Prepared for:

Delaware River Joint Toll Bridge Commission

I-95/Scudder Falls Bridge Improvement Project

Technical Memorandum No. 28

FINAL POINT OF ACCESS STUDY

Contract C-393A,
Capital Project No. CP0301A

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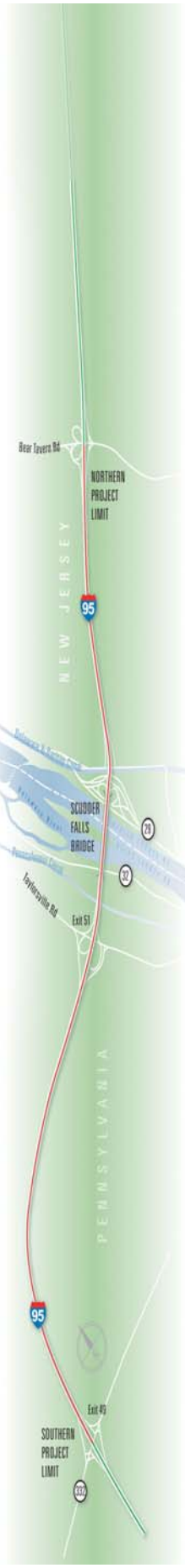

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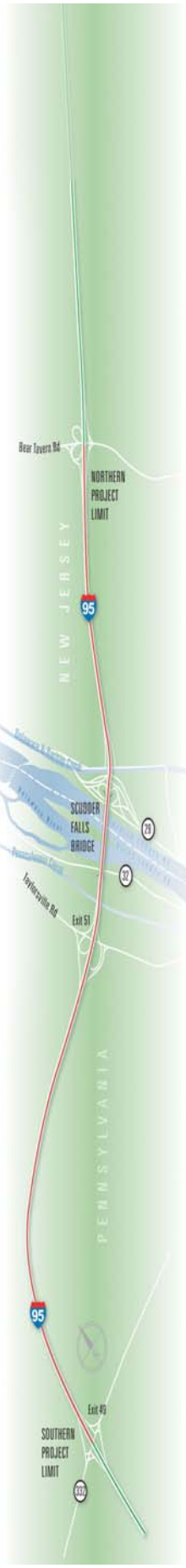

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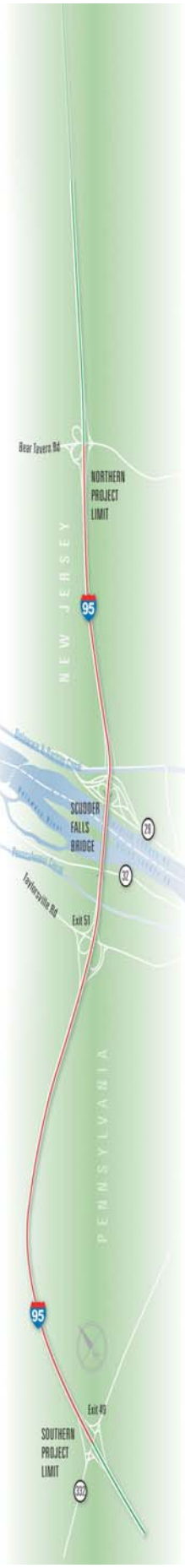

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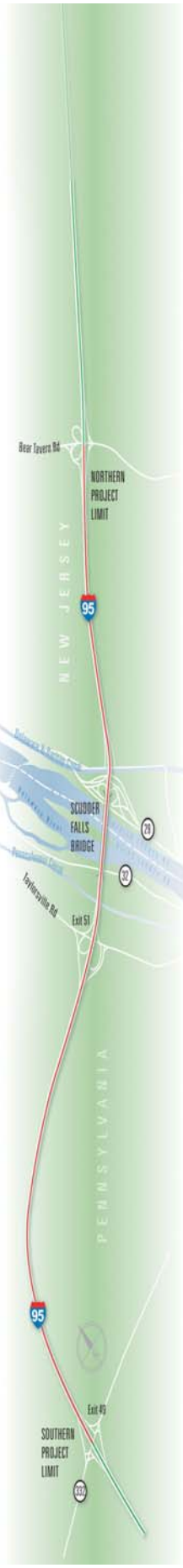

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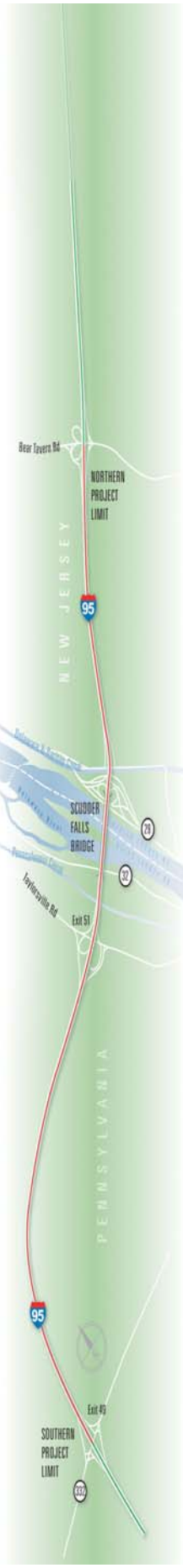


A. EXECUTIVE SUMMARY, INTRODUCTION, AND REQUIREMENTS

1. EXECUTIVE SUMMARY

PURPOSE OF ACCESS

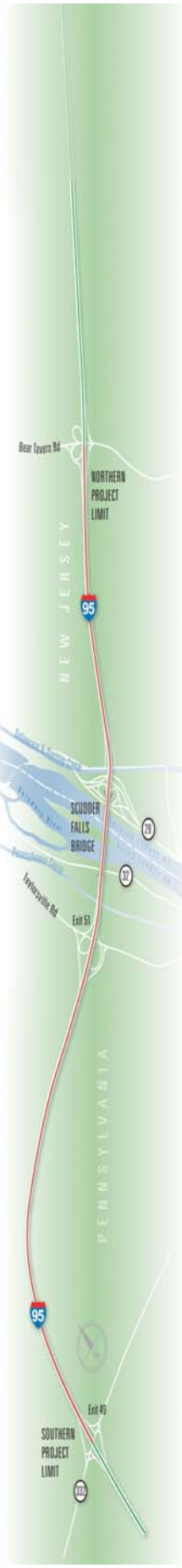
The Delaware River Joint Toll Bridge Commission (DRJTBC) proposes improvements to the I-95/Scudder Falls Bridge over the Delaware River and the adjoining I-95 mainline to alleviate traffic congestion and improve operational and safety conditions. The I-95/Scudder Falls Bridge, constructed in 1959, carries Interstate 95 (I-95) between Lower Makefield Township in Bucks County, Pennsylvania and Ewing Township, a suburb of Trenton, in Mercer County, New Jersey. Improvements are being evaluated to approximately 4.4 miles of I-95 extending from the PA Route 332 (Newtown-Yardley Road) Interchange in Pennsylvania to the Bear Tavern Road (County Route 579) Interchange in New Jersey (project area). The project area includes the I-95/Scudder Falls Bridge, the Taylorsville Road Interchange, and the NJ Route 29 Interchange (Figure 1, Appendix A). The two existing interchanges will continue to accommodate all movements and be upgraded to meet the transportation needs.

The need for the project was presented in the *Needs Report (Technical Memorandum No. 11, June 17, 2004)*, endorsed by the Federal Highway Administration (FHWA), the Pennsylvania Department of Transportation (PENNDOT), and the New Jersey Department of Transportation (NJDOT). The purpose of the project is to alleviate current and future (year 2030) traffic congestion and to upgrade existing safety and traffic operational conditions on the I-95/Scudder Falls Bridge and adjoining segments of I-95.

The overarching goal of the project is to improve mobility on this segment of I-95 to provide for interstate commerce and to accommodate movement of people and goods between Pennsylvania and New Jersey. A major project objective is to alleviate the recurring traffic congestion that occurs in the corridor during peak commuting periods. A second major project objective is to enhance safety by upgrading I-95 in the project area to meet current highway design and safety standards.

The following transportation needs have been identified for the project:

- Provide adequate shoulders to enhance safety and traffic flow. Provide adequate outside shoulders (breakdown lanes) on the I-95/Scudder Falls Bridge to provide pullover areas for vehicles in the event of a breakdown, crash, emergency, or other incidents;
- Provide adequate acceleration and deceleration lanes at adjoining interchanges, and adequate spacing of ramp merges, to improve traffic flow and enhance safety for merging of traffic from the adjoining interchanges at NJ Route 29 and Taylorsville Road;
- Provide adequate roadway capacity to provide acceptable traffic operations during peak travel periods (generally defined as Level of Service D (LOS D) in urban areas); and,
- Improve interchange configurations that do not currently meet design criteria for geometry, lane and shoulder widths, and ramp configurations.



The following transportation-related objectives include stakeholder interests articulated through the public participation program implemented for this project:

- Promote continued access for recreation and tourism, facilitating visitor flows traveling to historic attractions and sites along the Delaware River, and the Delaware Canals in New Jersey and Pennsylvania;

- Evaluate and address, if practicable, means of incorporating pedestrian and bicycle river crossing into a new or expanded bridge over the Delaware River;

- Evaluate and address, if practicable, improvements to TSM/TDM measures and park-and-ride activities in the project area and consider how improvements on the I-95/Scudder Falls Bridge and in the project area will support transit initiatives being planned by others; and,

- Promote access to community facilities and ensure mobility for emergency vehicles traveling through the I-95 corridor.

SUMMARY OF FINDINGS

Description of Proposed Alternative

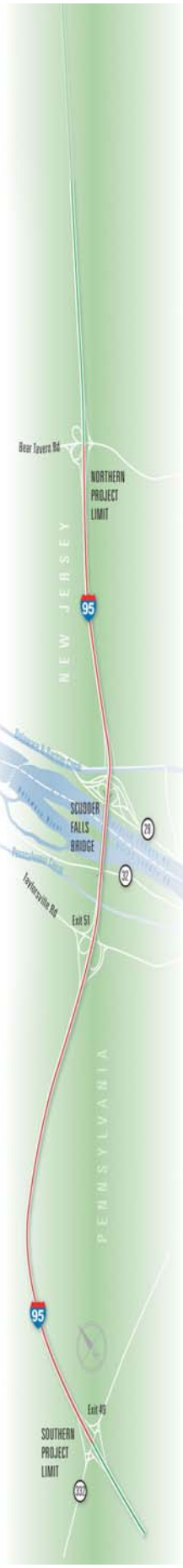
Of the options evaluated for the I-95/Scudder Falls Bridge and approaches, a full bridge replacement on a single-bridge structure with standard auxiliary lanes on an upstream alignment were found to best meet transportation objectives of improving safety and operational conditions while minimizing costs and impacts on the environment. These preferred bridge options are combined with the preferred design options for other project segments to compose project-wide Alternative 3:

- Pennsylvania I-95 mainline inside widening;
- Taylorsville Road Interchange Design Option 2 (retains three ramps); and,
- NJ Route 29 Interchange Design Option 1c Modified (NJDOT Roundabouts Modified with NJ Route 29 bypass).
- Tolling in the I-95 Mainline southbound direction only. The tolling option would be cashless. Electronic toll equipment will be mounted on an overhead gantry structure that is on or adjacent to the new Scudder Falls Bridge on the Pennsylvania side of the bridge.

In addition to the Build Alternatives, the EA will evaluate the No-Build and TSM/TDM measures (including provision of a 14-foot inside shoulder to accommodate the Route 1 Bus Rapid Transit (described later in this report) and incorporation of pedestrian/bicycle access on the bridge).

Need for Tolling

The DRJTBC's operations and capital program are financed solely by the revenues it collects from its seven current toll bridges. In the absence of federal and state transportation funding,



the cost of the I-95/Scudder Falls Bridge Improvement Project necessitates that the DRJTBC employ tolling at the facility to assure the financial integrity of its capital programs, of which the I-95/Scudder Falls Bridge Improvement project is the single, largest initiative.

Preliminary Design Evaluation

A preliminary design evaluation was conducted for the proposed roadway design based on the design criteria in PENNDOT and NJDOT design manuals for an Urban Interstate. The preliminary design evaluation indicates the proposed roadway improvements can be designed to meet all design criteria.

Preliminary Signing

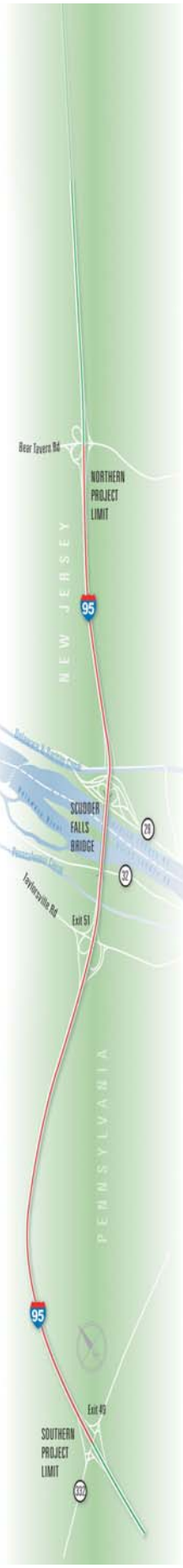
A preliminary signing plan has been prepared to demonstrate that the proposed roadway improvements can be signed to comply with PENNDOT and NJDOT signing requirements. The preliminary signing plan addresses the signing requirements on I-95 with All Electronic Cashless Tolling and the directional signing requirements on the exit ramps for both northbound and southbound for the Taylorsville Road and Route 29 interchanges as well as the PA Route 332 and Bear Tavern Road Interchanges. During final design all origin and destination signs and route signs will be developed to accommodate three digits based upon the future re-designation of I-95 to I-195. The Toll signing and the roundabout signing reflect the latest standards from the 2009 MUTCD (Manual on Uniform Traffic Control Devices).

Traffic Data

To understand existing traffic patterns in the study area and to provide a basis for traffic forecasts, a comprehensive traffic data collection program was conducted for this project. The traffic counts were collected in 2003 for I-95, all ramps and surrounding roadways. A license plate survey was conducted to gain an understanding into the use of the interchange on- and off-ramps between the closely spaced interchanges on each side of the bridge.

2010 traffic data was also collected to support the Traffic Diversion Study prepared by Jacobs in September 8, 2010, revised April 2011. Since the existing bridge is free of tolls, the diversion study was conducted to forecast the amount of traffic that will divert to other roadways and bridge crossings once tolls are implemented. The overall AADT decreased slightly between 2003 and 2010, while the peak hour traffic volumes increased. During the AM peak hour, the northbound volume (peak travel direction) increased 1.70% while the southbound volume increased 15.77%. During the PM peak hour, the southbound volume (peak travel direction) increased 3.26% while the northbound volume increased 15.86%. The lower increases in the peak travel directions reflect the observed roadway conditions which operate near capacity.

The decrease in AADT is a reflection of the current economic conditions with overall traffic growth in recent years slower than projected. The slight decrease in AADT along with the increase in peak hour travel is indicative of a recession, with motorists giving up non-essential trips and/or combining multiple trips into a single trip. As a result of the current economic recession, a decline in daily traffic is forecasted for the short-term, with a return to anticipated levels occurring in the future.



Traffic Forecasts

Traffic volume projections for the year 2030 were developed for the following conditions:

- 2030 No Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/Low Toll Daily, AM and PM Peak Hour
- 2030 Build/High Toll Daily, AM and PM Peak Hour

The year 2030 traffic projections for the project area and the regional diversions were developed utilizing the following main sources of information:

- Jacobs' Traffic and Revenue Study, dated September 8, 2011 and revised April 2011 which estimated traffic diversion percentages for the two toll levels, and conducted an origin-destination survey of Scudder Falls Bridge customers to predict diversion routes
- DVRPC's September 2004 Interstate 95 / Scudder Falls Bridge Traffic Study

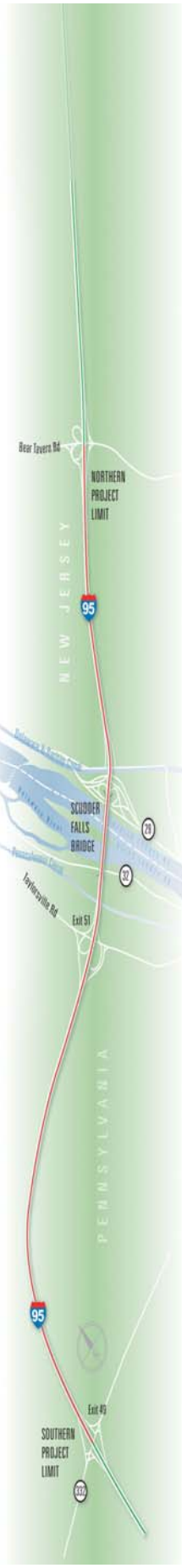
Growth in traffic volumes from 2003 traffic to 2030 No Build/No Toll are forecasted to range from 13% to 24% along the I-95 mainline, with the higher growth rates occurring in the northern sections of the project area. Growth for 2030 no-build to build is approximately 9% to 11%. The I-95/PA Turnpike Interchange currently in design was included as a constructed improvement in the model. The future volumes account for the impact of this improvement on through traffic in the I-95/Scudder Falls Bridge project area.

The Build/Low Toll Alternative results in an increase in volume of 2 to 3% for various sections of I-95 within the project area compared to the No Build/No Toll Alternative. The Build/High Toll Alternative results in a reduction in volume of 1 to 3% for various sections I-95 within the project area compared to the No Build/No Toll Alternative.

To gain an understanding of the potential impacts of the traffic diversions on the local roadways and adjacent river crossings, the DRJTBC commissioned a study to forecast the volume of traffic that would divert from the Scudder Falls Replacement Bridge to alternate locations once tolls are implemented. This report, entitled *Scudder Falls Bridge Traffic Diversion Study*, dated September 8, 2010 and revised April, 2011, was prepared by Jacobs Engineering Group, Inc. under contract with AECOM to conduct this analysis. The adjacent river crossings evaluated as part of this study included Washington Crossing Toll Supported Bridge to the north; and Calhoun Street Toll Supported Bridge, Lower Trenton Toll Supported Bridge and Trenton-Morrisville (Route 1) Toll Bridge to the south.

The estimated traffic diversion was developed for the interim year (2015) and future year 2030, assuming both a low toll scenario ($1.00 for passenger vehicles) and a high toll scenario ($3.00 for passenger vehicles) for the Scudder Falls Bridge. The truck toll for both scenarios was assumed to be $4 per axle for each truck. The diverted volumes for these scenarios were compared to traffic volumes projected to occur on the existing Scudder Falls Bridge without a toll.

The results of the analysis show that, during the peak hour, the volume of traffic using the newly completed I-95/Scudder Falls Replacement Bridge will not be appreciably different than the volume of traffic that would use the existing bridge without a toll. In fact, the new Scudder Falls Bridge is expected to see a slight increase in traffic during the peak hour while



the adjacent river crossings will each see a slight decrease in volume during the peak hour for the $1.00 and $3.00 toll scenarios in the year 2030. A similar result is obtained for the peak hour in the year 2015 under the $1.00 toll scenario, but under the $3.00 toll scenario, traffic on the I-95/Scudder Falls Replacement Bridge will decrease slightly while traffic on the other four DRJTBC bridges will increase slightly.

The reasons for these results may not be obvious at first glance. However, upon further examination, including observations of traffic conditions at alternative crossings, it is apparent that additional traffic will be attracted to using the newly completed Scudder Falls Bridge due to the combined improvements (additional travel lanes, safer ramp entrance and exit conditions) and the unacceptable travel delays associated with utilizing the alternative crossings. In essence the study reveals that motorists, who are already experiencing delays at these alternates, will be willing to pay a relatively modest toll in exchange for the reduced travel times and increased safety which will be provided by the new Scudder Falls Bridge.

Operational Analysis

To evaluate the Level of Service and overall traffic performance of I-95, traffic operations were evaluated on the I-95 mainline, the ramps, and the surrounding roadways for the year 2030 peak hour traffic conditions for the No-Build and Build Alternative. The operational analysis developed Levels of Service using the latest Highway Capacity Manual (HCM) and associated software (Highway Capacity Software). For signalized intersections the Synchro software tool was utilized.

The operational analysis presented in the Point of Access Study demonstrates that the proposed roadway improvements, for the mainline, interchanges and ramps, and the cross streets, will operate at an acceptable Level of Service (LOS D during peak hours) in build year 2030 conditions and will meet the needs of the project.

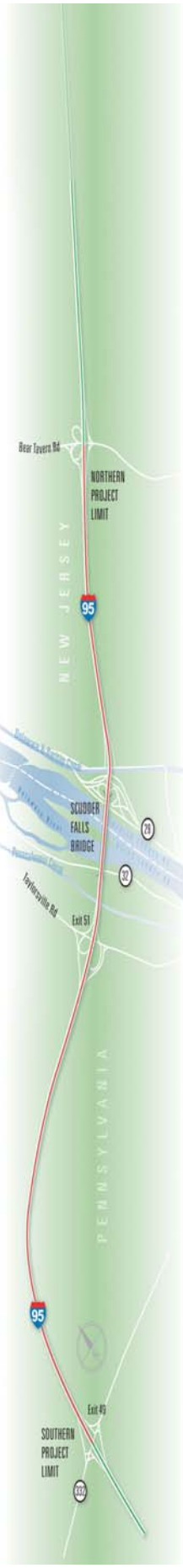
The LOS on I-95 south of the PA 332 Interchange degrades as follows:

- from LOS D in No Build/No Toll to LOS E in 2030 Build/No Toll, 2030 Build/Low Toll, and 2030 Build/High Toll during the A.M. peak period.
- from LOS E in No Build/No Toll to LOS F in 2030 Build/No Toll, and remains LOS E in 2030 Build/Low Toll, and 2030 Build/High Toll during the P.M. peak period.

These sections are beyond the project area. Based on meetings with the District 6-0 Executive Committee, PennDOT is coordinating with Bucks County and the DVRPC to program improvements for I-95 south of the PA 332 Interchange into the Long Range Plan.

The overall findings of this study indicate that the traffic diversions resulting from the tolling of the new Scudder Falls Bridge will cause minimal traffic impacts to the adjacent roadways and bridge crossings within the region during both peak and non-peak periods.

For the most critical operational period (the peak hour), there is actually a reduction in traffic on alternative crossings for the low-toll scenario, and an increase in traffic in 2030 for the high-toll scenario. In both scenarios and during all periods of the day, the impact of tolling in terms of congestion (as measured by volume-to-capacity ratios for roadways and bridges) remains at or very close to 2030 No Build/No Toll levels. These findings are a result of the limited capacity of alternative crossings and the significant operational and safety improvements associated with a new Scudder Falls Bridge.



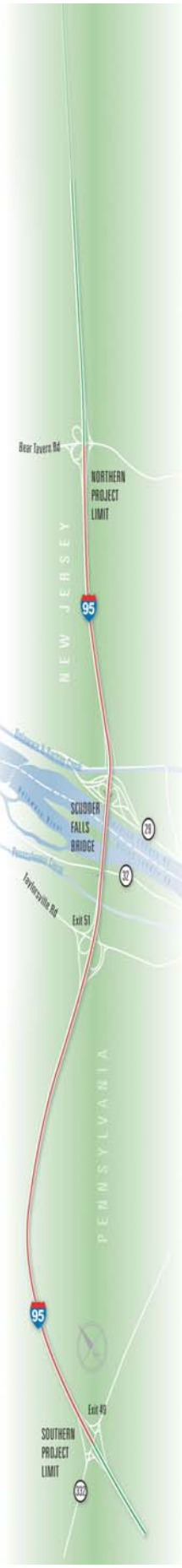
The DRJTBC has conducted an analysis of the traffic diversions anticipated as a result of the tolling of the I-95/Scudder Falls Replacement Bridge. The DRJTBC agrees to conduct pre-construction and post-construction traffic study and analysis as outlined in an Interagency Agreement currently being negotiated and to be entered into between and among the DRJTBC, PennDOT and NJDOT. The DRJTBC agrees to take reasonable measures to mitigate for traffic diversion impacts on Pennsylvania and New Jersey state roads in the event the traffic study and analysis identifies traffic issues, not identified in this POA or in the Addendum to the EA, which are attributed to the tolling of the I-95/Scudder Falls Replacement Bridge. Details regarding those mitigation commitments will be found in the Interagency Agreement.

Estimate, Funding and Schedule

The improvements proposed under the Scudder Falls Bridge project are currently estimated at $310.37 million.

The Commission examined a range of options for financing and delivering the project, including the pursuit of Federal and State funding. The Commission intends to implement tolling on the new Scudder Falls Bridge to support the capital costs and ongoing maintenance and operations of the bridge. On December 21, 2009 the Commission's Board authorized the implementation of tolls on the Scudder Falls Replacement Bridge. The Commission rendered its tolling decision after making an assessment of its overall capital program needs, its current system of financing the capital program, and -- most notably – the lack of sufficient outside sources of funding to support the project.

The project is currently undergoing review in accordance with the National Environmental Policy Act (NEPA). Final design is scheduled to begin after completion of the (NEPA) process. The project schedule reflects a 2011 issuance of a NEPA decision by the Federal Highway Administration (FHWA). Should the NEPA decision result in the issuance of a Finding of No Significant Impact (FONSI), final design could begin in 2012 and construction could begin in 2013. The start of construction could be affected if the Delaware River Joint Toll Bridge Commission decides to carry out the project as a public-private partnership [P3], which is being assessed. Once construction begins, it is estimated that it will take three to four years to complete the project.



