Figure 3-23f). This site has had petroleum discharges from its UST systems that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Northern Case Management under Case No. 90-11-09-1610. Specific contaminants of concern are gasoline constituents, primarily BTEX, MTBE, and TBA.

AOC 17 – Maintenance District 4

The Maintenance District 4 site is a Turnpike maintenance facility located at M.P. 80.8 on the southbound side of the Turnpike in Milltown (Figure 3-23f). This site has had petroleum discharges from its UST systems that may have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Southern Case Management under Case No. 93-09-13-1452. The Authority's Maintenance Department indicated that NJDEP issued a No Further Action letter associated with the removal of a waste-oil UST and its related piping. The Authority indicates that there is no other active remediation case ongoing at this site.

AOC 18 – Transfer Print Foils, Inc.

Transfer Print Foils, Inc. (also known as ITW Holopak) is located at 9 Cotters Lane on the northbound side of the Turnpike near M.P. 81.2 in East Brunswick (Figure 3-23e). This site has had petroleum and chemical discharges that have impacted soil and groundwater quality. The discharges have been assigned to NJDEP's Bureau of Operation, Maintenance & Monitoring under Case Nos. 03-08-28-1034; 91-06-04-1413 and 90-04-23-1742. Former UST contents and the extent of impact were not provided in the commercial database report.

3.18 Traffic and Transportation

3.18.1 Introduction

This section of the EIS describes baseline conditions as they relate to *traffic and transportation* facilities located within and near the Project Corridor. The Project Corridor includes approximately 35 miles of the Turnpike mainline from the southern terminus of the Proposed Project at approximately M.P. 48.2 (just south of Interchange 6) to the northern terminus at approximately M.P. 83.0 (at the N.J. Route 18 crossing of the Turnpike just south of Interchange 9). Although the focus of this Proposed Project is the portion of the Turnpike between M.P. 48.2 and the southern end of the dual-dual roadway design at approximately M.P. 72.5 near Interchange 8A, the existing transportation conditions along the dual-dual segment between Interchanges 8A and 9 are also addressed in this EIS due to the proposed paving of one additional lane in each direction along this segment. In addition to the 35-mile mainline, the Proposed Project also includes analysis and preliminary design of

interchanges and associated ramp systems, toll plazas and Turnpike ramp connections with local roadways past the toll plazas. There are five interchanges and associated ramps and toll plazas included within the Project Corridor. These interchanges include:

- Interchange 6 (Pearl Harbor Memorial Turnpike Extension) at M.P. 51.0;
- Interchange 7 (N.J. Route 206) at M.P. 53.3;
- Interchange 7A (Interstate 195) at M.P. 60.5;
- Interchange 8 (N.J. Route 33 and N.J. Route 133) at M.P. 67.6; and
- Interchange 8A (N.J. Route 32) at M.P. 73.7.

The Project Corridor also includes the portions of intersecting roadways in the immediate vicinity of the Turnpike interchanges, as well as the ramps at service areas along both directions of the Turnpike.

3.18.2 Data Sources and Methodology

3.18.2.1 Data Sources

For the *Traffic and Transportation* analysis conducted for the Proposed Project, data were obtained primarily from the *New Jersey Turnpike Interchange 6 – 8A Widening Program Traffic Analysis Report* prepared for the Proposed Project (The Louis Berger Group, Inc., 2006). That report examines and quantifies existing and future traffic operating conditions along the Turnpike mainline, its interchanges, and its connections with local roadways. In addition, a variety of available traffic studies that have recently been prepared for the Turnpike Authority were reviewed and used, as relevant. The list of documents reviewed in this regard includes the following:

- *New Jersey Turnpike Long Range Plan* (Wilbur Smith & Associates, 2004);
- *Toll Plaza Configuration Analysis* (Wilbur Smith & Associates);
- Toll Transaction Data (NJTA Operations Division, 2005);
- Straight Line Diagrams (NJDOT, 2005);
- Shift Supervisor Logs (NJTA Traffic Operations Center, 2005); and
- *New Jersey Turnpike Skycomp O&D and Weaving Study* (Parsons Transportation Group, 2005).

Supplemental data were obtained from several New Jersey Department of Transportation documents including: *New Jersey Crash Record Summaries*; *Route 1 - Mercer, Middlesex and Somerset Counties, New Jersey Regional Smart Growth Strategy*; and *Route 130 - Burlington County, New Jersey Three-Part Transportation Planning Effort*. Other documents reviewed and utilized as relevant included: *Middlesex County Comprehensive Transportation Study, Final Report* (Urbitran, December 2003); *2030 Access & Mobility Regional Transportation Plan for Northern New Jersey* (North Jersey Transportation Planning Authority, September, 2005); *Central New Jersey Route 1 Bus Rapid Transit Alternatives Analysis* (NJ Transit, February, 2006); *Destination 2030: Future Land Use and Transportation Facilities* (Delaware Valley Regional Planning Commission, June, 2005); and the *Monmouth-Ocean-Middlesex Rail Study* (NJ Transit, ongoing).

In addition to the above-stated sources, information was obtained from such other organizations as the Cross County Connection Transportation Management Association; the Burlington County Transportation Service and Burlink Bus Service; the Greater Mercer Transportation Management Association; the North Jersey Transportation Planning Authority (NJTPA) and the Delaware Valley Regional Planning Commission (DVRPC).

3.18.2.2 Methodology

Analytical procedures described in the *Highway Capacity Manual (HCM) 2000*, published by the Transportation Research Board, National Research Council, Washington, D.C., were used to conduct the traffic operational analyses at key locations along the Turnpike from just south of Interchange 6 to a point north of Interchange 8A. Traffic data collected in the field (traffic volumes, roadway geometries, etc.) were used to assess the existing operating conditions, while traffic volumes developed from comprehensive travel demand forecast modeling were used to assess future traffic operating conditions in the Project Corridor. Detailed capacity analyses were conducted at various types of facilities, including critical freeway sections, weaving segments, and ramp junctions within the Project Corridor.

Highway Capacity Manual (HCM) Criteria

The specific HCM criteria used to define the level of service (LOS) for each type of facility are described below.

Freeway Segments

For basic *freeway segments* (limited-access highway with interchange spacing at two miles or greater and free-flow speeds between 55 and 75 miles/hour), the LOS is estimated based on the *density* of the vehicles (i.e., a measure that quantifies the proximity of vehicles to each other within the traffic stream) and indicates the degree of maneuverability within the traffic stream. The LOS criteria for basic freeway segments are provided in Table 3.65.

Table 3.65
Basic Freeway Segments
Level of Service Criteria

LOS	Density Range (Passenger cars per mile per lane)
A	0 to 11
B	> 11 to 18
C	>18 to 26
D	>26 to 35
E	>35 to 45
F	>45

Source: Highway Capacity Manual 2000.

On basic freeway segments, LOS A describes completely free flow traffic conditions (densities of up to 11 passenger cars per mile per lane), while LOS F represents a forced break down in traffic flow (densities in excess of 45 passenger cars per mile per lane). LOS B, C, D, and E represent traffic flow conditions (densities) that fall between these two conditions. Generally, LOS A, B, C or D are considered acceptable operating conditions, while LOS E and F represent unacceptable conditions.

Weaving Segments

For *weaving segments* (portions of highway, usually between merge and diverge points, over which traffic streams cross paths through lane-changing maneuvers without the aid of traffic signals), a single LOS is determined based on the density (passenger cars per mile per lane) of the total flow of weaving and non-weaving vehicles. The LOS criteria for weaving segments, as defined in the HCM, are provided in Table 3.66.

Ramp Junctions

For *ramp junctions* (merge and diverge areas), the LOS is determined based on the density (passenger cars per mile per lane) in the influence area of the ramp. The LOS criteria for ramp-freeway junctions, as defined in the HCM, are provided in Table 3.67.

Table 3.66
Weaving Segment
Level of Service Criteria

LOS	Density (Passenger cars per mile per lane)
A	≤ 10
B	> 10 to 20
C	>20 to 28
D	>28 to 35
E	>35 to 43
F	>43

Source: Highway Capacity Manual 2000.

Table 3.67
Ramp Junction
Level Of Service Criteria

LOS	DENSITY (Passenger cars per mile per lane)
A	≤10
B	> 10 to 20
C	>20 to 28
D	>28 to 35
E	>35
F	Demand exceeds capacity

Source: Highway Capacity Manual 2000.

On ramp junctions, LOS A through E represents good operating conditions (density less than 35 passenger cars per mile per lane) for vehicles merging or diverging at influence areas without any adverse impacts to through traffic. However, LOS F represents a breakdown in good operating conditions, where the demand exceeds the capacity of a ramp and/or nearby freeway sections. No density value is calculated for LOS F since the density exceeds the maximum threshold of 35 passenger cars per mile per lane.

Volume-to-Capacity (V/C) Ratio

The *volume-to-capacity (V/C) ratio* is another measurement of roadway travel performance used to evaluate critical freeway segments, weaving segments and ramp junctions. The V/C ratio is the ratio of flow rate to capacity for a transportation facility and is calculated by dividing the demand flow rate (the number of vehicles passing a point on a lane or roadway during some time interval) by the capacity (the maximum rate of flow of the roadway under ideal conditions) for a traffic facility. V/C ratios range from 0 (no congestion) to greater than 1.0 (severe congestion). Low V/C ratios depict relatively free flow conditions, while high V/C ratios depict more congested conditions.

3.18.3 Existing Turnpike Configuration and Facilities

3.18.3.1 Existing Roadway Configuration

Figure 3-24 provides several cross sections of the existing Turnpike mainline within the Project Corridor. In the majority of the Project Corridor (i.e., the area between M.P. 48.2 located south of Interchange 6 and M.P. 72.5 located south of Interchange 8A), the Turnpike consists of three travel lanes in each direction, while in the northern portion of the Project Corridor (i.e., north of M.P. 72.5 to the northern terminus at M.P. 83.0 located south of Interchange 9), the Turnpike widens into a 10-lane dual-dual configuration roadway with a three-lane inner roadway and a two-lane outer roadway in each direction.

The Turnpike offers connections with many of the major east-west highways and roadways in central New Jersey, including: Pearl Harbor Memorial (PHM) Turnpike Extension to the Pennsylvania Turnpike (Interchange 6); Interstate 195 (Interchange 7A); and N.J. Route 33 (Interchange 8). In addition, Interchange 7 provides a direct connection with a major north-south highway (U.S. Route 206). The Turnpike also provides indirect connections with other north-south highways in relatively close proximity to Project Corridor interchanges (e.g., Route I-295 at Interchange 7 and U.S. Route 130 at Interchange 8A).

3.18.3.2 Turnpike Interchanges and Service Areas

A brief description of the major Turnpike elements (interchanges and service areas) within the Project Corridor is presented below from south to north:

Interchange 6 (M.P. 51.0)

The PHM Turnpike Extension (New Jersey Turnpike-Pennsylvania Extension) meets the Turnpike mainline at Interchange 6 (M.P. 51.0) in Mansfield Township, Burlington County. It was opened in 1956 to provide a direct connection with the new Delaware River Extension of the Pennsylvania Turnpike at Florence Township, Burlington County. The PHM Turnpike Extension is comprised of three travel lanes in both the eastbound and westbound directions. Interchange 6 is comprised of two-lane high speed ramps to and from the north, and one-lane lower speed ramps to and from the south.

Interchange 7 (M.P. 53.7)

U.S. Route 206 meets the Turnpike mainline at Interchange 7 (M.P. 53.7) in Bordentown Township, Burlington County, providing access between the Turnpike and the Trenton area in the northbound direction, and between the Turnpike and Hammonton in the southbound direction. The southern terminus of Route 206 is Hammonton near the Atlantic City Expressway, and continues to its northern terminus at the northwestern corner of New Jersey where it crosses into Milford, Pennsylvania. In the vicinity of Interchange 7, the Turnpike mainline is comprised of three travel lanes in each direction with full left and right shoulders. Interchange 7 is comprised of one-lane lower speed ramps to and from the northbound and southbound Turnpike.

Service Area 6S and 6N (M.P. 58.7)

Located approximately at M.P. 58.7 (between Interchanges 7 and 7A), Service Areas 6N (Woodrow Wilson) and 6S (Richard Stockton) are utilized by northbound and southbound Turnpike traffic, respectively. Service Area 6N is comprised of two automobile parking lots that contain a total of 151 spaces; two truck parking lots that contain a total of 42 spaces; two employee parking areas containing a total of 38 spaces; two fuel filling areas (one for gasoline and one for diesel fuel); and a travel plaza

building that offers food, concessions and restrooms. Service Area 6S, which is located directly across the Turnpike mainline from Service Area 6N, has a similar design and layout as its northbound counterpart, with the primary difference being the capacity of its parking lots. Like Service Area 6N, Service Area 6S has two automobile parking lots containing a total of 151 spaces and two truck parking lots containing a total of 42 spaces; however, the capacity of its two employee parking lots is slightly greater, containing a total of 42 spaces.

Interchange 7A (M.P. 60.0)

Interstate Route 195 meets the Turnpike mainline at Interchange 7A (M.P. 60.0) in Washington Township, Mercer County. Route I-195 (also known as the James J. Howard Interstate Highway, or the Central Jersey Expressway) is a 34-mile east-west highway that begins at N.J Route 34 in Wall Township and ends at Route I-295, just south of Trenton. In the vicinity of Interchange 7A, the Turnpike mainline is comprised of three travel lanes in each direction with full left and right shoulders. Interchange 7A is comprised of one-lane lower speed ramps to and from the northbound and southbound Turnpike.

Interchange 8 (M.P. 67.6)

N.J. Route 33 meets the Turnpike mainline at Interchange 8 (M.P. 67.6) in East Windsor Township, Mercer County, near Hightstown. Route 33 is an east-west state highway that begins at the western end of U.S. Route 1 in Trenton, Mercer County, and ends at N.J Route 71 in Neptune Township, Monmouth County. In the vicinity of Interchange 8, the Turnpike mainline is comprised of three travel lanes in each direction with full left and right shoulders. Interchange 8 is comprised of one-lane lower speed ramps to and from the northbound and southbound Turnpike.

Service Area 7S (M.P. 71.7)

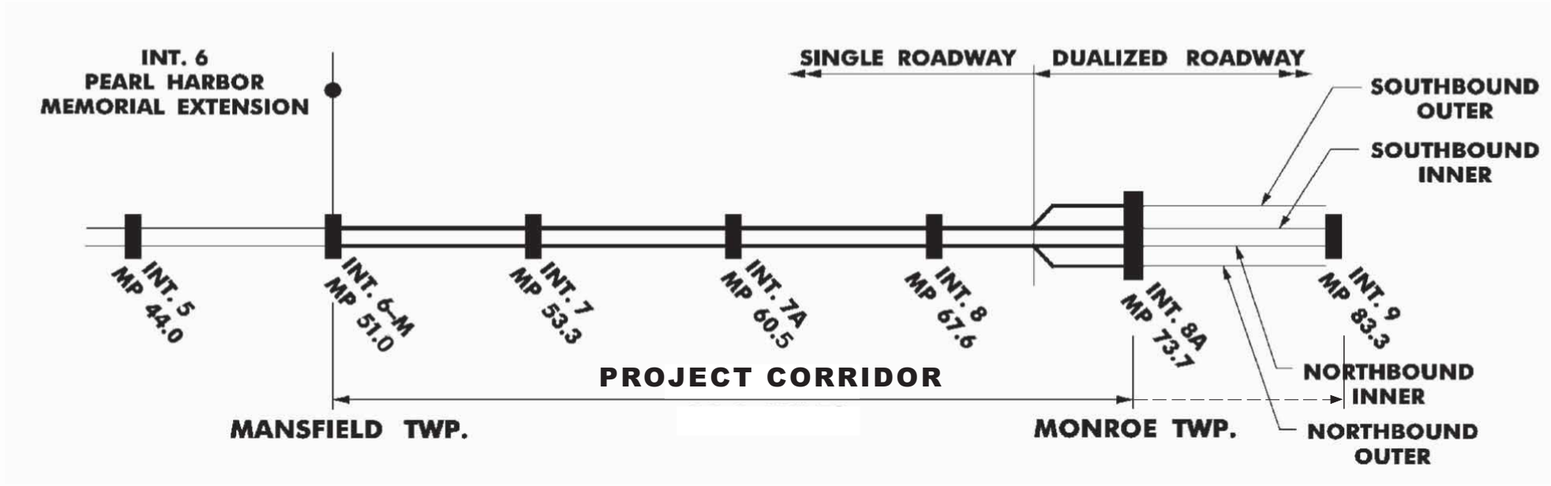
Service Area 7S (Molly Pitcher) is located at M.P. 71.7, approximately 2.2 miles south of Interchange 8A. This service area is utilized by southbound traffic and is comprised of: two automobile parking lots that contain a total of 403 spaces; two truck parking lots that contain a total of 89 spaces; two employee parking areas containing a total of 63 spaces; two fuel filling areas (one for gasoline and one for diesel fuel); and a travel plaza building that offers food, concessions and restrooms.

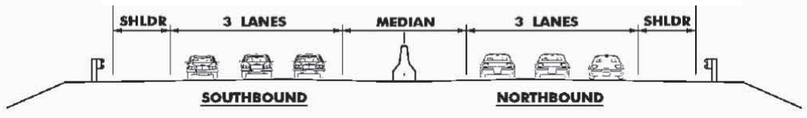
Interchange 8A (M.P. 73.7)

N.J. Route 32 meets the Turnpike mainline at Interchange 8A (M.P. 73.7), located at the boundary of Monroe and South Brunswick Townships, Middlesex County. N.J. Route 32 is an east-west state highway that provides a short connection between U.S. Route 130 in South Brunswick and the Turnpike. To the east of the Turnpike, the roadway is designated as Forsgate Drive. Beginning at a point just south of Interchange 8A and continuing north, the Turnpike mainline is comprised of a 10-lane dual-dual section with a three-lane inner roadway and a two-lane outer roadway in each direction. South of Interchange 8A, the Turnpike mainline is comprised of three travel lanes in each direction. The transition from a five-lane dual roadway to a three-lane roadway is accomplished via 1,200-foot long lane tapers, with only one lane merged at any given point. The lanes are added by means of a 2,400-foot long taper with the two lanes added simultaneously.

3.18.3.3 Other Key Routes near the Project Corridor

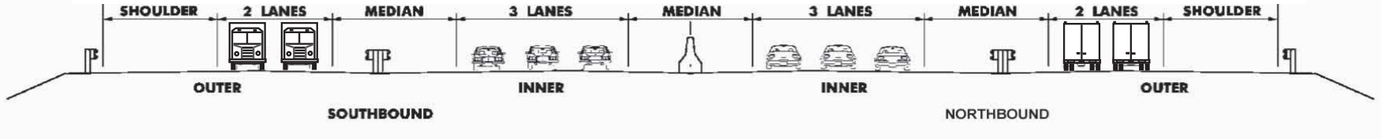
A brief description of other key roadways in the vicinity of the Project Corridor are presented below:





SINGLE ROADWAY SECTION

SOUTHERN PROJECT TERMINUS TO INTERCHANGE 8A



DUAL ROADWAY SECTION

INTERCHANGE 8A TO INTERCHANGE 9

EXISTING NEW JERSEY TURNPIKE
ROADWAY CONFIGURATION

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-24

N.J. Route 133 (Hightstown Bypass)

N.J. Route 133 (Hightstown Bypass) is a 3.8-mile bi-directional, east-west state highway in East Windsor Township, Mercer County. Route 133 serves as a bypass around the north side of Hightstown, beginning at its eastern end at N.J. Route 33 (just east of New Jersey Turnpike Interchange 8). It first travels in a northerly direction and then continues westward past U.S. Route 130, ending at County Route 571, at a point just east of County Route 535. Route 133 has two travel lanes in each direction and a posted speed limit of 50 mph along its entire length.

U.S. Route 130

U.S. Route 130 is an 83-mile north-south highway that is located completely within the state of New Jersey and serves through and local traffic movements. It is located west of, and parallel to the Turnpike from Deepwater (Route I-295 and U.S. Route 40) north to U.S. Route 1 (near New Brunswick). The majority of the Route 130 corridor maintains two through travel lanes in each direction. Roadway shoulders are adjacent to both the median and the curb lanes. At major intersections, auxiliary lanes such as left turn bays are available. In the vicinity of the Project Corridor, the posted speed limit on Route 130 is 50 mph. This roadway forms connections with most of the major east-west roads intersecting with the Turnpike in the Project Corridor, including the PHM Turnpike Extension, Route I-195, and N.J. Route 33.

3.18.4 Traffic Volume Development

3.18.4.1 Data Collection

Upon the completion of the existing data review discussed above in Section 3.18.2.1, gaps in the existing data were identified and a data collection program was developed to obtain the missing information. Various traffic data were collected within the Project Corridor, including the following:

- ***Toll Transactions Data*** – Toll transactions data were obtained from the Turnpike Authority for a 12-month period from July 1, 2004 to June 30, 2005. Selected elements of some 250 million records were compiled to summarize existing travel patterns for the Turnpike sections/interchanges, and to establish mainline traffic volumes, interchange volumes, and entry-to-exit trip matrices. The New Jersey Turnpike Toll Transactions Tabulator (NJT4) is a database-processing program developed specifically for the analysis of this Proposed Project. This program extracts, aggregates, and summarizes data for Turnpike sections and interchanges for various time intervals and was used to extract the necessary information from the toll transactions data

- ***Manual Turning Movement Counts*** – Manual turning movement counts were conducted at key locations along the Project Corridor on a mid-week day during the months of November and December 2005 for morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak periods. Generally, three vehicle class categories (i.e., cars, heavy trucks, and buses) were counted at most key locations with seven vehicle class categories (i.e., passenger cars, 2-axles and six tires, 3-axles, 4-axles, 5-axles, 6-axles, and others) being counted at selected locations in the Project Corridor. Figures 3-25a and 3-25b, and Table 3.68 outline the Turnpike manual traffic data collection locations and elements.

- ***Automatic Traffic Recorder Counts*** – Continuous (24-hour) directional Automatic Traffic Recorder (ATR) counts were conducted at various ramp and roadway locations for a seven-day period between Monday, November 07, 2005 and Monday, December 05, 2005. Figures 3-

25a and 3-25b, and Table 3.69 outline the Turnpike ATR machine count locations and elements.

3.18.5 Existing Traffic and Safety Conditions

3.18.5.1 Existing Volumes

Figures 3-26a through 3-26c show the Year 2005 existing weekday AM peak hour traffic volumes at various locations within the Project Corridor. Figures 3-27a through 3-27c show the Year 2005 existing weekday PM peak hour traffic volumes at various locations within the Project Corridor.

Figures 3-28a through 3-28c show the Year 2005 existing Friday PM peak hour traffic volumes at various locations within the Project Corridor. Finally, Figures 3-29a through 3-29c show the Year 2005 existing Sunday PM peak hour traffic volumes at various locations within the Project Corridor. All of these figures show volumes on the mainline segments and Turnpike entering/exiting ramps. They also show volumes on the ramps between the Turnpike toll plazas and the intersecting highways, as well as on the adjacent sections of the intersecting highways themselves. These ramp and highway volumes were based on peak hour counts collected specifically for the Proposed Project, which were then adjusted to be consistent with the toll plaza entering and exiting volumes as derived from the NJT4 model and speed run data.

3.18.5.2 Existing Traffic Level of Service

Existing traffic operating conditions were assessed in the Project Corridor using the HCM criteria described previously in Section 3.18.2.2. Detailed LOS analyses were conducted for 18 Turnpike mainline sections located between, but not including, Interchange 5 and Interchange 9, one weaving segment and 23 ramp junctions.