II. INTRODUCTION

Project Description

The purpose of the project is to alleviate traffic congestion and upgrade existing safety and traffic operational conditions on the I-95/Scudder Falls Bridge and the segment of I-95 extending from the Bear Tavern Road (County Route 579) Interchange to the PA Route 332 (Newtown-Yardley Road) Interchange. Improvements are being evaluated to a total of approximately 4.4 miles of the I-95 mainline.

The goal is to enhance safety by meeting current highway design and safety standards. The project includes consideration of improvements at the four interchanges along the I-95 mainline (PA Route 332 and Taylorsville Road in Pennsylvania and NJ Route 29 and Bear Tavern Road in New Jersey) to meet current highway and geometric design standards. Interchange improvements may include addition of acceleration and deceleration lanes and providing adequate spacing of ramp merges.

A major project objective is to alleviate traffic congestion on the I-95/Scudder Falls Bridge and the I-95 project area between PA Route 332 and the Bear Tavern Road Interchange. The I-95/Scudder Falls Bridge and adjoining highway segments are projected to be operating over capacity in 2030. The goal for the improvements in this segment of I-95 would be to achieve traffic Level of Service D during peak hours, generally considered to represent an acceptable traffic operating level in an urban environment. Additional transitional engineering necessary to achieve the LOS D goal will be made along the approximately 1.5-mile section of I-95 extending to the Bear Tavern Road (County Route 579) Interchange, and the approximately 1.5 mile section of I-95 extending from Taylorsville Road to PA 332 Interchange.

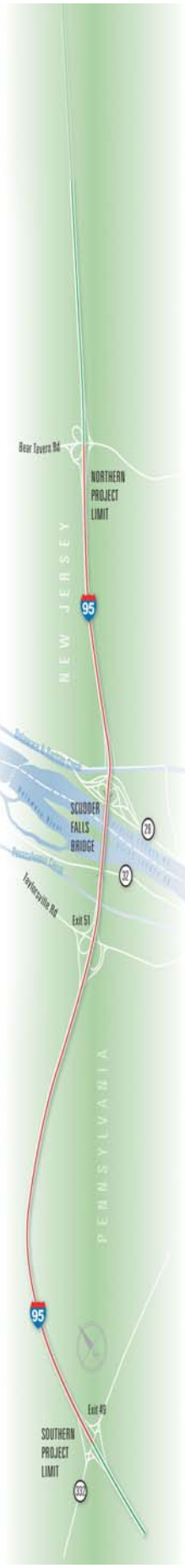
The project area is located within the Delaware Valley Regional Planning Commission region. It is within a Transportation Management Area and a non-attainment area for air quality.

Study Area Description

I-95/Scudder Falls Bridge Improvement Project Area

The I-95 project area is shown in Figure 1 in Appendix A. The I-95 project area encompasses 2.6 miles of I-95 in Pennsylvania between the western project limit at the PA Route 332 Interchange and the west bank of the Delaware River, and 1.6 miles in New Jersey extending from the east bank of the Delaware River to the Bear Tavern Road Interchange. The I-95/Scudder Falls Bridge crossing spans the Delaware River over a distance of approximately 0.2 miles. The NJ Route 29 Interchange in New Jersey borders the Delaware River at the bridge crossing, and the Taylorsville Road Interchange in Pennsylvania is also situated in close proximity to the I-95/Scudder Falls Bridge. The I-95 project area is located entirely within the limits of Lower Makefield Township in Pennsylvania and Ewing Township in New Jersey.

In Pennsylvania, the I-95 project corridor also crosses under Dolington Road and Quarry Road and extends over the Delaware Canal and River Road (PA Route 32) along the Delaware River bank. In New Jersey, I-95 also crosses over NJ Route 29 (River Road), the Delaware and Raritan Canal, and Upper River Road (NJ Route 175).



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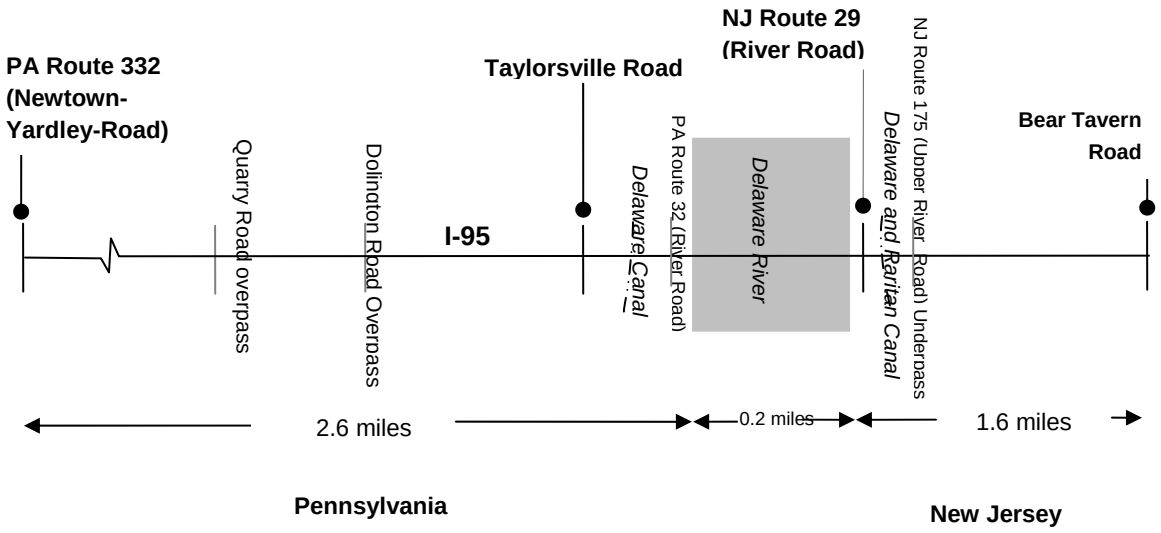
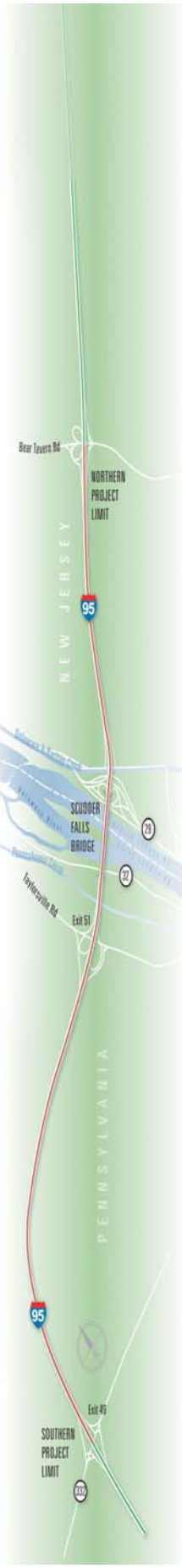


Study Area Definition: DVRPC Traffic Forecasting and Environmental Assessment

The traffic forecasting methodology employed by the Delaware Valley Regional Planning Commission (DVRPC) considered the transportation demands and patterns over the entire DVRPC region which encompasses five counties in Pennsylvania and four counties in New Jersey. The Bucks County Planning Commission and the Mercer County Planning Commission were consulted in identifying developments within Bucks and Mercer counties, respectively, as inputs to the DVRPC traffic forecasting model. The results of the DVRPC traffic model form the basis for evaluation of existing and future transportation conditions within the I-95 project corridor.

In general, a broader region was defined for the purposes of transportation modeling and evaluation of socioeconomic factors such as population and employment. For the purposes of evaluating the effects on the human, cultural, and natural environment, different study areas were used to assess effects on different parameters, depending on the resources evaluated and types of impacts anticipated. More site-specific analyses were employed in evaluating direct impacts associated with project construction (e.g., wetlands delineations and archaeological excavations).

The sections below provide an overview of the regional context for the proposed improvements and also provide a description of the land uses and natural resources within the 4.4 miles along the I-95 project corridor.



Regional Context: Major Traffic Generators

The I-95 corridor in the project area is a major commuter route for employment destinations in or near the study area, as well as for commuters residing in communities along the route. The project area is within commuting distance to Philadelphia and major nearby employment centers in Bucks and Mercer counties, and the New Jersey state capital in the City of Trenton. Many of the towns proximate to the Delaware River have become tourist destinations, bedroom communities, or second-home communities.

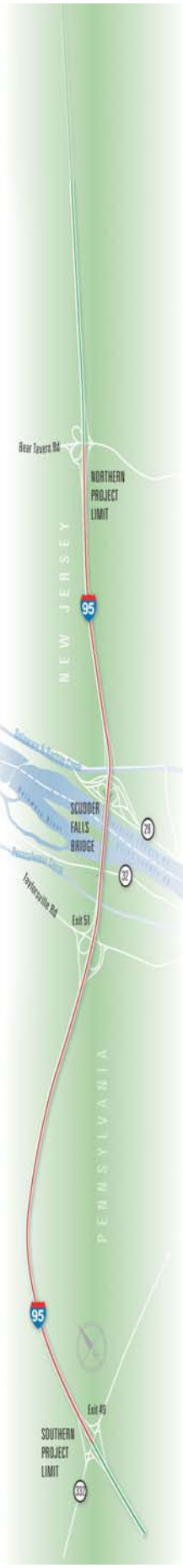
Large employment centers in New Jersey based in Ewing Township, neighboring Hopewell Township and the City of Trenton are major traffic generators, contributing to peak hour travel. Large employers in the area include Merrill Lynch, Janssen Pharmaceutical, and Bristol-Myers Squibb in neighboring Hopewell Township, and New Jersey Manufacturers Insurance Company and Educational Testing Services in Ewing Township. The State of New Jersey is a major employer in the area, with the State Police headquarters and the Jones Farm Correctional Facility adjacent to the south side of I-95, and the location of the state capital in the City of Trenton.

Large employment centers in the project area include the Mountain View Office Park at the Bear Tavern Road Interchange and the Lower Makefield Corporate Center at the PA Route 332 Interchange in Newtown. PA Route 332 also provides access to nearby large employment centers in Newtown Township that include the Newtown Corporate Center, Lockheed Martin Corporation, and Holy Family University located within one-half mile to one mile of the I-95 corridor.

The Bear Tavern Road Interchange provides access to the Trenton-Mercer Airport and surrounding industrial and commercial uses. West Trenton hosts a variety of smaller stores, restaurants, and commercial establishments oriented towards travelers and other larger industries.

The Pennsylvania interchanges at PA Route 332 and Taylorsville Road also provide access to major tourist attractions in Bucks County, including the surrounding historic downtown areas of Newtown, New Hope, Yardley and Washington Crossing Historic Park. The PA Route 332 (Newtown-Yardley Road) Interchange provides access to Newtown to the northwest and Yardley Borough to the southeast. The Taylorsville Road Interchange accommodates traffic destined for neighboring Upper Makefield Township, Washington Crossing, and New Hope, a major tourist and shopping destination of regional importance, to the north, and Yardley Borough to the south. A Pennsylvania Department of Transportation (PENNDOT) park-and-ride lot is situated north of I-95 on Taylorsville Road at the Woodside Road intersection.

In New Jersey, NJ Route 29 to the north accommodates travel to tourist destinations at the historic Washington Crossing State Park and Lambertville, a popular cultural and shopping destination. The NJ Route 29 Interchange also provides access to Trenton, a major center of business and commerce, to the south, of which Ewing Township is a suburb.



Project Area Description

Land Uses in the I-95 Corridor

The I-95/Scudder Falls Bridge extends through rural to suburban areas of Bucks County (Lower Makefield Township) in Pennsylvania and Mercer County (Ewing Township) in New Jersey. The Pennsylvania segment of I-95 adjoins largely suburban development, consisting largely of subdivisions, and public and privately owned farmlands. The Lower Makefield Township Farmland Preservation Program has been formed in response to development pressures in Pennsylvania, resulting in conservation of undeveloped farmlands in conjunction with several subdivision developments constructed along the I-95 corridor. The Lower Makefield Farmland Preservation Corporation owns several large farmland preservation parcels adjacent to I-95, including the Patterson Farm adjoining the PA Route 332 Interchange and a parcel adjoining the Taylorsville Road Interchange. The WCHR radio towers are surrounded by township-owned land in this area north of I-95 and west of Taylorsville Road.

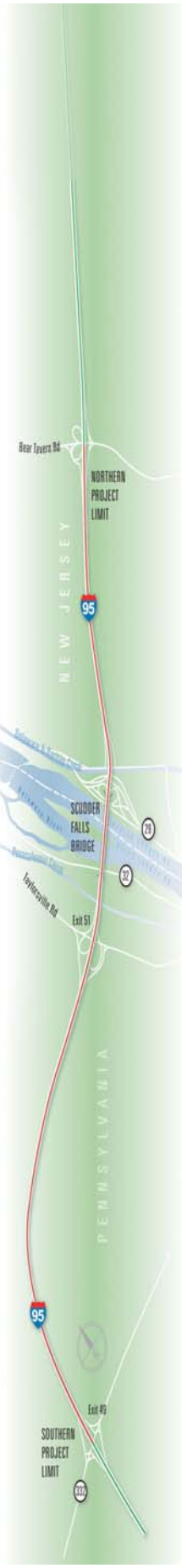
Surrounding areas in the New Jersey portion of the I-95 corridor consist predominantly of densely developed residential areas to the north, with state property on the south. NJ Route 29 provides access to the New Jersey State Police headquarters, which adjoins the southwest portion of the I-95 project corridor in New Jersey. The New Jersey Department of Corrections Jones Farm, south of Bear Tavern Road (County Route 579), adjoins the southeast portion of the I-95 corridor in New Jersey. New Jersey farmland preservation initiatives have included transfer of the development rights to Jones Farm from the State to the State Agriculture Development Committee, which is responsible for the administration of the State's Farmland Preservation Program. Other publicly owned property at the Bear Tavern Road Interchange include a City of Trenton water tank, the New Jersey Department of Transportation Maintenance Facility, and New Jersey Water Supply Authority field office, located south of I-95.

Commercial development in the corridor is limited to the Lower Makefield Corporate Center at the PA Route 332 Interchange, on the western end of the project, and the Mountain View Office Park at the Bear Tavern Road Interchange at the eastern limit of the project.

Natural Resources and Open Space

The project area also provides access to popular water-based recreation. The Taylorsville Road and NJ Route 29 Interchanges border on the historic canals and their park systems and are proximal to the Delaware River. The Taylorsville Road Interchange is located approximately 1,500 feet west of the Delaware River and is proximal to the Delaware Canal and its towpath and State Park. Recreational uses along the Delaware River and the Delaware Canal are accessible from Taylorsville Road via Woodside Road and PA Route 32 (River Road). PA Route 32, a Pennsylvania designated Scenic Road, extends along the west bank of the Delaware River.

The I-95/Scudder Falls Bridge spans the Delaware River and an island, located within the Pennsylvania portion of the river, known as Park Island or generally referred to as part of the Scudder Falls Islands. Recreational uses in the river include the Scudder Falls Recreation Area, approximately 2,000 feet north of the bridge, which accommodates whitewater recreation.



NJ Route 29 is a National Scenic Byway, also known as the Delaware River Scenic Byway, and extends along the east bank of the Delaware River. The NJ Route 29 Interchange occupies the area between the east river bank and the Delaware and Raritan Canal and its adjoining towpath and State Park. NJ Route 29 also provides direct access to the Scudder Falls Recreation Access, north of I-95, which accommodates parking along the Delaware and Raritan Canal State Park and recreational access to whitewater along the Delaware River.

Regulatory Context

The Delaware River Joint Toll Bridge Commission (DRJTBC), formed in 1934 by Pennsylvania and New Jersey, operates under an interstate compact approved by the United States Congress. Their mission is to acquire, construct, administer, operate, and maintain the vehicular and pedestrian bridges over the Delaware River as the DRJTBC deems necessary to assure safe and efficient river crossings to advance the interests of the two states. The Commission's jurisdiction extends 140 miles from the New York border to the Philadelphia/Bucks County line.

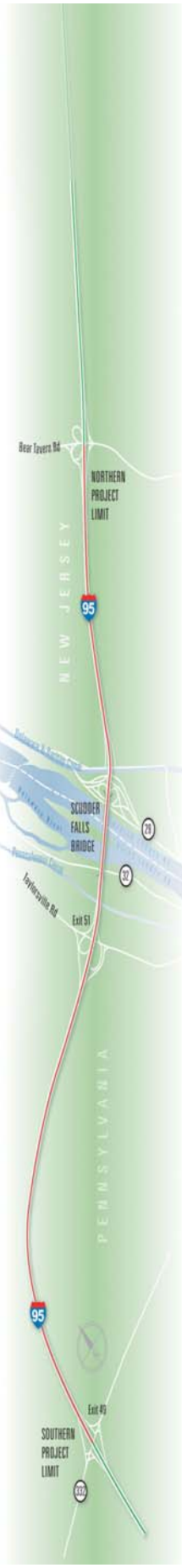
In January of 2003, the DRJTBC, PENNDOT, and the New Jersey Department of Transportation (NJDOT) entered into a *Memorandum of Agreement (MOA) between the DRJTBC, PENNDOT, and the NJDOT to Alleviate Existing and Future Congestion along the I-95 Scudder Falls Bridge Corridor* (January 2003). The MOA formed a partnership of these transportation agencies, working with the regional planning agency, the Delaware Valley Regional Planning Commission, and established a framework for environmental documentation and preliminary design of planned improvements.

An Environmental Assessment (EA) is being prepared by the DRJTBC, in cooperation with the Pennsylvania Department of Transportation (PENNDOT) and the New Jersey Department of Transportation (NJDOT) to comply with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347, as amended in 1975 and 1982). In accordance with the Memorandum of Agreement between these transportation agencies and in compliance with Federal Highway Administration requirements, the EA for the I-95/Scudder Falls Bridge Improvement Project is being developed in accordance with the PENNDOT *Transportation Development Process: Environmental Assessment Handbook*.

Project Purpose and Need

The need for the project was presented in the *Needs Report (Technical Memorandum No. 11, June 17, 2004)*, endorsed by the Federal Highway Administration (FHWA), the Pennsylvania Department of Transportation (PENNDOT), and the New Jersey Department of Transportation (NJDOT). The purpose of the project is to alleviate current and future (year 2030) traffic congestion and to upgrade existing safety and traffic operational conditions on the I-95/Scudder Falls Bridge and the adjoining segments of I-95.

The overarching goal of the project is to improve mobility on this segment of I-95 to provide for interstate commerce and to accommodate movement of people and goods between Pennsylvania and New Jersey. A major project objective is to alleviate the recurring traffic congestion that occurs in the corridor during peak commuting periods. A second major project objective is to enhance safety by upgrading I-95 in the project area to meet current highway design and safety standards.



The following transportation needs have been identified for the project:

- Provide adequate shoulders to enhance safety and traffic flow. Provide adequate outside shoulders (breakdown lanes) on the I-95/Scudder Falls Bridge to provide pullover areas for vehicles in the event of a breakdown, crash, emergency, or other incidents;

- Provide adequate acceleration and deceleration lanes at adjoining interchanges, and adequate spacing of ramp merges, to improve traffic flow and enhance safety for merging of traffic from the adjoining interchanges at NJ Route 29 and Taylorsville Road;

- Provide adequate roadway capacity to provide acceptable traffic operations during peak travel periods (generally defined as Level of Service D (LOS D) in urban areas); and,

- Improve interchange configurations that do not currently meet design criteria for geometry, lane and shoulder widths, and ramp configurations.

The following transportation-related objectives include stakeholder interests articulated through the public participation program implemented for this project:

- Promote continued access for recreation and tourism, facilitating visitor flows traveling to historic attractions and sites along the Delaware River, and the Delaware Canals in New Jersey and Pennsylvania;

- Evaluate and address, if practicable, means of incorporating pedestrian and bicycle river crossing into a new or expanded bridge over the Delaware River;

- Evaluate and address, if practicable, improvements to TSM/TDM measures and park-and-ride activities in the project area and consider how improvements on the I-95/Scudder Falls Bridge and in the project area will support transit initiatives being planned by others; and,

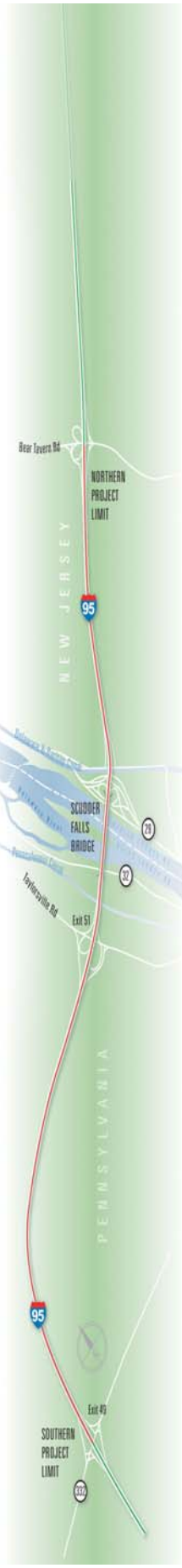
- Promote access to community facilities and ensure mobility for emergency vehicles traveling through the I-95 corridor.

III. REQUIREMENTS FOR APPROVAL OF ACCESS

The eight (8) requirements necessary for approval of access identified by PennDOT guidance and consistent with the FHWA's Policy on Interstate access are discussed below. Each of the eight requirements is addressed with a summary of how that requirement is satisfied by the proposed action:

a. *The need being addressed by the request cannot be adequately satisfied by existing interchanges to the limited access facility, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands.*

   Design year (2030) operating conditions are projected to be undesirable on the Scudder Falls Bridge northbound in the A.M. peak period, and southbound in the P.M. peak period



under No Build/No Toll conditions. In addition, southbound south of the bridge is projected to be undesirable during the PM peak period. The Taylorsville Road Interchange northbound on-ramps are projected to operate at an undesirable LOS (LOS F) in the A.M. while the southbound off-ramps are projected to operate at an undesirable LOS in the P.M. peak hours. The Route 29 interchange northbound off-ramp is projected to have undesirable LOS during the A.M. peak hour while the southbound on-ramp is projected to have an undesirable LOS in the P.M. peak hour. The project is being undertaken in order to substantially reduce traffic congestion (achieve traffic LOS D during peak hours) and improve safety and operational conditions. Access control along surface streets, traffic signals and turning lane improvements at ramp termini and adjacent intersections do not adequately address the project needs.

b. *The need being addressed by the request cannot be adequately satisfied by reasonable Transportation System Management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the limited access facility without the proposed change(s) in access.*

Transportation Systems Management (TSM) measures are strategies designed to increase the safety, capacity, and efficiency of the existing transportation system and include measures such as ramp metering, high-occupancy vehicle lanes, intelligent transportation systems (ITS), and incident management. Transportation Demand Management (TDM) measures are strategies to focus on travel demand and changing driver behaviors and include measures such as ridesharing, increased use of transit, and bike/walk incentives. Under the TSM/TDM alternative, the measures that were considered include:

Ramp Metering: All on ramps operate at LOS D or better during the 2030 No Build except the Taylorsville Road NB on ramp and the Route 29 SB on ramp. Both of the ramps are in areas with severe congestion that is too severe to be mitigated alone by ramp metering.

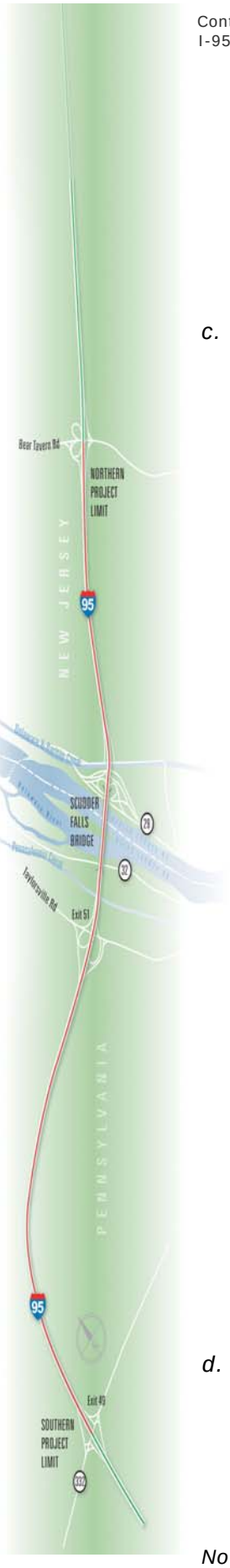
Accommodations for Proposed Route 1 Bus Rapid Transit: The proposed NJDOT Bus Rapid Transit project involves a bus feeder system that would service the Route 1 corridor. A potential bus feeder route has been identified that would include a stop at the Taylorsville Road park and ride lot. Incorporation of 14-foot inside shoulders along I-95 in the project area for possible future use as bus lanes by the proposed Route 1 Bus Rapid Transit is proposed to allow buses to bypass congestion on I-95.

High Occupancy Vehicle (HOV) Facilities: The project area covers about four miles along I-95. HOV lanes alone would not meet the project needs.

Park and Ride Facilities: The Taylorsville Road Interchange area includes a park and ride facility off Woodside Road that is owned by PennDOT and maintained by the DRJTBC. Coordination with the Bucks and Mercer County Transportation Management Associations and large local employers has been performed during the project development process and will continue.

Intelligent Transportation Systems/Incident Management: PennDOT is currently completing installation of a Traffic Incident Management System for I-95 within Pennsylvania. NJDOT already has cameras along this section of I-95 in New Jersey. Systems will be maintained during and after the proposed project improvements.

Pedestrian/Bicycle Access: Provision of pedestrian/bicycle access in part is a TDM strategy and is planned to be included across the bridge.



The TSM/TDM alternative would not provide sufficient traffic relief to address the traffic congestion that occurs during peak hours and is projected to worsen in 2030. This alternative also would not address structural and geometric deficiencies of the I-95/Scudder Falls Bridge and adjoining interchanges. The TSM/TDM strategies would not satisfy the purpose and need as a standalone alternative. However, the TSM/TDM measures deemed appropriate will be incorporated as part of the proposed project improvements.

c. *An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the limited access facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access. The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network. Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the limited access facility, ramps, intersection of ramps with crossroad, and local street network. Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative.*

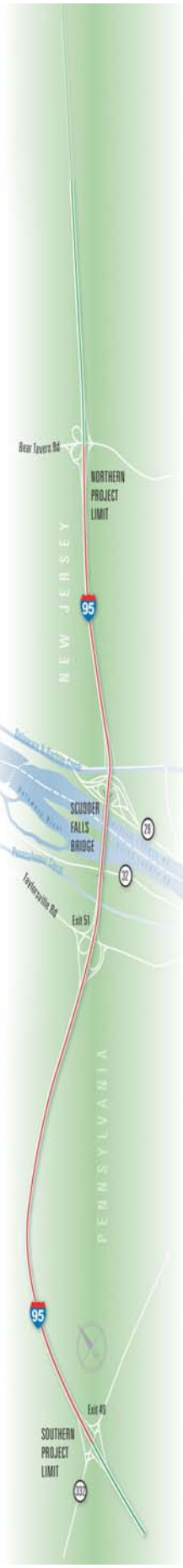
The project operational analyses indicate that the proposed project improvements are projected to operate at an acceptable LOS D during the 2030 Build conditions, including the mainline, ramp merge/diverge areas, ramp termini, and adjacent intersections. In addition, the diversion study prepared for the project indicates that traffic which may divert due to tolling of the bridge has minimal impact to area roadways compared to the No Build/No Toll conditions. The LOS on I-95 south of the PA 332 Interchange degrades as follows:

- from LOS D in No Build/No Toll to LOS E in 2030 Build/No Toll, 2030 Build/Low Toll, and 2030 Build/High Toll during the A.M. peak period.
- from LOS E in No Build/No Toll to LOS F in 2030 Build/No Toll, and remains LOS E in 2030 Build/Low Toll, and 2030 Build/High Toll during the P.M. peak period.

These sections are beyond the project area. Based on meetings with the District 6-0 Executive Committee, PennDOT is coordinating with Bucks County and the DVRPC to program improvements for I-95 south of the PA 332 Interchange into the Long Range Plan.

A conceptual signing plan has been prepared and illustrates that the proposed improvements can be effectively signed.

d. *The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards.*



The proposed project improvements maintain all existing interchanges with full access, and connect only to state roadways. The existing northbound Upper River Road on-ramp in New Jersey is too close to the northbound on-ramp from NJ Route 29 to meet design criteria for successive on ramps. This ramp is proposed to be closed to public traffic. Current traffic using this ramp will utilize the northbound NJ Route 29 on-ramp. The existing Upper River Road on-ramp is proposed to be gated and utilized for emergencies only by the nearby NJ Emergency Operations Center for Homeland Security events. Specific emergency use will be coordinated further by NJDOT and NJ State Police.

The proposed access will be designed to meet or exceed current standards, except for the possible design exceptions noted later in this report related to mainline superelevation, headlight stopping sight distance at Woodside and Taylorsville Road, and vertical clearance for NJ 29 and NJ 175. Preliminary design will be further developed to minimize design exceptions.

e. *The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within Transportation Management Areas, as appropriate.*

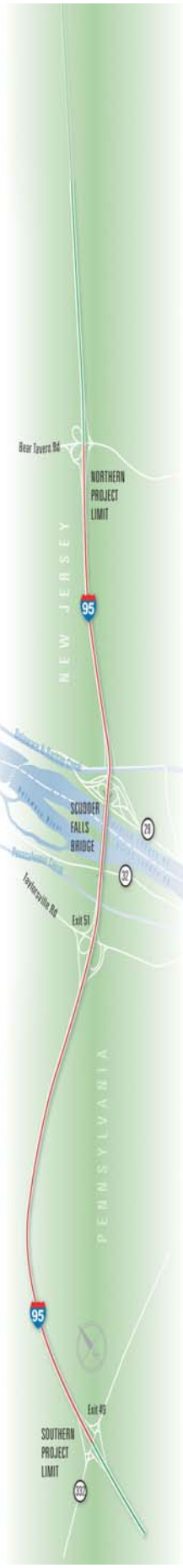
The project is included on the Delaware Valley Regional Planning Commission Long Range Transportation Plan (ID #36) and is funded by the DRJTBC, with no federal or state funds. The project has obtained and included local and regional land use and transportation plans.

f. *In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan.*

No new interchange additions are anticipated in the project area. Regionally, the I-95/ Pennsylvania Turnpike interchange is proposed and has been accounted for in the 2030 travel projections.

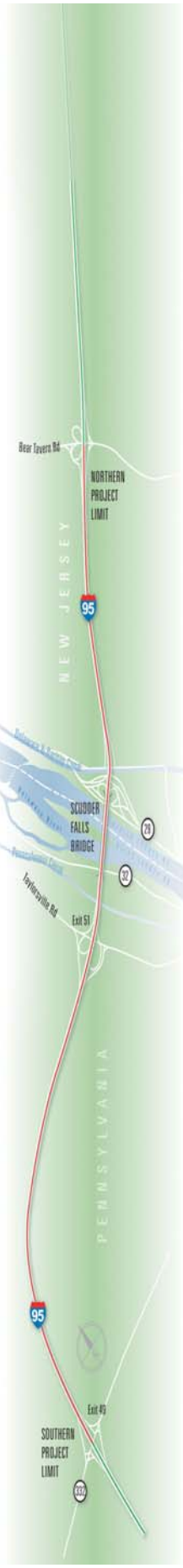
g. *When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements. The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and limited access facility access point.*

The proposed project improvements are not due to a substantial change in current or planned developments or land use. No developer agreements or commitments are necessary. However, planned developments within the region and specifically Bucks County, Pennsylvania and Mercer County, New Jersey were obtained and considered in the 2030 travel projections.



h. The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing.

The proposed improvements have been included in the Environmental Assessment as the proposed action. A discussion on the environmental aspects is included in Section E of this report.



B. ENGINEERING STUDY

I. CURRENT CONDITIONS

Roadway Network

I-95 is a controlled-access interstate highway, with a posted speed limit in the project area of 55 miles per hour in Pennsylvania and 65 miles per hour in New Jersey. At the western end of the project area, the I-95 corridor consists of two 12-foot travel lanes in each direction in Pennsylvania. The roadway continues east as a four-lane highway over the I-95/Scudder Falls Bridge to the New Jersey Route 29 Interchange. East of the NJ Route 29 Interchange, I-95 widens to three 12-foot travel lanes in each direction. The I-95 corridor in the project area is the only interstate highway connecting Bucks and Mercer counties.

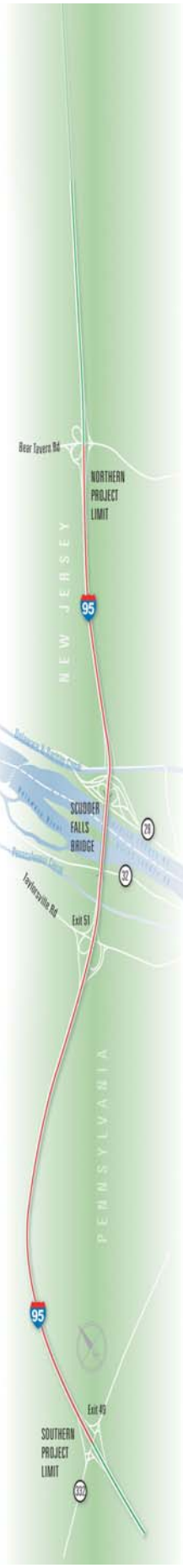
I-95 in the project area includes four grade-separated interchanges at PA Route 332 (Newtown-Yardley Road) and Taylorsville Road in Pennsylvania and NJ Route 29 (River Road) and Bear Tavern Road (County Route 579) in New Jersey. The project corridor also includes:

- two overpass structures spanning Taylorsville Road and the Delaware Canal in Pennsylvania;
- the I-95/Scudder Falls bridge spanning River Road (PA Route 32) in Pennsylvania, the Delaware River at the state border with New Jersey, and NJ Route 29 southbound in New Jersey; and,
- an overpass structure spanning NJ Route 29 northbound, the Delaware and Raritan Canal, and adjoining Upper River Road (NJ Route 175) in New Jersey.

On the west end of the project area, the I-95 mainline in Pennsylvania includes a 60-foot wide median that includes grassed areas and paved inside shoulders. The median narrows to the north approaching Taylorsville Road and consists of paved inside shoulders and median barrier. The median narrows to five feet (including a two-foot concrete median barrier) on the I-95/Scudder Falls Bridge, and the narrow paved median area with concrete median barrier continues north past NJ Route 29. The I-95 median widens to the north of the NJ Route 29 Interchange, where the median barrier is replaced by grassed median areas. The total median width approaching and continuing north past the Bear Tavern Road Interchange in this area is approximately 38 feet.

The inside shoulder width does not meet current design criteria along most of the I-95 corridor in the study area and is about four feet along the Pennsylvania portion of the project corridor and is close to zero feet in New Jersey. The breakdown lane width (outside shoulder) is adequate (12 feet) along the majority of the corridor, with the exception of I-95 bridges over Taylorsville Road, the Pennsylvania Delaware Canal, the I-95/Scudder Falls Bridge, the New Jersey Delaware and Raritan Canal, and the 1,500-foot section of I-95 southbound east of the I-95/Scudder Falls Bridge.

The I-95 corridor is shown in Figures I-2, II-1, and II-2, and the I-95 corridor and four interchange areas are described in more detail in the following section from southwest to northeast.



I-95 Pennsylvania Exit 49, PA Route 332 Interchange

At the western project limit, I-95 intersects PA Route 332 at a full-movement, diamond interchange with signalized ramp intersections at PA Route 332. A PENNDOT project implemented interchange improvements that include adding another movement to the southeastern quadrant of this interchange (interchange loop) to improve operational conditions. The needs for the I-95/PA Route 332 Interchange improvements are addressed as part of this separate PENNDOT project. The improvements were assumed to be in place for this report and the associated analyses.

I-95 between PA Route 332 and Taylorsville Road

The roughly 1.8-mile section of I-95 between PA Route 332 and Taylorsville Road includes two over passing bridges at Quarry Road and Dolington Road and a rest area along the southbound lanes. This highway segment consists of two 12-foot travel lanes in each direction, with inside and outside shoulders. The right shoulder is 12-feet wide in this highway segment, providing adequate space to accommodate disabled vehicles, but the left shoulder does not meet current design criteria (approximately four feet) in width. Figure 2 in Appendix A shows the existing interchange.

On the western end of this highway segment, the median is wide, consisting of grassed areas and inside paved shoulders, with a width of approximately 60 feet, and narrows past the rest area and approaching Taylorsville Road. The I-95 median approaching and west of Taylorsville Road narrows and includes a concrete median barrier, and the grassed median is replaced by pavement past the ramp terminals east of the interchange.

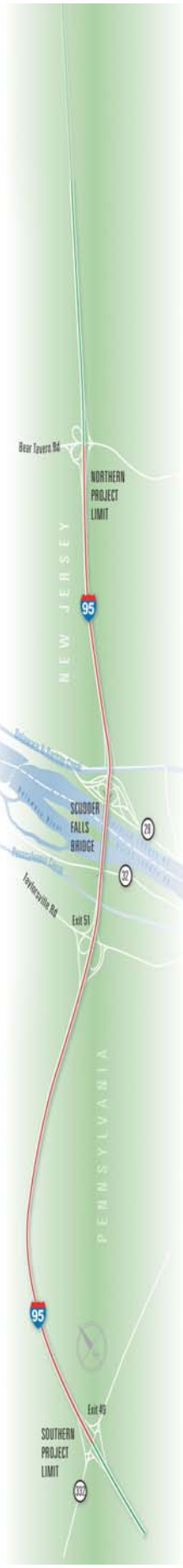
I-95 Pennsylvania Exit 51, Taylorsville Road Interchange

The Taylorsville Road Interchange is a full-movement, half diamond/half cloverleaf interchange with unsignalized intersections at Taylorsville Road. The speed limit on Taylorsville Road is 35 miles per hour south of the interchange, and increases to 45 miles per hour north of the interchange. Taylorsville Road is a minor arterial providing access to Yardley Borough to the south and to Washington Crossing and New Hope to the north.

There are a total of six interchange ramps. Two ramps comprise the half-diamond east of Taylorsville Road, and four ramps comprise the half cloverleaf on the west (entrance/exit ramps to/from I-95 northbound on the south, and entrance/exit ramps to/from I-95 southbound on the north).

The shoulders on I-95 in the interchange area do not meet current design criteria for shoulder widths, and the breakdown lane (outside shoulder) narrows on the bridge over Taylorsville Road. One interchange ramp does not meet horizontal geometry requirements. Several ramp vertical curves also do not provide for the appropriate sight distance.

The acceleration lengths for all ramps, with the exception of one I-95 southbound on-ramp, were found to be substandard. The deceleration lengths for all ramps, except for the I-95 southbound off-ramp, were adequate. The spacing of the two I-95 southbound off-ramps onto Taylorsville Road was found to be substandard. Several ramp radii at the interchange also do not meet current design criteria at the merge with I-95. These deficiencies in



acceleration lengths, ramp spacing, and ramp radii at the I-95 merge create safety and operation problems for vehicles entering and exiting the I-95 mainline.

It should be clarified that the existing corridor and interchanges were analyzed for substantial criteria in 2003 and the results were issued in Tech Memo No. 3: Deficiency Analysis. At that time, the July 2002 Pub. 13 (DM2) was in effect, and PennDOT Strike-off letter 432-06-07 was not issued until September 2006.

The intersection of the I-95 northbound off-ramp in the southwest interchange quadrant, and Taylorsville Road is a three-leg unsignalized intersection. The intersection of I-95 southbound on-ramp (in the northwest quadrant) and Taylorsville Road is a three-leg unsignalized intersection.

The southbound I-95 on-ramp intersection with Taylorsville Road is located 500 feet from a signalized intersection with Woodside Road. This intersection of Taylorsville Road and Woodside Road is a four-leg signalized intersection. Taylorsville Road widens to three southbound lanes and two northbound lanes where it passes under I-95, but narrows to one travel lane in each direction further north of Woodside Road and about 1,000 feet south of I-95 at intersections with Highland Drive and Maplevale Drive.

Access to the PENNDOT park-and-ride lot is located on Woodside Road, 200 feet east of the Taylorsville Road intersection. Woodside Road also crosses over and provides access to the Delaware Canal, to the east, and terminates at River Road (PA Route 32), a principal arterial, along the Delaware River.

I-95 from Taylorsville Road to Scudder Falls Bridge

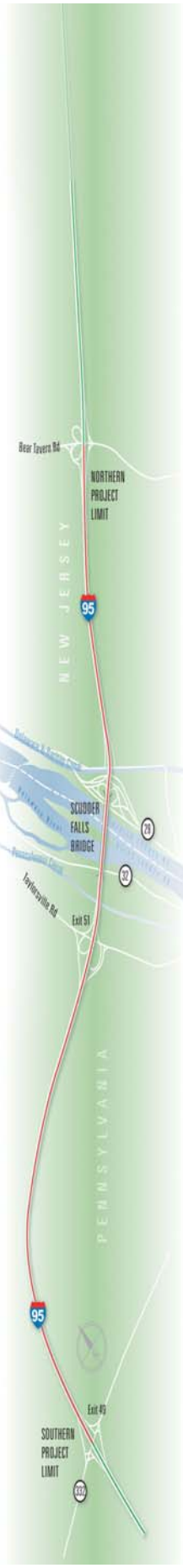
The distance from the Taylorsville Road ramp terminals on I-95 to the I-95/Scudder Falls Bridge is less than 1,000 feet. East of the Taylorsville Road Interchange, I-95 passes over the Delaware Canal on structure. The right shoulder in this area narrows over the Pennsylvania Delaware Canal Bridge to ten feet, and the median narrows to less than the minimum width of 22 feet over the 300 feet approaching the I-95/Scudder Falls Bridge.

I-95/Scudder Falls Bridge

The Scudder Falls Bridge, carrying I-95 over the Delaware River, was constructed in 1959 and opened to traffic in 1961. The I-95/Scudder Falls Bridge spans over River Road (PA Route 32) in Pennsylvania, the Delaware River and Park Island, and NJ Route 29 southbound in New Jersey.

The main river bridge is a two-way roadway with two lanes in each direction divided by a five-foot median that includes a two-foot concrete median barrier. Both directions are 27-feet wide with no inside shoulder or breakdown lane on the bridge. Narrow safety walks, measuring two to six feet are provided on both sides of the bridge. The distance from the northernmost Taylorsville Road Interchange northbound on-ramp to the bridge is approximately 760 feet, and the distance from the NJ Route 29 southbound on-ramp to the bridge is approximately 170 feet.

The total length of the bridge is 1,740 feet from abutment to abutment. There are no posted loads, vertical clearances, or speed limit restrictions on the bridge. The bridge has been in service since 1961, with no changes in overall lane capacity.



The load ratings for the bridge superstructure do not meet current AASHTO (American Association of State Highway and Transportation Officials), PENNDOT or NJDOT design standards. For the AASHTO HS20 (36-ton) vehicle, the existing load factor design (LFD) inventory rating is 30 tons, controlled by the main girders. The bridge is currently not posted for loads, because the operating rating is greater than 36 tons; however permit loads currently require operational restrictions limiting concurrent truck traffic on the bridge.

I-95 from Scudder Falls Bridge to NJ Route 29/NJ Route 175 Interchange

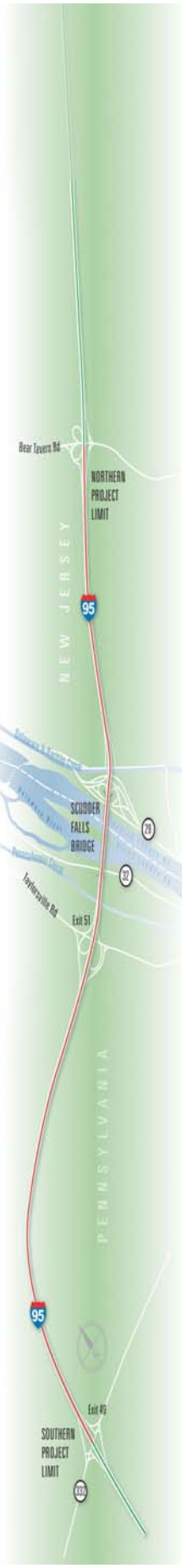
East of the I-95/Scudder Falls Bridge, I-95 extends over NJ Route 29 northbound, the Delaware and Raritan Canal, and NJ Route 175 (Upper River Road) on a bridge structure roughly 800 feet east of the Delaware River. In New Jersey, the left shoulder is only one and one-half feet wide, and the right shoulder is deficient in width at the New Jersey canal bridge, where the I-95 mainline is bordered by the 14-foot northbound on-ramp and the 13-foot southbound off-ramp. North of this point, I-95 transitions to three travel lanes in each direction. The median width also does not meet current design criteria and consists of the concrete median barrier and the northbound and southbound left shoulders (five feet).

I-95 New Jersey Exit 1, NJ Route 29 Interchange

The NJ Route 29 Interchange is a grade-separated interchange with a scissor configuration and criss-crossing pattern for the ramps. The NJ Route 29 Interchange is a full-movement, all yield-controlled directional interchange with the exception of one movement. The NJ Route 29 southbound to I-95 northbound, movement is completed via NJ Route 175 (Upper River Road). The speed limit on the mainline of I-95 in the area of this interchange is 65 miles per hour. The speed limit on NJ Route 29 to the north and south of the interchange is 45 miles per hour. NJ Route 29 is an undivided, two-lane roadway north of the interchange, and becomes a divided highway with two travel lanes in each direction to the south of I-95. The interchange ramps are located between NJ Route 29 southbound and northbound. NJ Route 29 provides access to Trenton to the south and to Washington Crossing and Lambertville to the north. Figure 3 in Appendix A shows the existing interchange.

To the east, the Delaware and Raritan Canal and Upper River Road (NJ Route 175) extend parallel to River Road at I-95, and cross under NJ Route 29/River Road to the north. NJ Route 29 and River Road merge to the south and north of the interchange, and NJ Route 29 (River Road) intersects Upper River Road (NJ Route 175) after crossing north over the Delaware and Raritan Canal. Upper River Road (NJ Route 175), a minor arterial, closely follows the east side of the canal, passing under I-95, where it provides access to an on-ramp onto I-95 northbound.

Interchange improvements planned by the NJDOT at this location were evaluated in the *Final Step 1 Engineering Investigation Report for I-95/New Jersey Route 29/New Jersey Route 175 Interchange* in November 1995. This report indicated the I-95/NJ Route 29/NJ Route 175 Interchange includes 19 ramp merges and seven at-grade intersections, including intersections with Bernard Drive/Park Driveway, which provides access to the Scudder Falls Recreation Access parking lot north of the interchange.



The existing scissors ramps were intended to provide access and egress to I-95 and NJ Route 29 with as many free-flow conditions as possible, without any signalized intersections. As a result, there are many yield-controlled, and some stop-controlled intersections in very close proximity. The complexity of the NJ Route 29 geometry, with these intersecting ramps within the interchange area, is confusing for drivers. The interchange also has substandard ramp geometries and ramp merges.

On I-95, there are two entrance ramps and one exit ramp for I-95 northbound, and one entrance and one exit ramp for I-95 southbound. The I-95/Scudder Falls Bridge Improvement Project included an evaluation of a total of the ten on- or off-ramps for the I-95/NJ Route 29 Interchange and several other ramps from surrounding roadways. The majority of these ramps have ramp radii (horizontal geometry), and all have ramp widths, that do not meet current design criteria. All but three interchange ramps do not meet requirements for vertical sight distance and geometry, and minimum required radii for 60 mile per hour freeway ramp merges. Several of the acceleration and deceleration lengths for on- and off-ramps do not meet current design criteria, and the separation along I-95 between on- and off-ramps was found to be substandard in both the northbound and southbound directions.

Horizontal sight distance is also insufficient at certain locations within the interchange where ramps intersect. The use of a stop sign at the southbound I-95 ramp merge from NJ Route 29 and at other at-grade intersections within the interchange area is undesirable when connecting an Interstate highway (I-95) to a principal arterial (NJ Route 29).

Upper River Road (NJ Route 175) intersects NJ Route 29 southbound north of the interchange area and provides a connection to I-95 northbound. The intersection of the I-95 northbound on-ramp and Upper River Road is a three-leg unsignalized intersection. This intersection is located in close proximity to access for the New Jersey State Police headquarters off Trooper Drive on Upper River Road.

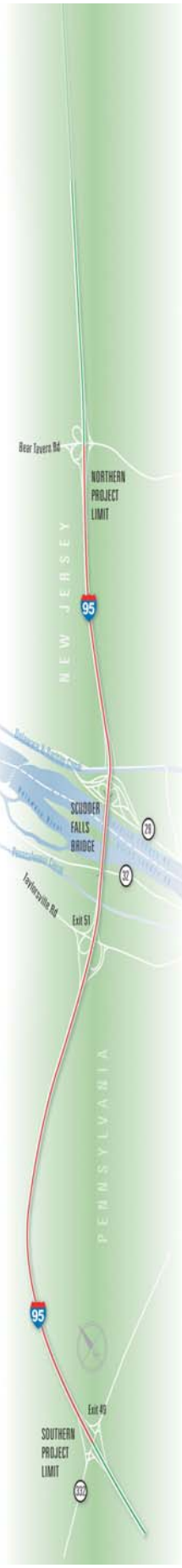
North of the interchange, Park Driveway provides access to the Scudder Falls Recreation Area, and becomes Bernard Road to the east. The intersection of NJ Route 29 and Bernard Road is a four-leg unsignalized intersection. The intersection of Upper River Road and Park Driveway is a four-leg unsignalized intersection with the west leg operating one-way eastbound.

I-95 from NJ Route 29 Interchange to Bear Tavern Road

East of the NJ Route 29 Interchange, I-95 climbs up gradient, over a distance of 1.2 miles, to the Bear Tavern Road Interchange with three 12-foot travel lanes in each direction. The median width does not meet current design criteria (less than ten feet) over the section of I-95 extending about 1,000 feet east of the NJ Route 29 Interchange. The southbound lanes lack a breakdown lane (outside shoulder) over a distance of approximately 750 feet approaching the NJ Route 29 Interchange.

A study of the horizontal sight distance on I-95 indicates that curves east of the I-95 Bridge over NJ Route 29 do not meet the minimum required sight distance. The concrete median barrier obstructs horizontal sight distance in the northbound direction along these curves. In the southbound direction, the concrete barrier located along the gore area of the I-95 southbound on-ramp from NJ Route 29 obstructs the line of sight in the right hand lane.