Turnpike Mainline Segment Analysis

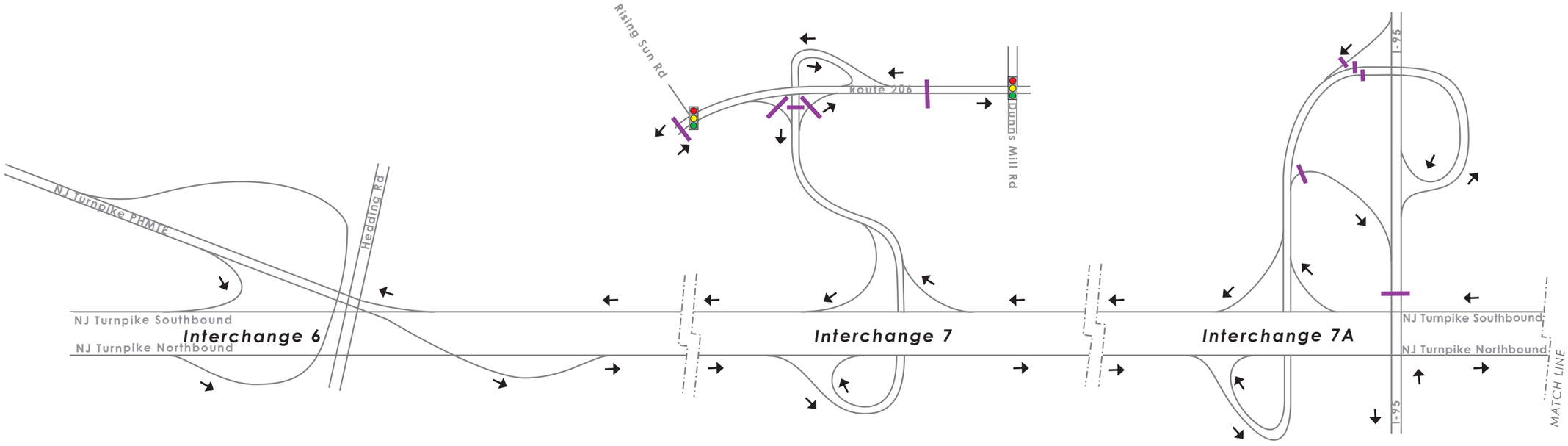
A total of 18 Turnpike mainline segments were analyzed for Weekday AM, Weekday PM, Friday PM and Sunday PM peak hour conditions using the HCM freeway methodology. A summary of the Turnpike mainline segment LOS analysis is presented in Table 3.70. As shown in the table, all mainline segments operate at LOS D or better, except for the following:

- Between Interchange 8 and Interchange 8A

Mainline segment M12 (southbound) operates at LOS "F" during both the Weekday PM and Friday PM peak hour.

Weaving Segment Analysis

One Turnpike weaving segment was analyzed for Weekday AM, Weekday PM, Friday PM and Sunday PM peak hour conditions using the HCM weaving segment methodology previously described (Section 3.18.2.2). A summary of the Turnpike weaving segment LOS analysis is presented in Table 3.70. During the analyzed peak hours, the weaving segment operates at LOS D or better except for the following:



LEGEND

- Automatic Traffic Recorder (ATR)Counts
- Manual Turning Movement Counts

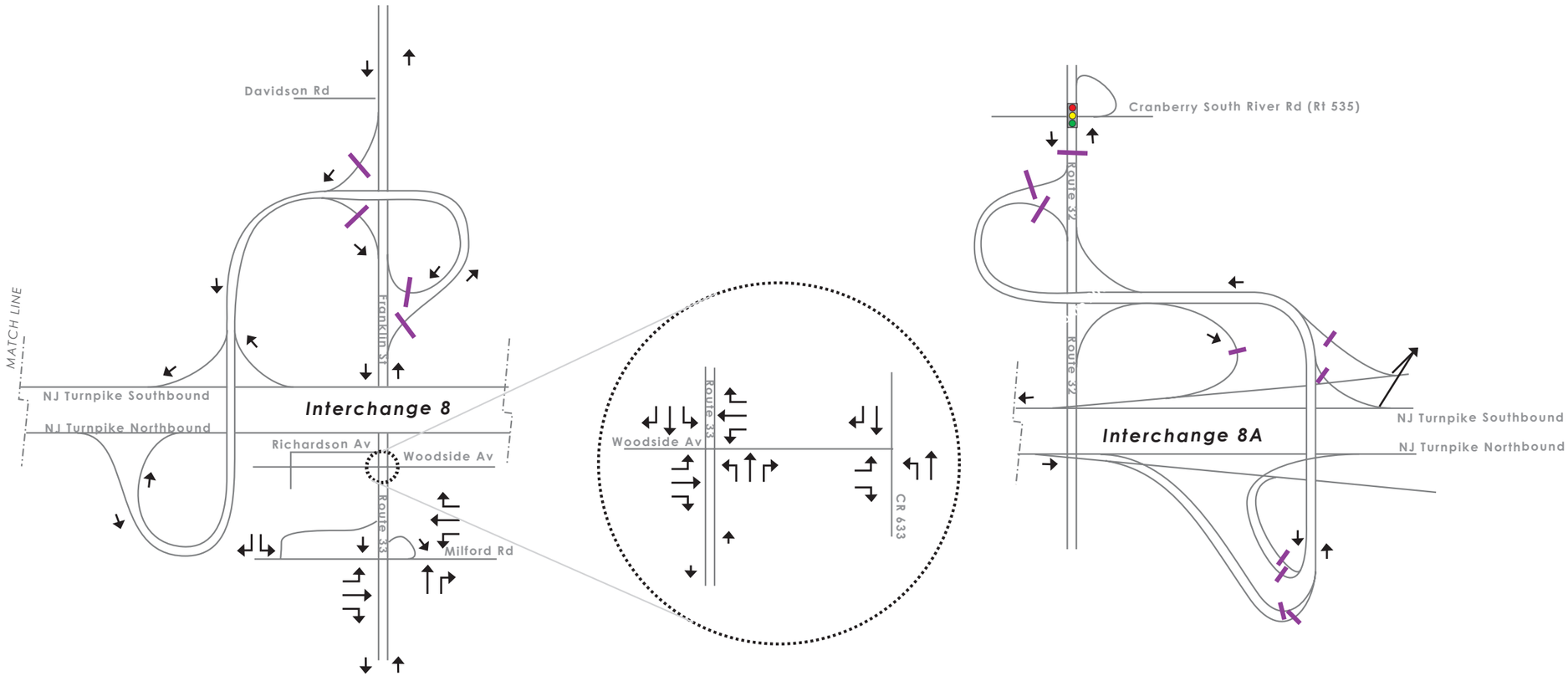
NOT TO SCALE

TRAFFIC DATA COLLECTION LOCATIONS

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-25a



LEGEND

Automatic Traffic Recorder (ATR)Counts

Manual Turning Movement Counts

NOT TO SCALE

TRAFFIC DATA COLLECTION LOCATIONS

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-25b

Table 3.68
New Jersey Turnpike Manual Turning Movement
Count Locations and Elements

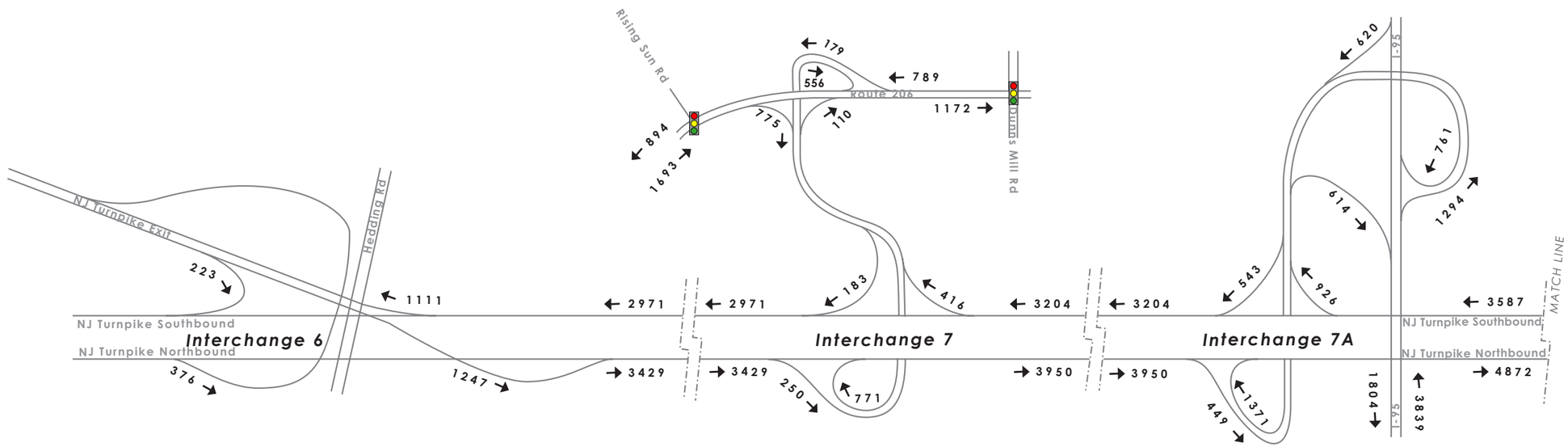
Count Location	Count Element
Interchange 7	Ramp: From US 206 SB to Turnpike
	Ramp: From US 206 NB to Turnpike
	Ramp: Turnpike to US 206 SB
	Ramp: Turnpike to US 206 NB
Service Area 6S	Ramp: Entrance to Service Area
Service Area 6N	Ramp: Entrance to Service Area
Interchange 7A	Ramp: From Interstate 195 WB to Turnpike
	Ramp: From Interstate 195 EB to Turnpike
	Ramp: Turnpike to Interstate 195 WB
	Ramp: Turnpike to Interstate 195 EB
Interchange 8	NJ 33 east of Davidson Road
	NJ 33 at Milford Road
	NJ 33 at Woodside Avenue
	CR 633 at Woodside Avenue
Service Area 7S	Ramp: Entrance to Service Area
Interchange 8A	NJ 32 at Route 535
	Car and Truck NB Through Lanes
	Car Only NB Through Lanes
	Car and Truck SB Through Lanes
	Car Only SB Through Lanes
	Ramp: Entrance NB Car and Truck
	Ramp: Entrance NB Car Only
	Ramp: Entrance to Turnpike SB
	Ramp: Car Only SB Exit
	Ramp: Car and Truck SB Exit
Service Area 8N	Entrance Ramp Car and Truck
	Entrance Ramp Car Only

Source: The Louis Berger Group (2006).

Table 3.69
New Jersey Turnpike Automatic Traffic Recorder
Count Locations and Elements

Count Location	Count Element
Interchange 7	US 206 just south of Dunn's Mill Road
	US 206 just south of Old York Rd
	Ramp: Fro m US 206 SB to Turnpike
	Ramp: From US 206 NB to Turnpike
	Ramp: Turnpike to US 206 SB
	Ramp: Turnpike to US 206 NB
Service Area 6N	Ramp: Exit to Turnpike Truck
	Ramp: Exit to Turnpike Cars
Service Area 6S	Ramp: Exit to Turnpike Cars
	Ramp: Exit to Turnpike Truck
	Ramp: Exit to Turnpike Cars
Interchange 7A	Interstate 195 at Turnpike Bridge
	Ramp: From Interstate 195 WB to Turnpike
	Ramp: From Interstate 195 EB to Turnpike
	Ramp: Turnpike to Interstate 195 WB
	Ramp: Turnpike to Interstate 195 EB
Interchange 8	NJ 33 east of Davidson Road
	Ramp: Turnpike to NJ 33 WB
	Ramp: Turnpike to NJ 33 WB
	Ramp: NJ 33 EB to Turnpike
	Ramp: NJ 33 WB to Turnpike
	CR 633 west of Woodside Avenue
Service Area 8S	Ramp: Exit to Turnpike Truck
	Ramp: Exit to Turnpike Cars
Interchange 8A	NJ 32 East of Route 535
	Ramp: Exit NB Car and Truck
	Ramp: Exit NB Car Only
	Ramp: Entrance to Turnpike SB
	Ramp: Car Only SB Exit
	Ramp: Car and Truck SB Exit

Source: The Louis Berger Group (2006).