Approximately 650 feet east of the NJ Route 29 Interchange, I-95 slowly begins to widen. Near the northbound I-95 ramp merge from NJ Route 175, the I-95 concrete barrier is replaced by grassed median. The southbound travel lanes in this area and continuing north towards Bear Tavern Road are adjoined by a noise barrier. The median widens to the north to approximately 38 feet (including inside shoulders).



11. Planned and Proposed Improvements in the Area

Other Development Planned in the Area

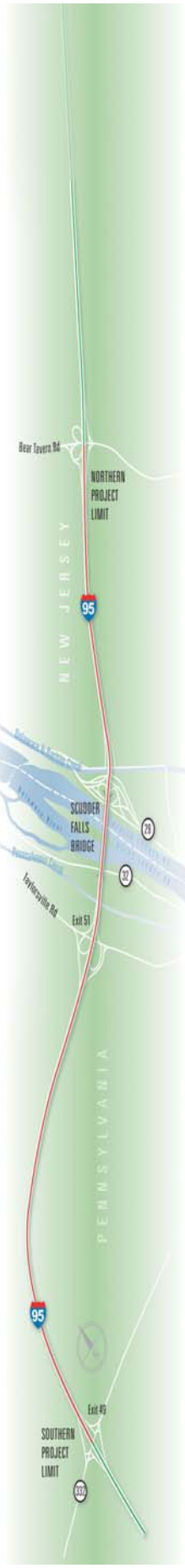
The development along the I-95 corridor includes large office complexes in the vicinity of the I-95 interchanges, with several such recent and proposed developments in New Jersey, and low-density residential construction in Pennsylvania.

The I-95 corridor is primarily developed in Ewing Township on the New Jersey side, with the south side of I-95 bordered by state-owned property (New Jersey State Police and Jones Farm Correctional Facility). It is anticipated that future developments in Ewing Township would largely consist of commercial or industrial redevelopment, due to the lack of developable lands and efforts to improve the local tax base. Recent proposals in the vicinity of I-95 include the Emergency Operations Center proposed for the New Jersey State Police headquarters, south of I-95, and an age-restricted residential development to the northwest of the Bear Tavern Road Interchange, north of I-95. A number of large office or commercial developments have been recently constructed or are proposed in the areas east of the I-95 project corridor in New Jersey (see Table 1).

On the Pennsylvania side, recent developments along the I-95 corridor have occurred primarily in the area north of I-95 over the past ten years in areas that previously consisted of farmlands. Recent developments north of the I-95 corridor include the construction of the Lower Makefield Corporate Center to the northwest of the PA Route 332 Interchange. Areas north of I-95 and areas to the south near the PA Route 332 Interchange include newer low-density residential developments which have incorporated areas of preserved farmlands under the Lower Makefield Township Farmland Preservation Program. This program employs zoning ordinance provisions in the low-density residential district surrounding I-95 on the north and southwest, requiring that certain percentages of lands be set aside as part of planned developments to be used for farming or other open space use. The program includes the creation of the Lower Makefield Township Farmland Preservation, Inc., which owns the properties and safeguards their future use. Since it was enacted in 1985, more than 311 acres of farmland have been preserved. The township is also developing a recreational golf course facility off Woodside Road.

These trends for residential development, in concert with open space/farmland preservation, in Lower Makefield Township, and construction of office parks and commercial redevelopment on available parcels within and adjoining the corridor, particularly on the New Jersey side, are expected to continue in the future. However, the availability of buildable lands may restrict the pace of future development along the project corridor.

Development proposals within Bucks County and Mercer County were identified through coordination with the county planning commissions, and local proposed developments were identified through coordination with the Ewing Township and Lower Makefield Township planning officials. A number of developments are proposed in the project area communities, including those described in Table 1.



The new or proposed development in the vicinity of I-95 and the Trenton-Mercer Airport in Ewing Township are shown in Table 1. Large future development plans include expansion for other large employers in neighboring Hopewell Township identified in this table. Proposed developments in Lower Makefield Township consist largely of smaller residential developments. In neighboring Newtown Township, several office developments in the general vicinity of the project are proposed.

The list was developed in 2003 for use in the traffic model. Traffic generated from any developments that are now constructed and open are accounted for in the 2010 base volumes and 2030 traffic volume projections.

Table 1
Proposed Developments

Community	Development
Ewing Township	• A future proposal for the Bloomberg Financial office complex, known as Ewing Corporate Park, in Ewing Township would total one million square feet of development at the next I-95 exit to the north (Scotch Road), with direct access to the NJ Route 31 interchange. • An age-restricted development on 26 acres adjoining the I-95/Bear Tavern Road Interchange was approved for development of less than 148 single-family units. • A Courtyard by Marriott is under construction south of I-95 at Scotch Road in Ewing Township. There will also be two new office buildings totaling 190,000 square feet, along with possible renovation of existing First Union buildings. • On the west side of Scotch Road, Mercer County has a lease agreement with the Advance Groups for developing the Scotch Road Technical Center with 100,000 square feet of space. • Two new office developments, totaling 550,000 square feet will occur along Phillips Boulevard off Lower Ferry Road, east of the project corridor. • Construction has started on two office buildings at the Ewing Commerce Plaza along Sullivan Way near West Trenton that will generate 430,000 square feet of office space and flex warehouse space.

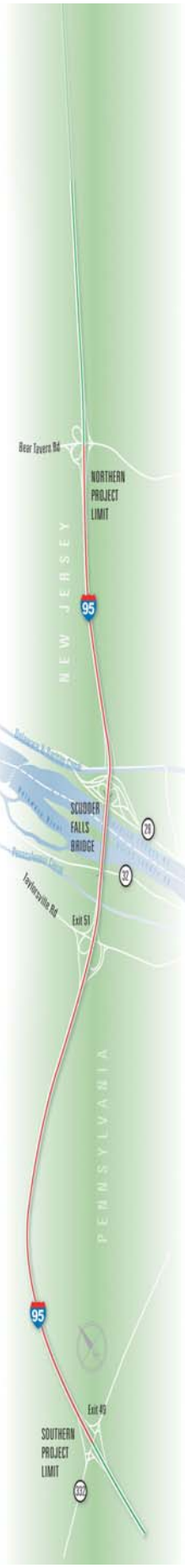
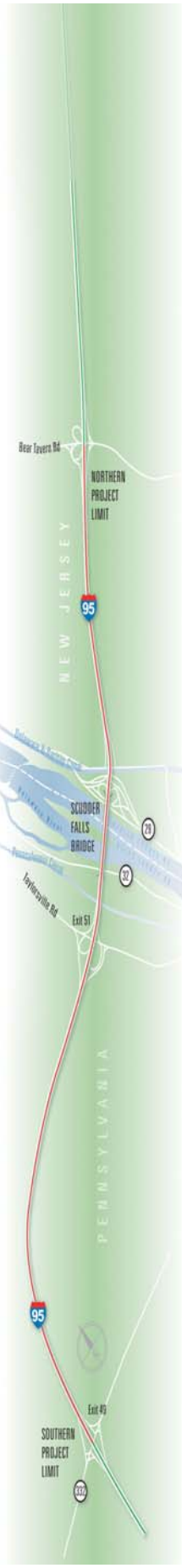


Table 1
Proposed Developments

Community	Development
Hopewell Township	• Merrill Lynch recently constructed 1.4 million square feet of office space in Hopewell Township, north of the Scotch Road Interchange immediately east of the project corridor. The entire development that was approved for the Merrill Lynch facility consists of 3.5 million square feet, accommodating a total of about 10,000 employees. • Janssen Pharmaceutical along Bear Tavern Road proposes to add 830,000 square feet of office space to existing 500,000 square feet of office and research space. This would increase employees from 1,380 to 3,880. • Bristol-Myers Squibb will be expanding its facilities under an approved general development plan permitting 2.8 million square feet of development, of which about one million square feet has been built. • The Townsend Properties Trust property has 300,000 square feet of office and laboratory space and an approved general development plan allows another 500,000 square feet of expansion.
Lower Makefield Township	• New office building construction is proposed on Township Line Road by Liberty Property Limited Partnership (132,000 square feet). • The Realen Homes proposal for the Chanticleer Preliminary Plan consists of 17 residential lots on Mt. Eyre Road. • The preliminary plans for Fieldstone at Lower Makefield call for a total of 74 residential lots on Edgewood Road. • Flowers-Madany Tract on Washington Crossing Road is proposed to house 32 residential lots. • Lower Makefield Township is constructing the Makefield Highlands Golf Course on 168 acres on Woodside Road, off Taylorsville Road and north of I-95. This recreational facility is scheduled to open in the summer of 2004. The feasibility study developed for this facility cites an average capacity of 210 players per day.
Newtown Township	• Durham Road Associates Professional Offices proposed to construct 80,750 square feet of office development on PA Route 413 north of the Newtown Bypass. • Newtown Office Park involves construction of 89,560 square feet of office development on Newtown-Yardley Road at Friend's Lane. • Newtown Commons proposes 415,000 square feet of development on Upper Silver Lake Road.



The historic development patterns in and surrounding the project area are anticipated to continue, which will contribute to the need for future I-95 improvements to meet both existing and future traffic demands. The developments identified by the Bucks and Mercer County Planning Commissions for municipalities within Bucks and Mercer counties were factored into the DVRPC regional model of travel demand.

Other Proposed Transportation Improvements in the Area

Existing and Planned Public Transportation Services

Public transportation services in the vicinity of the study area include a Southeastern Pennsylvania Transportation Authority (SEPTA) rail line and several NJ Transit bus lines. The closest rail service is the SEPTA R3 West Trenton Regional Rail line, which has stations in Yardley and West Trenton, providing service into Center City Philadelphia.

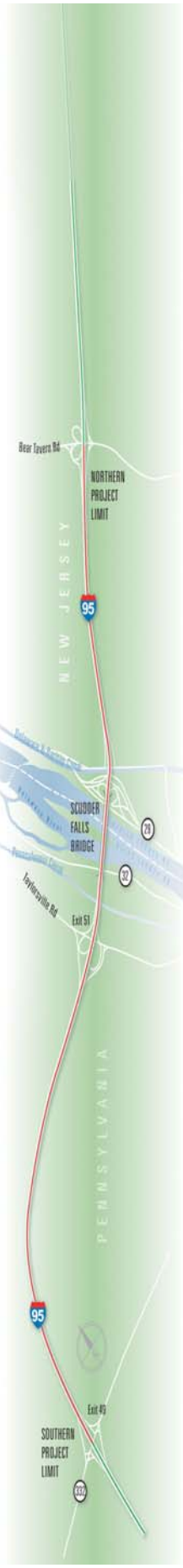
NJ Transit has several bus routes in the area. NJ Transit service on Bus Route 607 extends from Bear Tavern Loop south on Bear Tavern Road, across I-95, extending north on Upper Ferry Road past the Trenton-Mercer Airport, with service into Hamilton (Independence Plaza). Bus Route 608 extends from Lambertville to the Hamilton Rail Station, with a stop at the New Jersey State Police barracks on Trooper Drive. Bus Route 609 extends from Lower Ferry Road in Ewing Township, east of the project corridor, to the Quaker Bridge Mall on Route 1 in Lawrence Township.

Extension of commuter rail service by New Jersey Transit on the West Trenton Line 21 miles to the northeast to provide service on existing track to Bridgewater to connect to the Raritan Valley Line Corridor is currently under study. The Raritan Valley Line provides service from High Bridge, New Jersey through Raritan and into Newark and New York City. This planned rail extension would traverse I-95 to a new rail station off I-95 in Hopewell Township.

Another study underway is the NJ Transit alternatives analysis study for the Route 1 Bus Rapid Transit (BRT), which involves an exclusive busway along the Route 1 corridor. The prior feasibility study performed by the Greater Mercer Transportation Management Association in collaboration with the Central Jersey Transportation Forum identified the Taylorsville Road PENNDOT park-and-ride lot as the western end of one of several potential feeder bus routes providing service to the core segment of a possible Route 1 Bus Rapid Transit system. Further analysis of access from the park-and-ride lot on Taylorsville Road is included in the NJ Transit Options Analysis for the BRT.

Another project mentioned by DVRPC in the January 2004 Transportation Forum was a study of establishing a multimodal transportation center with transit providing service to the Trenton-Mercer Airport. The Bear Tavern Road Interchange provides access to the Trenton-Mercer Airport, which is situated approximately 1,500 feet east and north of Bear Tavern Road.

The airport is currently serviced by two commercial airlines: Boston-Maine Airways (Pan Am Airways) providing service to Bedford, Massachusetts and Shuttle America (U.S. Airways Express) providing service to Bedford and Pittsburgh, Pennsylvania. The Trenton-Mercer Airport also accommodates general aviation.



Existing Travel Demand Management Initiatives in the I-95 Corridor

The study area is serviced by the Greater Mercer Transportation Management Association and the Bucks County Transportation Management Association (TMA). The two TMAs work with businesses in Mercer and Bucks counties to provide carpool, vanpool and shuttle services to and from area rail stations for employees. There are no shuttle services across the I-95 corridor at the present time. The PENNDOT park-and-ride lot located on Taylorsville Road supports ridesharing, although there is no organized bus or shuttle service operating from this location. The closest TMA shuttle service is operated by the Greater Mercer TMA, which operates a shuttle service for Merrill Lynch to the Hamilton Rail Station.

I-95 and Pennsylvania Turnpike Interchange

The I-95 and Pennsylvania Turnpike Interchange project is currently in the design phase. With the completion of the interchange, the re-designation of a portion of I-95 is anticipated. The renaming includes the portion of current I-95 from the PA Turnpike in Bristol, Pennsylvania to the Route 1 Interchange in Lawrenceville, New Jersey. This section of I-95 will be renamed I-195.

Proposed Roadway Improvements

A broad range of options to meet the project purpose and need for the I-95/Scudder Falls Bridge Improvement Project was evaluated as part of the options screening process. The project is being undertaken in order to substantially reduce traffic congestion (achieve traffic LOS D during peak hours) and improve safety and operational conditions. The No-Build and TSM/TDM Options will not meet the project purpose and need. The Environmental Assessment will include the No-Build Alternative as a baseline for comparison to the Build Options. In addition, planning and evaluation of appropriate Transportation Systems Management/Transportation Demand Management (TSM/TDM) options will continue. These TSM/TDM measures include:

- Intelligent Transportation Systems/Incident Management as identified in the Conceptual ITS Study. The study includes recommendations for ITS implementation such as Dynamic Message Signs, Closed Circuit Television Cameras, Incident Detection System, Highway Advisory Radio, Roadway Weather Information Systems, conduit/fiber optic cable, Freeway Service Patrols and an Incident Management Plan;
- Incorporation of 14-foot inside shoulders for possible future use as bus lanes by the Route 1 Bus Rapid Transit (which have been incorporated into proposed concept designs). The 14-foot shoulder will function as an effective shoulder for vehicular refuge areas and will be signed as such if a BRT is implemented;
- Pedestrian/bicycle access on the I-95/Scudder Falls Bridge; and,
- Continued coordination with the Bucks and Mercer County Transportation Management Associations and large local employers.

Existing I-95 includes two travel lanes in each direction in Pennsylvania and on the I-95/Scudder Falls Bridge up to the NJ Route 29 Interchange, and three travel lanes in each direction east of NJ Route 29 in New Jersey. Design options evaluated over the 4.4-mile

project area that extends from PA Route 332 to Bear Tavern Road in New Jersey included the following range of options that were developed for various segments of the project. These project segments, from west to east, are:

1. Pennsylvania I-95 Mainline Segment from the PA Route 332 Interchange to the Taylorsville Road Interchange
2. Taylorsville Road Interchange
3. I-95/Scudder Falls Bridge and Approaches, including I-95 mainline in New Jersey to the Bear Tavern Road Interchange
4. NJ Route 29 Interchange

The major project-wide options developed for I-95 and various design options developed for project segments are described in more detail below. The options are developed to meet the project need, including providing for a LOS D or better during peak hours.

Pennsylvania I-95 Mainline

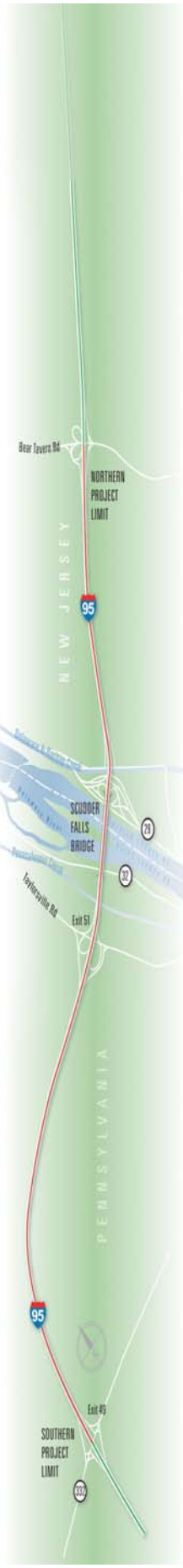
Widening this section is needed to obtain LOS D or better during peak hours. Two options for lane additions on the Pennsylvania I-95 mainline were considered for the segment west of the Taylorsville Road Interchange: **inside widening** and **outside widening**. Both design options involve adding one travel lane in each direction either within the existing median (inside widening) or to the right of the existing travel lanes in each direction (outside widening), for a total of three travel lanes in each direction.

The outside widening option would cost approximately $1 million less to construct than the inside widening option. However, the outside widening option would generally involve greater environmental impacts. Widening outside the existing travel lanes would require more clearing of roadside forested vegetation and would involve additional impacts to a wetland, a stream, and greater impact to highway drainage ditches. Inside widening would be performed within the existing right-of-way, while outside widening would involve minor property impacts. When considering the total effects of the outside widening versus the inside widening, and with consideration of the position of Lower Makefield Township supporting the inside widening, inside widening is the preferred design option for the Pennsylvania I-95 Mainline.

Taylorsville Road Interchange

The four Design Options that were considered for the existing Taylorsville Road Interchange are as follows:

- **Design Option 1:** Retains all ramps (including the two southbound off-ramps and two northbound on-ramps) similar to the existing configuration.
- **Design Option 2:** Eliminates eastern southbound off-ramp and combines it with the western southbound off-ramp; retains two northbound on-ramps.
- **Design Option 3:** Eliminates eastern northbound on-ramp and combines it with the western northbound on-ramp; retains two southbound off-ramps.
- **Design Option 4:** Eliminates both the eastern southbound off-ramp and eastern northbound on-ramp and combines each with the respective western southbound off-ramp and northbound on-ramp.



Each option retains the existing northbound off-ramp and southbound on-ramp.

Of the four design options considered at the Taylorsville Road Interchange, a design option that eliminates the eastern southbound off-ramp (**Design Option 2**) was advanced for further consideration. Design Option 2 is the preferred option for the Taylorsville Road Interchange because it would provide better traffic operations and enhance traffic safety, would have lesser property impacts, and would generally have comparable or lesser impact to natural resources (supporting information is provided in the Tech Memo No. 26 Alternatives Screening Report). This option eliminates the weave problem for the motorists destined to Woodside Road southbound from the southbound I-95 off-ramp to westbound Taylorsville Road.

NJ Route 29 Interchange

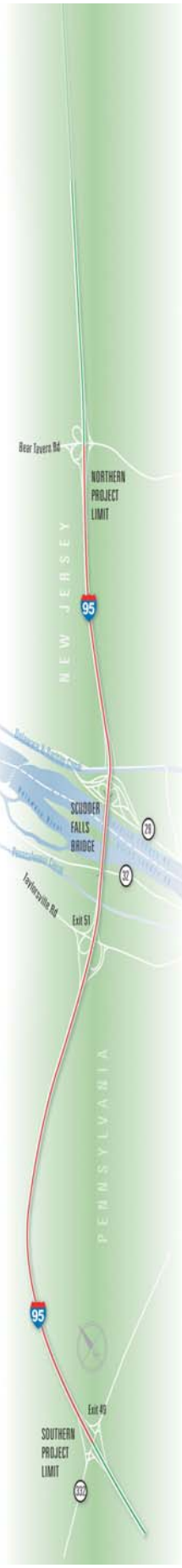
Four options were identified for the NJ Route 29 Interchange. These design options would eliminate the existing criss-crossing intersection configurations, would eliminate the stop-sign control at the southbound I-95 on-ramp, and would provide adequate acceleration/deceleration lanes on I-95. The four design options are:

- **Design Option 1a:** Folded diamond interchange that realigns NJ Route 29 to the southbound NJ Route 29 travel lanes (west side) with signalized intersections and eliminates the existing bypass around the interchange (east side).
- **Design Option 1b:** Folded diamond interchange that realigns NJ Route 29 to the southbound NJ Route 29 travel lanes (west side) with signalized intersections and retains the bypass around the interchange (east side) for northbound traffic.
- **Design Option 1c:** Folded diamond interchange with two roundabouts for traffic traveling between NJ Route 29 and I-95, and bypasses for NJ Route 29 through traffic.
- **Design Option 2:** Folded diamond interchange that realigns NJ Route 29 to the northbound NJ Route 29 travel lanes (east side) with one signalized intersection and one unsignalized intersection.

The initial screening and the review process with NJDOT resulted in the roundabout option as the preferred option. Additional studies were completed for various roundabout options. These options included the following:

- **Option 1a Modified**: Folded Diamond with Roundabout. This alternative is generally the same as option 1a; however, it incorporates two-lane roundabouts at the loop ramp/ NJ Route 29 intersections instead of traffic signals. The NJ Route 29 Northbound bypass is not included in this option and all interchange traffic must utilize the two roundabouts.
- **Option 1c: NJDOT Roundabout**. For this option the interchange loop ramps intersect with I-95 traffic at single lane roundabouts. Northbound and southbound traffic on NJ Route 29 bypass the interchange intersections. The single lane roundabouts also include bypass lanes for right turning traffic.
- **Option 1c Modified: NJDOT Roundabout Modified**. This option is based on 1c and also incorporates single lane roundabouts. Bypass ramps are not included at the roundabouts. This option includes bypasses for northbound and southbound NJ Route 29.

Option 1c Modified: NJDOT Roundabout Modified is the preferred option selected by NJDOT to be advanced for the project.



I-95/Scudder Falls Bridge and Approaches

An array of Build and design options was evaluated for the I-95/Scudder Falls Bridge and approaches:

- Structural Options involving Bridge rehabilitation (full and partial) with widening or Bridge replacement;
- Lane Configuration Options:
    - Double-deck (Two-level) bridge,
    - Contra-flow lane (reversible lane for use in peak flow directions),
    - Standard Lane Additions,
    - Collector/Distributor roadway;
- Alignment Options (existing Centerline, Upstream, or Downstream Alignments).

Of these, the standard lane additions and collector/distributor roadways are major project-wide options, and other design options were evaluated for specific project segments.

Structural Options

- **Bridge Rehabilitation (either full or partial rehabilitation)** to meet current AASHTO, PENNDOT, and NJDOT criteria would result in costs that approach (or even exceed) those for bridge replacement. Under the PENNDOT policies and guidelines, if life cycle costs for bridge rehabilitation are within 30% of the life cycle costs for bridge replacement, bridge replacement is recommended. Moreover, although the bridge can be strengthened, rehabilitation does not eliminate concerns associated with the age and previous loading history of the bridge (currently exceeding 40 years in service and expected to remain in service for at least 75 more years) and its non-redundant configuration.

- **Bridge replacement** is proposed, as the two options evaluated for rehabilitation of the I-95/Scudder Falls Bridge are not considered fiscally prudent and therefore not selected for further consideration. In addition, complete bridge replacement will allow greater flexibility and efficiency and longer spans, thus reducing the number of piers in the Delaware River. All project options carried forward for further consideration include replacement of the I-95/Scudder Falls Bridge. Further, based on the conceptual-level designs that have been developed to date, all project options are based on a single bridge structure.

Lane Configuration Options

Several optional configurations were evaluated to provide the number of lanes and shoulders required to provide LOS D in the design year 2030 and to meet design criteria.

- The **Double-Deck Bridge Option** would be $18 million (2005 $) more than the Standard Lane Addition Design Option. A double-deck bridge would pose a higher security risk than

a single-level bridge. In addition, a double-deck bridge would be more visually intrusive in the environment, as well as to bridge users, than a single-level bridge due to its height. For the foregoing reasons, the Double-deck I-95/Scudder Falls Bridge option is not advanced for further consideration.

- The **Contra-Flow Lane Option** would employ a movable barrier, with one less travel lane provided in the off-peak flow direction. The preliminary estimate of initial and life cycle costs for the Contra-flow bridge operating system is $12,500,000 (2005 $). The savings resulted from constructing one less lane on the bridge will be about $4,000,000 (2005 $). Therefore the Contra-flow Lane option will cost an additional $8,500,000 (2005 $) over the Standard Lane Addition option. In addition to the cost differential, a Contra-flow Lane over such a short length of roadway would not be efficient. Safety would be an issue at the end treatments of the moveable barrier and in transition areas into and out of the Contra-flow Lane. For these reasons, the Contra-flow Lane Design Option is not advanced for further consideration.

Project-Wide Options

Two lane configuration options evaluated for the Scudder Falls Bridge were the **standard lane additions and collector/distributor roadway design options.** Since the physical changes necessary for these options extend well beyond the existing bridge, the evaluation of these options encompass the entire 4.4 mile project area. As such, they are considered and referred to as project-wide options. Both options incorporate inside widening as the preferred design option for the Pennsylvania I-95 Mainline segment of the project. In addition, both options incorporate Taylorsville Road Design Option 2 and Option 1c Modified: NJDOT Roundabout Modified is the preferred option selected by NJDOT to be advanced for the project. In order to provide an equitable comparison of the differences between the Collector/Distributor Roadway and Standard Lane Additions Options, both options utilize a centerline alignment for the I-95/Scudder Falls Bridge. These options are described below:

- **Collector-Distributor (CD) Roadway (Option 1):** The Collector/Distributor Roadway would segregate northbound I-95 mainline traffic from traffic entering or exiting at Taylorsville Road and at NJ Route 29. The northbound I-95 travel lanes and the CD Roadway would be separated by a six-foot wide raised divider. This CD Roadway would only be provided in the northbound direction, over a total length of about 2.4 miles. The northbound CD Roadway ramp would begin, on its western end, approximately 0.8 mile west of Taylorsville Road (across from the rest area in Pennsylvania) and would merge back into the I-95 mainline roughly 1.5 miles east of NJ Route 29 (at the western edge of the Jones Farm property).

  Under the CD Roadway alternative, the highway cross-section would be wider (roughly 20 to 28 feet) than the standard lane additions at the bridge and between the Taylorsville Road and NJ Route 29 Interchanges.

  Standard Lane Additions (Option 2): Existing I-95 includes two travel lanes in each direction west of NJ Route 29, and three travel lanes in each direction east of NJ Route 29. The area immediately east of the I-95/Scudder Falls Bridge, which is two lanes in each direction, is a transition area from two lanes to three lanes in each direction. Under the alternative for standard lane additions, one travel lane in each direction would be added on the entire I-95 mainline, with an additional northbound lane added east of Taylorsville Road to accommodate projected northbound traffic demand. Between the Taylorsville

Road Interchange and the NJ Route 29 Interchange, one auxiliary lane in each direction would be provided to facilitate merging and diverging at the interchange ramps resulting in a total of five lanes northbound and four lanes southbound on the I-95/Scudder Falls Bridge and approaches.

The Levels of Service associated with both options are comparable and acceptable, but the CD Roadway Option does not present sufficient additional operational benefits to justify the increase in cost ($10.5 million more – 2005 $) and property/environmental impacts, when compared with the Standard Lane Additions Option. For these reasons, the Standard Lane Additions Option is advanced for further consideration over the CD Roadway Option.

Alignment Options

The I-95/Scudder Falls Bridge Alignment Options evaluated included:

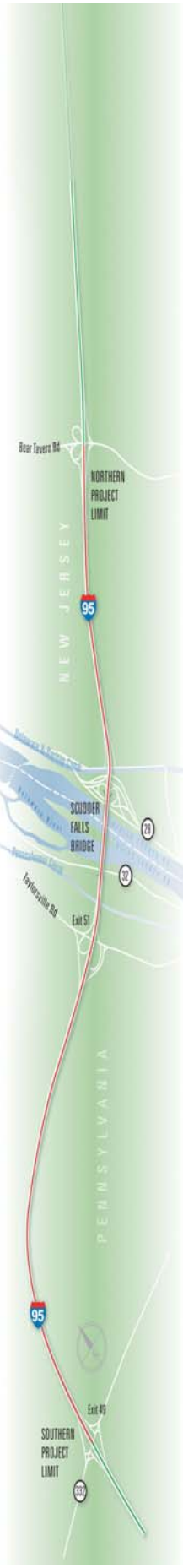
- **Centerline Alignment** (new bridge on existing centerline);
- **Upstream (Northern) Alignment** that involves a new bridge overlapping the existing bridge; and,
- **Downstream (Southern) Alignment** that involves a new bridge overlapping the existing bridge.

The impacts of the three alignment options are generally of the same scope and magnitude. However, notable distinctions among the options favor the Upstream Alignment with respect to property impacts, most environmental impacts, and its avoidance of the concrete flood overflow structure on the south side of the existing bridge. For these reasons, the Upstream Alignment Design Option is advanced for further consideration.

Tolling Alternatives

The DRJTBC is proposing to toll the I-95/Scudder Falls Replacement Bridge as part of the I-95/Scudder Falls Bridge Improvement Project in the southbound direction only. By Resolution on December 21, 2009, the Delaware River Joint Toll Bridge Commission determined that the I-95/Scudder Falls Replacement Bridge will be tolled in order to fund the needed improvements. Tolling will be "cashless," or "all electronic tolling (AET)." With AET, tolls will be collected electronically through the E-ZPass system or video capture and billing. A conventional toll plaza will not be built. AET is an electronic toll collection system that allows the motorist to travel at prevailing speeds without having to stop to pay the toll. License plates of motorists passing through the "cashless" toll system who are not E-ZPass tag holders will be subject to video capture by the electronic equipment mounted in the overhead gantry. The DRJTBC will send a bill to the customer to collect the toll.

On the I-95/Scudder Falls Replacement Bridge, tolling will be in the southbound direction only; i.e. entering Pennsylvania. This one-direction toll collection is consistent with all other tolled DRJTBC bridges crossing from New Jersey to Pennsylvania. Electronic toll equipment will be mounted on an overhead gantry structure that is on or adjacent to the new bridge on the Pennsylvania side of the bridge. Cabinets for electronic equipment will be located on or below the bridge outside of natural or human resource areas or in areas planned to be disturbed as part of the improvements documented in the EA/Draft 4(f). Therefore, there will be no change to the physical footprint



impact, and thus there will be no additional direct or indirect impact to natural or human resources due to the AET facilities.

The DRJTBC currently uses the E-ZPass system to collect tolls on seven of its twenty bridges including Trenton-Morrisville, New Hope-Lambertville, Interstate 78, Easton-Phillipsburg, Portland-Columbia, Interstate 90 (Delaware River Gap) and Milford-Montague. The remaining DRJTBC bridges, including the I-95/Scudder Falls Bridge, are toll-supported bridges. Tolls are not collected on toll-supported bridges, but their operation, maintenance, and improvements are funded by toll revenues.

Transportation Systems Management (TSM)

Transportation Systems Management (TSM) concepts were reviewed to determine whether they meet the project needs. These include ramp metering, transit, HOV facilities and park and ride lots, pedestrian facilities and ITS.

Ramp Metering: In the correct application, ramp metering can improve flow along the I-95 mainline by controlling the flow of traffic from the on-ramps, versus allowing platoons of traffic from on-ramps to merge, often times forcing their way into mainline traffic causing reduced speeds. The following freeway entrance ramps are included in the project area:

I-95 NB on-ramp from PA Route 332 North
I-95 NB on-ramp from PA Route 332 South
I-95 NB on-ramp from Taylorsville Road North
I-95 NB on-ramp from Taylorsville Road South
I-95 NB on-ramp from NJ Route 29
I-95 NB on-ramp from Upper River Road
I-95 NB on-ramp from Bear Tavern Road
I-95 SB on-ramp from Bear Tavern Road North
I-95 SB on-ramp from Bear Tavern Road South
I-95 SB on-ramp from NJ Route 29
I-95 SB on-ramp from Taylorsville Road
I-95 SB on-ramp from PA Route 332 West

All on ramps operate at LOS D or better during the 2030 No Build/No Toll except the Taylorsville Road NB on ramp and the Route 29 SB on ramp. Both of the ramps are in areas with severe congestion that is too severe to be mitigated alone by ramp metering.

Transit: The Route 1 Bus Rapid Transit (BRT) project in New Jersey has been considered in this project. The BRT alone will not meet the project need. Incorporation of 14-foot inside shoulders for possible future use as bus lanes by the Route 1 Bus Rapid Transit will be incorporated into proposed designs. The 14-foot shoulder will function as an effective shoulder for vehicular refuge areas and will be signed as such if a BRT is implemented.

High Occupancy Vehicle (HOV) Facilities: The project area covers about four miles along I-95. HOV lanes alone would not meet the project needs.

Park and Ride Facilities : Strategically located park and ride lots could provide motorist the opportunity to carpool reducing their commuting costs, and reducing the number of vehicles on portions the roadway network. The PENNDOT park-and-ride lot located on Taylorsville

Road supports ridesharing, although there is no organized bus or shuttle service operating from this location. This park and ride lot will be maintained with the proposed improvements.

Pedestrian/bicycle access has been studied and is proposed for inclusion in the proposed improvements on the I-95/Scudder Falls Bridge.

Intelligent Transportation Systems (ITS)/Incident Management includes equipment to facilitate improved roadway operations and incident response. Typically, equipment includes Dynamic Message Signs, Closed Circuit Television Cameras, Incident Detection System, Highway Advisory Radio, Roadway Weather Information Systems, conduit/fiber optic cable, Freeway Service Patrols and an Incident Management Plan all managed from the PennDOT and NJDOT Traffic Management Centers. Existing ITS equipment exists within New Jersey and has been recently installed in Pennsylvania within the project area.

The TSM improvements alone or combined do not meet the project needs.

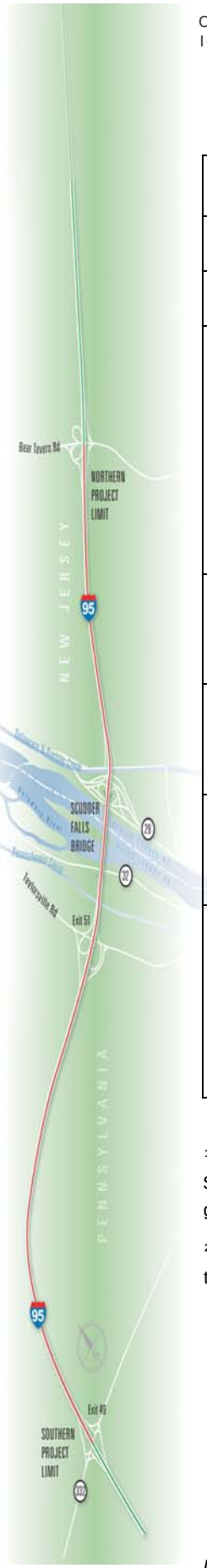
Description of Proposed Alternative

Of the options evaluated for the I-95/Scudder Falls Bridge and Approaches, full bridge replacement on a single bridge structure with the standard lane additions on an upstream alignment were found to best meet transportation objectives of improving safety and operational conditions while minimizing costs and impacts on the environment. These preferred bridge options are combined with the preferred design options for other project segments to compose project-wide Alternative 3:

- Pennsylvania inside widening on the mainline;
- Taylorsville Road Interchange Design Option 2 (retains three ramps); and,
- NJ Route 29 Interchange Design Option 1c Modified: NJDOT Roundabout Modified which include single-lane roundabouts. Bypass ramps are not included at the roundabouts. This option includes the bypasses for northbound and southbound NJ Route 29.
- Tolling in the I-95 Mainline southbound direction only. The tolling option would be cashless. Electronic toll equipment will be mounted on an overhead gantry structure that is on or adjacent to the new Scudder Falls Bridge on the Pennsylvania side of the bridge.

In addition to this Build Alternative, the EA will evaluate the No-Build, and TSM/TDM measures (including provision of a 14-foot inside shoulder to accommodate the Route 1 Bus Rapid Transit and incorporation of pedestrian/bicycle access on the bridge) will be advanced.

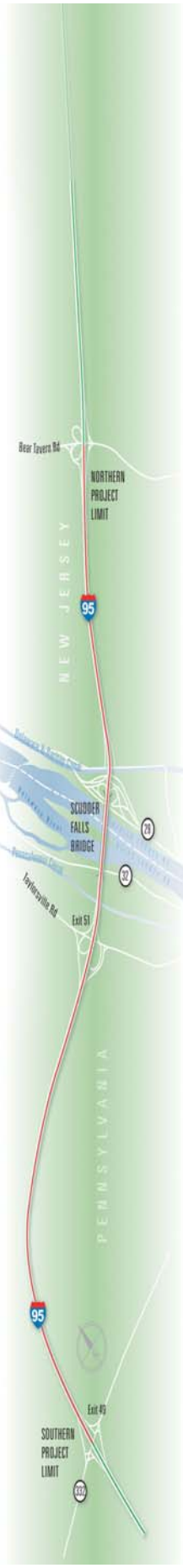
The proposed alternative is illustrated in the plans provided in Appendix B. The gore to gore distances for the ramps is illustrated below.



I-95 Gore to Gore Distances					
Section	**From**	**To**	**Distance (Feet)**	**Criteria[1] (Feet)**	**Comments**
Rest Area	I-95 SB On-ramp from Rest Area	I-95 SB Off-ramp to Rest Area	2,074	1,000	
Taylorsville Road	I-95 SB On-ramp from Taylorsville Road	I-95 SB Off-ramp to Rest Area	1,559	1,000	
	I-95 NB Off-ramp to Taylorsville Road	I-95 NB On-ramp from Taylorsville Road EB	1,271	750	
	I-95 NB On-Ramp from Taylorsville Road EB	I-95 NB on-ramp from Taylorsville Road WB	626	1,000	Ramp B adds lane to I-95, Min Dist does not apply
	I-95 SB Off-ramp to Taylorsville Road	I-95 SB On-ramp from Taylorsville Road EB	976	750	
Taylorsville Road to NJ Route 29	I-95 NB On-ramp from Taylorsville Road WB	I-95 NB Off-ramp to NJ Route 29	2,526	1,000	
	I-95 SB On-ramp from NJ Route 29	I-95 SB Off-ramp to Taylorsville Road	3,417	1,000	(PA Standard>NJ Standard)
NJ Route 29	I-95 NB Off-ramp to NJ Route 29	I-95 NB On-ramp from NJ Route 29	1,184	500	
	I-95 SB off-ramp to NJ Route 29	I-95 SB On-ramp from NJ Route 29	763	500	
NJ Route 29 to Bear Tavern Road	I-95 SB off-ramp to NJ Route 29	I-95 SB On-ramp from Bear Tavern Road SB	5,801	500	
	I-95 NB on-ramp from NJ Route 29	I-95 NB Off-ramp to Bear Tavern Road	5,754	500	
Bear Tavern Road	I-95 NB Off-ramp to Bear Tavern Road	I-95 NB On-ramp from Bear Tavern Road	1,97	500	
	I-95 SB On-ramp from Bear Tavern Road NB	I-95 SB Off-ramp to Bear Tavern Road SB	304	500	NJDOT Roadway Design Manual, Figure 7-I,[2]
	I-95 SB Off-ramp to Bear Tavern Road SB	I-95 SB On-ramp from Bear Tavern Road SB	87	500	

[1] Interchanges located in PA, governing gore to gore distances from PENNDOT DM-2, Chapter 1 - General Design, Section 1.6 - Acceleration and Deceleration (Speed-Change) Lanes. Interchanges located in NJ, governing gore to gore distances from NJ Roadway Design Manual, Section 7 - Interchanges, Figure 7-I.

[2] As stated in NJ Roadway Design Manual, Section 7 - Interchanges, Figure 7-I, gore to gore length for an entrance terminal followed by exit terminal is NOT applicable to distance between Loop Ramps or Cloverleaf interchanges.



Options Development and Screening

The analysis and screening process for the Design Options under consideration was a multi-phase process in which the engineering feasibility, costs, and environmental consequences of the options were evaluated. Design Options were carried forward for further evaluation and consideration based on the following factors:

- Engineering design features and feasibility
- Safety and Mobility, Traffic Operations, and Constructability;
- Opportunities for Multi-modal Connectivity and Bicycle/Pedestrian Access;
- Costs;
- Community Resources, including Land Acquisition, Displacements, Parklands and Community/Public Facilities;
- Natural Resources, including Waterways, Wetlands, Floodplains, Farmlands, and Endangered Species; and,
- Cultural Resources, including archeological and historic resources, National Register designated and eligible properties, and Section 4(f) properties.

The criteria were developed based on the project needs and environmental resource data.

Additional information is provided below for the screening of the Taylorsville Road Interchange and the NJ Route 29 Interchange. These options were screened using the following detailed criteria:

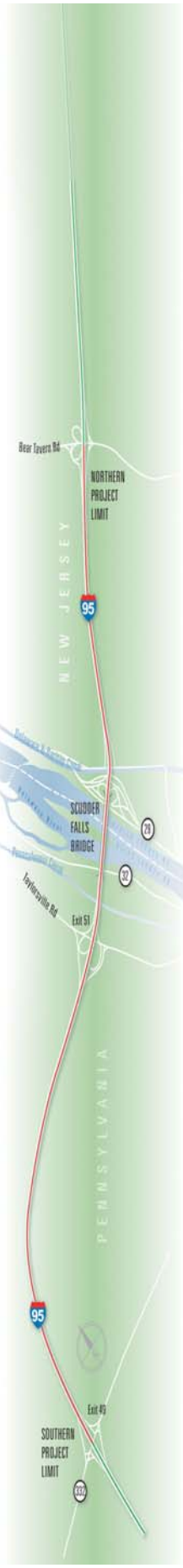
<u>Taylorsville Road Interchange</u>

In addition to the no-Build Alternative, the options for the Taylorsville Road Interchange included the following:

Option 1: Retain all existing ramps
Option 2: One Southbound Off-Ramp
Option 3: One Northbound On-Ramp
Option 4: One Southbound Off-Ramp and One Northbound On-Ramp

Each option retains the existing northbound off-ramp and southbound on-ramp. These four options were screened from a traffic operations perspective using the following criteria:

- Effect on Taylorsville Road west of I-95
- Effect on Taylorsville Road /Woodside Road Intersection
- Effect on I-95 Southbound
- Effect on Taylorsville Road east of I-95
- Effect on I-95 Northbound
- Number of new signalized intersections
- Length of reconstruction on Taylorsville Road
- Effects on Regional Access
- Effects on Local Access
- Constructability, construction detours, staging, number of lanes open during construction
- Change in impervious area and opportunities for Stormwater Management
- Major utility impacts
- Opportunities to accommodate pedestrian/bicycle access
- Construction cost



Options 1, 3, and 4 have significant traffic and operational problems either along Taylorsville Road or the ramps providing access to I-95. Both Option 1 and 3 have an undesirable weave on Taylorsville Road from the I-95 southbound off-ramp to turn left onto Woodside Road, similar to the existing condition. Option 4 has one northbound on-ramp which requires two lanes to accommodate the over 2,500 morning peak hour vehicles.

During the PENNDOT review process, an additional alternative was evaluated which maintained all four ramps. The I-95 southbound off-ramp to Taylorsville Road westbound was relocated to terminate on Woodside Road. This additional alternative would have impacted a historic property along Woodside Road and was therefore eliminated from further consideration.

Option 2 was recommended as the proposed alignment. Refer to the Options Screening Report for matrices comparing the options. Using the evaluation criteria, the highlights of Option 2 are as follows:

- Effect on Taylorsville Road west of I-95: Requires new signal, eliminating the undesirable weave
- Effect on Taylorsville Road /Woodside Road Intersection: Expand intersection (same for all options)
- Effect on I-95 Southbound: One one-lane exit
- Effect on Taylorsville Road east of I-95: Requires new signal.
- Effect on I-95 Northbound: Two successive entrances.
- Number of new signalized intersections: Two
- Length of reconstruction on Taylorsville Road: 2,500 feet
- Effects on Regional Access: All movements are accommodated (same for all options).
- Effects on Local Access: Indirect access to Taylorsville Road from I-95 SB to Taylorsville Road westbound (loop ramp).
- Constructability, construction detours, staging, and number of lanes open during construction: Conventional staging, with possible short-term lane closures during off peak hours.
- Change in impervious area and opportunities for Stormwater Management: 2.6 acre increase in impervious area (lowest of all options). Stormwater management will be accommodated within the infields of the ramps.
- Major utility impacts: No major impacts (same for all options).
- Opportunities to accommodate pedestrian/bicycle access: Yes (same for all options).
- Construction cost: Estimated $7,300,000, the lowest of the options.

<u>NJ Route 29 Interchange</u>

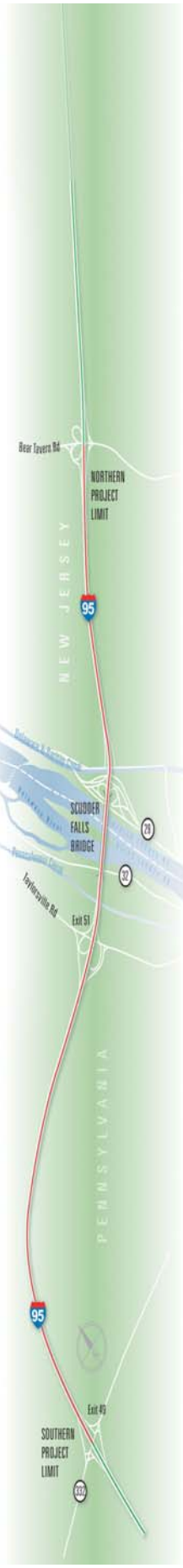
In addition to the No-Build Alternative, the options for the NJ Route 29 Interchange included the following:

Option 1a: Folded Diamond on NJ Route 29 Southbound Alignment without a Bypass for NJ Route 29 Northbound

Option 1b: Folded Diamond on NJ Route 29 Southbound Alignment with a Bypass for NJ Route 29 Northbound

Option 1c: Folded Diamond on NJ Route 29 Southbound Alignment with Roundabout Intersections with a Bypass for NJ Route 29 Northbound and Southbound.

Option 2: Folded Diamond on NJ Route 29 Northbound Alignment



These four options were screened from a traffic operations perspective using the following criteria:

- Effect on NJ Route 29 Northbound through traffic
- Effect on NJ Route 29 Southbound through traffic
- Effect on ramp traffic
- Level of Service
- Movements
- Number of signalized intersections
- Safety and Geometric Design Considerations
- Effects on Regional Access
- Effects on Local Access
- Constructability, construction detours, staging, number of lanes open during construction
- Change in impervious area and opportunities for Stormwater Management
- Major utility impacts
- Opportunities to accommodate pedestrian/bicycle access
- Construction cost

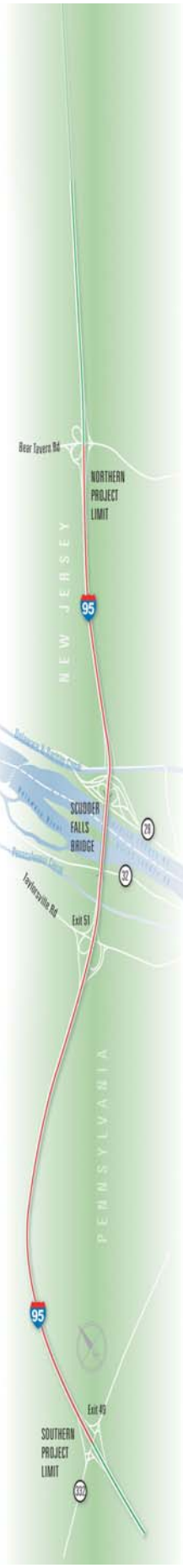
The initial screening and the review process with NJDOT resulted in the roundabout option as the preferred option. Additional studies were completed for various roundabout options. These options included the following:

- Option 1a Modified: Folded Diamond with Roundabout. This alternative is generally the same as Option 1a; however, it incorporates two-lane roundabouts at the loop ramp/ NJ Route 29 intersections instead of traffic signals. The NJ Route 29 Northbound bypass is not included in this option and all interchange traffic must utilize the two roundabouts.
- Option 1c: NJDOT Roundabout. For this option the interchange loop ramps intersect with I-95 traffic at single-lane roundabouts. Northbound and southbound traffic on NJ Route 29 bypass the interchange intersections. The single-lane roundabouts also include bypass lanes for right-turn traffic.
- Option 1c Modified: NJDOT Roundabout Modified. This option is based on 1c and also incorporates single-lane roundabouts. Bypass ramps are not included at the roundabouts. This option includes bypasses for northbound and southbound NJ Route 29.

These options were compared to the Option 1a. The complete report comparing the options is included in Appendix C. Also, refer to the Options Screening Report for matrices comparing the options.

Option 1c Modified: NJDOT Roundabout Modified which includes single-lane roundabouts, however, bypass ramps are not included at the roundabouts. This option includes the River Road Bypass (Northbound and Southbound NJ Route 29). Using the evaluation criteria, the highlights of Option 1c Modified are as follows:

- Effect on NJ Route 29 Northbound through traffic: None. The bypass is maintained.
- Effect on NJ Route 29 Southbound through traffic: A bypass for southbound traffic is added.
- Effect on ramp traffic: All ramp traffic utilize the roundabouts for access to and from I-95.
- Level of Service: B or better at the roundabouts.



- Movements: All movements are accommodated.
- Number of signalized intersections: None
- Safety and Geometric Design Considerations: The roundabouts will need to be carefully signed to provide for safe and efficient movement of traffic. The maximum grades into and out of the roundabout and the vertical clearance over NJ Route 29 northbound are also considerations that will be addressed in the design.
- Effects on Regional Access: All movements are accommodated (same for all options).
- Effects on Local Access: Eliminates Upper River Road northbound on-ramp. Traffic using this ramp will utilize the NJ Route 29 Interchange northbound on-ramp.
- Constructability, construction detours, staging, and number of lanes open during construction: Multi-stage construction with temporary ramps and short term detours are anticipated.
- Change in impervious area and Opportunities for Stormwater Management: approximately 1.25 acre increase in impervious area. Stormwater management will be accommodated within the interchange area.
- Major utility impacts: No major impacts (same for all options).
- Opportunities to accommodate pedestrian/bicycle access: Yes (same for all options).
- Construction cost: Estimated $24,000,000.