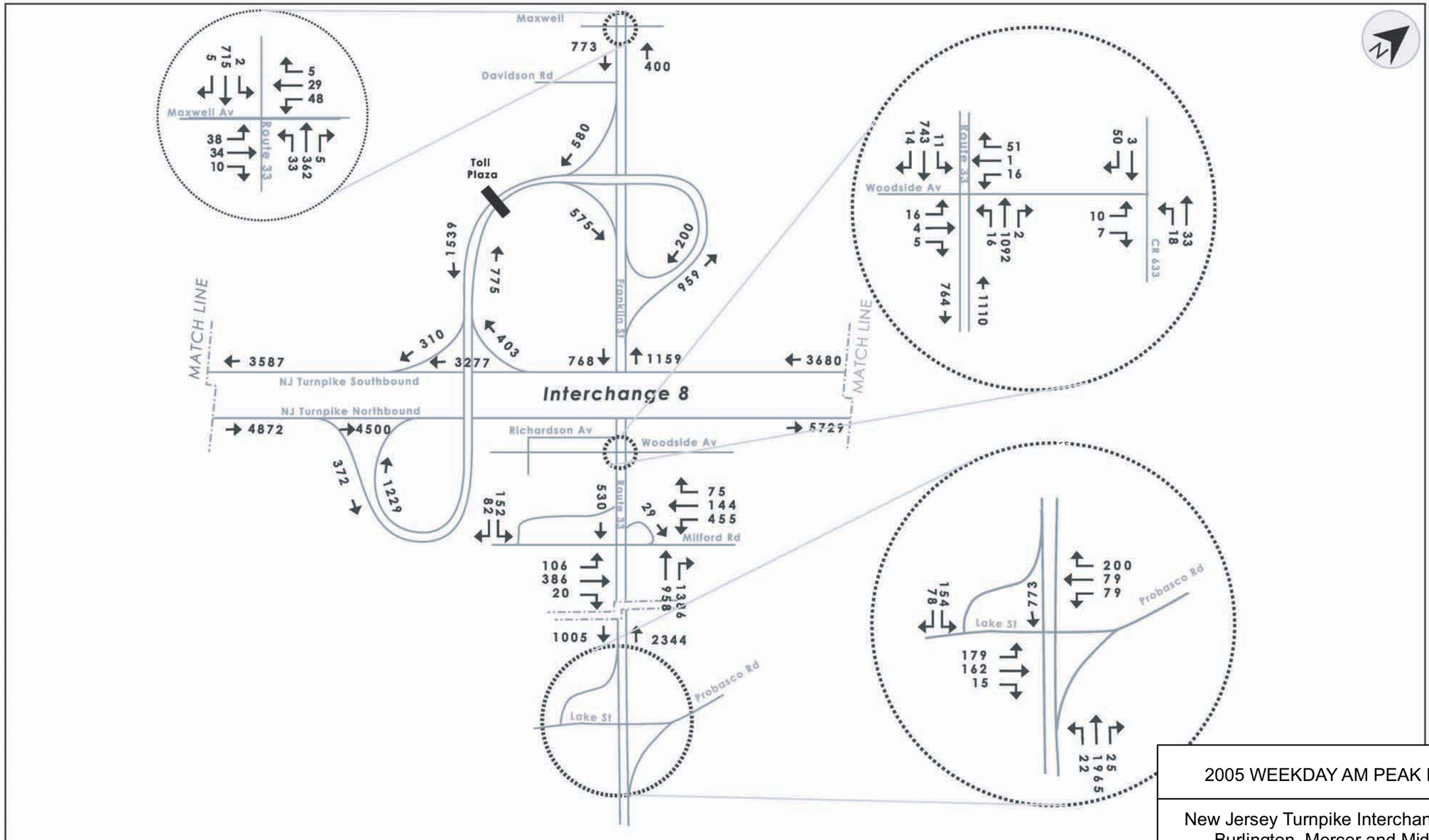
NOT TO SCALE

2005 WEEKDAY AM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-26a

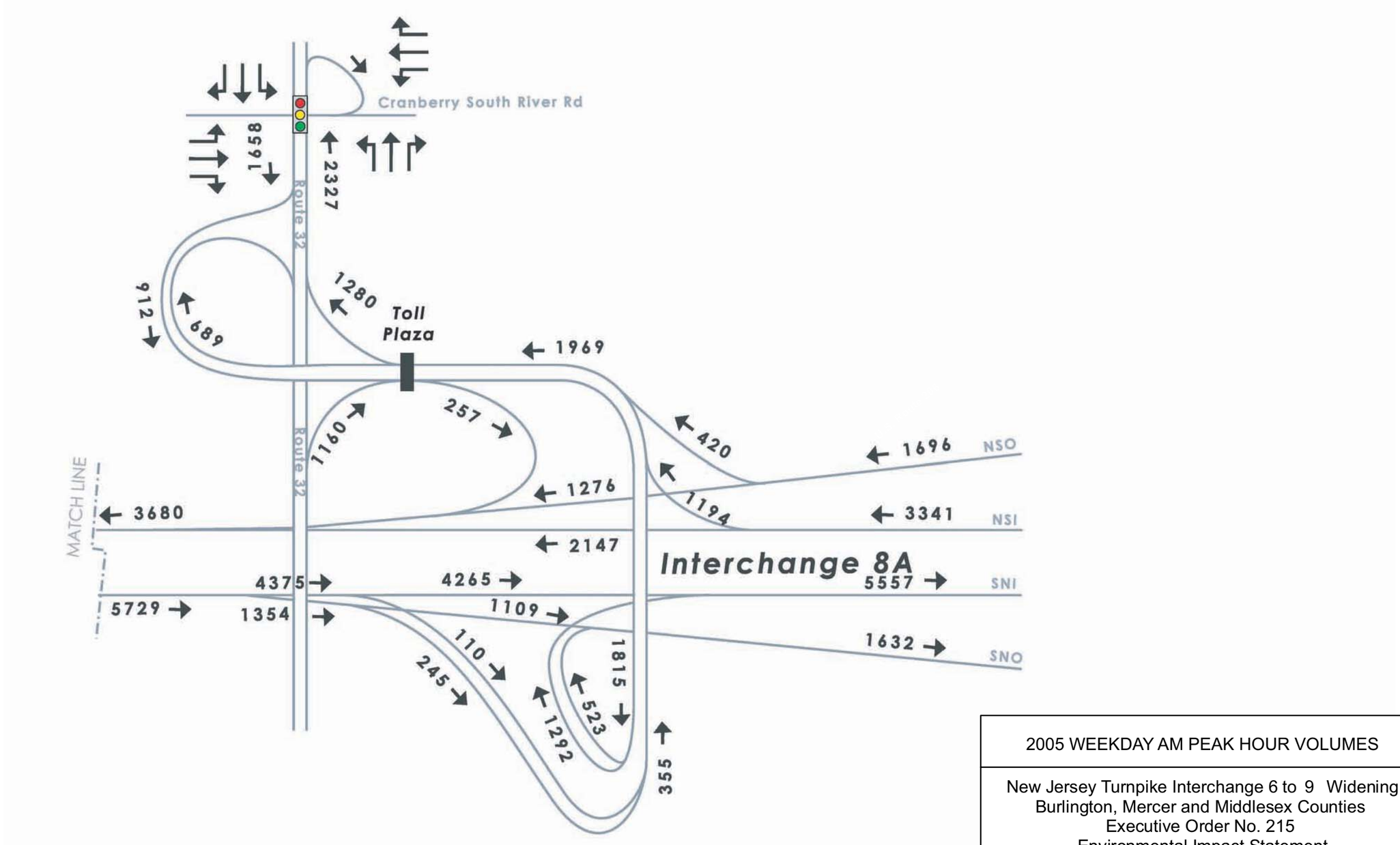


2005 WEEKDAY AM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-26b

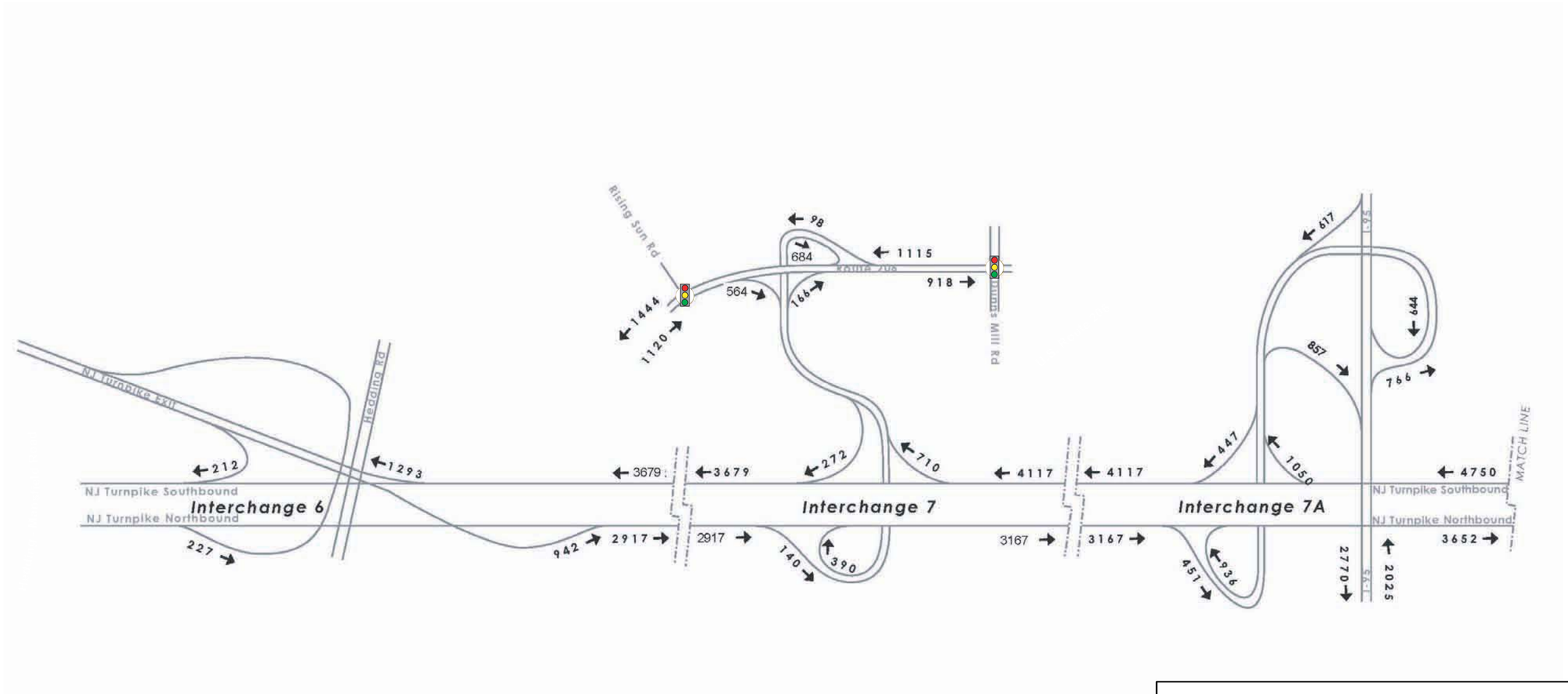


2005 WEEKDAY AM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-26c

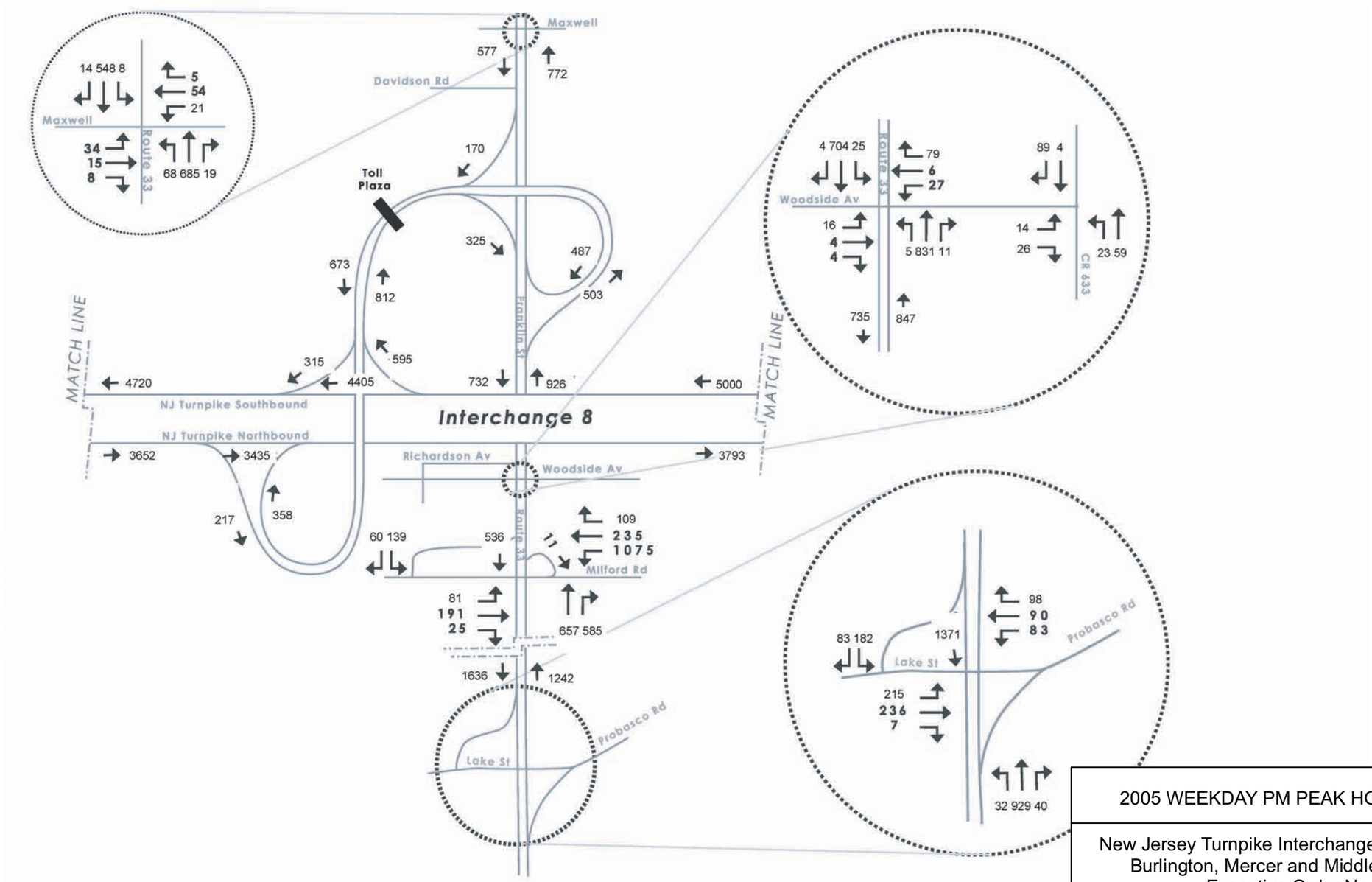


2005 WEEKDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-27a

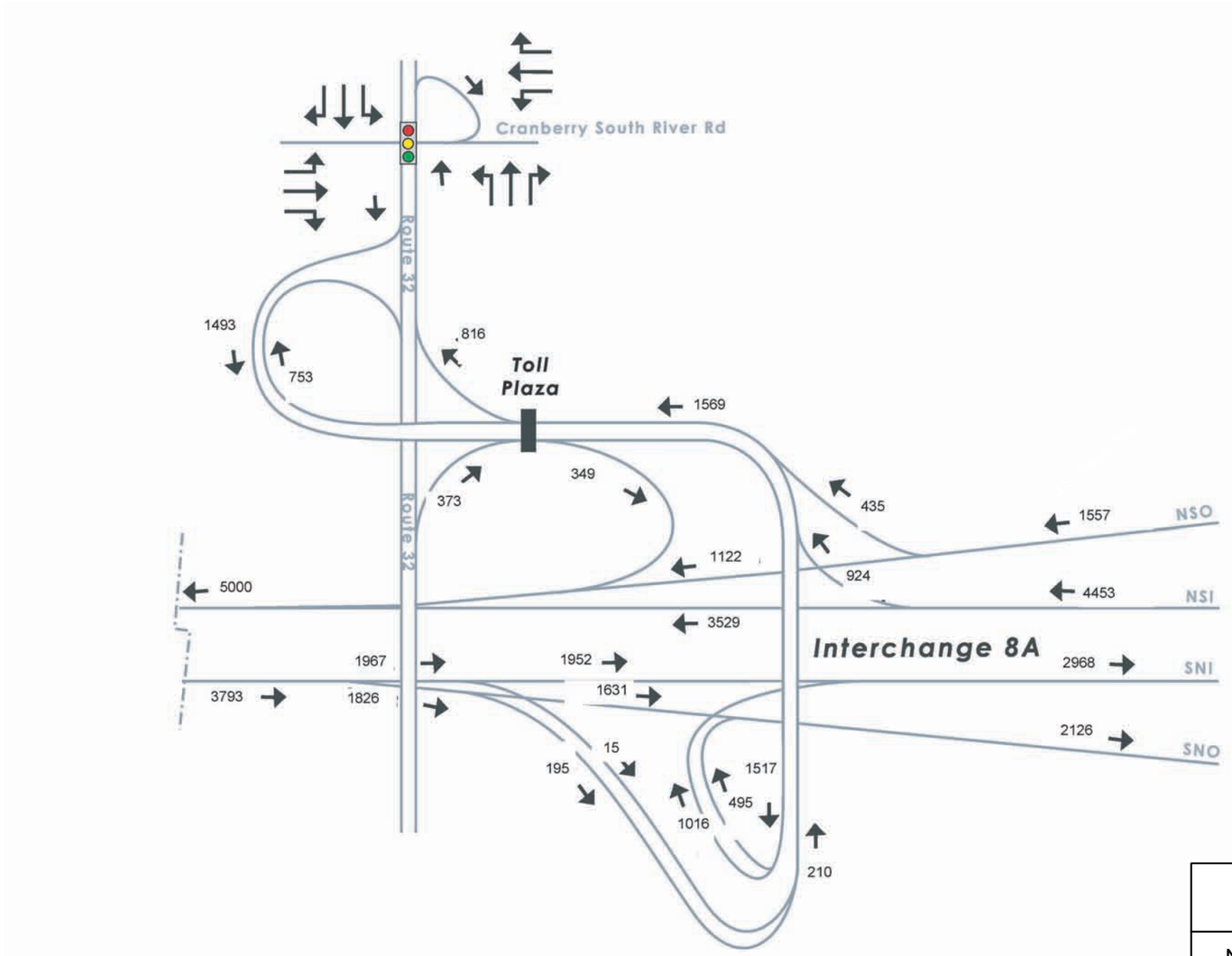


2005 WEEKDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-27b

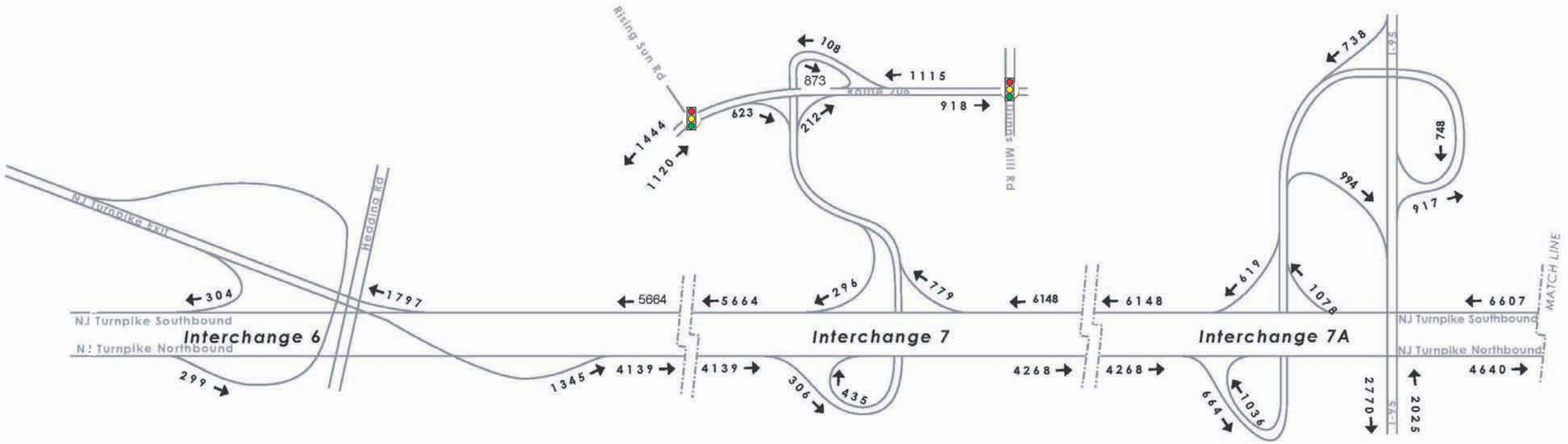


2005 WEEKDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-27c



NOT TO SCALE

(9/12/05 Rev 0)

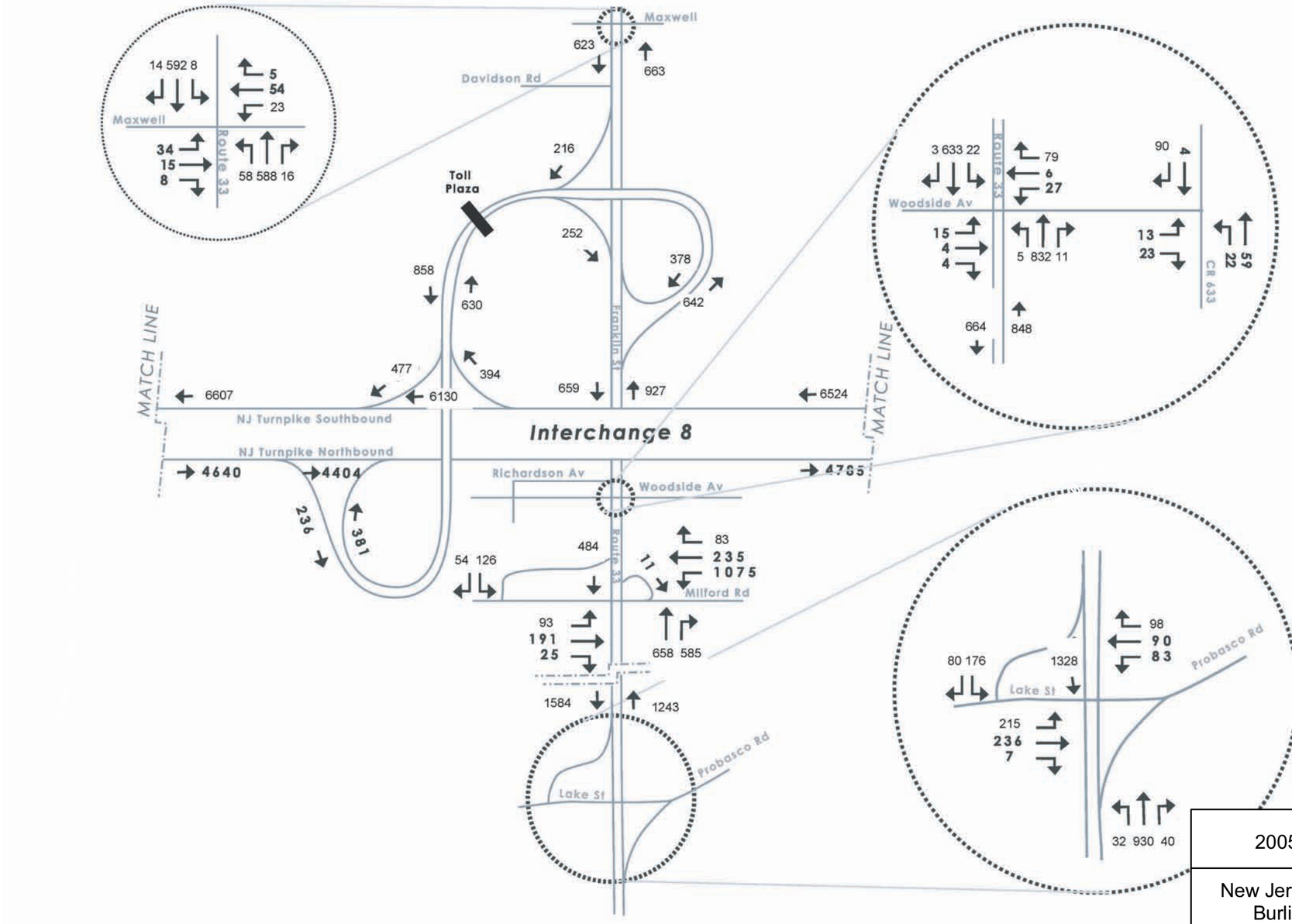
2005 FRIDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY

NEW JERSEY TURNPIKE

FIGURE 3-28a

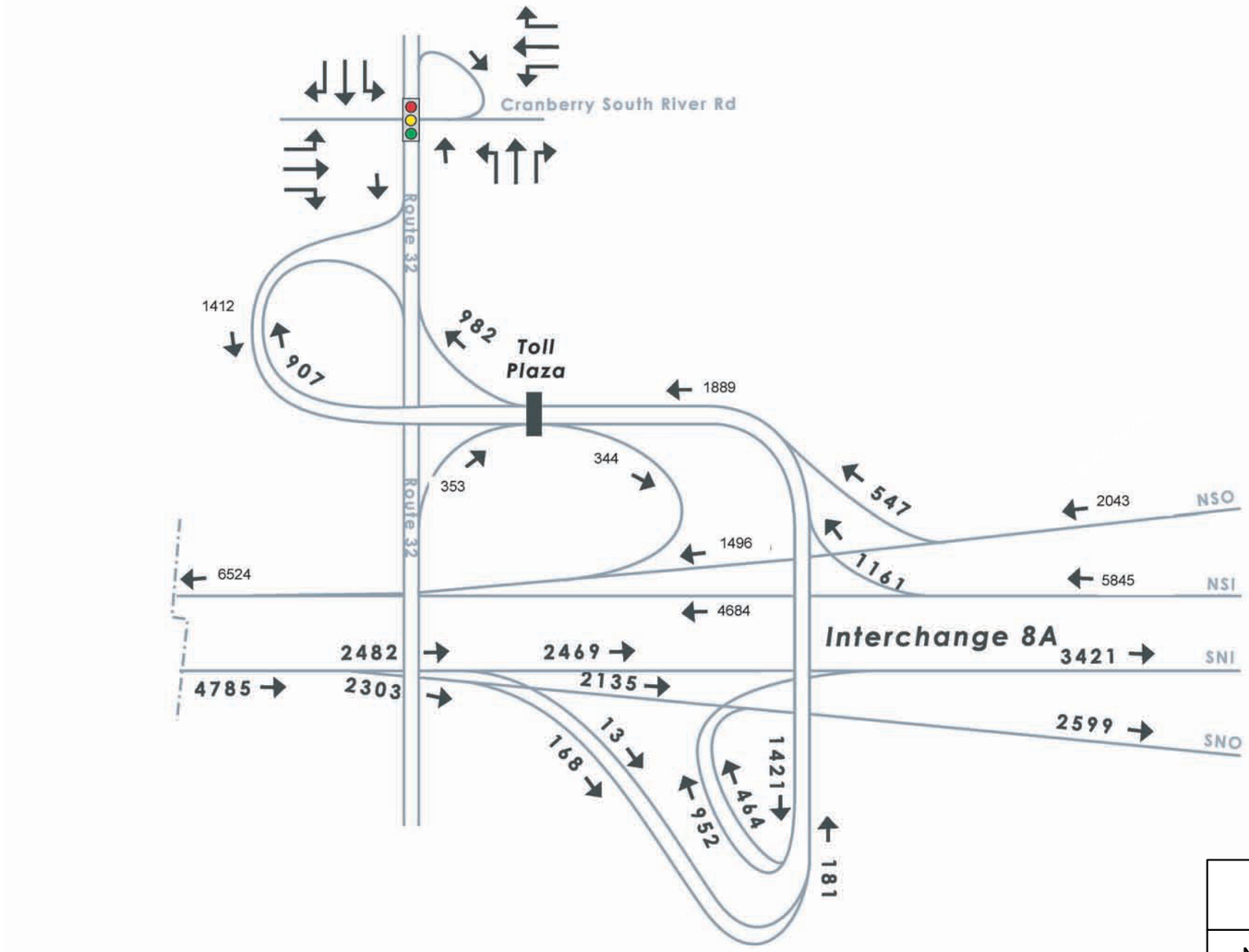


2005 FRIDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-28b

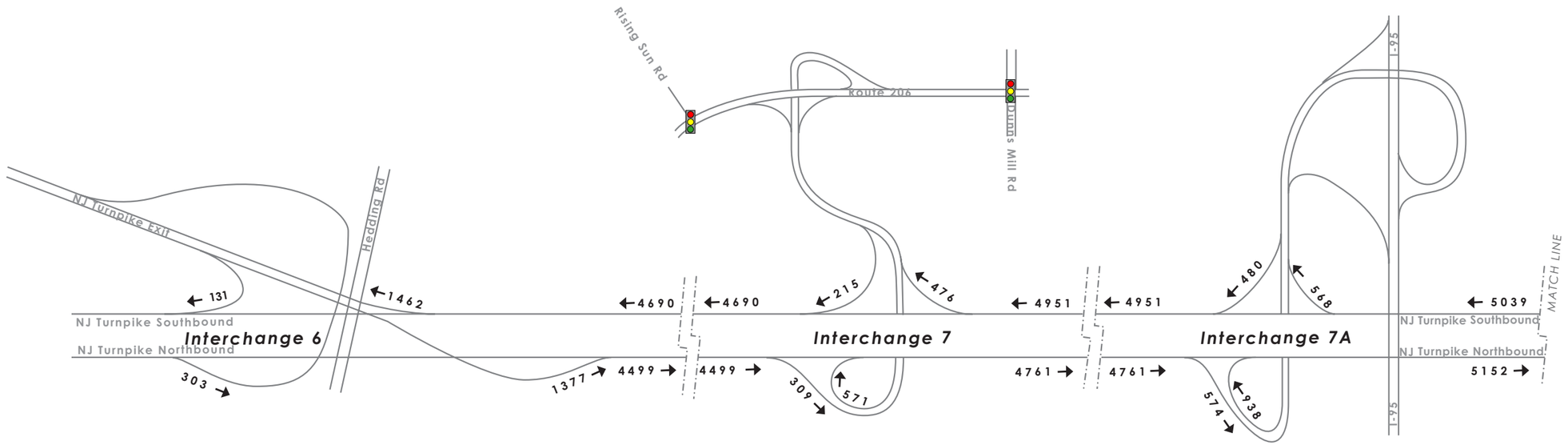


2005 FRIDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-28c



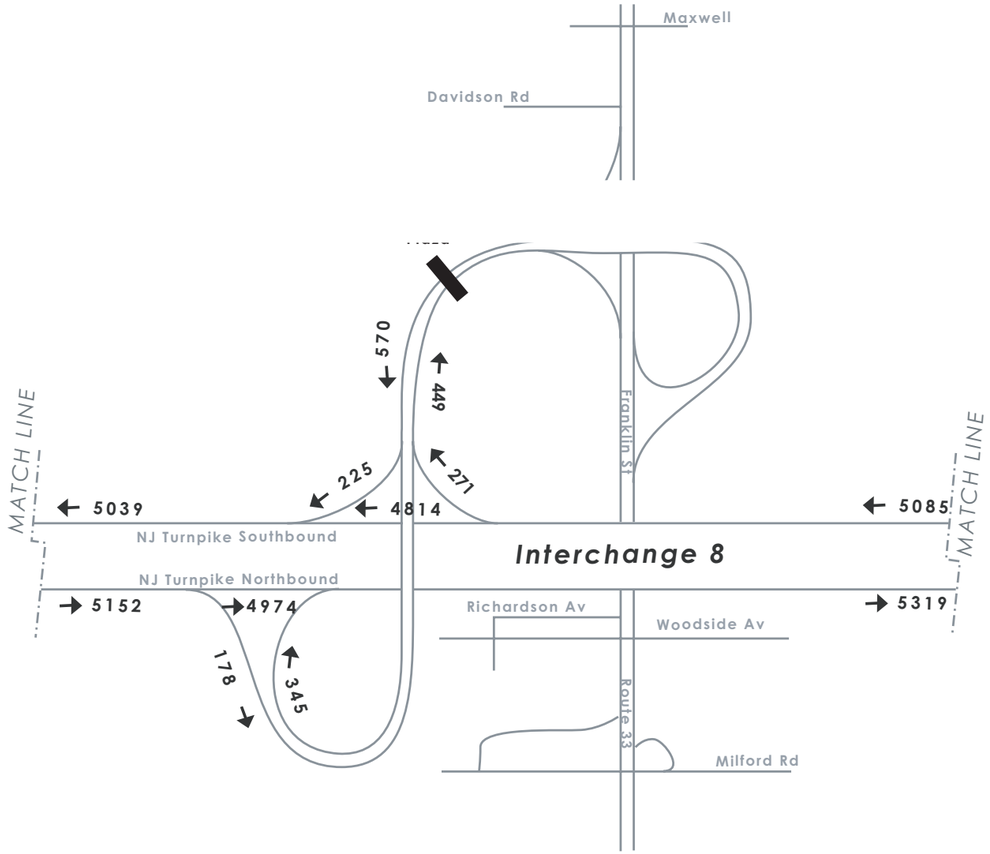
NOT TO SCALE

2005 SUNDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-29a



2005 SUNDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
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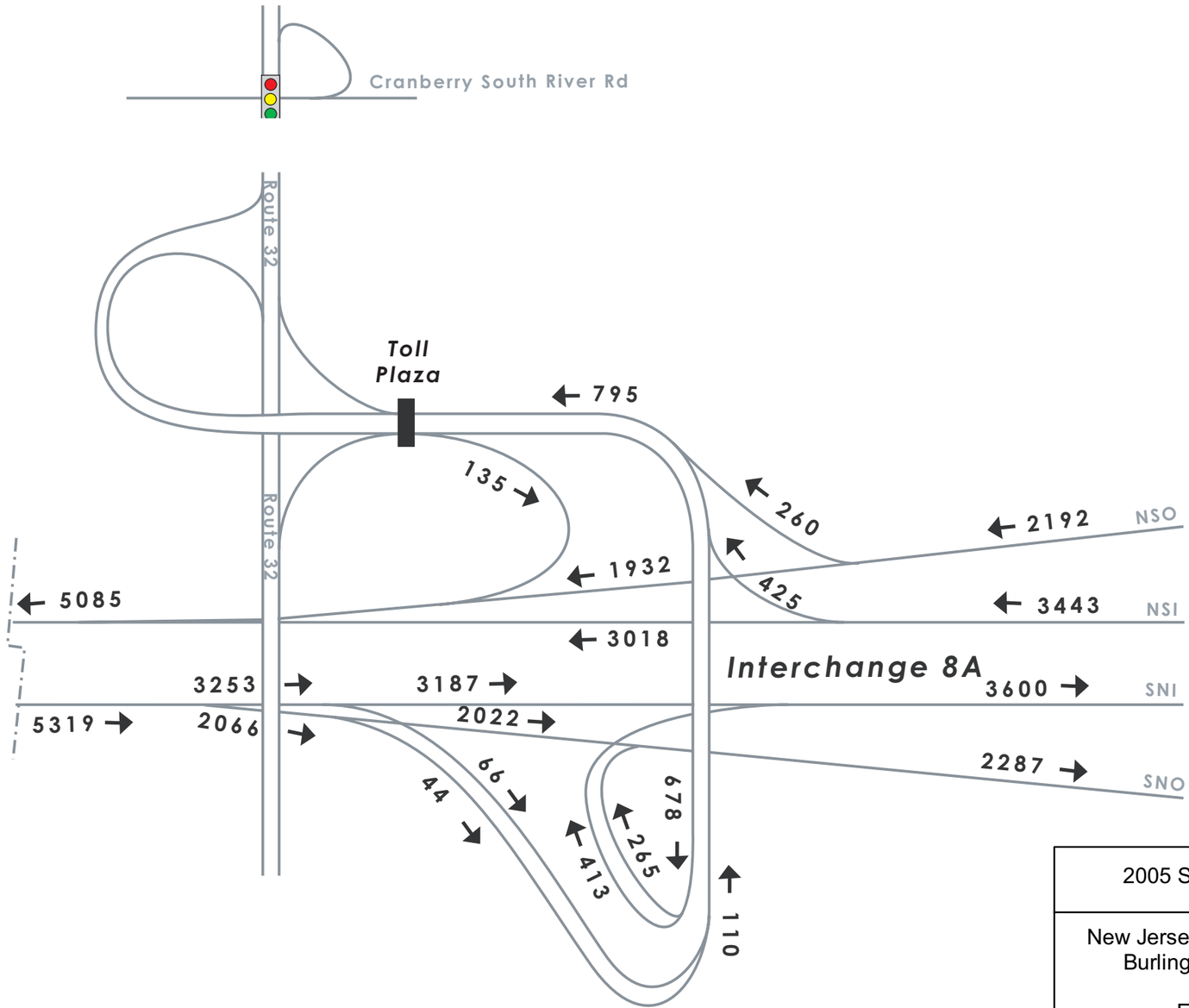
NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-29b