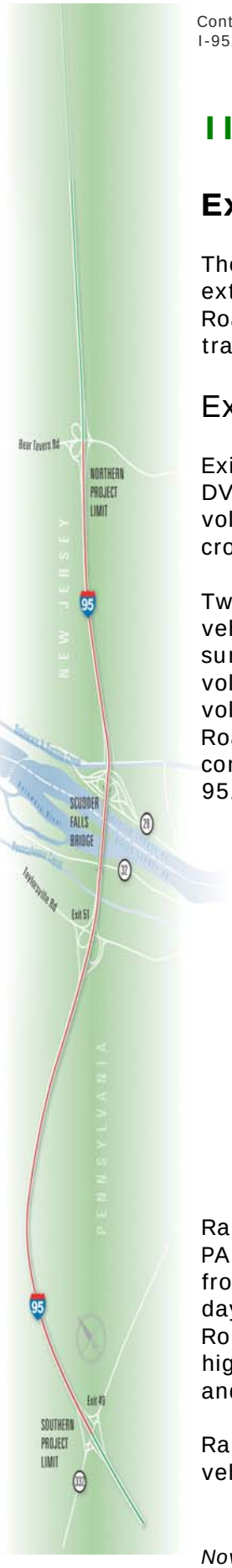
Preliminary Signing

A preliminary signing plan has been prepared to demonstrate that the proposed roadway improvements can be signed to comply with PENNDOT and NJDOT signing requirements. The preliminary signing plan addresses the signing requirements on I-95 with All Electronic Cashless Tolling and the directional signing requirements on the exit ramps for the Taylorsville Road and NJ Route 29 Interchanges as well as the PA Route 332 and Bear Tavern Road Interchanges. During final design all origin and destination signs and route signs will be developed to accommodate three digits based upon the future re-designation of I-95 to I-195. The Toll signing and the roundabout signing reflect the latest standards from the 2009 MUTCD (Manual on Uniform Traffic Control Devices). The preliminary signing plans are presented in Appendix D.

Safety

Safety improvements were identified in the project needs including provision of adequate shoulders, acceleration and deceleration lanes. Improvements proposed are designed to meet or exceed current standards except for the possible design exceptions noted later in this report related to mainline superelevation, headlight stopping sight distance at Woodside and Taylorsville Road, and vertical clearance for NJ 29 and NJ 175. Preliminary and final design will be developed to minimize design exceptions. Proposed improvements such as shoulder widening and acceleration/deceleration lane length improvements are expected improve safety in the project area to meet the project need to improve safety.

Directional signing concepts are included in the Appendices. The conceptual signing plans illustrate the signing can be provided along the mainline and interchanges with minimal complexity.



III. TRAFFIC AND OPERATIONAL ANALYSIS

Existing Traffic Volumes (2003)

The study area for purposes of traffic analysis is illustrated on Figure III-1. The study area extends from the PA Route 332 Interchange (PA Exit 49) on the south to the Bear Tavern Road Interchange (NJ Exit 2) on the north. Manual turning movement counts and automatic traffic recorder counts were conducted in the study area in October, 2003.

Existing 2003 Average Annual Daily Traffic (AADT) Volumes

Existing Average Annual Daily Traffic (AADT) volumes in the study area are illustrated in the DVRPC Traffic Study report (Figures 1A and 1B) in Appendix F. These include directional volumes on each mainline segment of I-95, ramp volumes at all interchanges, and volumes on cross roads and local roads.

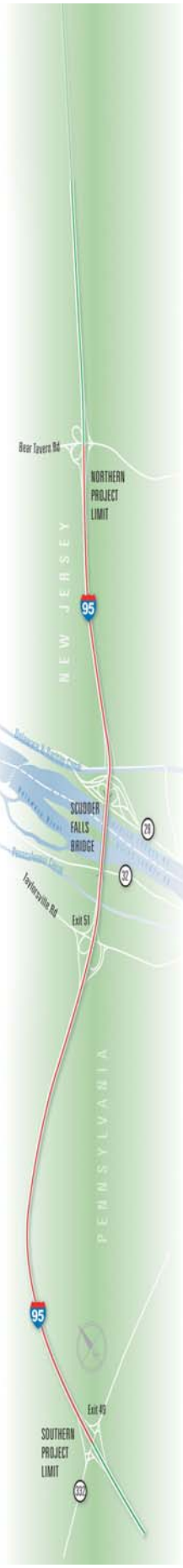
Two-way AADTs on I-95 in the study area range from 53,800 vehicles per day to 63,300 vehicles per day. Truck traffic comprises approximately 6% of total vehicular traffic. Table 2 summarizes these AADT volumes for each mainline segment in the study area. The highest volume segment is the segment south of the PA Route 332 Interchange, while the lowest volume segment is the segment between the PA Route 332 Interchange and the Taylorsville Road Interchange. The directional distribution is slightly skewed to southbound traffic, which comprises approximately 52% to 53% of the AADT. At 59,500 vehicles per day, the I-95/Scudder Falls Bridge has the second highest AADT in the study area.

Table 2
I-95 Mainline Traffic Volumes
2003 Existing Average Annual Daily Traffic

Limits	Existing 2003 AADT (vpd)
US 1 (Exit 46) to PA Route 332 (Exit 49)	63,300
PA Route 332 (Exit 49) to Taylorsville Road (Exit 51)	53,900
Taylorsville Road (Exit 51) to NJ Route 29 (Exit 1)	59,500
NJ Route 29 (Exit 1) to Bear Tavern Road (Exit 2)	57,100
Bear Tavern Road (Exit 2) to Scotch Road (Exit 3)	57,500

Ramp volumes vary by interchange and direction. As shown on Table 3, ramp volumes at the PA Route 332 Interchange are the highest in the study area. In particular, movements to and from the south are highest, with AADTs of 12,100 vehicles per day and 11,600 vehicles per day on the southbound on-ramp from PA Route 332 and on the northbound off-ramp to PA Route 332, respectively. Movements to and from the north at this interchange are the second highest in the study area. The northbound on-ramp carries an AADT of 6,700 vehicles per day and the southbound off-ramp carries an AADT of 7,500 vehicles per day.

Ramp AADTs at the Taylorsville Road Interchange range from 2,600 vehicles per day to 4,000 vehicles per day. Total movements to and from the south (6,600 vehicles per day) are



significantly less (just over half) than the total movements to and from the north (12,300 vehicles per day).

Ramp AADTs at the NJ Route 29/NJ Route 175 Interchange range from 1,400 vehicles per day to 4,900 vehicles per day. Although volumes on individual ramps vary widely, the directional orientation is generally balanced. Total movements to and from the south equal 9,600 vehicles per day, while total movements to and from the north equal 7,100 vehicles per day.

Ramp AADTs at the Bear Tavern Road Interchange range from 2,000 vehicles per day to 4,800 vehicles per day. Although volumes on individual ramps vary widely, the directional orientation is generally balanced. Total movements to and from the south equal 8,200 vehicles per day, while total movements to and from the north equal 8,700 vehicles per day.

Table 3
I-95 Ramps Traffic Volumes
2003 Existing Average Annual Daily Traffic

Interchange	Movement	Existing 2003 AADT (vpd)
PA Route 332 Interchange	I-95 NB off-ramp to PA Route 332	11,600
	PA Route 332 on-ramp(s) to I-95 NB	6,700
	PA Route 332 on-ramp to I-95 SB	12,100
	I-95 SB off-ramp to PA Route 332	7,500
Taylorsville Road Interchange	I-95 NB off-ramp to Taylorsville Road	3,300
	Taylorsville Road EB on-ramp to I-95 NB	2,900
	Taylorsville Road WB on-ramp to I-95 NB	2,600
	Taylorsville Road on-ramp to I-95 SB	3,300
	I-95 SB off-ramp to Taylorsville Road EB	2,800
	I-95 SB off-ramp to Taylorsville Road WB	4,000
NJ Route 29/NJ Route 175 Interchange	I-95 NB on-ramp to NJ Route 29 (River Road)	4,900
	NJ Route 29 (River Road) on-ramp to I-95 NB	1,400
	NJ Route 175 (Upper River Road) on-ramp to I-95 NB	1,900
	NJ Route 29 (River Road) on-ramp to I-95 SB	4,700
	I-95 SB off-ramp to NJ Route 29 (River Road)	3,800
Bear Tavern Road (CR 579) Interchange	I-95 NB off-ramp to Bear Tavern Road	3,800
	Bear Tavern Road on-ramp to I-95 NB	4,800
	Bear Tavern Road EB on-ramp to I-95 SB	2,400
	I-95 SB off-ramp to Bear Tavern Road	3,900
	Bear Tavern Road WB on-ramp to I-95 SB	2,000

Existing AADTs for the cross roads and local roads in the study area are tabulated in Table 4. The most heavily traveled cross road is PA Route 332. Northwest of I-95, PA Route 332 carries 34,400 vehicles per day. Southeast of the interchange, the AADT is substantially lower at 10,700 vehicles per day. Bear Tavern Road (Route 579) has an AADT of 14,600 vehicles per day east of I-95, and AADTs total 9,900 vehicles per day west of I-95. The existing AADT on NJ Route 29 (River Road) north of I-95 is 13,700 vehicles per day. AADTs on Taylorsville Road are 10,800 vehicles per day north of I-95 and 11,100 vehicles per day south of I-95.

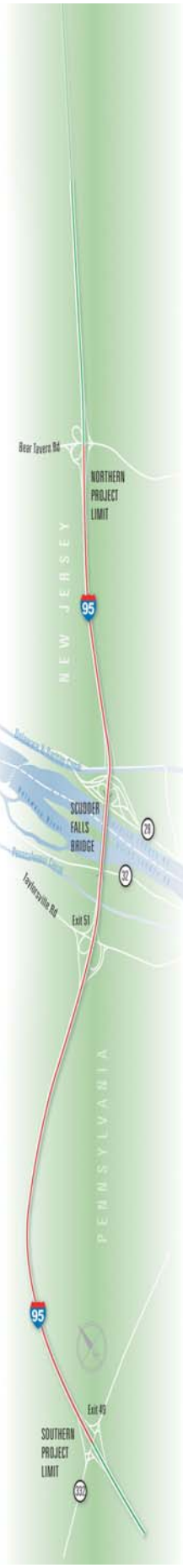


Table 4
Cross Roads and Local Roads Traffic Volumes
2003 Existing Average Annual Daily Traffic

Road	Location	2003 AADT (vpd)
PA Route 332	West of I-95 interchange	34,400
PA Route 332	East of I-95 Interchange	10,700
Taylorsville Road	North of I-95 Interchange	10,800
Taylorsville Road	South of I-95 Interchange	11,100
Woodside Road	West of Taylorsville Road	5,400
Woodside Road	East of Taylorsville Road	4,000
NJ Route 29 (River Road)	North of I-95 Interchange	13,600
NJ Route 175 (Upper River Road)	North of I-95 Interchange	3,600
NJ Route 175 (Upper River Road)	South of I-95 Interchange	2,400
Bear Tavern Road	North of I-95 Interchange	9,900
Bear Tavern Road	South of I-95 Interchange	14,600
Scenic Drive	NJ Route 29 to CR 579 (Bear Tavern Road)	4,300

Existing (2003) Peak Hour Traffic Volumes

Weekday A.M. and P.M. peak hour traffic volumes in the study area are schematically illustrated in the DVRPC Traffic Study report (Figures 2A and 2B) in Appendix F. These include directional volumes on each mainline segment of I-95, ramp volumes at all interchanges, and turning movement volumes at the study area intersections.

As shown in Table 5, peak hour traffic volumes on I-95 in the project area are highly directional. During the A.M. peak hour, the two-way mainline traffic volume between the PA Route 332 Interchange (Exit 49) and the Taylorsville Road Interchange (Exit 51) is 4,731 vehicles per hour (vph), of which 67% (3,191 vph) is northbound traffic. Similarly during the P.M. peak hour, 68% (3,402 vph) of the two-way traffic volume (4,996 vph) is southbound traffic.

The directionality of traffic on the I-95/Scudder Falls Bridge is even more pronounced. Nearly 79% (5,111 vph) of the two-way traffic (6,505 vph) on the bridge is northbound traffic during the A.M. peak hour. During the P.M. peak hour, 72% (4,183 vph) of the two-way traffic volume (5,753 vph) on the I-95/Scudder Falls Bridge is southbound traffic.

This directionality continues into New Jersey. During the A.M. peak hour, the two-way mainline traffic volume between the NJ Route 29 Interchange (Exit 1) and the Bear Tavern Road Interchange (Exit 2) is 6,149 vph, of which 77% (4,744 vph) is northbound traffic. Similarly, during the P.M. peak hour, 74% (4,074 vph) of the two-way traffic volume (5,493 vph) is southbound traffic.

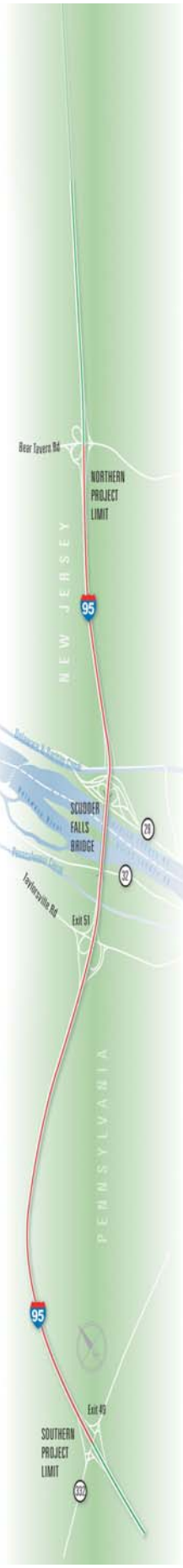


Table 5
I-95 Mainline Traffic Volumes
2003 Existing Peak Hours

Direction	Location	A.M. Peak	P.M. Peak
Northbound	Between Exit 46 (US Route 1) & Exit 49 (PA Route 332)	2,834	2,265
Southbound		2,440	3,523
Total		**5,274**	**5,788**
Northbound	Between Exit 49 & Exit 51 (Taylorsville Road)	3,191	1,594
Southbound		1,540	3,402
Total		**4,731**	**4,996**
Northbound	Between Exit 51 & Exit 1 (NJ Route 29)— I 95/Scudder Falls Bridge	5,111	1,,570
Southbound		1,394	4,183
Total		**6,505**	**5753**
Northbound	Between Exit 1 & Exit 2 (Bear Tavern Road)	4,744	1,419
Southbound		1,405	4,074
Total		**6,149**	**5,493**
Northbound	Between Exit 2 & 3	4,500	1,745
Southbound		1,578	3,605
Total		**6,078**	**5,350**

The highest volume one-way directional segment of I-95 in the study area is on the I-95/Scudder Falls Bridge in the A.M. peak hour. In the northbound direction during the A.M. peak hour, this volume is 5,111 vph (2,555 vehicles per lane). In the southbound direction during the P.M. peak hour, the highest one-way volume for two-lane segments in the study area also is on the bridge, at 4,183 vph.

Existing 2003 A.M. and P.M. peak hour ramp volumes are tabulated in Table 6. The northbound directionality exhibited on the mainline segments of I-95 in the A.M. peak hour is also evident in the northbound ramp volumes. This is most apparent on the northbound off-ramp to PA Route 332 (915 vph); the northbound on-ramp from PA Route 332 (1,272 vph); the northbound on-ramp from Taylorsville Road eastbound (1,096 vph); the northbound on-ramp from Taylorsville Road westbound (968 vph); the northbound off-ramp to NJ Route 29 (709 vph); the northbound off-ramp to Bear Tavern Road (822 vph), and on the northbound on-ramp from Bear Tavern Road (578 vph).

The southbound directionality exhibited on the mainline segments of I-95 in the P.M. peak hour also is evident in the southbound ramp volumes. This is most apparent on the combined southbound on-ramps from Bear Tavern Road (734 vehicles per day); the combined southbound off-ramps to Taylorsville Road (1,026 vph); the southbound off-ramp to PA Route 332 (1,135 vph), and on the southbound on-ramp from PA Route 332 (1,256 vph).

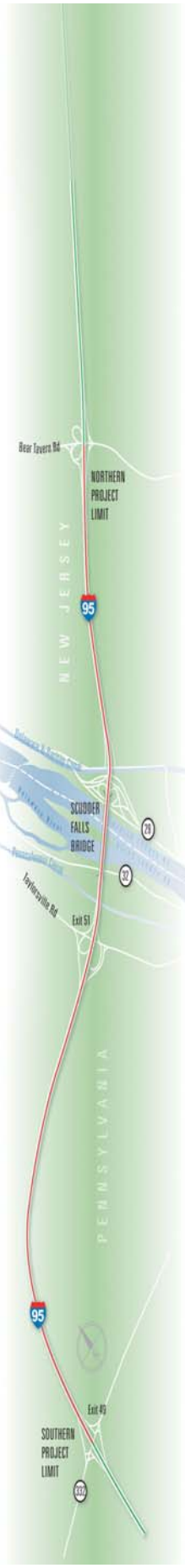


Table 6
I-95 Ramp Volumes
2003 Existing Peak Hours

Interchange	Movement	A.M. Peak	P.M. Peak
PA Route 332	I-95 NB off-ramp to PA Route 332	915	1178
	PA Route 332 on-ramp(s) to I-95 NB	1272	507
	I-95 SB off-ramp to PA Route 332	445	1135
	PA Route 332 on-ramp to I-95 SB	1345	1256
Taylorsville Road	I-95 NB off-ramp to Taylorsville Road	144	308
	Taylorsville Road EB on-ramp to I-95 NB	1096	166
	Taylorsville Road WB on-ramp to I-95 NB	968	118
	I-95 SB off-ramp to Taylorsville Road WB	118	584
	I-95 SB off-ramp to Taylorsville Road EB	72	442
	Taylorsville Road on-ramp to I-95 SB	336	245
NJ Route 29/NJ Route 175	I-95 NB on-ramp to NJ Route 29 (River Road)	709	354
	NJ Route 29 (River Road) on-ramp to I-95 NB	128	62
	NJ Route 175 (Upper River Road) on-ramp to I-95 NB	214	141
	I-95 SB off-ramp to NJ Route 29 (River Road)	309	252
	NJ Route 29 (River Road) on-ramp to I-95 SB	298	361
Bear Tavern Road (CR 579)	I-95 NB off-ramp to Bear Tavern Road	822	226
	Bear Tavern Road on-ramp to I-95 NB	578	552
	Bear Tavern Road WB on-ramp to I-95 SB	63	327
	I-95 SB off-ramp to Bear Tavern Road	430	265
	Bear Tavern Road EB on-ramp to I-95 SB	194	407

Existing 2003 A.M. and P.M. peak hour turning movement volumes at the cross road and local road intersections in the study area are tabulated in Tables 7.

During the A.M. peak hour, movements to and from the west dominate traffic flows at the PA Route 332 Interchange. At the Taylorsville Road Interchange, movements on Taylorsville Road from the south continuing east to I-95 dominate traffic flows at this interchange. At the NJ Route 29 Interchange, southbound traffic on NJ Route 29 is the dominant flow. At the Bear Tavern Road Interchange, eastbound movements dominate traffic flows.

Similar to the A.M. peak hour, movements to and from the west dominate traffic flows at the PA Route 332 Interchange during the P.M. peak hour. At the Taylorsville Road Interchange during the P.M. peak hour, the dominant movements are generally opposite those of the A.M. peak hour (i.e., to the east and west from I-95). At the NJ Route 29 Interchange, dominant P.M. peak hour flows are to the west. At the Bear Tavern Road Interchange, eastbound and westbound flows are comparable.

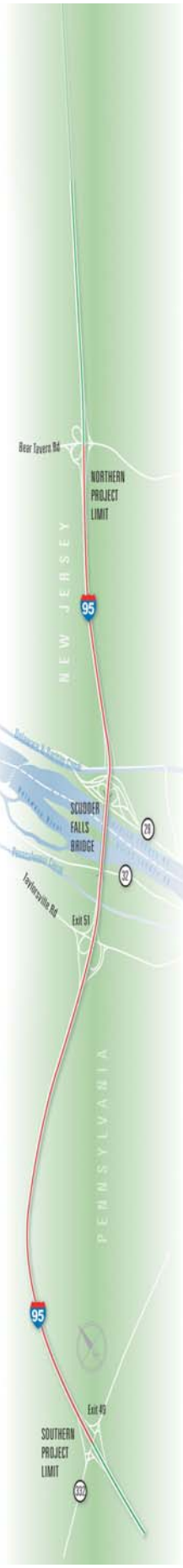


Table 7
2003 Existing Peak Hour Intersection Volumes

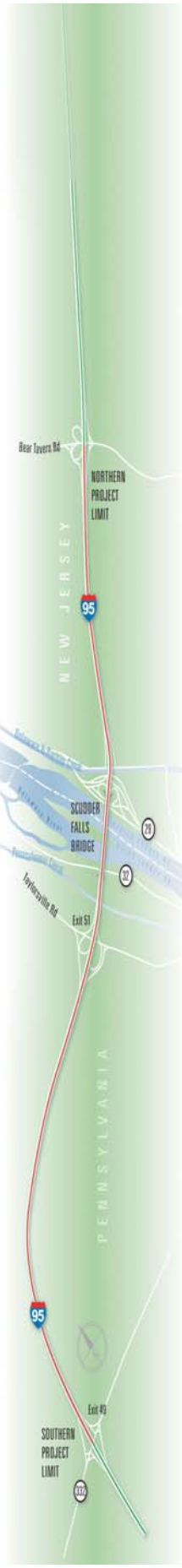
Intersection	Intersection	2003 Existing	
		A.M. Peak	P.M. Peak
1	I-95 NB & PA Route 332	2,839	2,425
2	I-95 SB & PA Route 332	4,084	4,257
3	I-95 NB & Taylorsville Road	1,499	1,312
4	I-95 SB & Taylorsville Road	1,391	1,474
5	Woodside Road & Taylorsville Road	1673	1,741
6	I-95 NB Off-Ramp & NJ Route 29	709	354
7	I-95 SB Off-Ramp & NJ Route 29	309	252
8	I-95 NB & Upper River Road	476	320
9	Bernard Road & NJ Route 29	1,327	1,335
10	Park Driveway & Upper River Road	411	174
11	I-95 NB & Bear Tavern Road	2,474	1966
12	I-95 SB& Bear Tavern Road	1,862	1,491
13	Scenic Drive & Bear Tavern Road	1,832	1,994

Travel Patterns

A license plate matching survey was conducted at the I-95/Scudder Falls Bridge on December 16, 2003. The purpose of this survey was to collect information on the travel patterns of the motorists who cross the bridge. This information is important, as the analysis of improvement options will most likely require that a "weaving" analysis be performed to assure that any improvement options will meet operational design standards. This survey was conducted from 7 A.M. to 10 A.M. in the northbound direction and from 3 P.M. to 6 P.M. in the southbound direction. For purposes of the license plate survey, the study area extends from the Taylorsville Road Interchange to the NJ Route 29 Interchange.

All trips can be categorized into three major types (local, regional, and through) and two sub types (regional-origin and regional-destination). Local trips are defined as trips made from a point within the study area to another point within the study area. Through trips are defined as trips made from a point outside the study area, to another point outside the study area. Regional trips are defined as trips made from a point within the study area to a point outside of the study area (regional-origin) or trips made from a point outside the study area to a point within the study area (regional-destination).

The results of the license plate matching survey are tabulated on Table 8 for the A.M. peak period and Table 9 for the P.M. peak period. The data demonstrate that the predominant movements on the I-95/Scudder Falls Bridge are through movements, 52.4% northbound during the A.M. peak period and 72.7% southbound during the P.M. peak period. Regional traffic on the bridge also is substantial, at 37.8% northbound in the A.M. peak period and 21.5% southbound during the P.M. peak period. Only 9.8% and 5.8% of the traffic during the



respective A.M. and P.M. peak periods is local, having both an origin and destination within the study area.

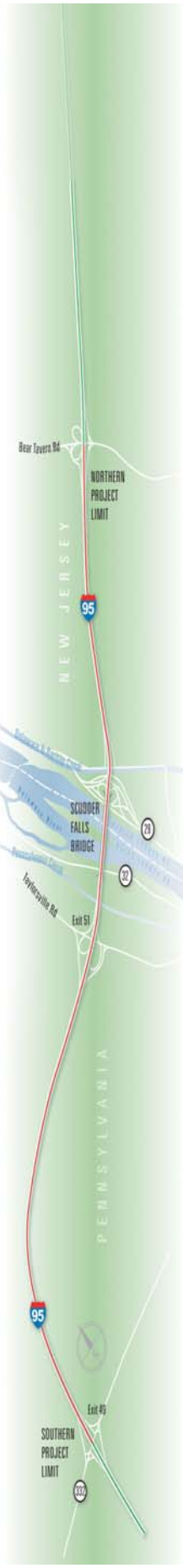
I-95 Northbound A.M. Peak

During the A.M. peak, approximately 52% of the traffic has neither an origin nor a destination in the study area and is considered through traffic. Approximately 38% of the trips are regional in nature, and almost all of these (90%) originate from the Taylorsville Road Interchange. Of those regional trips originating from Taylorsville Road, roughly 60% come from the west and 40% come from the east. Almost 10% of the trips are local in nature, originating from Taylorsville Road destined to NJ Route 29, with an even distribution from the east and the west. Almost all of these local trips (90%) are destined for NJ Route 29 southbound.