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2005 SUNDAY PM PEAK HOUR VOLUMES

New Jersey Turnpike Interchange 6 to 9 Widening
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NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-29c

Table 3.70
2005 Existing Level of Service Summary
Mainline and Weaving Segment Analysis

Location	Segment	Weekday AM Peak Hour				Weekday PM Peak Hour				Friday PM Peak Hour				Sunday PM Peak Hour			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS
MAINLINE SEGMENT ANALYSIS																	
Interchange 5 to Interchange 6																	
M01	NB	2,56	17%	0.41	B	2,17	15%	0.34	B	3,09	9%	0.47	B	3,43	4%	0.51	B
M02	SB	2,08	19%	0.33	B	2,63	17%	0.42	B	4,17	10%	0.64	C	3,36	4%	0.50	B
Interchange 6 to Interchange 7																	
M03	NB	3,43	17%	0.54	C	2,91	15%	0.46	B	4,14	9%	0.63	C	4,50	4%	0.67	C
M04	SB	2,97	19%	0.47	B	3,65	17%	0.58	C	5,67	11%	0.87	D	4,69	4%	0.70	C
Interchange 7 to Interchange 7A																	
M05	NB	3,95	17%	0.63	C	3,17	16%	0.50	B	4,27	9%	0.65	C	4,76	4%	0.71	C
M06	SB	3,20	19%	0.51	B	4,14	18%	0.66	C	6,15	12%	0.95	E	4,95	4%	0.74	C
Interchange 7A to Interchange 8																	
M07	NB	4,87	16%	0.77	D	3,68	17%	0.58	C	4,64	11%	0.72	C	5,15	4%	0.77	D
M08	SB	3,59	20%	0.58	C	4,81	16%	0.76	D	6,61	12%	1.02	F	5,04	4%	0.75	D
Interchange 8 to Interchange 8A																	
M09	NB	5,73	20%	0.89	D	3,78	15%	0.60	C	4,79	12%	0.74	C	5,32	4%	0.79	D
M10	NB Inner	3,67	0%	0.54	C	2,45	0%	0.36	B	3,03	0%	0.44	B	3,25	0%	0.48	B
M11	NB Outer	2,06	37%	0.54	C	1,33	46%	0.36	B	1,76	29%	0.44	B	2,07	10%	0.48	B
M12	SB	3,86	20%	0.59	C	6,53	12%	1.01	F	6,53	12%	1.01	F	5,09	4%	0.76	D
M13	SB Inner	2,16	0%	0.32	A	3,03	0%	0.44	B	3,87	0%	0.57	C	3,02	0%	0.44	B
M14	SB Outer	1,52	48%	0.41	B	2,13	36%	0.55	C	2,65	29%	0.67	C	2,07	10%	0.48	B
Interchange 8A to Interchange 9																	
M15	NB Inner	4,59	0%	0.67	C	3,23	0%	0.47	B	3,82	0%	0.56	C	3,60	0%	0.53	C
M16	NB Outer	2,60	32%	0.66	C	1,77	40%	0.47	B	2,20	29%	0.55	C	2,29	10%	0.53	C
M17	SB Inner	3,28	0%	0.48	B	4,07	0%	0.59	C	4,99	0%	0.73	C	3,44	0%	0.50	B
M18	SB Outer	1,76	49%	0.48	B	2,29	37%	0.59	C	2,90	29%	0.73	C	2,19	10%	0.50	B
WEAVING SEGMENT ANALYSIS																	
Interchange 8A to Service Area 7S																	
W01	SB	3,68	20%	0.71	C	5,16	15%	0.96	E	6,53	12%	1.19	F	5,09	4%	0.88	D

Notes:
(1) Vol = Volume; (2) HV% = Heavy Vehicle Percentage; (3) V/C = Vehicle Capacity Ratio; (4) LOS = Level of Service;
NB = Northbound; SB = Southbound; Inner = Inner Roadway; Outer = Outer Roadway;
Source: The Louis Berger Group, Inc. (2006).

- Between Interchange 8 and Interchange 8A

Weaving Segment W01 (southbound) operates at LOS "E" during the Weekday PM Peak Hour and LOS "F" during the Friday PM peak hour.

Ramp Junctions (Merge and Diverge) Analysis

A total of 23 Turnpike ramp junctions (i.e., merge and diverge influence areas at seven connecting points with the mainline) were analyzed for AM Weekday and PM Friday peak hour conditions using the HCM ramp junction methodology previously described (Section 3.18.2.2). A summary of the Turnpike ramp junction LOS analysis is presented in Table 3.71. As shown in the table, in the AM Weekday and PM Friday peak hours, all mainline segments operate at LOS D or better except for the following:

- Interchange 7A

Off-ramp R11 (southbound) operates at LOS "F" during the Friday PM peak hour.

- Interchange 8

On-ramp R14 (northbound) operates at LOS "E" during the Weekday AM peak hour.
Off-ramp R15 (southbound) operates at LOS "F" during the Friday PM peak hour.
On-ramp R16 (southbound) operates at LOS "F" during the Friday PM peak hour.

Summary of LOS Analysis

In summary, the analyses of existing conditions on the Turnpike in the Project Corridor indicate moderate to poor levels of service from Interchange 6 to Interchange 9. Traffic backups tend to occur during the Friday PM peak hours at various locations along the Turnpike, but are more pronounced in the southbound direction primarily due to the lack of roadway capacity. At the merge section, the number of southbound Turnpike mainline travel lanes is reduced from five to three, creating stop-and-go traffic and thus leading to miles-long traffic backups.

3.18.5.3 Existing Safety Conditions

Accident Summary

NJDOT keeps annual records of traffic accidents by location throughout the state's 21 counties. Table 3.72 summarizes the total annual vehicular accidents that were reported on the New Jersey Turnpike mainline segments and interchange ramps from 2001 to 2004 for Burlington, Mercer, and Middlesex Counties, which are the three counties comprising the Project Corridor.

From 2001 to 2004, vehicular accidents on the Turnpike in these counties increased just over 40 percent from 2,428 to 3,455. Vehicular accidents in Burlington and Mercer Counties increased just over 20 percent during the four-year time period, while accidents in Middlesex County, which makes up two-thirds of all accidents, increased by 42.3 percent. Detailed Turnpike accident data were obtained from the Authority and analyzed below.

Turnpike vehicular accident data for a two-year period (2002 and 2003) were also obtained from the Authority. The Authority provided a summary of accident data that combined both northbound and southbound directions for mainline sections and interchanges of the Turnpike from M.P. 48.0 (just south of Interchange 6) to M.P. 78.0 (just north of Interchange 8A).

Table 3.71
2005 Existing Level of Service Summary
Ramp Junction Analysis

Location	Ramp	Weekday AM Peak Hour				Weekday PM Peak Hour				Friday PM Peak Hour				Sunday PM Peak Hour			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS	Vol	HV%	V/C	LOS
Interchange 6																	
R01	NB off-ramp	380	26%	0.36	A	220	13%	0.28	A	300	11%	0.39	A	300	5%	0.42	B
R02	NB on-ramp	1,25	19%	0.61	B	960	15%	0.50	B	1,35	9%	0.69	B	1,38	3%	0.72	B
R03	SB off-ramp	1,11	18%	0.51	B	1,26	17%	0.61	B	1,80	12%	0.89	C	1,46	3%	0.71	B
R04	SB on-ramp	220	0%	0.33	B	240	0%	0.41	B	300	0%	0.63	C	130	0%	0.48	B
Interchange 7																	
R05	NB off-ramp	250	12%	0.60	B	140	20%	0.51	B	310	10%	0.68	B	310	6%	0.71	B
R06	NB on-ramp	770	15%	0.66	C	400	20%	0.50	C	440	14%	0.65	C	570	6%	0.71	C
R07	SB off-ramp	420	21%	0.58	B	720	20%	0.73	C	780	19%	0.95	D	480	7%	0.78	C
R08	SB on-ramp	180	16%	0.46	B	230	15%	0.56	B	300	12%	0.84	D	220	6%	0.67	C
Interchange 7A																	
R09	NB off-ramp	450	16%	0.68	B	460	7%	0.57	B	660	5%	0.72	C	550	2%	0.75	C
R10	NB on-ramp	1,37	13%	0.85	D	980	16%	0.64	C	1,04	14%	0.77	D	940	4%	0.80	D
R11	SB off-ramp	930	14%	0.67	B	1,12	10%	0.83	C	1,08	10%	1.00	F	570	4%	0.79	C
R12	SB on-ramp	540	7%	0.54	B	450	14%	0.67	C	620	10%	0.96	D	480	3%	0.74	C
Interchange 8																	
R13	NB off-ramp	370	11%	0.80	C	250	9%	0.63	B	240	8%	0.75	C	180	3%	0.79	C
R14	NB on-ramp	1,23	2%	0.94	E	350	7%	0.59	C	380	7%	0.72	D	350	3%	0.77	D
R15	SB off-ramp	400	12%	0.65	B	690	3%	0.84	C	400	6%	0.97	F	270	3%	0.78	C
R16	SB on-ramp	310	7%	0.56	C	330	15%	0.74	D	480	10%	1.00	F	230	5%	0.72	C
Interchange 8A																	
R17	NB off-outer	210	0%	0.59	B	130	0%	0.41	B	100	0%	0.50	B	70	0%	0.53	B
R18	NB off-inner	150	49%	0.59	B	90	56%	0.39	A	80	49%	0.48	B	40	14%	0.52	B
R19	NB on-outer	1,13	0%	0.73	C	910	0%	0.52	C	900	0%	0.60	C	410	0%	0.53	C
R20	NB on-inner	680	22%	0.69	C	530	28%	0.49	C	520	29%	0.58	C	270	8%	0.55	C
R21	SB off-outer	1,12	0%	0.59	B	1,04	0%	0.69	C	1,11	0%	0.80	C	430	0%	0.57	B
R22	SB off-inner	490	38%	0.52	B	510	27%	0.65	C	600	23%	0.80	C	260	6%	0.55	B
R23	SB on-outer	260	21%	0.43	B	350	17%	0.58	C	350	18%	0.69	C	140	6%	0.50	C

Notes:
(1) Vol = Volume; (2) HV% = Heavy Vehicle Percentage; (3) V/C = Vehicle Capacity Ratio; (4) LOS = Level of Service;
NB = Northbound; SB = Southbound; Inner = Inner Roadway; Outer = Outer Roadway;
Source: The Louis Berger Group, Inc. (2006).

Table 3.72
Vehicular Accidents on New Jersey Turnpike Mainline Segments and Interchange Ramps By County (2001-2004)

County	Reported Vehicular Accidents				
	2001	2002	2003	2004	% Change 2001-2004
Burlington	561	552	646	677	20.7%
Mercer	534	668	621	645	20.8%
Middlesex	1,333	1,857	2,155	2,133	60.0%
Total	**2,428**	**3,077**	**3,422**	**3,455**	**42.3%**

Source: New Jersey Department of Transportation.

A total of 2,929 accidents occurred on the Turnpike (between M.P.48.0 and 78.0) in 2002 and 2003. Of these accidents, 2,497 (85 percent) occurred along the mainline and 432 (15 percent) occurred within the interchanges. From 2002 to 2003, the number of accidents on the Turnpike increased by eight percent, with the number of accidents along the mainline increasing by 14 percent and the number of accidents at the interchanges decreasing by 18 percent.

Mainline Accidents by Milepost

Table 3.73 shows the number of accidents along the Turnpike mainline between M.P.48.0 and M.P.78.0 for 2002 and 2003. For this 30-mile section of the Turnpike, 1,168 accidents occurred in 2002 and 1,329 accidents occurred in 2003, an increase of 13.8 percent (161 accidents). Overall, the number of accidents increased at 22 mileposts, with M.P.73.0 experiencing the largest increase (22 accidents); in contrast, the number of accidents decreased at nine mileposts, with M.P.53.0 and M.P. 66.0 experiencing the largest decreases (18 accidents).

Further analysis shows that the mainline locations with the highest number of reported accidents over the two-year period include: M.P. 73.0 with 172 accidents; M.P. 74.0 with 141 accidents; and M.P. 72.0 with 136 accidents. The three locations that experienced the greatest increase in accidents from 2002 to 2003 were: M.P. 73.0 with 22 accidents; M.P. 68.0 with 21 accidents; and M.P. 67.0 with 18 accidents. It should be noted that these locations are all within the merge areas and ramp approaches, indicating that the high number of accidents are most likely caused by the merging and diverging of traffic at these locations.

Accidents at Interchanges

Table 3.74 shows the number of accidents at Turnpike interchanges for 2003 and 2003, from Interchange 6 to Interchange 8A. At these five interchanges, 237 accidents occurred in 2002 and 195 accidents occurred in 2003, a decrease of 17.7 percent (42 accidents). Overall, the number of accidents increased at two interchanges, with Interchange 8 experiencing the largest increase (9 accidents); in contrast, the number of accidents decreased at the remaining three interchanges, with Interchange 8A experiencing the largest decrease (20 accidents).

Further analysis shows that the interchanges with the highest number of reported accidents over the two-year period include: Interchange 7A with 172 accidents; Interchange 8A with 126 accidents; and Interchange 7 with 53 accidents. The high number of accidents at these three interchanges is likely due to the complicated maneuvers required by drivers and limited weaving areas to access the mainline Turnpike.

Table 3.73
New Jersey Turnpike Mainline Vehicular Accidents Data Analysis
Between Interchanges 6 and 8A (2002-2003)

Mileposts	Number of Accidents		TOTAL	Change	Percentage Change
	2002	2003			
Milepost 48	24	19	**43**	(5)	(21%)
Milepost 49	21	14	**35**	(7)	(33%)
Milepost 50	13	22	**35**	9	69%
Milepost 51	31	33	**64**	2	6%
Milepost 52	28	31	**59**	3	11%
Milepost 53	64	46	**110**	(18)	(28%)
Milepost 54	25	28	**53**	3	12%
Milepost 55	22	29	**51**	7	32%
Milepost 56	23	37	**60**	14	61%
Milepost 57	37	35	**72**	(2)	(5%)
Milepost 58	36	34	**70**	(2)	(6%)
Milepost 59	26	43	**69**	17	65%
Milepost 60	68	55	**123**	(13)	(19%)
Milepost 61	32	42	**74**	10	31%
Milepost 62	25	37	**62**	12	48%
Milepost 63	36	41	**77**	5	14%
Milepost 64	41	35	**76**	(6)	(15%)
Milepost 65	38	34	**72**	(4)	(11%)
Milepost 66	52	34	**86**	(18)	(35%)
Milepost 67	48	66	**114**	18	38%
Milepost 68	43	64	**107**	21	49%
Milepost 69	31	48	**79**	17	55%
Milepost 70	39	51	**90**	12	31%
Milepost 71	38	51	**89**	13	34%
Milepost 72	65	71	**136**	6	9%
Milepost 73	75	97	**172**	22	29%
Milepost 74	68	73	**141**	5	7%
Milepost 75	33	39	**72**	6	18%
Milepost 76	34	38	**72**	4	12%
Milepost 77	33	46	**79**	13	39%
Milepost 78	19	36	**55**	17	89%
TOTAL	**1,168**	**1,329**	**2,497**	**161**	**14%**

Source: The New Jersey Turnpike Authority.

Table 3.74
New Jersey Turnpike Interchange Vehicular Accidents Data Analysis
Between Interchanges 6 and 8A (2002-2003)

Interchanges	Number of Accidents		TOTAL	Change	Percentage Change
	2002	2003			
Interchange 6	21	17	38	(4)	(19%)
Interchange 7	33	20	53	(13)	(39%)
Interchange 7A	93	79	172	(14)	(15%)
Interchange 8	7	16	23	(9)	129%
Interchange 8A	83	63	146	(20)	24%
TOTAL	**237**	**195**	**432**	**-42**	**(18%)**

Source: The New Jersey Turnpike Authority.

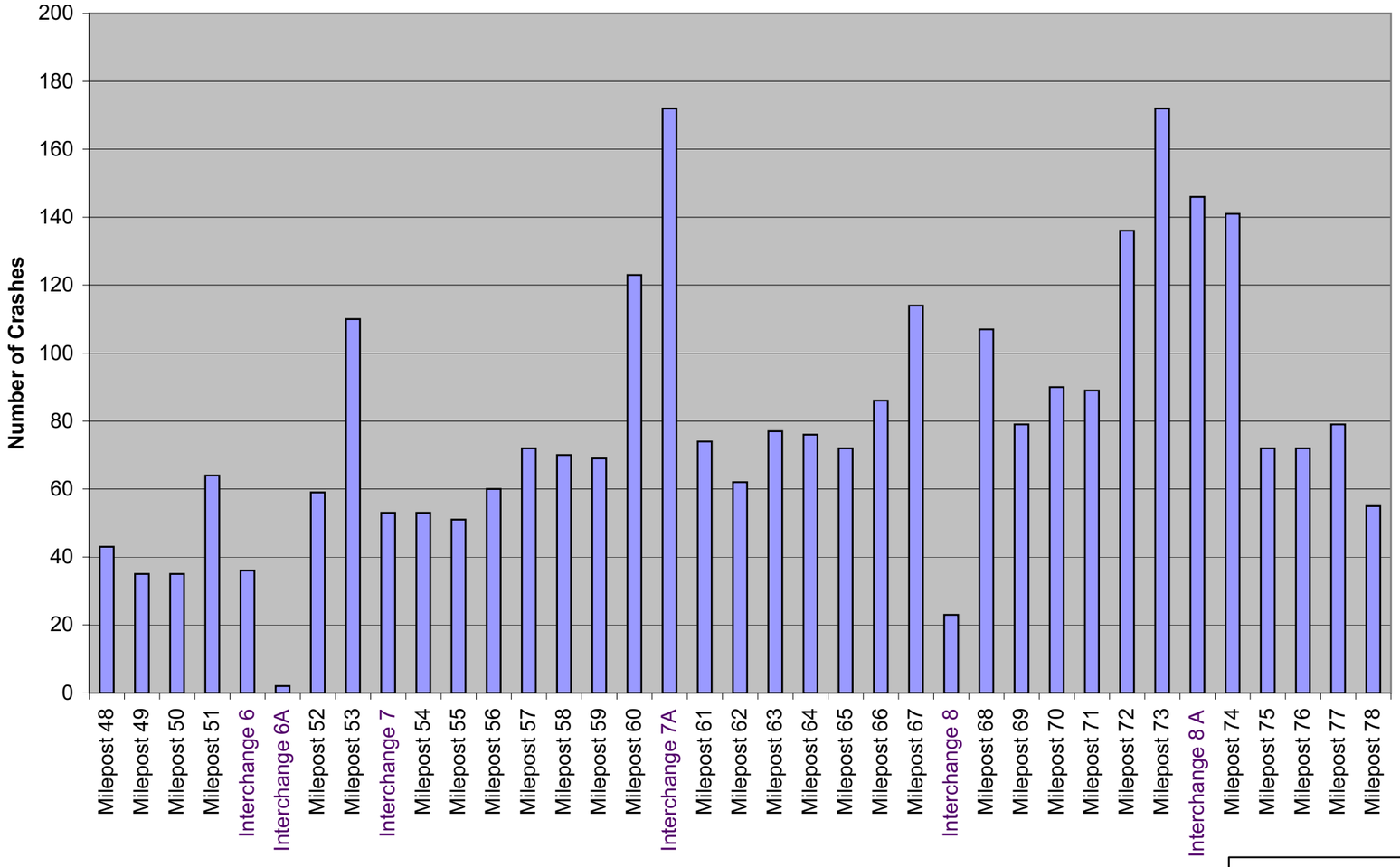
Figure 3-30 provides a graphical representation of the total number of accidents in 2002 and 2003 at key mileposts and interchanges along the Turnpike. The data indicate a direct correlation in the number of accidents relative to the location of the interchange. Generally, as one gets closer to the interchanges, the numbers of accidents tend to increase. This increase in accidents near interchanges could be explained by the weaving and merging of vehicles entering and exiting the Turnpike at these locations.

Located in the Turnpike's southbound mainline near M.P. 73.0 are both the on- and off-ramps of Interchange 8 and the merge area where five dual-dual travel lanes (three inner and two outer) are reduced to three travel lanes (single cross section). The high volume of merging traffic and overall congestion has led to a high number of accidents in this area. From 2002 to 2003, the number of accidents in a three-mile area from M.P. 72.0 to M.P. 74.0 was 449, which represented 18 percent of the total number of accidents reported in Project Corridor.

Accident Rates

Using 2002 and 2003 accident data, the number of accidents per million vehicle miles (MVM) for Turnpike mainline segments (both directions) from M.P. 48 (approximately three miles south of Interchange 6) to M.P. 78 (approximately five miles north of Interchange 8A) were calculated. These accident rates are shown in Table 3.75. Accident rates along the 30-mile Turnpike segment between M.P. 48 and M.P. 78 averaged approximately 0.85 accidents per MVM. The highest rates were observed at M.P. 72 (located just south of the terminus of the dual-dual Turnpike design near Interchange 8A), M.P. 73 (located near the terminus of the dual-dual Turnpike design and Interchange 8A) and M.P. 74 (located just north of Interchange 8A and the terminus of the dual-dual Turnpike design). At these three locations, the accident rates were approximately 1.35, 1.48 and 1.22 accidents per MVM, respectively.

The high accident rates around Interchange 8A can be explained by the fact that in the southbound direction (between M.P. 72 and M.P. 74) are both the on- and off-ramps of Interchange 8A and the mainline merge area where the Turnpike narrows from five lanes to three lanes. In a separate speed study conducted for the Proposed Project, it was determined that motorists traveling in the southbound direction (approaching the merge area) must reduce their vehicular speed from an average of 70 mph to 5 mph within a distance of one mile. Furthermore, this speed of 5 mph must be maintained, on average, for two miles. With this vehicular speed reduction and the constant acceleration and deceleration by motorists traveling in this congested area, motorists often become distracted and impatient, and are likely to perform risky movements (i.e., sudden lane changes). This type of behavior often leads to accidents, which is demonstrated by the high number of accidents in this area.