In summary, 44% of all northbound traffic on the I-95/Scudder Falls Bridge in the A.M. peak period originates from the Taylorsville Road Interchange. Approximately 14% of the northbound traffic on the bridge is destined for the NJ Route 29 Interchange.

Table 8
I-95/Scudder Falls Bridge License Plate Origin-Destination Survey:
A.M. Trip Classification Percentages

Trip Type		Movement From		Movement To		Percent
Local		Taylorsville Road	EB	NJ 29	NB	0.3%
		Taylorsville Road	EB	NJ 29	SB	4.9%
		Taylorsville Road	WB	NJ 29	NB	0.8%
		Taylorsville Road	WB	NJ 29	SB	3.8%
		Total				**9.8%**
Regional	Destination	I-95	NB	NJ 29	NB	3.9%
		I-95	NB	NJ 29	SB	
		Total				3.9%
	Origin	Taylorsville Road	EB	I-95	NB	14.5%
		Taylorsville Road	WB	I-95	NB	19.4%
		Total				33.9%
		Total				**37.8%**
Thru		I-95	NB	I-95	NB	52.4%
		Total				**52.4%**
Grand Total						**100.0%**



I-95 Southbound P.M. Peak

During the P.M. peak hour approximately 73% of the traffic has neither an origin nor a destination in the study area and is considered through traffic. Approximately 21% of the trips are regional in nature, and almost all of them (86%) are destined for the Taylorsville Road Interchange. Of those regional trips destined to Taylorsville Road, there is a fairly even distribution to both the east and west. Almost 6% of the trips are local in nature, originating from NJ Route 29 and destined to Taylorsville Road. Two-thirds of the local trips originate from NJ Route 29 northbound and two-thirds of the local trips are destined for Taylorsville Road westbound.

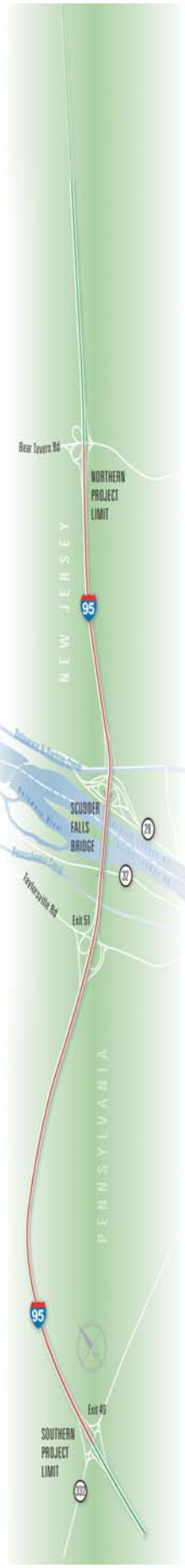
In summary, 9% of all southbound traffic on the bridge during the P.M. peak period originates from the NJ Route 29 Interchange. Approximately 24% of the southbound traffic on the bridge is destined for the Taylorsville Road Interchange.

Table 9
I-95/Scudder Falls Bridge License Plate Origin-Destination Survey: P.M. Trip Classification Percentages

Trip Type		Movement				Percent
		From		To		
Local		NJ 29	SB	Taylorsville Road	EB	1.2%
		NJ 29	SB	Taylorsville Road	WB	0.8%
		NJ 29	NB	Taylorsville Road	EB	1.0%
		NJ 29	NB	Taylorsville Road	WB	2.9%
		Total				**5.8%**
Regional	Destination	I-95	SB	Taylorsville Road	EB	8.5%
		I-95	SB	Taylorsville Road	WB	10.1%
		Total				18.6%
	Origin	NJ 29	SB	I-95	SB	2.9%
		NJ 29	NB	I-95	SB	
		Total				2.9%
		Total				**21.5%**
Thru		I-95	SB	I-95	SB	72.7%
		Total				**72.7%**
Grand Total						**100.0%**

Accident Data

The crash analysis documented the location, type and severity of crashes within the project area. Crashes were classified as to the roadway condition and time of crash. The complete crash analysis is included in Appendix E.



Methodology

The crash analysis was performed for the entire study area and included mainline I-95 and the four interchanges of PA Route 332, Taylorsville Road, NJ Route 29, and Bear Tavern Road (County Route 579). For the purposes of the crash analysis, I-95 is divided into four segments, as defined below:

- Segment 1 – PA Route 332 (Newtown-Yardley Road) to Dolington Road – 1.5 miles
- Segment 2 - Dolington Road to the PA abutment of the I-95/Scudder Falls Bridge – 1.2 miles
- Segment 3 – I-95/Scudder Falls Bridge – 0.28 miles
- Segment 4 – I-95/Scudder Falls Bridge New Jersey Abutment to Bear Tavern Road (County Route 579) – 1.5 Miles

The limits of these segments were based on the jurisdictional limits of the DRJTBC, PENNDOT, and NJDOT and allow a comparison of crash data from each state. The crash analysis included the sections of I-95 extending roughly 1.5 miles west of the PA Route 332 Interchange and 1.5 miles east of Bear Tavern Road.

Crash information was provided by the three transportation agencies having jurisdiction within the project study area, DRJTBC, PENNDOT, and NJDOT. The crash data was compiled and sorted, taking into account the possibility of dual records for the same incident, and it was determined that there were a total of 314 reported crashes from year 1999 to 2001.

Each crash was categorized into types such as, but not limited to, rear-end collisions, multi-car collisions, and side-swipes, and were plotted on collision diagrams to depict the corresponding segment location map, at the specific point of the incident. A tabular summary of all the crashes, per segment was created to show the type of incident, frequency of occurrence by weather, roadway conditions, light conditions and time of day.

Next, a qualitative and statistical analysis of each segment was completed. Crashes, injuries and fatality rates are used to compare crash experiences across state jurisdictions. For this analysis, crash rates were calculated in units of *crashes per million vehicle miles traveled per year* and are expressed by the following equations:

Million Vehicle Miles Traveled Per Year **=** Average Daily Traffic (ADT) x Segment Distance (in Feet) x 1 mile/5280 feet x 365 days/year

and

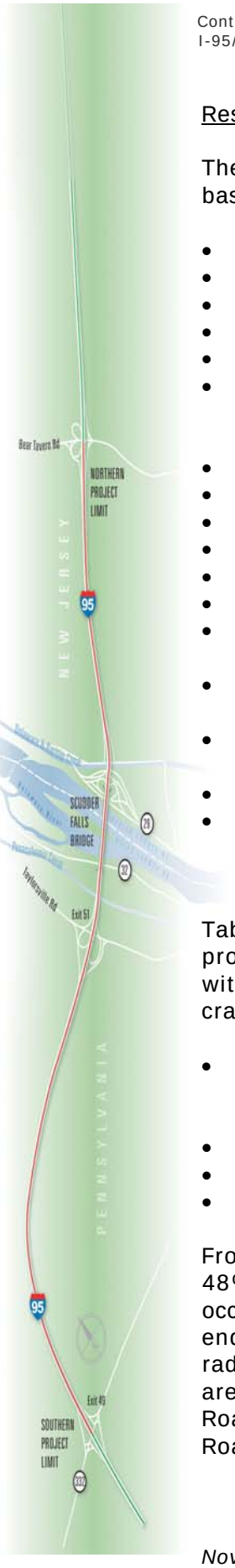
Crashes per Time Period **=** # of Crashes/Time Period (years)

Therefore,

Crash Rate = Crashes per Time Period / Million Vehicle Miles Traveled per Year

The crash rates for the four segments within the study period were calculated and identified within the study.

Finally, after review of all of the above information, observations to the frequency and locations of crashes were identified for each segment.



Results of Crash Analysis

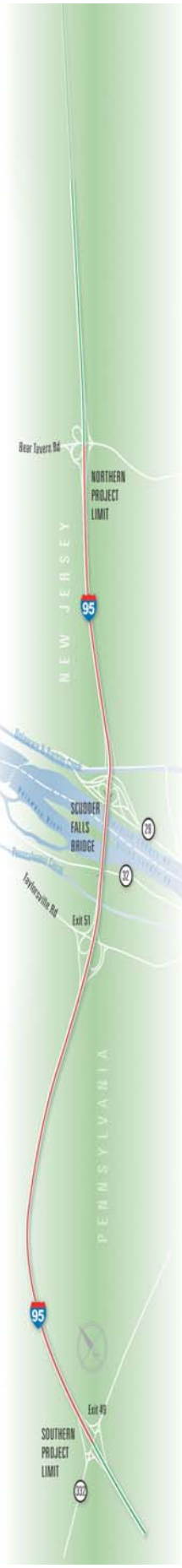
The following observations for *the entire study area*, between 1999 and 2001 were made based on the crash analysis:

- A total of 314 crashes were reported.
- Only one fatality was reported, within Segment 4.
- Approximately 48% of all the crashes occurred at the interchanges.
- Approximately 15% of all crashes involved trucks. Trucks represent 6% of daily traffic.
- 39% of the crashes were rear-end collisions.
- 30% of the crashes were classified as other types of crashes. Since each jurisdiction utilizes this designation in different ways, these crashes may include the following: debris on the roadway, animal encounter (deer), driving into a ditch, or hitting a pothole.
- 11% of the crashes were angled collisions.
- 10% of the crashes were sideswipe collisions.
- 7% of the crashes were fixed object collisions.
- 2% of the crashes were non collision crashes.
- <1% of the crashes involved pedestrians.
- 0% of the crashes were head on collisions.
- Over 85% of crashes that reported injuries yielded either minor or no injuries. This may be due to many of the crashes occurring during high volume and low speed time frames.
- Almost 75% of all crashes occur during clear weather, so weather does not play a major factor in crashes along the study area.
- Over 67% of all the crashes occur on dry surfaces, so precipitation does not play a major factor in crashes along the corridor.
- Almost 60% of all crashes occurred during the daylight hours.
- 45% of all crashes occurred within the A.M. and P.M. peak travel times (6 A.M. to 9 A.M. and 3 P.M. to 6 P.M.), or during six hours of the 24 hour day. This time period includes 42% of the AADT.

Table 10 and Figures 4 and 5 summarize the results of the crash analysis, and Figure III-9 provides a comparison with statewide crash rates. The following are observations for the area within the DRJTBC's jurisdiction, between 1999 and 2001, which were made based on the crash analysis:

- A total of 137 crashes were reported in an area the length equivalent of 0.75 miles or approximately 4,000 feet. This equates to 44% of the <u>total</u> study crashes occurring within only 15% of the analyzed roadway length.
- Approximately 78% of all these crashes occurred at the interchanges.
- Approximately 15% of all these crashes involved trucks.
- 46% of these crashes were rear-end collisions.

From this information, it is shown that a majority of the crashes occur at the interchanges: 48% of crashes within the I-95 corridor and 78% of crashes within the DRJTBC's jurisdiction occurred at interchanges. Most of the crashes at the interchanges can be categorized as rear-end collisions. From this information, it is apparent that interchange geometry, including radii, stopping sight distance, acceleration and deceleration lane lengths, and proper signing are important safety considerations. For instance, a majority of crashes at the Taylorsville Road Interchange occur on the movement onto I-95 northbound from westbound Taylorsville Road. Due to substandard acceleration lane length, vehicles had a tendency to accelerate



prematurely while other vehicles were in front of them. This was also seen at the NJ Route 29 Interchange for the movement onto I-95 southbound.

The corridor also experienced a number of crashes involving trucks. A consistent 15% of all crashes involved trucks and design considerations for trucks should be a part of the overall analysis and design of the corridor. Stopping sight distances should be especially reviewed since many of the crashes involving trucks were rear-end crashes. The grade of the two interchanges nearest the bridge play a major role in a trucks ability to accelerate and decelerate. Since the bridge sits at or near the sag of a vertical curve, trucks exiting I-95 northbound at Taylorsville Road, and I-95 exiting southbound at NJ Route 29 experience a stronger gravitational effect, which will increase the needed deceleration lane lengths. Gravity acts against vehicles breaking on a negative grade, therefore requiring additional deceleration lane length. The opposite affects the I-95 southbound traffic entering from Taylorsville Road, as well as traffic from NJ Route 29 entering on to I-95 northbound, the positive grade will increase the acceleration time and length of acceleration lanes.

In addition, 45% of crashes occurred during the A.M. and P.M. peak travel periods indicating the correlation of congested traffic conditions to crash incidence. The six-hour window where almost half of all crashes in the I-95 corridor studied occurred was from 6 A.M. to 9 A.M. and from 3 P.M. to 6 P.M.

The highest crash rates of four segments evaluated in the project area occurred on the I-95/Scudder Falls Bridge (Segment 3), which experienced a rate of 2.19 crashes per million vehicle miles traveled. This compares to rates of 0.63 to 0.78 crashes per million vehicle miles traveled for the western segments extending from the PA Route 332 Interchange to the Dolington Road overpass (Segment 1) and from the Dolington Road overpass to the Taylorsville Road Interchange (Segment 2). The second highest crash rates occurred on the eastern segment that includes the NJ Route 29 Interchange and extends east past the Bear Tavern Road Interchange (Segment 4). Higher crash rates on the I-95/Scudder Falls Bridge can be attributed to the narrow bridge configuration, with the lack of inside shoulders and breakdown lanes and the narrow median barrier.

The crash rate on the bridge was lower than the statewide average crash rate for similar four-lane facilities (see Table 10). Although the crash rate on the bridge was lower than the statewide average crash rate for similar four-lane facilities (3.76 crashes per million vehicle miles), it is important to note that the statewide rate for this segment is eight times higher than the statewide rate for Segment 1 (between PA Route 332 to Dolington Road). Potential causes are lack of shoulders and congestion that occurs at interchanges and on the bridge.

Segment 4, that includes the NJ Route 29 Interchange and I-95 extending approximately one mile east past the Bear Tavern Road Interchange experienced a crash rate below the statewide average for similar facilities (see Figure 4). Conversely, the Pennsylvania portion of I-95 (Segments 1 and 2), extending from the Taylorsville Road Interchange west to PA Route 332 Interchange, had an incidence of crashes that was above the statewide average for similar facilities.

The Crash Analysis will be completed with the latest three years of accident data as part of the final design effort to confirm the initial analysis results, identify any additional safety measures, and to obtain Safety Review approval.

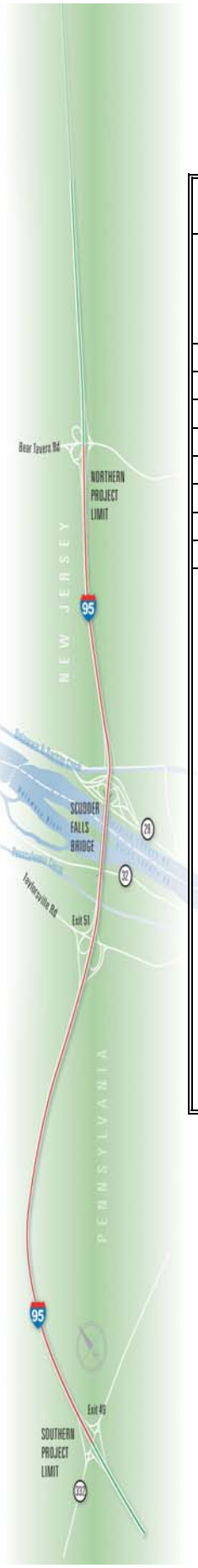


Table 10
I-95 PROJECT AREA CRASH ANALYSIS

Comparison Of Reported Crashes On All Segments

Segment	AADT	Distance (Miles)	Million Vehicle Miles Traveled / Year	Crashes Per Year	Crashes / Million Vehicle Miles Traveled	Average State Rate	Above / Below State Rate
1.5 miles west of PA Route 332 east to Dolington Road							
Segment 1	47,000	1.5	25.73	16.33	0.63	0.47	Above
Dolington Road to Taylorsville Road Interchange							
Segment 2	47,000	1.12	19.21	15.00	0.78	0.47	Above
I-95/Scudder Falls Bridge							
Segment 3	55,100	0.227	4.57	10.00	2.19	3.76*	Below
NJ Route 29 Interchange to roughly 1.5 miles beyond Bear Tavern Road Interchange							
Segment 4	50,690	3.03	56.06	63.33	1.13	1.66**	Below

Notes:
1. AADTs for segment 1 and 2 are collected from PENNDOT Statewide Traffic Volume Map provided on PENNDOT's official website.

2. The average state rate for segments 1 and 2 is collected from PENNDOT corrected 1997-2001 Homogeneous Report published by Crash Information Systems and Analysis Division (printed on 08/21/03).

3. AADTs for segments 3 and 4 are collected from NJDOT 2000 Straight Line Diagrams.

4. The avg. state rates for segments 3 and 4 are collected from NJDOT Crash Records (Statewide average
crash rates by cross-section geometry).
* 3.76 is the avg. rate between 1999 and 2001 [{3.44 (1999) + 4.35 (2000) + 3.50 (2001)} / 3] for a roadway facility with 4 or more lanes, barrier median and no shoulder.

** 1.66 is the avg. rate between 1999 and 2001 [{1.48 (1999) + 1.73 (2000) + 1.77 (2001)} / 3] for a roadway facility with 4 or more lanes, grass median and with shoulder.

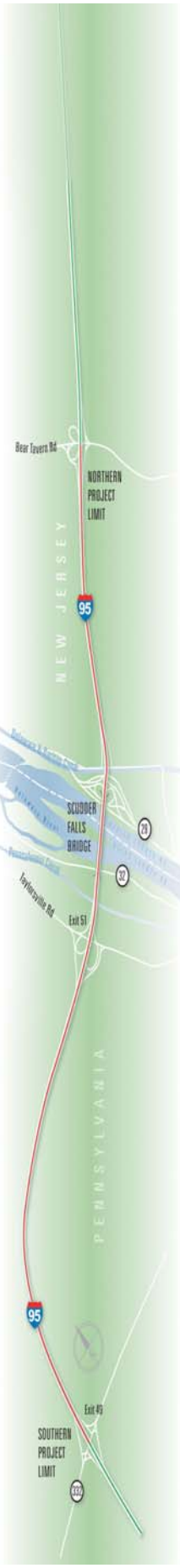


Figure 4
Comparison of Study Area Crash Rates with Average State Crash Rates

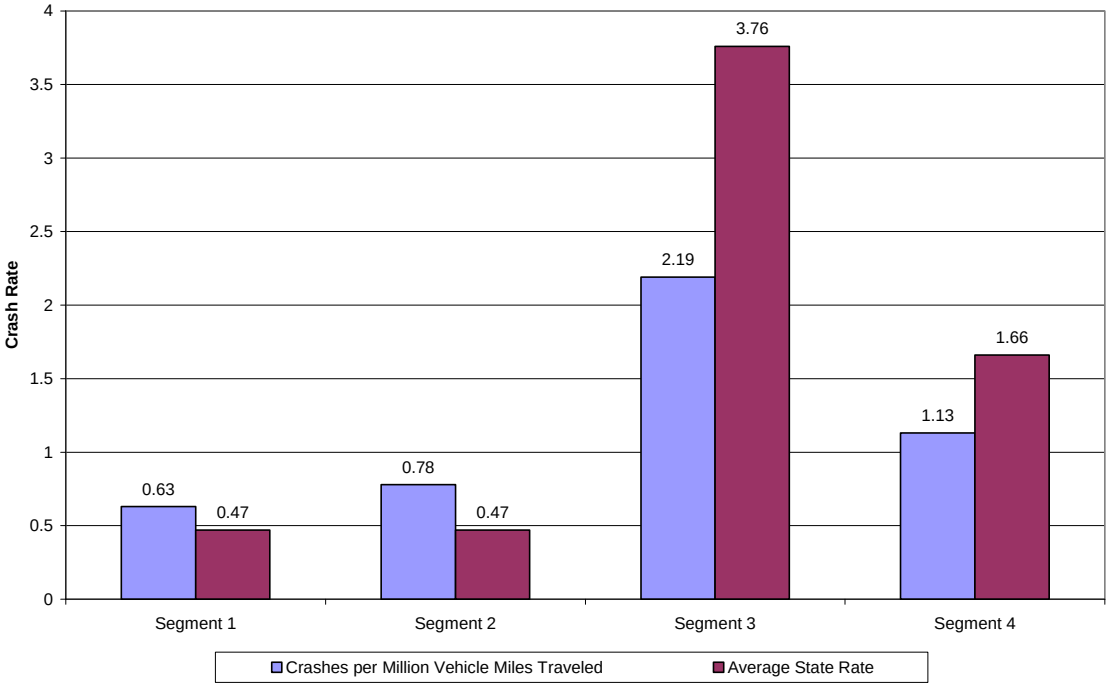
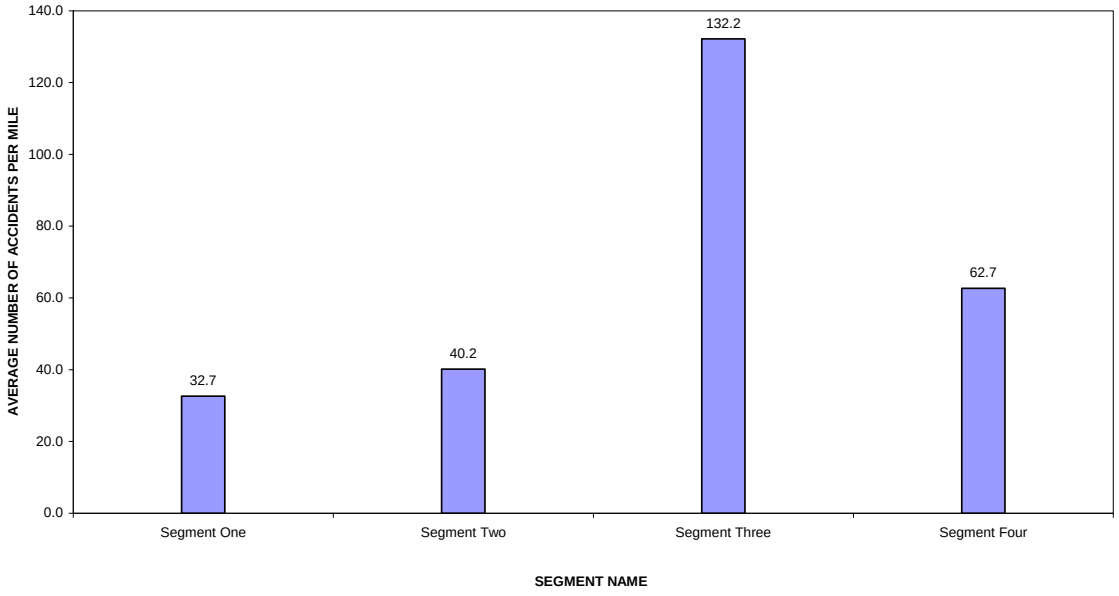
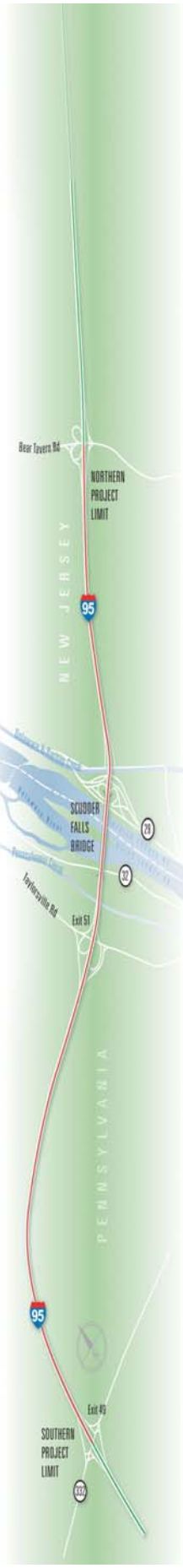


Figure 5
Number of Reported Accidents per Mile Based on Segment
From 1999 to 2001





EXISTING TRAFFIC VOLUME COMPARISON (2003 AND 2010 DATA)

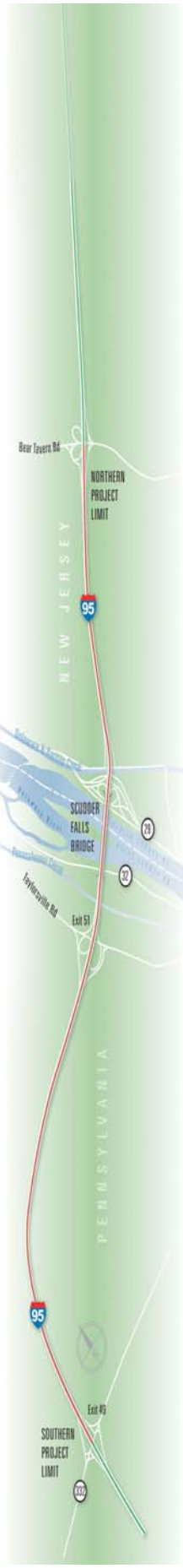
The Scudder Falls Bridge project traffic study volumes were initially collected in 2003. The Traffic Diversion Study collected available 2010 traffic volume data from various resources including the Delaware River Joint Toll Bridge Commission, the Delaware Valley Regional Planning Commission, PennDOT and NJDOT. A comparison of the 2003 and 2010 traffic volume data collection on the Scudder Falls Bridge is shown in Table 11.