TOTAL VEHICULAR ACCIDENTS (2002-2003) AT TURNPIKE INTERCHANGES AND MILEPOSTS (MP 48 TO 78)

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
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FIGURE
3-30

Table 3.75
Accident Rates (2003-03)
New Jersey Turnpike Mainline (M.P. 48.0 to 78.0)

Milepost			Section Length (Miles)	Average Annual Daily Traffic (AADT)	Vehicular Accidents			Actual Accident Rate (MVM)	Statewide Accident Rate* (2002-03) (MVM)	Relation to Statewide Rate	Critical Accident Rate	Actual/ Critical Accident Ratio	High Crash Location?
No.	Start (Mile)	End (Mile)			2002	2003	Total						
48	48.0	49.0	1.0	83,500	24	19	43	0.7054	4.3150	BELOW	4.9922	0.14	NO
49	49.0	50.0	1.0	83,500	21	14	35	0.5742	4.3150	BELOW	4.9922	0.12	NO
50	50.0	51.0	1.0	83,500	13	22	35	0.5742	4.3150	BELOW	4.9922	0.12	NO
Interchange 6 (Milepost 51.0)													
51	51.0	52.0	1.0	110,300	31	33	64	0.7948	4.3150	BELOW	4.9051	0.16	NO
52	52.0	53.0	1.0	110,300	28	31	59	0.7327	4.3150	BELOW	4.9051	0.15	NO
Interchange 7 (Milepost 53.3)													
53	53.0	54.0	1.0	121,600	64	46	110	1.2392	4.3150	BELOW	4.8773	0.25	NO
54	54.0	55.0	1.0	121,600	25	28	53	0.5971	4.3150	BELOW	4.8773	0.12	NO
55	55.0	56.0	1.0	121,600	22	29	51	0.5745	4.3150	BELOW	4.8773	0.12	NO
56	56.0	57.0	1.0	121,600	23	37	60	0.6759	4.3150	BELOW	4.8773	0.14	NO
57	57.0	58.0	1.0	121,600	37	35	72	0.8111	4.3150	BELOW	4.8773	0.17	NO
58	58.0	59.0	1.0	121,600	36	34	70	0.7886	4.3150	BELOW	4.8773	0.16	NO
59	59.0	60.0	1.0	121,600	26	43	69	0.7773	4.3150	BELOW	4.8773	0.16	NO
Interchange 7A (Milepost 60.0)													
60	60.0	61.0	1.0	133,000	68	55	123	1.2669	4.3150	BELOW	4.8529	0.26	NO
61	61.0	62.0	1.0	133,000	32	42	74	0.7622	4.3150	BELOW	4.8529	0.16	NO
62	62.0	63.0	1.0	133,000	25	37	62	0.6386	4.3150	BELOW	4.8529	0.13	NO
63	63.0	64.0	1.0	133,000	36	41	77	0.7931	4.3150	BELOW	4.8529	0.16	NO
64	64.0	65.0	1.0	133,000	41	35	76	0.7828	4.3150	BELOW	4.8529	0.16	NO
65	65.0	66.0	1.0	133,000	38	34	72	0.7416	4.3150	BELOW	4.8529	0.15	NO
66	66.0	67.0	1.0	133,000	52	34	86	0.8858	4.3150	BELOW	4.8529	0.18	NO
67	67.0	68.0	1.0	133,000	48	66	114	1.1742	4.3150	BELOW	4.8529	0.24	NO
Interchange 8 (Milepost 67.6)													
68	68.0	69.0	1.0	138,100	43	64	107	1.0614	4.3150	BELOW	4.8430	0.22	NO
69	69.0	70.0	1.0	138,100	31	48	79	0.7836	4.3150	BELOW	4.8430	0.16	NO
70	70.0	71.0	1.0	138,100	39	51	90	0.8927	4.3150	BELOW	4.8430	0.18	NO
71	71.0	72.0	1.0	138,100	38	51	89	0.8828	4.3150	BELOW	4.8430	0.18	NO
72	72.0	73.0	1.0	138,100	65	71	136	1.3490	4.3150	BELOW	4.8430	0.28	NO
Interchange 8A (Milepost 73.3)													
73	73.0	74.0	1.0	158,700	75	97	172	1.4847	4.2050	BELOW	4.6915	0.32	NO
74	74.0	75.0	1.0	158,700	68	73	141	1.2171	4.2050	BELOW	4.6915	0.26	NO
75	75.0	76.0	1.0	158,700	33	39	72	0.6215	4.2050	BELOW	4.6915	0.13	NO
76	76.0	77.0	1.0	158,700	34	38	72	0.6215	4.2050	BELOW	4.6915	0.13	NO
77	77.0	78.0	1.0	158,700	33	46	79	0.6819	4.2050	BELOW	4.6915	0.15	NO
78	78.0	79.0	1.0	158,700	19	36	55	0.4747	4.2050	BELOW	4.6915	0.10	NO
TOTAL/AVERAGE			**31.0**	**129,968**	**1,168**	**1,329**	**2,497**	**0.8490**	**4.2937**	**BELOW**	**4.3920**	**0.19**	**NO**

*MVM = Million Vehicle Miles; * New Jersey statewide accident rate on numbered roadways/interstates with 3 lanes and shoulder (M.P. 48-72) and with 4 or more lanes and shoulder (M.P. 73-78).*

Source: The New Jersey Turnpike Authority.

The lowest rate within the Project Corridor was approximately 0.47 accidents per MVM at M.P. 78. In this area, the Turnpike is a dual-dual configuration where the three inner lanes are used by cars only and the two outer lanes are used by both cars and heavy vehicles. This separation of cars and heavy vehicles generally provide for safer driving conditions.

3.18.6 Alternative Transportation Opportunities in Project Corridor Counties

The following sub-sections present alternative transportation opportunities that are available within the three counties comprising the Project Corridor (i.e., Burlington, Mercer and Middlesex Counties), regardless of whether these opportunities are specifically provided within the actual Project Corridor. These alternative transportation opportunities include public transportation, on-demand transportation/para-transit, and transportation initiatives sponsored by transportation management associations (TMAs).

3.18.6.1 Public Transportation

Burlington County

Burlington County is served by various public, private and on-demand transportation providers including the following:

- NJ Transit operates the River LINE light rail system from Trenton (Mercer County) to Camden (Camden County), with 11 station stops in Burlington County.
- NJ Transit and several private bus companies provide express bus services between various locations in Burlington County and New York City, Philadelphia and other towns/counties in New Jersey.
- NJ Transit operates local bus routes within urban areas and between communities.
- The Cross County Connection TMA, in conjunction with the Burlington County Board of Chosen Freeholders, operates the BurLink shuttle bus service that connects with NJ Transit bus routes and River LINE light rail stations.

The River LINE light rail system connects Burlington County residents with Trenton to the north and Camden to the south. At Trenton, commuters can connect to NJ Transit Northeast Corridor trains for service to Newark and New York City and Southeastern Pennsylvania Transportation Authority (SEPTA) R-7 trains to Philadelphia (30th Street Station), while at Camden, commuters can connect to Port Authority Transit Corporation (PATCO) service into downtown Philadelphia.

BurLink provides express and local shuttle bus service between various activity centers in Burlington County and major public transportation routes and stations.

Mercer County

Mercer County is served by various public, private, and on-demand transportation providers, including the following:

- NJ Transit operates one commuter rail corridor (Northeast Corridor), with three stations in Mercer County (Trenton, Hamilton and Princeton Junction).
- NJ Transit operates the River LINE light rail from Trenton (Mercer County) to Camden (Camden County), with three station stops in Mercer County.
- NJ Transit, SEPTA and some private bus companies provide express bus services between various locations in Mercer County and New York City, Philadelphia and other towns/counties

in New Jersey.
- NJ Transit operates local bus routes within urban areas and between communities.
- The Greater Mercer TMA, in conjunction with Starr Tours, provides free Jump Shuttle service between the Trenton Station and employment centers in West Trenton.
- The Greater Mercer TMA also operates the three-route Princeton University P-Rides Campus Shuttle that is free for everyone.
- Various other publicly and privately operated local shuttles also exist.

Middlesex County

The majority of public transportation in Middlesex County is operated by NJ Transit and a few small private companies. They include the following:

- NJ Transit operates three commuter rail lines (Northeast Corridor, New Jersey Coast Line, and Raritan Valley Line), with ten stations in Middlesex County.
- NJ Transit and some private bus companies provide express bus services between various locations in Middlesex County and New York City and other towns/counties in New Jersey.
- NJ Transit operates local bus routes within urban areas and between communities.
- Private and community operated shuttles/circulators provide local circulation and connections within and between communities (e.g., the Middlesex County Board of Chosen Freeholders sponsors two community shuttle routes – the New Brunswick-Jamesburg-Exit 8A shuttle and the Brunswick Square Mall-Monroe-Jamesburg shuttle).
- Sea Streak Ferry operates high speed ferry service between South Amboy and New York City (Manhattan).
- Rutgers University operates their Campus Bus System, which includes some routes that operate on local New Brunswick streets and which is open to the public.

Commuter rail and express bus services connect various residential areas in Middlesex County with important business and employment centers in Manhattan, Newark, Hoboken, and Trenton. There are three NJ Transit rail lines in the county. The Northeast Corridor Line provides service between Trenton and New York City; the North Jersey Coast Line provides service between Bay Head (Monmouth County) and Newark, Hoboken and New York City; and the Raritan Valley Line provides service between High Bridge (Hunterdon County) and Newark.

Within Middlesex County there are several major commuter/express bus corridors. In the AM and PM peak hours, there is frequent commuter/express bus service operated by NJ Transit and other private bus companies to New York City, Newark, and Jersey City along U.S. Route 9. There is also commuter bus service along the Turnpike and the Garden State Parkway, providing service to various park-and-ride lots and towns adjacent to these two highways. Other important express bus corridors include U.S. Route 27 and N.J. Route 18.

Most local bus service in Middlesex County connects NJ Transit train stations with local towns and major activity centers. These local bus services are primarily concentrated in the large urbanized areas of the county, including New Brunswick, Perth Amboy, Edison, and Metuchen.

3.18.6.2 On-Demand Transportation/Para-Transit

Burlington County

The Burlington County Transportation Service (BCTS) is an on-demand shuttle sponsored by the Burlington County Board of Chosen Freeholders and subsidized by various revenue sources and state

and federal grants. This non-emergency transportation service is available for eligible residents of the county, including senior citizens (age 60 and above) and adults with a disability (age 21 and above). Examples of non-emergency travel include: going to medical appointments at a doctor's office, medical center or hospital; going shopping and conducting other personal business; and going to the Burlington County Senior sites. Rides on the BCTS shuttle are on a first-call, first-serve basis and users must arrange for rides several days in advance.

Mercer County

Like Burlington County, Mercer County also provides on-demand transportation that serves disadvantaged and elderly people living in the county. Dubbed TRADE (Transportation Resources to Aid the Disadvantaged and Elderly), its primary purpose is to provide non-emergency transportation to eligible county residents who require transportation to maintain their lives and access community resources. TRADE is accessible to all eligible residents of Mercer County who are seniors (age 60 and over) and people with disabilities. Users can make reservations for TRADE transportation up to two weeks in advance.

Middlesex County

Middlesex County currently provides on-demand transportation through direct and indirect means. It provides demand response and subscription services to special populations in the county through its Area Wide Transportation Services (AWTS). It also helps support on-demand transportation through the County Board of Social Services (BSS), which contracts out service to private operators for specific eligible populations. BSS is able to provide transportation through several major funding sources, including Work First New Jersey (WFNJ) and Medicaid Non-Emergency Transportation. BBS contracts out on-demand service to four different taxi companies that operate in four different geographical areas of the county. BSS reimburses these taxi companies on a per-loaded mile basis, and Medicaid recipients are permitted to use any of the contracted companies, paid for by Medicaid.

3.18.6.3 Transportation Management Associations (TMAs)

Burlington County

The efforts of central New Jersey business leaders, local government officials, NJDOT and NJ Transit led to the incorporation of the Cross County Connection TMA in 1989 to provide solutions for transportation problems and manage alternative transportation services for seven counties in New Jersey, including Burlington County. The goals of the Cross County Connection are to address mobility issues in the region, while also creating initiatives to reduce the number of vehicles on local and state roadways. Its mission is to improve the quality of life through transportation solutions.

Cross County Connection is a non-profit organization and currently partners with large state and federal agencies such as NJDOT, NJ Transit, and FHWA to provide transportation solutions to mobility issues facing counties, municipalities, and employers in the region. Cross County Connection acts as a centralized source for carpools or vanpools, while also offering up-to-date information on commuter rail, light rail, buses, shuttles, bicycling, walking and traffic conditions.

Cross County Connection also partners with local area employers to develop transportation resources to help their employees get to and from work. These can range from basic services such as providing bus or train schedules, to more complex services such as organizing carpools and vanpools, and developing employee commute benefit programs.

Mercer County

The Greater Mercer TMA was established in 1984 as a non-profit partnership between the public and private sectors. Its goal is to reduce traffic congestion and improve mobility in and around Mercer County by providing a variety of transportation programs and services to area commuters. The TMA seeks to offer alternative transportation choices through a multi-modal, balanced transportation system. Members of the TMA are varied and include large and small employers, local governments, authorities, and state agencies.

Services offered by the Greater Mercer TMA include ride matching, car and vanpool programs, and senior citizen rideshare programs. Employees who work in Greater Mercer County or adjacent Ocean County are eligible to participate in ridematching programs. The TMA also works closely with local area employees on educational and other outreach programs.

Middlesex County

Keep Middlesex Moving (KMM) is the TMA for Middlesex County. It also provides some services for neighboring Monmouth County. KMM is a non-profit organization affiliated with the Middlesex County Improvement Authority, but is self-supporting through grants and member fees. The goal of KMM is to work with its members (i.e., local businesses, municipalities, and developers) to create transportation solutions such as carpooling, vanpooling, mass transit, compressed work week, telecommuting and much more.

The largest program that KMM administers is the New Jersey Statewide Rideshare Program, promoting ridesharing to both employers and the general public. KMM also works closely with many municipalities in the county in the areas of local transit planning, traffic calming, bicycle/pedestrian facilities, and corridor planning. KMM recently introduced an emergency ride home program for seniors and persons with disabilities.

3.19 Air Quality

3.19.1 Introduction

The Project Corridor passes through Burlington, Mercer, and Middlesex Counties. Burlington and Mercer Counties are located in the Philadelphia-Wilmington-Trenton AQCR (Air Quality Control Region) as defined by the U.S. Environmental Protection Agency (EPA), while Middlesex County is located in the New Jersey-New York-Connecticut AQCR. The entire three-county Project Corridor that is considered for *air quality* is currently designated by the EPA as a maintenance area for *carbon monoxide (CO)*; it is also considered to be in severe nonattainment for *1-hour ozone (O_3)* and moderate nonattainment for *8-hour ozone*, as well as in nonattainment for *particulate matter ($PM_{2.5}$)*. All three counties are also classified as being in attainment for *particulate matter (PM_{10})*, *nitrogen dioxide (NO_2)*, *sulfur dioxide (SO_2)*, and *lead (Pb)*.

The baseline air quality of the Project Corridor was evaluated, primarily in the areas immediately adjacent to the Turnpike, and in areas where air quality would be affected due to changes in traffic conditions. This evaluation included a review and an analysis of existing ambient air quality data that are monitored by the State, as well as a microscale ambient air concentration analysis using the EPA and NJDEP methodologies. The ambient air quality concentrations were identified and documented following the procedures described in NJDEP's *Guideline for Air Quality Analysis for Intersections* (May 2004) and NJDOT's *Air Quality Study Protocol*.

3.19.2 Background

3.19.2.1 Air Pollutants of Concern

The criteria pollutants regulated by the National Ambient Air Quality Standards (NAAQS) are considered to be of concern nationally, statewide and regionally. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions, while emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources. In contrast, ozone (O_3), lead (Pb), nitrogen oxides (NO_x), volatile organic compounds (VOCs) and particulates (PM_{10} and $PM_{2.5}$) come from both mobile and stationary sources.

Carbon monoxide (CO) is a colorless and odorless gas that results from the incomplete combustion of gasoline and other fossil fuels. In most areas of New Jersey, approximately 80 percent of CO emissions are from motor vehicles. Because CO disperses quickly, the concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near crowded intersections and along heavily congested roadways. Consequently, it is important to evaluate CO concentrations on a localized or microscale basis to determine impacts that could potentially result from the Proposed Project.

Ozone (O_3), which is also a colorless gas, is a major constituent of photochemical smog at the earth's surface. The precursors in the formation of ozone are VOCs and NO_x. In the presence of sunlight, ozone is formed through a series of chemical reactions that take place in the atmosphere. Because the reactions occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. Therefore, the effects of NO_x and VOC emissions from mobile sources are usually examined on a regional or mesoscale basis by the region's Metropolitan Planning Organizations (MPOs). The change in regional mobile source emissions of these pollutants is related to the total number of vehicle miles traveled (VMT). A project-level analysis for ozone and its precursors is usually not required if the project is included in the regional analysis conducted by the MPO.

Inhalable particulates (PM_{10} and $PM_{2.5}$) are emitted from various sources, including industrial facilities, power plants, construction activity and diesel-powered vehicles. PM_{10} and $PM_{2.5}$ reflect the size of the particulates, indicating that they are less than 10 or 2.5 micrometers (μm) in diameter, respectively. The procedure described in the EPA particulates analysis is followed to determine the most likely emission quantities of $PM_{2.5}$ pollutants and the necessity of a detailed analysis.

Sulfur dioxide (SO_2) emissions are primarily associated with the combustion of sulfur-containing fuels such as oil and coal. No appreciable quantities of this pollutant are emitted from project-related sources. Therefore, detailed analyses of SO_2 are not required for the Proposed Project.

Lead (Pb) emissions are primarily associated with motor vehicles and industrial sources that use gasoline containing lead additives. All vehicles produced in the United States after 1980 are designed to use unleaded fuel and, as a result, the ambient air concentrations of lead have declined significantly. Therefore, detailed analyses of lead emissions are not required for the Proposed Project.

3.19.2.2 National and State Ambient Air Quality Standards and Guidelines

The EPA defines *ambient air* in 40 CFR, Part 50, as that portion of the atmosphere, external to buildings, to which the general public has access, in compliance with the 1970 Clean Air Act (42 U.S.C. 7401 et seq.) and the 1990 Amendments (CAAA) (P.L. 101-549). The EPA has promulgated ambient air quality standards and regulations. The National Ambient Air Quality Standards (NAAQS) were enacted for the protection of public health and welfare, allowing for an adequate margin of safety. EPA has promulgated NAAQS for criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2),

particulates with a diameter less than or equal to a nominal 10 micrometers (PM_{10}), ozone (O_3), nitrogen dioxide (NO_2) and lead (Pb).

There are two types of standards: primary and secondary. *Primary standards* are designed to protect sensitive segments of the public from adverse health effects which may result from exposure to criteria pollutants. *Secondary standards* are designed to protect the environment from any known or anticipated adverse effects of a pollutant, including the effects on the natural environment (soil, water, vegetation) and the manmade environment (physical structures). Areas that do not meet the NAAQS are called *Nonattainment Areas*; areas that meet both sets of criteria are known as *Attainment Areas*. Areas that were previously in nonattainment, but are currently in attainment are known as *Maintenance Areas*.

In 1997, EPA updated the NAAQS for ozone and fine particulates. For ozone, the one-hour standard will eventually be supplanted by a new eight-hour standard. The standard for PM_{10} remains essentially unchanged, and a new standard for particulate matter less than or equal to 2.5 microns ($PM_{2.5}$) has been established.

The State of New Jersey has also adopted the same Ambient Air Quality Standards (AAQS) used at a national level that specify maximum permissible short-term and long-term concentrations of various contaminants (N.J.A.C. 7:27-13).

National and New Jersey standards for air quality are presented in Table 3.76.

3.19.2.3 Regulatory Setting

In addition to NAAQS, the federal and state governments have also established regulations and requirements to conform to the Clean Air Act. The regulatory setting applicable to the Proposed Project is described below.

State Implementation Plan

As mentioned previously, the Project Corridor traverses areas currently designated by EPA as being in severe nonattainment for 1-hour ozone, moderate nonattainment for 8-hour ozone, maintenance for CO, and nonattainment for $PM_{2.5}$. As a result, the requirements committed to in the State Implementation Plan (SIP) apply to the Proposed Project. The Clean Air Act Amendments require each state to submit a SIP to EPA which documents the necessary measures to achieve attainment status for the various pollutants. Any proposed project must not exacerbate or delay the achievement of the attainment of the standards. Since Burlington, Mercer, and Middlesex Counties are in non-attainment, SIPs have been submitted to EPA. An important element of the New Jersey SIP is an ongoing effort to identify and mitigate hot spots (those locations which have the potential to exceed the standards). The State has committed itself in the SIP to various regional and site-specific measures to reduce carbon monoxide, PM and ozone levels and eliminate hot spots to ensure that the NAAQS will be met by the mandated schedules. Therefore, all SIP requirements were followed in this air quality analysis.

State Criteria of Significant Air Quality Impact Levels

NJDEP has developed criteria to assess the significance of impacts on air quality that would result from proposed projects in nonattainment areas (as described in N.J.A.C. 7:27-18.4). These criteria set the minimum change in ambient air concentration that defines a significant environmental impact. For CO, the 1-hour and 8-hour impact criteria are 2,000 $\mu g/m^3$ (or 1.6 ppm) and 500 $\mu g/m^3$ (or 0.4 ppm), respectively. For PM_{10}, the 24-hour and annual average impact criteria are 5.0 $\mu g/m^3$ and 1.0 $\mu g/m^3$, respectively.

Table 3.76
National and New Jersey
Ambient Air Quality Standards

Pollutant	Primary	Secondary
Carbon Monoxide (CO)		
1-hour Average	35 ppm	35 ppm
8-hour Average	9 ppm	9 ppm
Sulfur Dioxide (SO_2)		
3-hour Average	--	0.5 ppm
24-hour Average	0.14 ppm	--
Annual Arithmetic Mean	0.03 ppm	--
Particulates (PM_{10})		
24-hour	150 $\mu g/m^3$	150 $\mu g/m^3$
Annual Geometric Mean	50 $\mu g/m^3$	50 $\mu g/m^3$
Particulates ($PM_{2.5}$)		
24-hour	65 $\mu g/m^3$	65 $\mu g/m^3$
Annual Geometric Mean	15 $\mu g/m^3$	15 $\mu g/m^3$
Total Suspended Particulate (TSP)[a]		
24-hour	250 $\mu g/m^3$	--
Annual Geometric Mean	75 $\mu g/m^3$	--
Ozone (O_3)		
1-hour Average	0.12 ppm	0.12 ppm
8-hour Average	0.08 ppm	0.08 ppm
Nitrogen Dioxide (NO_2)		
Annual Arithmetic Mean	100 $\mu g/m^3$	100 $\mu g/m^3$
Lead (Pb)		
Quarterly Average	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$

Notes:
[a] TSP standards are previously adopted by the federal.
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Annual standards never to be exceeded; short-term standards not to be exceeded more than once per year.

Source: 40 CFR 50; N.J.A.C. 7:27-13.

NJDEP Guidance for Air Quality Analysis at Intersections

To comply with the CAAA, NAAQS, and State regulations, NJDEP's Division of Air Quality developed the procedures and scopes for air quality analysis in its guidance document, *Air Quality Analysis for Intersections (*May 2004*)*. All air quality analyses undertaken for the Proposed Project utilized the procedures outlined in the guidance. These procedures also provide criteria for determining whether or not a quantitative analysis is required for affected intersections and ensure consistency with the aforementioned statutory and regulatory requirements.

3.19.3 Ambient Air Quality Monitoring Levels

Statewide and regional ambient air quality levels are continuously monitored in New Jersey by NJDEP. NJDEP operates several monitoring stations in Burlington, Mercer, and Middlesex Counties, as well as other locations. The most recent three-year (2003 – 2005) monitored ambient data which represent the area-wide air quality levels conducted by NJDEP are presented in Tables 3.77, 3.78, and 3.79, for the years 2003, 2004, and 2005, respectively. For all monitored data examined, the ambient air criteria pollutant concentrations were below (within) the NAAQS, with the exception of 8-hour ozone, which exceeded the standard. The eight-hour ozone readings in 2005 were 0.089 ~ 0.092 parts per million (ppm), while the NAAQS eight-hour standard for ozone is 0.080 ppm.

3.19.4 Mesoscale Emissions Burden Analysis

The CAA requires all regional transportation plans, activities, and programs in nonattainment or maintenance areas to conform to the applicable SIP (42 U.S.C.7506). EPA has developed criteria and procedures for determining conformity. Any regional Transportation Improvement Program (TIP) or Regional Transportation Plan (RTP) approved by the Metropolitan Planning Organization (MPO) having planning responsibility for a given area is determined to conform to the SIP if this plan or program, which includes all regionally significant projects, will not: cause or contribute to any new violation of the standard; or increase the frequency or severity of any existing violation; or delay timely attainment of the standards.

All MPOs are further required to conduct a mesoscale emissions burden analysis for their respective planning regions, which include all federally-funded and/or regionally significant projects identified in their TIPs or RTPs. The mesoscale emissions burden analyses for ozone and its precursors completed by MPOs cover all milestone years, including baseline 2005, 1-hour ozone attainment year 2007, 8-hour ozone attainment years 2010 and 2014, and future horizon years 2015 and 2025. If the mesoscale emissions burden analyses meet the NAAQS, then the TIPs and RTPs are considered to be in compliance with the SIP.

As a regionally significant project, the Proposed Project has been included in the mesoscale emissions burden analyses of the Draft FY 2006 – 2008 TIP approved by the North Jersey Transportation Planning Authority (NJTPA), the MPO that has planning responsibility for Middlesex County in terms of compliance with TIP/SIP conformity determinations. Similarly, the Proposed Project has been included in the mesoscale emission burden analyses of the *Draft Destination 2030 Long-Range Plan* prepared by the Delaware Valley Regional Planning Commission (DVRPC), the MPO that has planning responsibility for Burlington and Mercer Counties in terms of compliance with TIP/SIP conformity determinations. Given that the Proposed Project is included in the conforming TIPs and/or RTPs of both MPOs, then the mesoscale emissions of the Proposed Project are considered to meet the regional compliance requirement as well.

Table 3.77
New Jersey State Monitored Ambient Air Quality Data
(Year 2003)

		Ambient Concentration		
				NJ DEP Monitored Data
Pollutant	**Monitoring Station**	**Period**	**NAAQS**	**1st/2nd Highest**
Carbon Monoxide (CO)	1 East Broad Street Burlington (Burlington County)	 1-hour 8-hour	 35 ppm 9 ppm	 5.4 / 5.3 ppm 2.6 / 2.5 ppm
Sulfur Dioxide (SO_2)	130 Smith Street Perth Amboy (Middlesex County)	1-hour 8-hour	35 ppm 9 ppm	3.7 / 3.7 ppm 2.1 / 1.9 ppm
	130 Smith Street Perth Amboy (Middlesex County)	3-hour 24-hour Annual	0.50 ppm 0.14 ppm 0.03 ppm	0.041 / 0.033 ppm 0.020 / 0.020 ppm 0.005 ppm
Particulate (PM_{10})	120 Academy Street Trenton Public Library (Mercer County)	24-hour Annual	150 $\mu g/m^3$ 50 $\mu g/m^3$	125 / 70 $\mu g/m^3$ 23.0 $\mu g/m^3$
Particulate ($PM_{2.5}$)	120 Academy Street Trenton Public Library (Mercer County)	24-hour Annual	65 $\mu g/m^3$ 15 $\mu g/m^3$	57 / 42 $\mu g/m^3$ 13.5 $\mu g/m^3$
	Ryders Lane & Log Cabin New Brunswick (Middlesex County)	24-hour Annual	65 $\mu g/m^3$ 15 $\mu g/m^3$	52 / 45 $\mu g/m^3$ 13.0 $\mu g/m^3$
Ozone (O_3)	Rider College, Lawrence (Mercer County)	1-hour 8-hour	0.12 ppm 0.08 ppm	0.115 ppm (2^{nd}) 0.087 ppm (4^{th})
	R. U. Veg. Research Ryders Ln, New Brunswick (Middlesex County)	1-hour 8-hour	0.12 ppm 0.08 ppm	0.120 ppm (2^{nd}) 0.086 ppm (4^{th})
Nitrogen Dioxide (NO_2)	R. U. Veg. Research (Middlesex County)	Annual Average	0.053 ppm	0.018 ppm
Lead (Pb)	12th St at Joyce Kilmer Av. New Brunswick (Middlesex County)	Quarterly Average	1.5 µg/m3	0.04 µg/m3

Notes:
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Sources: U.S. EPA AIRS*Data*, New Jersey Air Quality Monitor Value Report (2003).

Table 3.78
New Jersey State Monitored Ambient Air Quality Data
(Year 2004)

Pollutant	Monitoring Station	Ambient Concentration		
				NJ DEP Monitored Data
		Period	NAAQS	1st/2nd Highest
Carbon Monoxide (CO)	1 East Broad Street Burlington (Burlington County)	 1-hour 8-hour	 35 ppm 9 ppm	 4.3 / 4.0 ppm 2.6 / 2.6 ppm
	130 Smith Street Perth Amboy (Middlesex County)	1-hour 8-hour	35 ppm 9 ppm	3.7 / 3.5 ppm 2.2 / 2.1 ppm
Sulfur Dioxide (SO_2)	130 Smith Street Perth Amboy (Middlesex County)	3-hour 24-hour Annual	0.50 ppm 0.14 ppm 0.03 ppm	0.031 / 0.029 ppm 0.020 / 0.018 ppm 0.004 ppm
Particulate (PM_{10})	120 Academy Street Trenton Public Library (Mercer County)	24-hour Annual	150 $\mu g/m^3$ 50 $\mu g/m^3$	45 / 43 $\mu g/m^3$ 19.0 $\mu g/m^3$
Particulate ($PM_{2.5}$)	120 Academy Street Trenton Public Library (Mercer County)	24-hour Annual	65 $\mu g/m^3$ 15 $\mu g/m^3$	42 / 38 $\mu g/m^3$ 12.5 $\mu g/m^3$
	Ryders Lane & Log Cabin New Brunswick (Middlesex County)	24-hour Annual	65 $\mu g/m^3$ 15 $\mu g/m^3$	40 / 36 $\mu g/m^3$ 11.2 $\mu g/m^3$
Ozone (O_3)	Rider College, Lawrence (Mercer County)	1-hour 8-hour	0.12 ppm 0.08 ppm	0.103 ppm (2^{nd}) 0.082 ppm (4^{th})
	R. U. Veg. Research Ryders Ln, New Brunswick (Middlesex County)	1-hour 8-hour	0.12 ppm 0.08 ppm	0.112 ppm (2^{nd}) 0.080 ppm (4^{th})
Nitrogen Dioxide (NO_2)	R. U. Veg. Research (Middlesex County)	Annual Average	0.053 ppm	0.017 ppm
Lead (Pb)	12th St at Joyce Kilmer Av. New Brunswick (Middlesex County)	Quarterly Average	1.5 µg/m3	0.12 µg/m3

Notes:
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Sources: U.S. EPA AIRS*Data*, New Jersey Air Quality Monitor Value Report (2004).

Table 3.79
New Jersey State Monitored Ambient Air Quality Data
(Year 2005)

		Ambient Concentration		
				NJ DEP Monitored Data
Pollutant	**Monitoring Station**	**Period**	**NAAQS**	**1st/2nd Highest**
Carbon Monoxide (CO)	1 East Broad Street Burlington (Burlington County)	 1-hour 8-hour	 35 ppm 9 ppm	 4.3 / 4.3 ppm 2.9 / 2.5 ppm
Sulfur Dioxide (SO_2)	130 Smith Street Perth Amboy (Middlesex County) 130 Smith Street Perth Amboy (Middlesex County)	1-hour 8-hour 3-hour 24-hour Annual	35 ppm 9 ppm 0.50 ppm 0.14 ppm 0.03 ppm	3.7 / 3.0 ppm 2.2 / 1.9 ppm 0.050 / 0.040 ppm 0.025 / 0.021 ppm 0.004 ppm
Particulate (PM_{10})	120 Academy Street Trenton Public Library (Mercer County)	24-hour Annual	150 $\mu g/m^3$ 50 $\mu g/m^3$	53 / 48 $\mu g/m^3$ 23.0 $\mu g/m^3$
Particulate ($PM_{2.5}$)	120 Academy Street Trenton Public Library (Mercer County) Ryders Lane & Log Cabin New Brunswick (Middlesex County)	24-hour Annual 24-hour Annual	65 $\mu g/m^3$ 15 $\mu g/m^3$ 65 $\mu g/m^3$ 15 $\mu g/m^3$	27 / 27 $\mu g/m^3$ 11.8 $\mu g/m^3$ 30 / 28 $\mu g/m^3$ 12.7 $\mu g/m^3$
Ozone (O_3)	Rider College, Lawrence (Mercer County) R. U. Veg. Research Ryders Ln, New Brunswick (Middlesex County)	1-hour 8-hour 1-hour 8-hour	0.12 ppm 0.08 ppm 0.12 ppm 0.08 ppm	0.110 ppm (2^{nd}) 0.089 ppm (4^{th}) 0.125 ppm (2^{nd}) 0.092 ppm (4^{th})
Nitrogen Dioxide (NO_2)	R. U. Veg. Research (Middlesex County)	Annual Average	0.053 ppm	0.018 ppm
Lead (Pb)	12th St at Joyce Kilmer Av. New Brunswick (Middlesex County)	Quarterly Average	1.5 $\mu g/m^3$	0.16 $\mu g/m^3$

Notes:
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Sources: U.S. EPA AIRS*Data*, New Jersey Air Quality Monitor Value Report (2005).

3.19.5 Microscale Modeling Analysis

While regional or mesoscale burdens including the Proposed Project emissions were analyzed by the MPOs and have been included in their respective TIP/RTP conformity determinations, CO and $PM_{2.5}$ have been analyzed on a localized, or microscale level. These analyses were conducted due to the fact that ambient concentrations of CO and PM are predominantly influenced by mobile source emissions, and therefore, are the most relevant to the Proposed Project.

To evaluate ambient concentrations and the Proposed Project's potential impact, a series of mobile source microscale analyses was performed in accordance with the guidelines and assumptions outlined in the NJDEP guideline for air quality analysis for intersections, the NJDOT air analysis protocol, and EPA procedures for determining maximum ambient concentrations.

The existing ambient air quality conditions along the Project Corridor within Burlington, Mercer, and Middlesex Counties were examined by utilizing the EPA-developed *Guidelines for Modeling Carbon Monoxide from Roadway Intersections, (*EPA-454/R-92-005*)* and the NJDEP guidance. These guidance documents require that an air quality impact analysis be conducted to assess the significance of project impact by reviewing the Project Corridor's status, conducting a microscale hot-spot analysis and a regional emission evaluation, and identifying locations of sensitive receptors. Unless a screening assessment can conclude that non-significant impacts on air quality would result, a quantitative analysis to further determine compliance with standards and criteria is required. Thus, a series of quantitative microscale hot-spot air quality analyses were conducted to ascertain and report the potential impacts resulting from the Proposed Project traffic. The analysis procedures are consistent with the application of EPA's MOBILE6.2 and CAL3QHC models as presented in *User's Guide to Mobile6.2: Mobile Source Emission Factor Model* (Publication EPA-420-R-02-028) and *User's Guide to CAL3QHC, Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*. NJDEP's guidance provided in *Air Quality Analysis for Intersections* (NJDEP, May 2004), as well as NJDOT protocol, were also utilized.

The various steps employed in conducting the microscale modeling are described below. These general procedures were employed for modeling existing (2005) microscale conditions, as well as future microscale conditions, both with and without the Proposed Project.

Determine Air Quality Sensitive Areas

The Proposed Project alignment alternatives were reviewed to identify sensitive areas within the Project Corridor and to determine their distances from the roadway. Sensitive areas and receptors are residences, schools, nursing homes, parks, recreation areas, hospitals and any location associated with young, elderly or the infirm. The sensitive areas or receptors located within 500 feet from the Proposed Project were examined for current and future traffic conditions, including changes in levels of service, traffic volumes, congestion, etc., and were chosen as candidate sites for the screening study.

Screening Test

Next, based on traffic conditions, land use, and state screening criteria, the potentially-affected sensitive areas were examined. A screening test was conducted using changes in level of service and other traffic components to determine the significance of any potential impact on studied interchanges / intersections and sensitive locations pursuant to NJDEP guidance.

Analysis Sites Selection

Based on screening test results, projected traffic volumes, and relative distances between receptors and the roadway, a series of potential hot-spot analysis sites were selected. These locations included immediately adjacent sites that would experience direct impact from the Proposed Project, and sites near other local roads that could be significantly affected by the Proposed Project.

Receptors at each analyzed interchange or intersection site were located in reasonable locations based on the NJDEP guidance by consideration of the following:

- Receptors should be placed along each leg of the intersection or interchange, ramp, and on both sides of roadways;
- Receptors should be placed on the sidewalks where the general public has continuous access or along the closest property line where there are no sidewalks;
- Sidewalk receptors should be located outside the "mixing zone" of the free flow links, and therefore, shall be placed at least 9.9 feet (3.01 meters) away from the edge of roadway outside travel lane;
- Receptors should be located near the corner and at mid-block for each approach and departure at the intersection;
- For long approaches, the receptors should be located from the intersection corner up to the mid-block location;
- The nearest point (to traffic lanes) of property lines of all residences, hospitals, rest homes, schools, playgrounds or the entrances and air intakes to buildings should be used; and
- Receptors should be placed 6 feet (1.8 meter) above the ground.

Calculation of CO and $PM_{2.5}$ Vehicular Emissions and Concentrations

Emission calculations for the existing year and project construction year (estimated year of completion - ETC) year were performed. These calculations were based on traffic information and survey data, including traffic volumes, speeds, and vehicle classification. Emission factor calculation and air quality impact evaluation are in accordance with EPA publication AP-42, *Compilation of Air Pollutant Emission Factors – Second Edition, Mobile Source Emissions Model* (Latest Version, MOBILE6.2), and *CAL3QHC or CAL3QHCR Dispersion Model.*

The methodology for predicting motor vehicle-generated pollutant concentrations includes an examination of meteorology, traffic conditions and physical configurations. Procedures for determining maximum one-hour and eight-hour CO concentrations are included in the EPA-developed *Guideline for Modeling Carbon Monoxide from Roadway Intersections, (EPA-454/R-92-005)*, and *Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9 (Revised)*; and the guidance and procedures developed by NJDEP. Except for those survey data obtained from traffic analysis, regional summaries of traffic used in the emissions analysis were also based on the NJDEP guideline. Vehicular emissions were first determined mathematically as a function of route speed, vehicle classification, ambient temperature and other factors. A dispersion model was then employed to simulate mathematically how traffic, meteorology, and geometry combine to affect pollutant concentrations. Emission factors were then calculated by utilizing the EPA's computerized mobile source emissions model, *MOBILE6.2*. These factors were then multiplied by traffic volumes to determine free-flow corridor source strength and idle emissions. A mathematical model *CAL3QHC* (Version 2.0, EPA-404/12-92-006) developed by EPA was used to calculate the predicted air constituent concentrations. *CAL3QHC* is a state-of-the-art dispersion model widely used for predicting pollutant concentrations near roadway segments and intersections. This model assumes that the dispersion of pollutants downwind of a source follows a Gaussian distribution. Each lane of traffic is modeled as a straight, continuous, finite line source with a

uniform emission rate. The downwind CO and PM concentrations can be calculated by numerical integration along the line source.

A microscale analysis was conducted for CO and $PM_{2.5}$ concentrations for worst-case peak hour periods for various scenarios and analysis years. This task included a review of regional information, air quality background, meteorological data, and SIP information. By using the dispersion model, *CAL3QHC*, the air quality impact concentrations for the interchanges or intersections, and sensitive areas were predicted.

Assumption of Worst-Case Meteorological Conditions

In *CAL3QHC* modeling, the principal meteorological factors which influence the transport and concentration of pollutants from vehicular sources are wind speed, wind direction, mixing height, and atmospheric stability. Following the recommendations contained in the NJDEP guidance, the air quality analysis was based on the following assumptions:

- Utilization of the worst-case winter temperatures to evaluate emissions;
- An atmospheric stability class E (5) for rural areas, and D (4) for urban areas;
- A roughness length of 108 centimeters for suburban or rural locations;
- A wind speed of 1 meter/second (m/s);
- A mixing height of 1,000 meters; and
- A wind angle search at 5 degree increments to determine the highest concentration.

Determination of Background Concentrations

Background concentrations are those pollutant levels not directly accounted for through the mobile source modeling analysis of the project's traffic. It represents a significant portion of the total ambient carbon monoxide or particulates concentrations and would not usually be affected by project-related vehicular emissions. These background levels are added to the modeling results to obtain total pollutant concentrations at a prediction site. These total concentrations are then used for comparison with the NAAQS. Based on the NJDEP guidance, the default suburban area CO backgrounds of 3.0 ppm and 2.1 ppm, for 1-hour and 8-hour levels respectively, were used. For $PM_{2.5}$, the second highest 24-hour monitored value 28 $\mu g/m^3$ and annual average value 12.7 $\mu g/m^3$ (obtained from representative stations during the most recent year [2005] in the NJDEP's monitoring network) were used as 24-hour and annual average background concentrations, respectively (See Table 3.77).

Evaluation of Ambient Concentrations and Compliance Determination

The total ambient concentrations were obtained by adding the *CAL3QHC* predicted impacts to the background levels. These total CO levels were compared to the NAAQS of 35 and 9 ppm for the peak one-hour and eight-hour periods, respectively. The total $PM_{2.5}$ levels were compared to the NAAQS of 65 $\mu g/m^3$ and 15 $\mu g/m^3$ for the 24-hour and annual average periods, respectively.

3.19.6 Summary of Existing Air Quality Microscale Analysis

CAL3QHC was used to model one-hour and eight-hour CO concentrations resulting from vehicular emissions at each of the microscale analysis sites. These concentrations were added to the background concentrations to predict total ambient CO pollutant concentrations. The total one-hour and eight-hour CO levels were then compared to the NAAQS of 35 ppm and 9 ppm, respectively. The existing 2005 ambient CO concentrations for the areas immediately adjacent to the Project Corridor in Burlington, Mercer, and Middlesex Counties were assessed. Under 2005 existing worst peak hour condition, all estimated concentrations are well below (within) the standards, and no exceedances of one-hour or eight-hour NAAQS at any locations were predicted.

The microscale analysis site in each of the three Project Corridor counties that resulted in the worst-case CO concentrations was identified. In Burlington County, the worst-case concentrations were found to exist near Interchange 7 in Bordentown Township. In Mercer and Middlesex Counties, the worst-case concentrations were found to exist near Interchange 8 in East Windsor Township and near Interchange 8A in Monroe Township, respectively.

The one- and eight-hour ambient CO concentrations predicted for the worst-case receptor in each county are summarized in Tables 3.80 and 3.81, respectively. Of the three sites presented, the overall worst-case concentrations were found to exist near Interchange 8. The predicted maximum one-hour and eight-hour total CO ambient concentrations at the overall worst-case receptor location near Interchange 8 are 10.40 ppm and 7.28 ppm, respectively, while the NAAQS standards for one-hour and eight-hour CO concentrations are 35 ppm and 9 ppm, respectively.

Table 3.80
NJ Turnpike Interchange 6 – 8A Widening Project
Predicted Maximum Carbon Monoxide Concentration

1-hour Concentration (ppm)

Predicted Site / Interchange Area	2005 Existing	NAAQS
Burlington County/Interchange 7	9.20	35.0
Mercer County/Interchange 8	10.40	35.0
Middlesex County/Interchange 8A	9.20	35.0

Notes:
a. ppm = parts per million
b. Including 1-hour CO background concentrations 3.0 ppm
c. NAAQS (National Ambient Air Quality Standard) for 1-hr CO = 35 ppm

Source: The Louis Berger Group, Inc., February 2006.

Table 3.81
NJ Turnpike Interchange 6 – 8A Widening Project
Predicted Maximum Carbon Monoxide Concentration

8-hour Concentration (ppm)

Predicted Site / Interchange Area	2005 Existing	NAAQS
Burlington County/Interchange 7	6.44	9.0
Mercer County/Interchange 8	7.28	9.0
Middlesex County/Interchange 8A	6.44	9.0

Notes:
a. ppm = parts per million
b. Including 8-hour CO background concentrations 2.1 ppm
c. NAAQS (National Ambient Air Quality Standard) for 8-hr CO = 9 ppm

Source: The Louis Berger Group, Inc., February 2006.

The ambient total particulate ($PM_{2.5}$) concentrations were also predicted at microscale analysis sites in the three counties. Under 2005 existing conditions, all estimated concentrations are below (within) the standards, and no exceedances of 24-hour or annual average NAAQS at any locations considered in this analysis scenario were predicted.

The same general sites exhibiting the worst-case CO concentrations in each county along the Project Corridor were found to exhibit the worst-case $PM_{2.5}$ concentrations as well. The 24-hour and annual average ambient $PM_{2..5}$ concentrations predicted for the worst-case receptor in each county are summarized in Tables 3.82 and 3.83, respectively. Similar to the CO analysis, the overall worst-case $PM_{2.5}$ concentrations were also found to occur near Interchange 8. The predicted maximum 24-hour and annual average total $PM_{2.5}$ concentrations at the overall worst-case receptor location near Interchange 8 are 35.2 $\mu g/m^3$ and 14.14 $\mu g/m^3$, respectively, while the NAAQS standards for one-hour and eight-hour $PM_{2..5}$ concentrations are 65 $\mu g/m^3$ and 15 $\mu g/m^3$, respectively.

Table 3.82
NJ Turnpike Interchange 6 – 8A Widening Project
Predicted Maximum Particulates (PM2.5) Concentration

24-hour Concentration ($\mu g/m^3$)

Predicted Site / Interchange Area	2005 Existing	NAAQS
Burlington County/Interchange 7	34.4	65.0
Mercer County/Interchange 8	35.2	65.0
Middlesex County/Interchange 8A	33.6	65.0

Notes:
a. $\mu g/m^3$ = micro-gram per cubic meter
b. Including 24-hour $PM_{2.5}$ background concentrations 28 $\mu g/m^3$
c. NAAQS (National Ambient Air Quality Standard) for 24-hr $PM_{2.5}$ = 65 $\mu g/m^3$

Source: The Louis Berger Group, Inc., February 2006.

Table 3.83
NJ Turnpike Interchange 6 – 8A Widening Project
Predicted Maximum Particulates (PM2.5) Concentration

Annual Average Concentration ($\mu g/m^3$)

Predicted Site / Interchange Area	2005 Existing	NAAQS
Burlington County/Interchange 7	13.98	15.0
Mercer County/Interchange 8	14.14	15.0
Middlesex County/Interchange 8A	13.82	15.0

Notes:

a. $\mu g/m^3$ = micro-gram per cubic meter
b. Including annual average $PM_{2.5}$ background concentrations 12.7 $\mu g/m^3$
c. NAAQS (National Ambient Air Quality Standard) for annual average $PM_{2.5}$ = 15 $\mu g/m^3$

Source: The Louis Berger Group, Inc., February 2006

3.20 Noise

3.20.1 Introduction

A noise analysis was conducted to characterize existing noise levels in the Project Corridor. The Project Corridor for the noise analysis is defined as the area within 1,000 feet of either side of the existing Turnpike mainline right-of-way between the southern terminus located south of Interchange 6

and the northern terminus near Interchange 9. The Project Corridor also generally includes an equivalent distance around the Turnpike interchanges, except the area around Interchange 8, where an expanded area was considered to incorporate potential toll plaza relocation alternatives that have been studied.

Noise is basically defined as unwanted sound. It is emitted from many sources including airplanes, factories, railroads, and motor vehicles. Highway noise, or traffic noise, is usually a composite of noises from engine exhaust and tire-roadway interaction. The magnitude of noise is usually described by its sound pressure. Since the range of sound pressure varies greatly, a logarithmic scale is used to relate sound pressures to some common reference level, usually the decibel (dB). Sound pressures described in decibels are called sound pressure levels and are often defined in terms of frequency-weighted scales (A, B, C, or D).

The A-weighted decibel scale is used almost exclusively in vehicle noise measurement because it reflects the frequency range to which the human ear is most sensitive (1,000-6,000 Hertz). Sound levels measured using an A-weighted decibel scale are generally expressed as dBA. Throughout this section, all noise levels are expressed in dBAs. Several examples of noise pressure levels in dBA scale are listed in Table 3.84.

Table 3.84 indicates that most individuals in urbanized areas are exposed to fairly high noise levels from many sources as they go about their daily activities. The degree of disturbance or annoyance from unwanted sound depends essentially on three factors:

- The amount and nature of the intruding noise;
- The relationship between background noise and the intruding noise; and
- The type of activity occurring where the noise is heard.

In considering the first of these factors (i.e., amount and nature of the intruding noise), it is important to note that individuals have different sensitivity to noise. Loud noises bother some more than others and some patterns of noise also enter into an individual's judgment of whether or not a noise is offensive. For example, noises occurring during sleeping hours are usually considered to be more of a nuisance than the same noises in the daytime.

With regard to the second factor (i.e., the relationship between background noise and the intruding noise), individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). For instance, the blowing of a car horn at night when background noise levels are typically about 45 dBA would generally be more objectionable than the blowing of a car horn in the afternoon when background noises are likely to be 60 dBA or higher.

The third factor (i.e., the type of activity occurring where the noise is heard) is related to the interference of noises with activities of individuals. In a 60 dBA environment, normal work activities requiring high levels of concentration may be interrupted by loud noises, while activities requiring manual effort may not be interrupted to the same degree.

Since sound is described in logarithmic scale (i.e., dBs), sound levels can not be added by ordinary arithmetic means. In fact, a doubling of the noise source produces only a 3 dB increase in the sound pressure (noise) level. Studies have shown that this increase is barely perceptible to the human ear, whereas a change of 5 dB is readily perceptible. As a general rule, an increase or decrease of 10 dBs in noise level is perceived by an observer to be a doubling or halving of the sound, respectively.

Table 3.84
Examples of Common Sounds:
A-weighted Sound Level in Decibels (dBA)

A-weighted	Overall Level	Noise Environment
120	Uncomfortably loud (32 times as loud as 70 dBA)	Military jet airplane takeoff at 50 feet.
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet. Locomotive pass-by at 100 feet.
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet. Diesel truck 40 mph at 50 feet.
70	Moderately loud	Freeway at 50 feet from pavement edge at 10 a.m. Vacuum cleaner (indoor).
60	Relatively quiet (1/2 as loud as 70 dBA)	Air condition unit at 100 feet. Dish washer at 10 feet (indoor).
50	Quiet (1/4 as loud as 70 dBA)	Large transformers. Small private office (indoor).
40	Very quiet (1/8 as loud as 70 dBA)	Birds calls. Lowest limit of urban ambient sound.
10	Extremely quiet	Just audible (1/64 as loud as 70 dBA)
0		Threshold of hearing.

Source: Federal Agency Review of Selected Airport Noise Analysis Issues, 1992.
Modified by The Louis Berger Group, Inc., 2003.

3.20.2 Data Sources and Methodology

3.20.2.1 Data Sources

Residential areas are specifically addressed as part of the Turnpike Authority's current *Policy for Construction of Noise Barriers in Residential Areas* (Revised – Effective Date, December 18, 2001), and therefore, are the focus of the noise analysis conducted for the Proposed Project. Residential areas or neighborhoods located along the Project Corridor were identified via review of 2002 aerial photos at 1"= 400' scale and a series of internal reports prepared by The Louis Berger Group for the Authority regarding their Retrofit Noise Barrier Program. These sources were supplemented by field investigation along the Project Corridor, as well as information about recently-approved residential development obtained from local tax offices.

3.20.2.2 Methodology

Noise monitoring was performed at 19 sensitive receptor sites located within the Project Corridor in order to identify existing noise levels. These sites, all of which are located to the south of Interchange 8A, include existing residential areas containing at least five residences in a cluster, as well as a senior citizens community. The selection of representative receptors for monitoring was designed to maximize understanding of the variety of roadway-receptor configurations that exist (e.g., topography, distance, traffic volumes, etc.). In general, at least one receptor point in each of the residential neighborhoods located to the south of Interchange 8A was selected for measurement.

Of the 19 monitoring sites, four were measured for continuous 24-hour periods, while the others were measured for short-term periods of 20 minutes each. One 24-hour measurement site was included within each of the individual Turnpike segments between Interchanges 6 and 8A (i.e., one each between Interchanges 6 and 7, Interchanges 7 and 7A, Interchanges 7A and 8, and Interchanges 8 and 8A). Short-term noise levels were measured during weekday AM and PM peak hours (6:30 AM to 9:00 AM and 3:00 PM to 6:00 PM, respectively). All measurements recorded noise levels for Leq, L10, L50, L90, LMin, and LMax.

In locations where noise barriers already exist along the Project Corridor, no monitoring was performed since the noise levels behind the barriers in those areas are not representative of highway-related noise. For instance, in the case of the Interchange 8A to Interchange 9 segment of the Proposed Project, most residential neighborhoods are already protected by noise barriers as a result of the previous Turnpike widening completed in the early 1990s, as well as a retrofit noise barrier program implemented by the Authority during that same decade. Therefore, no noise measurements were taken at those already-protected neighborhoods. For the few neighborhoods along that segment that are not currently protected by noise barriers, the results of previous noise-level measurements conducted for the Authority were used.

Existing A-weighted noise levels were monitored in general accordance with NJDOT Traffic Noise Policy, and FHWA's *Measurement of Highway-Related Noise: Final Report* (FHWA-PD-96-046). Measurements at each identified site were taken in order to establish the baseline noise environments. Bruel & Kjaer 2236, 2260, and Rion NL-21 Precision Sound Level Meters (SLM) were used for field measurement. The SLMs meet or exceed the requirements set forth in the ANSI S1.4-1983 Standards for Type 1 and 2 quality and accuracy. Acoustical calibrators (Bruel & Kjaer 4230 and 4231) were used to calibrate the SLMs for each measurement interval.

The SLMs were operated on the A-weighting network and slow-meter response as recommended by FHWA. Measurements were not collected when roadway pavement was wet, or when wind speed exceeded 12 miles per hour. A porous windscreen was used on each SLM during all measurement periods. All of the measurements were taken by mounting the SLMs approximately five feet above the sidewalk or ground surface at each receptor. This height is generally considered representative of ear level of an average person. Wherever possible, measurement sites were located in open areas away from buildings or other potentially reflective surfaces, but which are representative of the outdoor use area of a given receptor.

Along with the noise measurements, a Field Noise Monitoring Sheet was completed, which noted variables such as site surface, pavement type, nearby landmark, distance to landmark, lane direction, site address, observer, grade difference (if any), temperature, wind speed, and a sketch of the Project Corridor. If an unusual noise source interrupted the monitoring session, the measurement was temporarily paused until the noise source was out of range. Typical noise sources of this type include occasional aircraft overflights, local idling of motorcycles, barking dogs, etc.

3.20.3 Existing Noise Levels

The 19 residential sites at which noise measurements were taken specifically for the Proposed Project, as well as their recorded noise levels, are graphically depicted in Figures 3-31a through 3-31f. Also presented on those figures are three additional residential sites located to the north of Interchange 8A, for which recent noise measurements were available from previous studies conducted for the Authority. Existing noise barriers constructed within the Project Corridor are also depicted on the figures, since no measurements were taken at the neighborhoods behind those barriers. Most of the existing noise barriers that exist within the Project Corridor are located between Interchanges 8A and 9, although four barriers exist south of Interchange 8A as well.

3.20.3.1 24-Hour Noise Measurement Levels

As indicated previously, four of the 19 residential sites were monitored for 24-hour periods. The advantage of 24-hour monitoring is that the recorded noise levels during each hour confirms the period of peak traffic noise, thereby ensuring that the short-term measurements will coincide with the peak traffic noise periods along each segment and along each side of the Turnpike. These four 24-hour monitoring sites are described below.

Interchange 6 to Interchange 7 – Site No. 1, a residence located at 817 Hedding – Mansfield Road in Mansfield Township (M.P. 51.4 southbound), was monitored for a continuous 24-hour period. The residence is situated approximately 500 feet from the existing southbound edge of pavement, and is representative of a small cluster of homes lining both sides of the perpendicular roadway, as well as a proposed adjacent development of nine homes that has advanced through the subdivision process. The monitor was placed at the side of the home facing the Turnpike. Noise levels at this site ranged between 49.6 dBA during the early morning hours and 58.0 dBA during the early evening. Predominant noise sources at this location were occasional bird noises, and vehicular traffic on the Turnpike and Mansfield Road. Noise measurement results at this site are presented in Table 3.85.

Interchange 7 to Interchange 7A – Site No. 4, a residence located at 41 Shanahan Lane in Chesterfield Township (M.P. 55.7 northbound), was monitored for a continuous 24-hour period. The residence is situated approximately 200 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the dead-end roadway that meets the Turnpike at a 45-degree angle. The monitor was placed at the rear of the home facing the Turnpike. Noise levels ranged between 66.6 dBA during the early morning hours and 73.8 dBA during the AM peak traffic period. Predominant noise sources were occasional aircraft flyovers and vehicular traffic on the Turnpike. Noise measurement results at this site are presented in Table 3.86.

Interchange 7A to Interchange 8 – Site No. 8, a residence located at 19 Hickory Way in Washington Township (M.P. 60.8 southbound), was monitored for a continuous 24-hour period. The residence is situated approximately 300 feet from the existing southbound edge of pavement, and is representative of a development of 30 – 40 new homes constructed off of Robbinsville – Allentown Road. The monitor was placed at the rear of the home facing the Turnpike. Noise levels ranged between 59.6 dBA during the early morning hours and 67.3 dBA during the AM peak traffic period. Predominant noise sources at this site were occasional bird noises, aircraft flyovers and vehicular traffic on the Turnpike. Noise measurement results at this site are presented in Table 3.87.

Table 3.85
24-Hour Noise Measurement Results

Site 1 - 817 Hedding - Mansfield Road		
24 Hour Measurements		
Date	**Time**	**Leq (1-Hour)**
3/21/2006	12:00 PM	53.3
3/21/2006	1:00 PM	53.2
3/21/2006	2:00 PM	55.3
3/21/2006	3:00 PM	53.9
3/21/2006	4:00 PM	54.8
3/21/2006	5:00 PM	56.4
3/21/2006	6:00 PM	57.9
3/21/2006	7:00 PM	58.0
3/21/2006	8:00 PM	57.7
3/21/2006	9:00 PM	55.2
3/21/2006	10:00 PM	55.2
3/21/2006	11:00 PM	52.1
3/22/2006	12:00 AM	50.6
3/22/2006	1:00 AM	49.6
3/22/2006	2:00 AM	49.9
3/22/2006	3:00 AM	52.0
3/22/2006	4:00 AM	52.6
3/22/2006	5:00 AM	54.3
3/22/2006	6:00 AM	55.7
3/22/2006	7:00 AM	55.2
3/22/2006	8:00 AM	54.9
3/22/2006	9:00 AM	55.2
3/22/2006	10:00 AM	54.4
3/22/2006	11:00 AM	53.2

Source: The Louis Berger Group, Inc. 2006.

Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

0 500 1,000 2,000 Feet

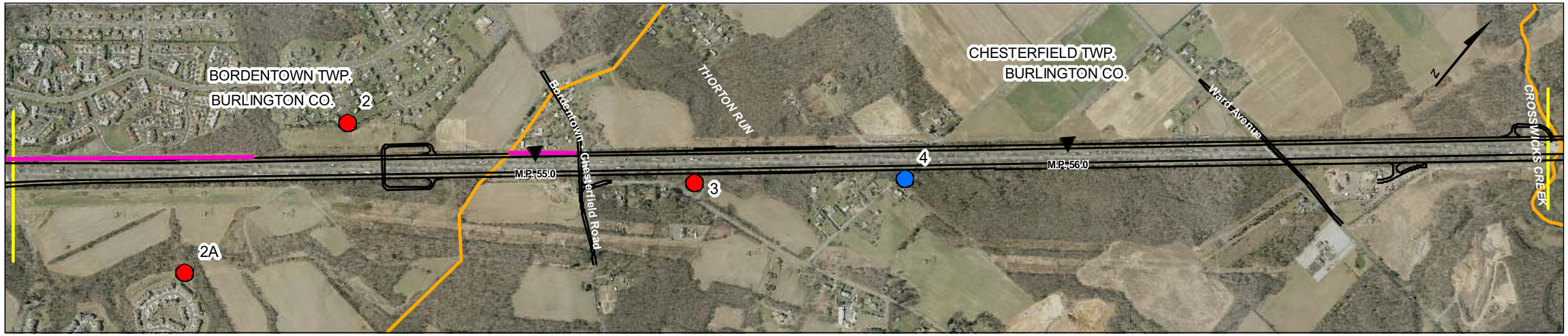
Source: Digital Orthophotos - 2006 Aerial Photography.

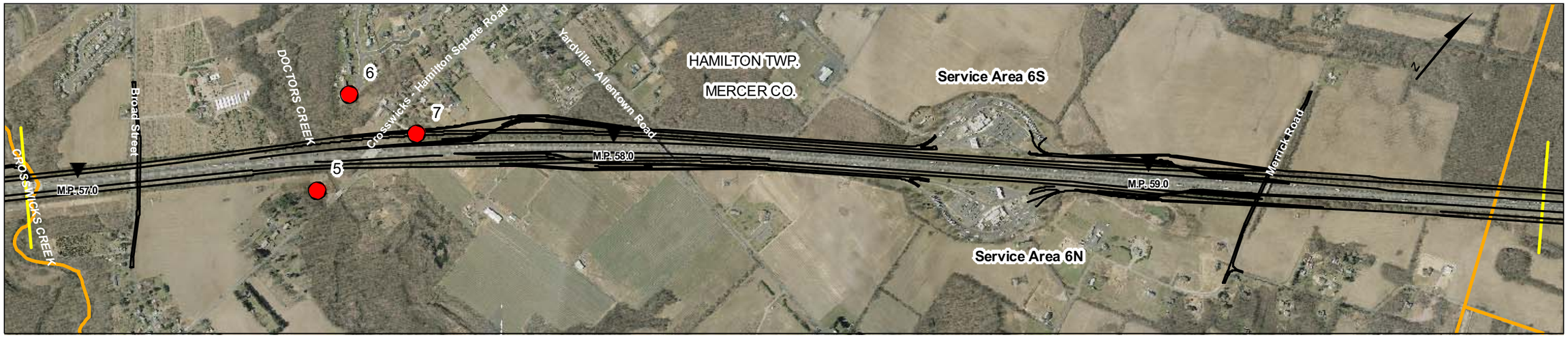
NOISE MEASUREMENT SITES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-31a





0 500 1,000 2,000 Feet

Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

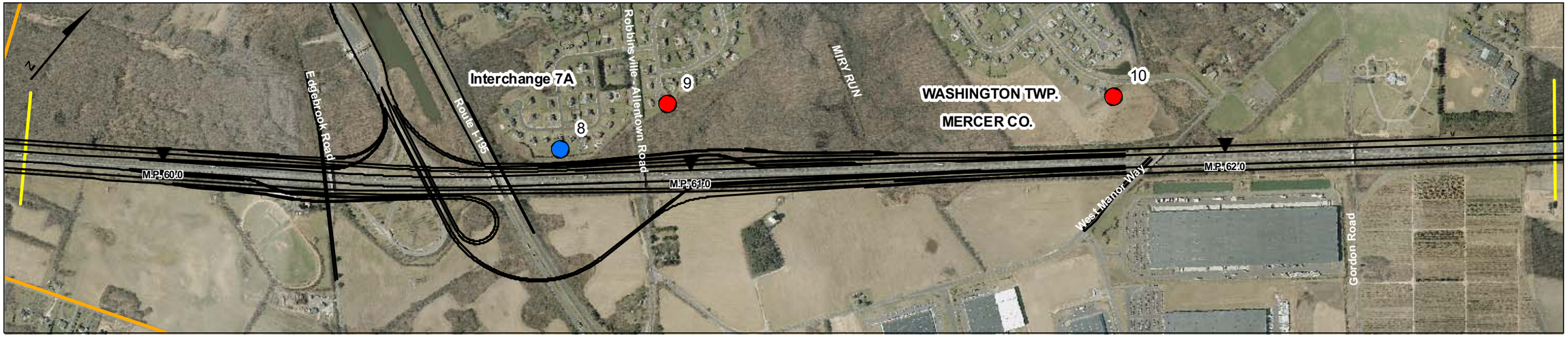
Source: Digital Orthophotos - 2006 Aerial Photography.

NOISE MEASUREMENT SITES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-31b



0 500 1,000 2,000 Feet

Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

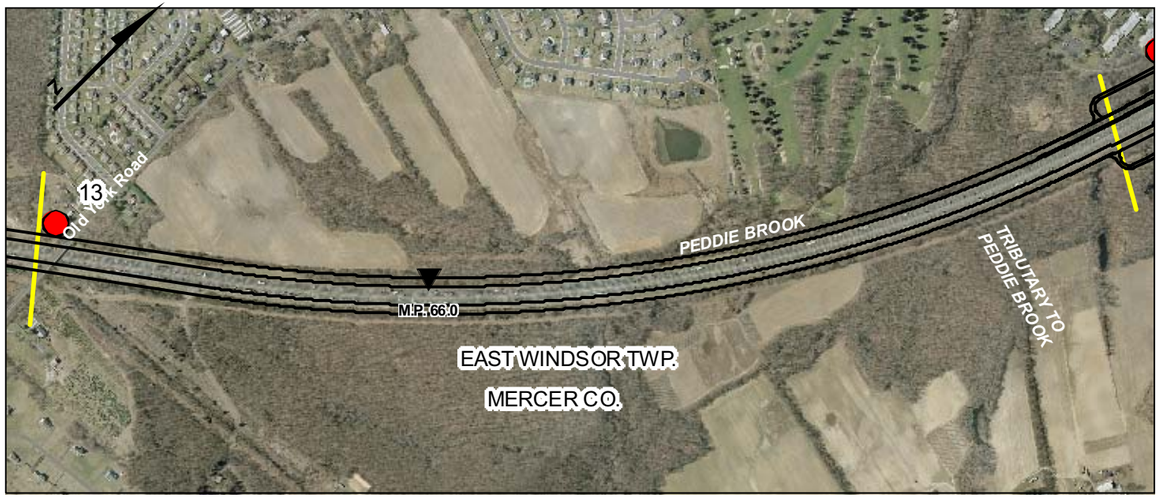
Source: Digital Orthophotos - 2006 Aerial Photography.

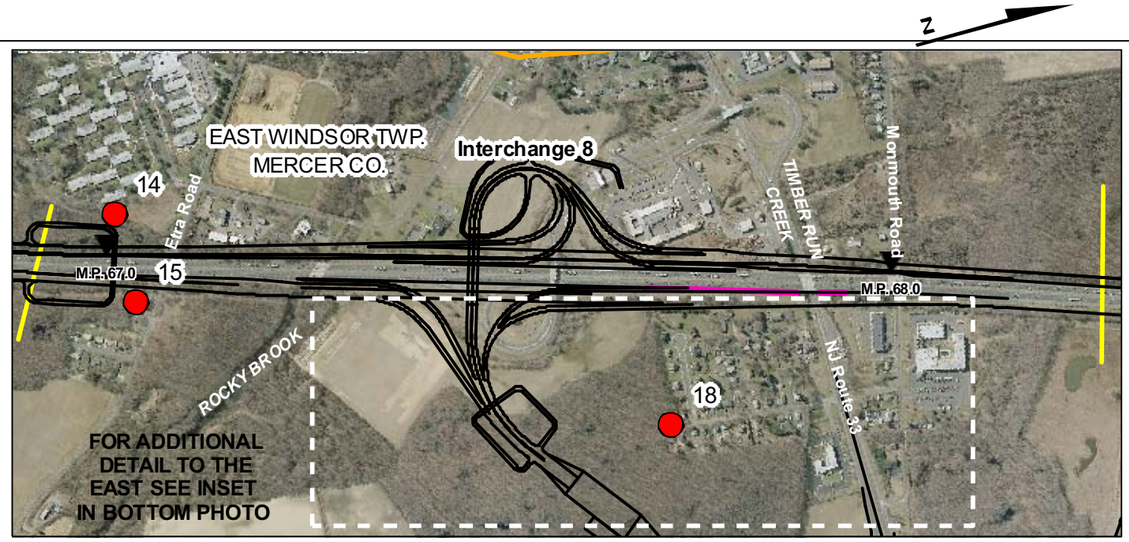
NOISE MEASUREMENT SITES

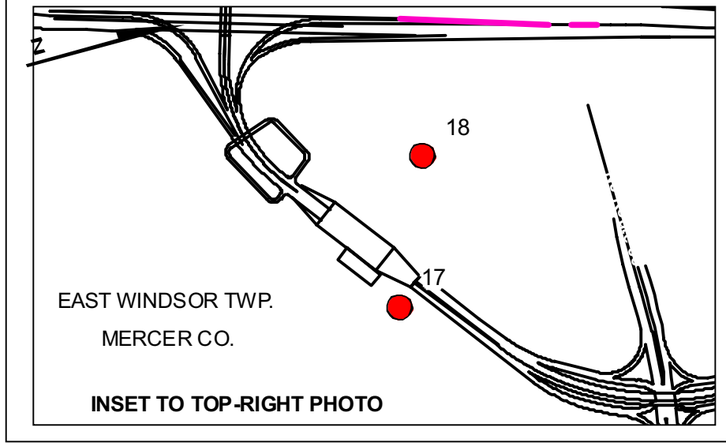
New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-31c







Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

0 500 1,000 2,000 Feet

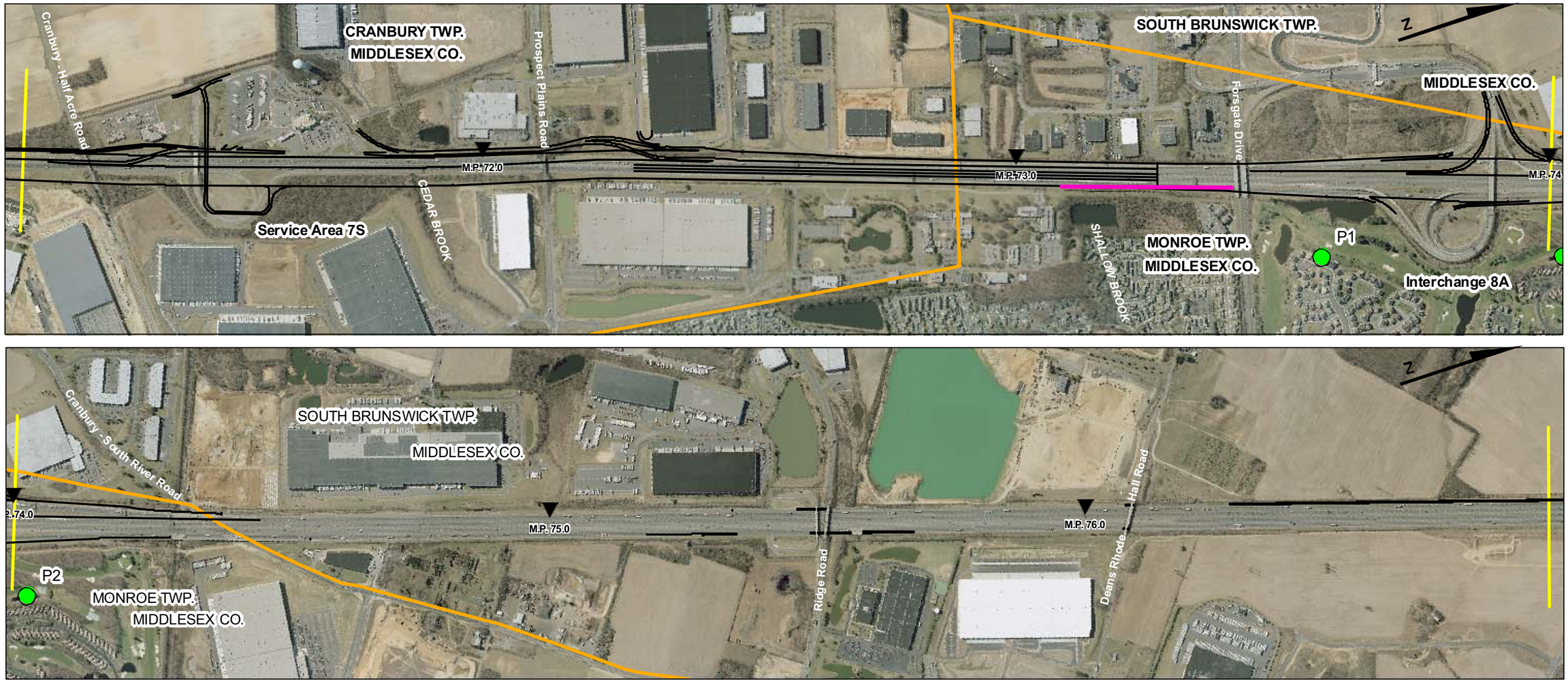
Source: Digital Orthophotos - 2006 Aerial Photography.

NOISE MEASUREMENT SITES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-31d



0 500 1,000 2,000 Feet

Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

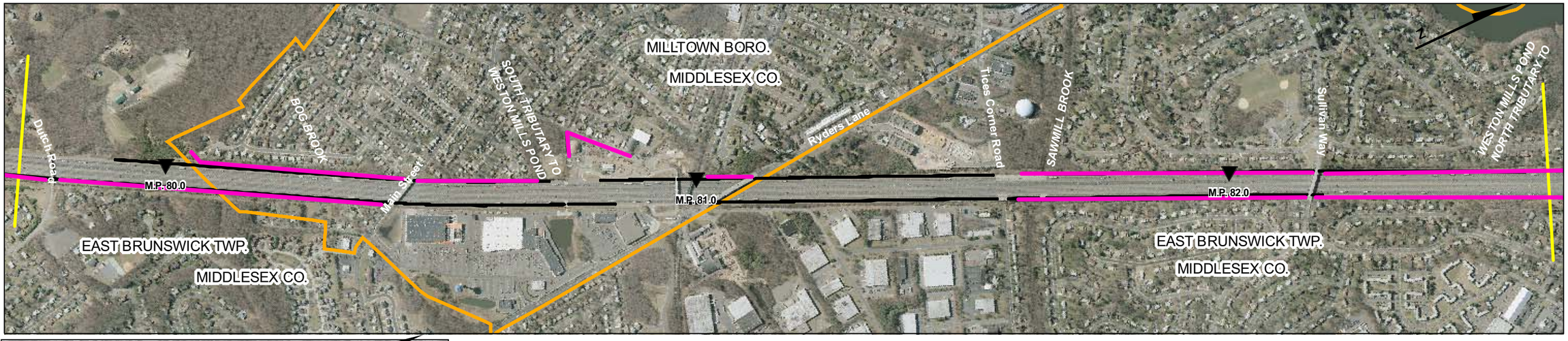
Source: Digital Orthophotos - 2006 Aerial Photography.

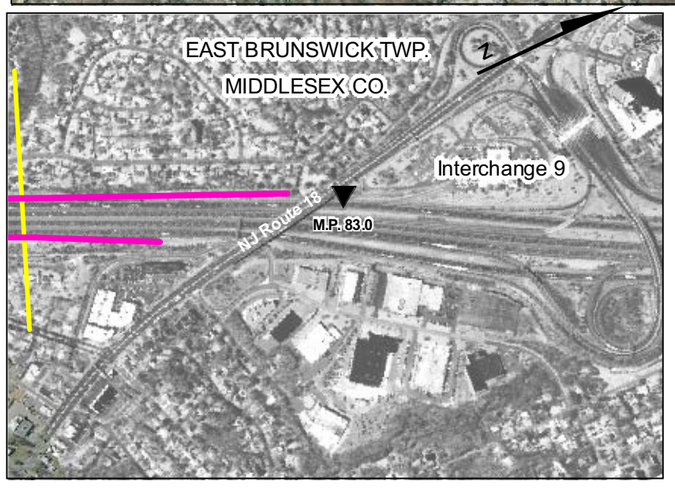
NOISE MEASUREMENT SITES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
Environmental Impact Statement

NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE
3-31e





Legend

- Matchline
- Municipal / County Boundary
- Short-term monitoring sites
- Long-term monitoring sites
- Previously monitored sites
- Existing Noise Walls

0 500 1,000 2,000 Feet

Source: Digital Orthophotos - 2006 Aerial Photography.

NOISE MEASUREMENT SITES

New Jersey Turnpike Interchange 6 to 9 Widening
Burlington, Mercer and Middlesex Counties
Executive Order No. 215
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NEW JERSEY TURNPIKE AUTHORITY
NEW JERSEY TURNPIKE

FIGURE 3-31f

Table 3.86
24-Hour Noise Measurement Results

Site 4 - 41 Shanahan Lane		
24 Hour Measurements		
Date	**Time**	**Leq (1-Hour)**
3/21/2006	12:00 PM	70.7
3/21/2006	1:00 PM	69.9
3/21/2006	2:00 PM	70.4
3/21/2006	3:00 PM	71.0
3/21/2006	4:00 PM	70.8
3/21/2006	5:00 PM	70.3
3/21/2006	6:00 PM	69.5
3/21/2006	7:00 PM	68.2
3/21/2006	8:00 PM	67.9
3/21/2006	9:00 PM	67.5
3/21/2006	10:00 PM	67.5
3/21/2006	11:00 PM	67.0
3/22/2006	12:00 AM	66.6
3/22/2006	1:00 AM	67.0
3/22/2006	2:00 AM	68.2
3/22/2006	3:00 AM	69.6
3/22/2006	4:00 AM	70.6
3/22/2006	5:00 AM	72.2
3/22/2006	6:00 AM	73.2
3/22/2006	7:00 AM	73.8
3/22/2006	8:00 AM	73.3
3/22/2006	9:00 AM	72.9
3/22/2006	10:00 AM	72.6
3/22/2006	11:00 AM	71.8

Source: The Louis Berger Group, Inc. 2006

Table 3.87
24-Hour Noise Measurement Results

Site 8 - 19 Hickory Way		
24 Hour Measurements		
Date	**Time**	**Leq (1-Hour)**
2/28/2006	1:00 PM	64.3
2/28/2006	2:00 PM	66.2
2/28/2006	3:00 PM	66.6
2/28/2006	4:00 PM	66.3
2/28/2006	5:00 PM	66.1
2/28/2006	6:00 PM	65.2
2/28/2006	7:00 PM	65.7
2/28/2006	8:00 PM	65.0
2/28/2006	9:00 PM	64.1
2/28/2006	10:00 PM	63.2
2/28/2006	11:00 PM	62.3
2/28/2006	12:00 AM	61.5
3/1/2006	1:00 AM	59.6
3/1/2006	2:00 AM	60.2
3/1/2006	3:00 AM	60.1
3/1/2006	4:00 AM	64.4
3/1/2006	5:00 AM	65.6
3/1/2006	6:00 AM	67.3
3/1/2006	7:00 AM	66.7
3/1/2006	8:00 AM	64.5
3/1/2006	9:00 AM	64.2
3/1/2006	10:00 AM	64.8
3/1/2006	11:00 AM	64.0
3/1/2006	12:00 PM	65.4

Source: The Louis Berger Group, Inc. 2006

Interchange 8 to Interchange 8A – Site No. 16, a residence located at 14 Hightstown-Cranbury Station Road in Cranbury Township (M.P. 70.0 northbound) was monitored for a continuous 24-hour period. The residence is situated approximately 150 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that crosses under the Turnpike at approximately a 45-degree angle. The monitor was placed at the rear of the home facing the Turnpike. Noise levels ranged between 69.1 dBA during the early morning hours and 75.9 dBA during the AM peak traffic period. The predominant noise source at this site was vehicular traffic on the Turnpike. Noise measurement results at this site are presented in Table 3.88.

Table 3.88
24-Hour Noise Measurement Results

Site 16 - 14 Hightstown-Cranbury Station Road		
24 Hour Measurements		
Date	**Time**	**Leq (1-Hour)**
3/23/2006	1:00 PM	74.0
3/22/2006	2:00 PM	75.3
3/22/2006	3:00 PM	75.4
3/22/2006	4:00 PM	75.1
3/22/2006	5:00 PM	74.8
3/22/2006	6:00 PM	73.7
3/22/2006	7:00 PM	72.0
3/22/2006	8:00 PM	72.4
3/22/2006	9:00 PM	71.5
3/22/2006	10:00 PM	70.4
3/22/2006	11:00 PM	69.7
3/23/2006	12:00 AM	69.1
3/23/2006	1:00 AM	69.1
3/23/2006	2:00 AM	69.8
3/23/2006	3:00 AM	71.2
3/23/2006	4:00 AM	73.8
3/23/2006	5:00 AM	74.8
3/23/2006	6:00 AM	75.7
3/23/2006	7:00 AM	75.9
3/23/2006	8:00 AM	75.9
3/23/2006	9:00 AM	75.6
3/23/2006	10:00 AM	74.9
3/23/2006	11:00 AM	74.7
3/23/2006	12:00 PM	72.4

Source: The Louis Berger Group, Inc. 2006

3.20.3.2 Short-Term Noise Measurement Levels

Fifteen receptors located in currently unprotected residential areas along the Turnpike between the southern project terminus and Interchange 8A were monitored for short-term, 20-minute periods during both the AM and PM peak traffic periods on a typical weekday. The locations of these receptors are depicted on Figures 3-31a through 3-31f, and the results of both short-term noise measurements at each receptor are presented in Table 3.89.

Assiscunk Creek to Interchange 6

No residential areas containing at least five clustered homes exist within this segment.

Interchange 6 to Interchange 7

No currently unprotected residential areas containing at least five clustered homes, other than Site No. 1 (see Section 3.20.3.1 above), exist within this segment.

Interchange 7 to Interchange 7A

Short-term noise levels were measured at Site No. 2A, a residence located at 49 Winding Brook Road in Bordentown Township (M.P. 54.3 northbound). The residence is situated approximately 1,000 feet from the existing northbound edge of pavement, and is representative of a large residential development constructed off of Bordentown – Georgetown Road. The monitoring equipment was placed approximately 20 feet from the rear of the home, facing the Turnpike. The highest recorded noise level was 64.3 dBA, measured during the PM peak traffic period. The predominant noise sources at this location were occasional bird noises, aircraft flyovers and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 2, a residence located at 6 David Court in Bordentown Township (M.P. 54.6 southbound). The residence is situated approximately 400 feet from the existing southbound edge of pavement, and is representative of a development of more than 50 homes constructed off of Bordentown – Chesterfield Road. The monitoring equipment was placed approximately 15 feet from the rear of the home, facing the Turnpike. The highest recorded noise level was 65.2 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 3, a residence located at 200 Bordentown-Crosswicks Road in Chesterfield Township (M.P. 55.2 northbound). The residence is situated approximately 100 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that runs parallel to the Turnpike for a short distance. The monitoring equipment was placed approximately 25 feet from the rear of the home, facing the Turnpike. The highest noise level recorded was 73.5 dBA, measured during the PM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 5, a residence located at 4827 Crosswicks-Hamilton Square Road in Hamilton Township (M.P. 57.4 northbound). The residence is situated approximately 400 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that crosses under the Turnpike at approximately a 45-degree angle. The monitoring equipment was placed approximately 24 feet from the rear of the home, facing the Turnpike. The highest noise level recorded was 64.7 dBA during both the AM and PM peak hours. The predominant noise sources were occasional bird noises, aircraft flyovers, and vehicular traffic on the Turnpike and Crosswicks-Hamilton Square Road.

Table 3.89
Short-Term Noise Measurement Results

Site	Address	Date	Time	Period	Leq
2A	49 Winding Brook Road	3/1/06	6:39 AM	AM	**63.5**
		2/28/06	3:59 PM	PM	**64.3**
2	6 David Court	3/1/06	7:10 AM	AM	**65.2**
		2/28/06	3:25 PM	PM	**61.5**
3	200 Bordentown-Crosswicks Road	2/22/06	8:55 AM	AM	**72.6**
		2/21/06	5:09 PM	PM	**73.5**
5	4827 Crosswicks-Hamilton Square Road	3/1/06	7:46 AM	AM	**64.7**
		2/28/06	4:51 PM	PM	**64.7**
6	38 Alessio Terrace	3/1/06	8:15 AM	AM	**56.6**
		2/28/06	5:23 PM	PM	**57.3**
7	4654 Crosswicks-Hamilton Square Road	2/22/06	8:26 AM	AM	**72.2**
		2/21/06	4:09 PM	PM	**70.1**
9	Cottage Place Drive	3/23/06	8:02 AM	AM	**57.0**
		3/22/06	4:32 PM	PM	**56.5**
10	1 Patriot Drive	3/1/06	8:01 AM	AM	**57.2**
		2/28/06	5:04 PM	PM	**58.1**
11	301 Sharon Road	2/22/06	7:36 AM	AM	**64.1**
		2/21/06	4:34 PM	PM	**67.7**
12	24 Allens Road	2/22/06	7:09 AM	AM	**66.8**
		2/21/06	5:07 PM	PM	**66.0**
13	892 Old York Road	3/1/06	7:25 AM	AM	**76.8**
		2/28/06	4:22 PM	PM	**76.3**
14	49 Meadow Lakes	3/1/06	6:55 AM	AM	**59.7**
		2/28/06	3:48 PM	PM	**58.6**
15	254 Etra Road	2/22/06	6:33 AM	AM	**69.6**
		2/21/06	3:14 PM	PM	**69.0**
17	36 Daniel Street	3/23/06	7:20 AM	AM	**56.4**
		3/22/06	3:44 PM	PM	**57.5**
18	63 Woodside Avenue	3/1/06	6:25 AM	AM	**56.7**
		2/28/06	3:04 PM	PM	**57.7**

Source: The Louis Berger Group, Inc., 2006.

Short-term noise levels were measured at Site No. 6, at the residence of 38 Alessio Terrace in Hamilton Township (M.P. 57.5 southbound). The residence is situated approximately 500 feet from the existing southbound edge of pavement, and is representative of approximately six homes which are part of a larger development that extends into the Project Corridor. The monitoring equipment was placed approximately 27 feet from the side of the home, facing the Turnpike. The highest recorded noise level was 57.3 dBA, measured during the PM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 7, a residence located at 4654 Crosswicks-Hamilton Square Road in Hamilton Township (M.P. 57.6 southbound). The residence is situated approximately 100 feet from the existing southbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that crosses under the Turnpike at approximately a 45-degree angle. The monitoring equipment was placed approximately 12 feet from the wooden fence at the Turnpike right-of-way line. The highest noise level recorded was 72.2 dBA, measured during the AM peak traffic period. The predominant noise sources were vehicular traffic on the Turnpike and Crosswicks-Hamilton Square Road.

Interchange 7A to Interchange 8

Short-term noise levels were measured at Site No. 9, a point at the end of Cottage Place Drive in Washington Township (M.P. 61.0 southbound). The residence is situated approximately 700 feet from the existing southbound edge of pavement, and is representative of a development of approximately 15 homes constructed off of Robbinsville – Allentown Road. The monitoring equipment was placed on the end of the road, parallel to the first row of homes closest to the Turnpike. The highest recorded noise level was 57.0 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were occasional bird noises, aircraft flyovers and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 10, a residence located at 1 Patriot Drive in Washington Township (M.P. 61.8 southbound). The residence is situated approximately 600 feet from the existing southbound edge of pavement, and is representative of a development of approximately 25 homes constructed off of West Manor Way. The monitoring equipment was placed approximately three feet from the metal fence at the rear of the home, facing the Turnpike. The highest recorded noise level was 58.1 dBA, measured during the PM peak traffic period. The predominant noise sources at this site were vehicular traffic on the Turnpike, Patriot Drive and West Manor Way.

Short-term noise levels were measured at Site No. 11, a residence located at 301 Sharon Road in Washington Township (M.P. 63.1 northbound). The residence is situated approximately 700 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that crosses over the Turnpike at approximately a 45-degree angle. The monitoring equipment was placed approximately 28 feet from the rear of the home, facing the Turnpike. The highest recorded noise level was 67.7 dBA, measured during the PM peak traffic period. The predominant noise sources at this site were vehicular traffic on the Turnpike and Sharon Road.

Short-term noise levels were measured at Site No. 12, a residence located at 24 Allens Road in Washington Township (M.P. 63.8 northbound). The residence is situated approximately 550 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that runs parallel to the Turnpike. The monitoring equipment was placed approximately 36 feet from the rear of the home, facing the Turnpike. The highest recorded noise level was 66.8 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 13, a residence located at 892 Old York Road in East Windsor Township (M.P. 65.5 southbound). The residence is situated approximately 100 feet from the existing southbound edge of pavement, and is representative of a large development constructed off of Old York Road. The monitoring equipment was placed in the front of the home, in the street at the end of Old York Road, facing the Turnpike. The highest recorded noise level at this site was 76.8 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site No. 14, a residence located at 49 Meadow Lakes in East Windsor Township (M.P. 67.0 southbound). The residence is situated approximately 350 feet from the existing southbound edge of pavement, and is representative of the large Meadow Lakes Assisted-Living and Senior Community. The monitoring equipment was placed approximately 29 feet from the front of the home, facing the Turnpike. The highest recorded noise level was 59.7 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike and Meadow Lakes Road.

Short-term noise levels were measured at Site No. 15, a residence located at 254 Etra Road in East Windsor Township (M.P. 67.0 northbound). The residence is situated approximately 150 feet from the existing northbound edge of pavement, and is representative of a small cluster of homes lining both sides of the roadway that crosses over the Turnpike. The monitoring equipment was placed approximately 36 feet from the rear of the home, facing the Turnpike. The highest recorded noise level was 69.6 dBA, measured during the AM peak traffic period. The predominant noise sources at this location were vehicular traffic on the Turnpike and Etra Road.

Interchange 8 to Interchange 8A

Short-term noise levels were measured at Site No. 17, a residence located at 36 Daniel Street in East Windsor Township (M.P. 67.7 northbound). The residence is situated approximately 1,950 feet from the existing northbound edge of pavement, and is representative of a small linear development constructed off of Milford Road. This receptor was selected for monitoring due to its proximity to a proposed relocation of Interchange 8 to the east of the existing Turnpike. The monitoring equipment was placed in front of the home at the end of Daniel Street, facing the Turnpike. The highest recorded noise level was 57.5 dBA, measured during the PM peak traffic period. The predominant noise sources at this location were occasional bird noises and vehicular traffic on the Turnpike and N.J. Route 33.

Short-term noise levels were measured at Site No. 18, a residence located at 63 Woodside Avenue in East Windsor Township (M.P. 67.7 northbound). The residence is situated approximately 950 feet from the existing northbound edge of pavement, and is representative of a development of approximately 40 homes constructed off of N.J. Route 33 near Interchange 8. Although a noise barrier already exists along the Turnpike to protect this development, this receptor is specifically representative of the portion of the development located furthest away from, and east of the Turnpike, close to the area where a relocation of Interchange 8 is proposed to be constructed to the south and east of the development. The monitoring equipment was placed approximately 15 feet from the front of the home, facing the Turnpike. The highest recorded noise level was 57.7 dBA, measured during the PM peak traffic period. The predominant noise sources at this site were occasional bird noises and vehicular traffic on the Turnpike and Woodside Avenue.

3.20.3.3 Interchange 8A – Interchange 9 Previous Noise Measurement Levels

For the few currently unprotected residential developments within the portion of the Project Corridor located between Interchange 8A and Interchange 9, previously monitored noise levels collected for the Authority were available and are presented as the baseline noise condition for that segment. Three

short-term sites were monitored during the weekdays in February and March of 2003 at residential developments that were already existing or under construction at that time. These sites and their monitored noise levels are provided in Table 3.90.

Table 3.90
Previous Noise Measurement Results

Site	Address	Date	Time	Period	Leq
P1	60 Muirfield Boulevard	2/6/03	6:00 AM	AM	63
P2	73 Fairways Boulevard	3/27/03	6:00 AM	AM	65
P3	33 McGinnis Street	3/18/03	6:00 AM	AM	68

Short-term noise levels were measured at Site P1, at the residence of 60 Muirfield Boulevard in Monroe Township (M.P. 73.6 northbound). The site was located approximately 600 feet from the existing northbound edge of pavement, and was representative of a new development (The Fairways at Forsgate) that was still under construction near Interchange 8A at the time of conducting the measurements. The monitoring equipment was placed approximately 40 feet from the rear of the home, facing the Turnpike. The maximum one-hour noise level recorded during the weekday AM peak traffic period was approximately 63.0 dBA. The predominant noise source was vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site P2, at the residence of 73 Fairways Boulevard in Monroe Township (M.P. 74.0 northbound). The site was located approximately 600 feet from the existing northbound edge of pavement, and was representative of a large residential development (The Greens at Forsgate) that already existed near Interchange 8A at the time of conducting the measurements. The monitoring equipment was placed approximately 15 feet from the rear of the home, facing the Turnpike. The maximum one-hour noise level recorded during the weekday AM peak traffic period was approximately 65.0 dBA. The predominant noise sources were occasional overhead aircrafts and vehicular traffic on the Turnpike.

Short-term noise levels were measured at Site P3, at the residence of 33 McGinnis Street in East Brunswick Township (M.P. 79.2 northbound). The site was located approximately 100 - 150 feet from the existing northbound edge of pavement, and was representative of a new development that was still under construction off of Hardenburg Lane at the time of conducting the measurements. The monitoring equipment was placed approximately 15 feet from the rear of the home, facing the Turnpike. The maximum one-hour noise level recorded during the weekday AM peak traffic period was approximately 68.0 dBA. The predominant noise sources were occasional bird noises, overhead aircrafts and vehicular traffic on the Turnpike.

3.20.4 Existing Noise Barrier-Protected Neighborhoods

The Project Corridor already contains more than six miles of noise barriers along its entire length, with more than five of those miles located north of Interchange 8A. These include a total of 17 separate barrier locations, with 13 of them located north of Interchange 8A. Most of the barriers constructed north of Interchange 8A, as well as one immediately south of Interchange 8A, were provided as part of the previous Interchange 8 to Interchange 9 widening project included within the Authority's 1985 – 90 Widening Program. The remaining barriers within the Project Corridor were constructed as part of the Authority's Retrofit Noise Barrier Program initiated during the 1990s.