Table 11
2003 and 2010 Scudder Falls Bridge
Volume Comparison

	AADT	AM Peak Hour	PM Peak Hour
Northbound Direction			
2003 Traffic Volumes	28,000	5111	1570
2010 Traffic Volumes	27,982	5199	1866
% Difference	-0.06%	1.72%	18.85%
Southbound Direction			
2003 Traffic Volumes	31,500	1394	4183
2010 Traffic Volumes	30,500	1655	4324
% Difference	-3.17%	18.72%	3.37%
TOTAL (Both Directions)			
2003 Traffic Volumes	59,500	6505	5753
2010 Traffic Volumes	58,482	6854	6190
% Difference	-1.71%	5.36%	7.60%

As shown, the overall AADT decreased slightly between 2003 and 2010, while the peak hour traffic volumes increased. During the AM peak hour, the northbound volume (peak travel direction) increased 1.71% while the southbound volume increased 18.72%. During the PM peak hour, the southbound volume (peak travel direction) increased 3.37% while the northbound volume increased 18.85%. The lower increases in the peak travel directions reflect the observed roadway conditions which operate near capacity.

The decrease in AADT is a reflection of the current economic conditions with overall traffic growth in recent years slower than projected. The slight decrease in AADT along with the increase in peak hour travel is indicative of a recession, with motorists giving up non-essential trips and/or combining multiple trips into a single trip. As a result of the current economic recession, a decline in daily traffic is forecasted for the short-term, with a return to anticipated levels occurring in the future.



Traffic Forecasts

Traffic volume projections for the year 2030 were developed for the following conditions:

- 2030 No Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/Low Toll Daily, AM and PM Peak Hour
- 2030 Build/High Toll Daily, AM and PM Peak Hour

2030 No Build/No Toll Volume Projections

Estimated future year daily volumes for the No Build/No Toll condition were developed from the 2010 base traffic volume on the Scudder Falls Bridge using background growth rates determined by first correlating historic traffic growth with the national Gross Domestic Product (GDP) and Industrial Production Index (IPI), then using *Blue Chip Economic Indicators* forecasts of GDP and IPI to predict future traffic growth. Table 12 shows the estimated background growth rates in daily traffic and the average annual percent change (AAPC). This 2030 daily volume for the Scudder Falls Bridge was then applied and balanced through the roadway network.

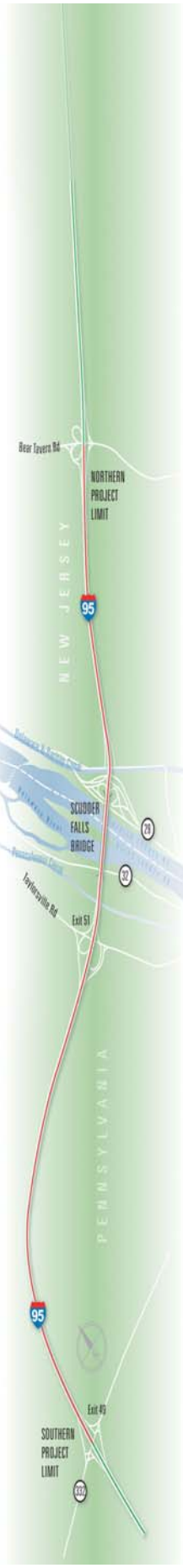
Table 12
Scudder Falls Bridge Estimated Future Growth Rates in Daily Traffic
Peak Diversion Direction, PM Southbound
No Build/No Toll

Year	Growth over 2010	AAPC from 2010	Growth over 2015	AAPC from 2015	No Build/No Toll AADT
2010					30,500
2015	5.8%	1.2%			32,266
2030	21.1%	1.1%	14.5%	1.0%	36,936

Estimated future year peak hour volumes for the No Build/No Toll condition were developed from the 2010 base traffic volume on the Scudder Falls Bridge using estimated background growth rates from the DVRPC Study (annual growth rate from 2003 to 2030). Table 13 shows the estimated background growth rates in peak hour traffic and the average annual percent change (AAPC). The 2030 peak hour volume on the bridge was balanced through the original roadway network, all mainline, ramp and ramp terminus movements. The 2030 No Build/No Toll peak hour traffic volumes are illustrated in Figures 6A and 6B in Appendix G.

Table 13
Scudder Falls Bridge Estimated Future Growth Rates in Peak Hour Traffic
Peak Diversion Direction, PM Southbound
No Build/No Toll

Year	Growth over 2010	AAPC from 2010	Growth over 2015	AAPC from 2015	No Build/No Toll Peak Hr.
2010					4,324
2015	5.8%	1.2%			4,574
2030	13.2%	0.7%	7.0%	0.5%	4,895



2030 Build/No Toll Volume Projections

Estimated future year daily and peak hour volumes for the Build/No Toll condition were developed using factors from the DVRPC's 2004 Study. According, to the study, when the bridge widening occurs, daily traffic is expected to increase by approximately 12% in 2015 and 11% in 2030 on the Scudder Falls Bridge for both daily and peak hour traffic when compared to the No Build/No Toll condition. These factors were applied to the No Build/No Toll volume to estimate the Build/No Toll volume on the Scudder Falls Bridge. The 2030 peak hour volume on the bridge was then balanced through the original roadway network, all mainline, ramp and ramp terminus movements. The 2030 Build/No Toll peak hour traffic volumes are illustrated in Figures 9A and 9B in Appendix G.

2030 Build, Toll Volume Projections

A study and analysis of the traffic diversions associated with tolling of the new Scudder Falls Bridge was completed. The study and analysis was prepared by Jacobs Engineering Group, Inc. under contract with AECOM and resulted in the report titled, Scudder Falls Bridge Traffic Diversion Study, dated September 8, 2010 and revised May 2011.

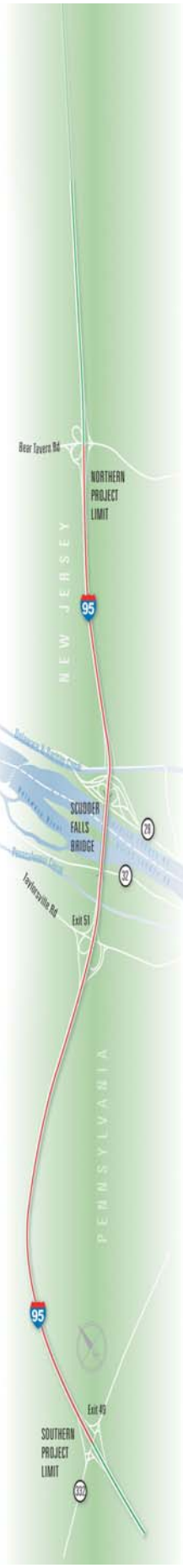
When tolls are introduced to a facility for the first time, it is expected that some drivers will divert to alternate locations to avoid paying the toll. It is also expected that the Scudder Falls Bridge Replacement Project, which includes a new, widened Scudder Falls Bridge, will attract additional traffic from the other river crossings, mitigating some of the effects of diversions due to tolling. To gain an understanding of the potential impacts of the traffic diversions on the local roadways and adjacent river crossings, the DRJTBC commissioned a study to forecast the volume of traffic that would divert from the Scudder Falls Bridge to alternate locations once tolls are implemented. The adjacent river crossings evaluated as part of this study included Washington Crossing Toll-Supported Bridge to the north, and Calhoun Street Toll-Supported Bridge, Lower Trenton Toll-Supported Bridge and Trenton-Morrisville (Route 1) Toll Bridge to the south.

The resulting volumes were compared to the capacity of the existing roadway network in the region surrounding the Scudder Falls Bridge in order to evaluate the ability of these roadways to handle any increased volumes. The volume of traffic expected to divert to adjacent river crossings was also forecasted and compared to existing traffic volumes at those facilities.

The estimated traffic diversion was developed for the interim year (2015) and build future year 2030, assuming both a low-toll scenario ($1 for passenger vehicles) and a high-toll scenario ($3 for passenger vehicles) for the Scudder Falls Bridge. The truck toll for both scenarios was assumed to be $4 per axle for each truck. The diversion volumes for these scenarios were compared to traffic volumes projected to occur on the existing Scudder Falls Bridge without a toll.

The Traffic Diversion Study developed diversion estimates utilizing the Jacobs' 2009 Traffic and Revenue Study, which estimated traffic diversion percentages for the two toll levels, and conducted an origin-destination survey of Scudder Falls Bridge customers to predict diversion routes, and the DVRPC's September 2004 Interstate 95 / Scudder Falls Bridge Traffic Study as the main sources of information.

The general steps taken to produce traffic diversion routes were:



- Collecting and compiling bridge and roadway traffic data.
- Running and testing the NJRTM-E model to determine diversions to other river crossings.
- Estimating volumes for the No Build/No Toll and Build/No Toll condition.
- Estimating volumes as well as diversion traffic volumes and routes for Build/Low Toll and Build/High Toll scenarios.

The effects on traffic of tolling the I-95/Scudder Falls Replacement Bridge were evaluated as part of the *Jacobs' Scudder Falls Bridge Traffic Diversion Study*, including the geographic extent and magnitude of traffic diversions. The study area for this impact assessment covers the area in which traffic diversions occur on roadways in the vicinity of the project. The study area extends beyond the I-95 project area municipalities of Lower Makefield Township and Ewing Township to include Hopewell Township, Lawrence Township, the City of Trenton in New Jersey and Morrisville Borough, Yardley Borough, Middletown, and Upper Makefield Township in Pennsylvania. The study area has been expanded to extend north to include Washington Crossing in Pennsylvania; east to include the intersection of U.S. Route 1 with I-95 in New Jersey; and, west to include the intersection of U.S. Route 1 with I-95 in Pennsylvania.

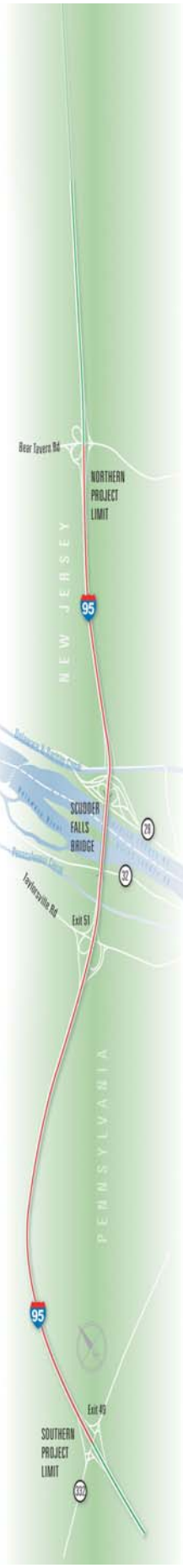
The study area includes four adjacent DRJTBC bridge crossings over the Delaware River. To the north, the study area includes the Washington Crossing Toll-supported Bridge. To the south, the study area includes the Calhoun Street Toll-supported Bridge, the Lower Trenton Toll-supported Bridge, and the Trenton-Morrisville/U.S. Route 1 Toll Bridge.

The Washington Crossing Toll-supported Bridge is located 2.8 miles north of the I-95/Scudder Falls Bridge. This bridge connects Washington Crossing Road (PA Route 532) in Upper Makefield Township, Pennsylvania and Washington Crossing Pennington Road (Mercer County Route 546) in Hopewell Township, New Jersey. The bridge has a 15-foot wide steel grid deck, a posted speed limit of 15 miles per hour (mph), and a posted weight limit of 3 tons.

The Calhoun Street Toll-supported Bridge, 4.6 miles south of the I-95/Scudder Falls Bridge, connects Trenton Avenue in Morrisville, Pennsylvania with Calhoun Street in Trenton, New Jersey. The Calhoun Street Toll-supported Bridge is the second oldest vehicular bridge in continuous operation across the Delaware River. The bridge was recently rehabilitated and has a posted speed limit of 15 mph, and a weight limit of 3 tons.

The Lower Trenton Toll-Supported Bridge, also known as the "Trenton Makes and the World Takes Bridge" (or Lower "Trenton Makes" Bridge), is located 0.9 mile south of the Calhoun Street Toll-supported Bridge. The original Lower Trenton Bridge was the first bridge to span the Delaware River and portions of the substructure date back to the original construction (1804). The Lower Trenton Toll-supported Bridge connects East Bridge Street in Morrisville, Pennsylvania with Warren Street in Trenton, New Jersey. The bridge roadway consists of two lanes: a lane in each direction separated by the center truss. The curb-to-curb width of each roadway is 21 feet. The bridge is currently posted for a five-ton weight limit and a 25 mph speed limit.

The Trenton-Morrisville/U.S. Route 1 Toll Bridge is located 0.1 mile south of the Lower Trenton Toll-supported Bridge and 5.6 miles south of the I-95/Scudder Falls Bridge. The bridge carries U.S. Route 1 over the Delaware River and is six lanes wide (three lanes in each direction). The toll plaza is located on the Pennsylvania side of the bridge, along the southbound (entering PA) lanes which widen to five lanes at the toll plaza.



Estimates were made of the amount of traffic projected to divert to other bridges (toll-diverted traffic) and also of the amount of traffic projected to divert to the I-95/Scudder Falls Replacement Bridge due to improved service and safety on this bridge (attracted traffic).

Projected traffic diversions were developed in the Jacobs' *Scudder Falls Bridge Traffic Diversion Study* for the design year, 2030, and for year, 2015, for both a low toll ($1.00 for passenger vehicles) and a high toll ($3.00 for passenger vehicles) scenario for the I-95/Scudder Falls Replacement Bridge (Build/Toll condition). The truck toll used for both scenarios was $4.00 per axle for each truck. The diverted volumes for these scenarios were compared to traffic volumes projected to occur on the existing Scudder Falls Bridge without improvements and without a toll (No Build/No Toll condition).

2030 Build/No Toll roadway network volumes from the DVRPC study used the diversion percentages determined in the Traffic Diversion Study to develop the Build/Low Toll and Build/High Toll volumes for the detailed roadway network. Traffic Diversion volumes shown in the table below for the Scudder Falls Bridge were used for the Build/Low Toll and Build/High Toll projections. Diversion percentages were also applied to the Taylorsville Road, Route 29, and Bear Tavern Road volumes. Table 14 indicates the peak hour Build, Low and High Toll volumes on the Scudder Falls Bridge compared to the Build/No Toll and No Build/No Toll volumes. The 2030 Build/Low Toll and Build/High Toll peak hour traffic volumes are shown in Figures 10A, 10B, 11A and 11B in Appendix G.

Table 14
Scudder Falls Bridge
Projected 2030 Peak Hour Traffic Volumes

		2030 No Build/No Toll	2030 Build/No Toll	2030 Build/Low Toll	2030 Build/High Toll
AM Peak	NB	5719	6343	6343	6343
	SB	2521	2797	2373	2128
PM Peak	NB	2634	2950	2950	2950
	SB	4895	5427	5126	4953

Table 15 illustrates the 2030 AADT volumes on the I-95 mainline. Growth in traffic volumes from 2003 traffic to 2030 No Build/No Toll are forecasted to range from 13% to 24% along the I-95 mainline, with the higher growth rates occurring in the northern sections of the project area. Growth for 2030 no-build to build is approximately 9% to 11%. The I-95/PA Turnpike Interchange currently in design was included as a constructed improvement in the model. The future volumes account for the impact of this improvement on through traffic in the I-95/Scudder Falls Bridge project area.

The Build/Low Toll Alternative results in an increase in volume of 2 to 5% for various sections of I-95 within the project area compared to the No Build/No Toll Alternative. The Build/High Toll Alternative results in an increase in volume of 1 to 2% south of the bridge, and a reduction in volume of 2 to 3% on the bridge and to the north compared to the No Build/No Toll Alternative.

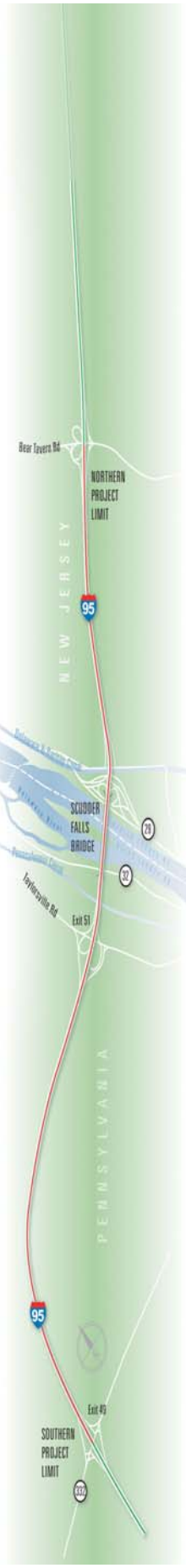


Table 15
I-95 Mainline
2003 and 2030 Average Annual Daily Traffic

Limits	Existing 2003 AADT (vpd)	2030 No-Build/No Toll AADT (vpd)	2030 Build / No Toll AADT (vpd)	2030 Build / Low Toll AADT (vpd)	2030 Build / High Toll AADT (vpd)
US 1 (Exit 46) to PA Route 332 (Exit 49)	63,300	71,700	78,500	75,300	73,400
PA Route 332 (Exit 49) to Taylorsville Road (Exit 51)	53,900	62,400	69,600	65,200	62,680
Taylorsville Road (Exit 51) to NJ Route 29 (Exit 1)	59,500	70,800	78,700	72,400	68,800
NJ Route 29 (Exit 1) to Bear Tavern Road (Exit 2)	57,100	70,300	77,100	71,960	69,140
Bear Tavern Road (Exit 2) to Scotch Road (Exit 3)	57,500	71,200	77,500	72,730	70,070

*Volumes are rounded to the nearest 100.

The Build/Low Toll Alternative results in a reduction in volume of 4 to 8% for various sections of I-95 within the project area compared to the Build/No Toll Alternative. The Build/High Toll Alternative results in a reduction in volume of 7 to 13% for various sections of I-95 within the project area compared to the Build/No Toll Alternative.

Table 16 illustrates the 2030 AADT volumes on the I-95 ramps. Growth rates from 2003 to 2030 at study area ramps are generally projected to be similar to growth rates projected for the I-95 mainline. Ramp volumes vary by interchange and direction. As shown on Table 12, ramp volumes at the PA Route 332 Interchange are the highest in the study area. In particular, movements to and from the south are highest, with AADTs of 14,400 vehicles per day and 13,600 vehicles per day on the southbound on-ramp from PA Route 332 and on the northbound off-ramp to PA Route 332, respectively. Movements to and from the north at this interchange are the second highest in the study area. The northbound on-ramp carries an AADT of 8,900 vehicles per day and the southbound off-ramp carries an AADT of 9,800 vehicles per day. Growth for 2030 no-build to build ranges from approximately 0 to 12%.

Ramp volumes for the Build/Low Toll and Build/High Toll scenarios in 2030 indicate increases and decreases compared to the Build/No Toll reflecting traffic diversions. Ramps with increased volumes for the low toll and high toll include:

I-95 NB off-ramp to PA Route 332 – 3 and 4% increase
Taylorsville Road on-ramp to I-95 SB – 20 and 30% decrease
I-95 SB off-ramp to NJ 29 (River Road) – 13 and 20% increase
I-95 SB off-ramp to Bear Tavern Road – 5 and 8% increase

Ramps with reduction in volumes for the low toll and high toll include:

I-95 SB off-ramp to PA 332 – 8 and 12% reduction
I-95 SB off-ramp to Taylorsville Road – 12 and 18% reduction
NJ 29 (River Road) on-ramp to I-95 SB – 9 and 16% reduction
Bear Tavern Road WB on-ramp to I-95 SB – 3 % reduction

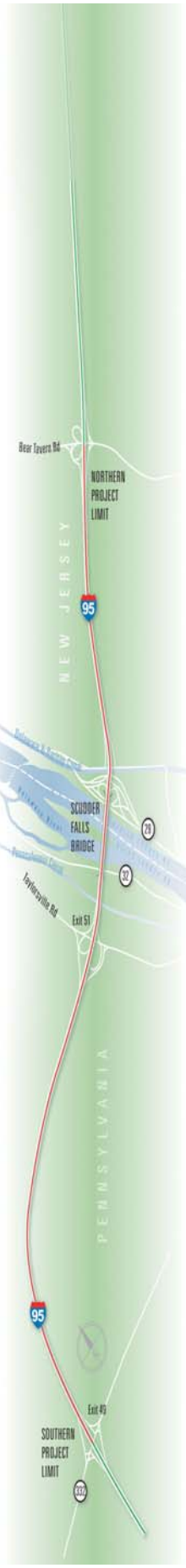
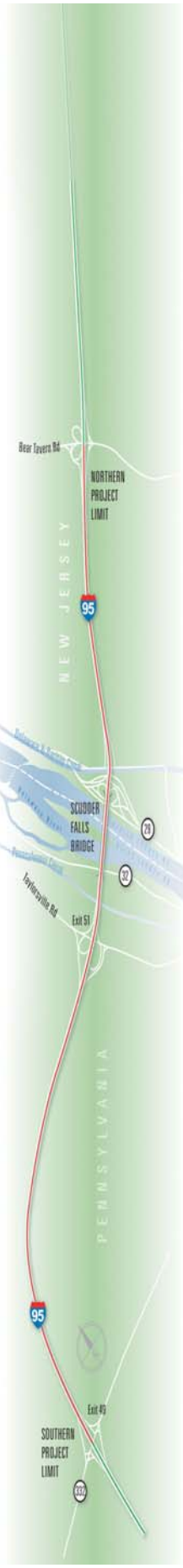


Table 16
I-95 Ramps
2003 and 2030 Average Annual Daily Traffic

Inter-change	Movement	Existing 2003 AADT (vpd)	2030 No-Build/No Toll AADT (vpd)	2030 Build/ No Toll AADT (vpd)	2030 Build/ Low Toll AADT (vpd)	2030 Build/ High Toll AADT (vpd)
PA Route 332 Interchange	I-95 NB off-ramp to PA Route 332	11,600	13,600	14,000	14,400	14,600
	PA 332 on-ramp(s) to I-95 NB	6,700	8,900	9,500	9,500	9,500
	PA 332 on-ramp to I-95 SB	12,100	14,400	14,700	14,700	14,700
	I-95 SB off-ramp to PA 332	7,500	9,800	10,300	9,500	9,100
Taylorsville Road Interchange	I-95 NB off-ramp to Taylorsville Road	3,300	4,200	4,200	4,200	4,200
	Taylorsville Road EB on-ramp to I-95 NB	2,900	3,800	4,200	4,200	4,200
	Taylorsville Road WB on-ramp to I-95 NB	2,600	3,500	3,800	3,800	3,800
	Taylorsville Road on-ramp to I-95 SB	3,300	4,200	4,200	5,000	5,480
	I-95 SB off-ramp to Taylorsville Road EB*	2,800	4,100	9,500	8,400	7,800
	I-95 SB off-ramp to Taylorsville Road WB*	4,000	5,400			
NJ Route 29/NJ Route 175 Interchange	I-95 NB on-ramp to NJ B29 (River Road)	4,900	5,500	6,100	6,100	6,100
	NJ 29 (River Road) on-ramp to I-95 NB	1,400	2,300	5,200	5,200	5200
	NJ 175 (Upper River Road) on-ramp to I-95 NB**	1,900	2,900			
	NJ 29 (River Road) on-ramp to I-95 SB	4,700	5,200	5,800	5,300	4,900
	I-95 SB off-ramp to NJ 29 (River Road)	3,800	5,000	5,100	5,760	6,140
Bear Tavern Road (CR 579) Interchange	I-95 NB off-ramp to Bear Tavern Road	3,800	4,800	5,200	5,200	5,200
	Bear Tavern Road on-ramp to I-95 NB	4,800	6,300	6,400	6,400	6,400
	Bear Tavern Road EB on-ramp to I-95 SB	2,400	3,100	3,100	3,100	3,100
	I-95 SB off-ramp to Bear Tavern Road	3,900	5,300	5,400	5,670	5,830
	Bear Tavern Road WB on-ramp to I-95 SB	2,000	2,800	3,100	3,000	3,000

*Combined into single off-ramp to Taylorsville Road.
** Combined into single on-ramp at NJ 29 (River Road) on-ramp to I-95 NB.

*Volumes are rounded to the nearest 10.



Regional Traffic Diversions

Appendix G contains tables and roadway network graphics from the Traffic Diversion Study prepared by Jacobs. As shown in the tables, each of the five DRJTBC bridges from Washington Crossing to Trenton-Morrisville, including the I-95/Scudder Falls Bridge, will be affected by tolling and the proposed roadway improvements, although the magnitude of these effects is small. When comparing the 2030 Build/High Toll condition to the 2030 No Build/No Toll condition, "toll-diverted trips" will slightly outweigh the "attracted trips," therefore AADT on the I-95/Scudder Falls Replacement Bridge is projected to drop by approximately three percent, as a small amount of traffic diverts to other bridges. The Washington Crossing Toll-supported Bridge and the Calhoun Street Toll-supported Bridge are the two closest bridges to the I-95/Scudder Falls Bridge. Both of these bridges provide one lane in each direction. Average annual daily traffic (AADT) on the Washington Crossing Toll-supported Bridge will increase by approximately five percent, while AADT on the Calhoun Street Toll-supported Bridge will increase by approximately one percent. Most of the toll-diverted traffic from the I-95/Scudder Falls Replacement Bridge is projected to divert to the Trenton-Morrisville (U.S. Route 1) Toll Bridge, but only results in a traffic increase of less than two percent. AADT on the Lower Trenton Toll-supported Bridge will increase by less than one percent.

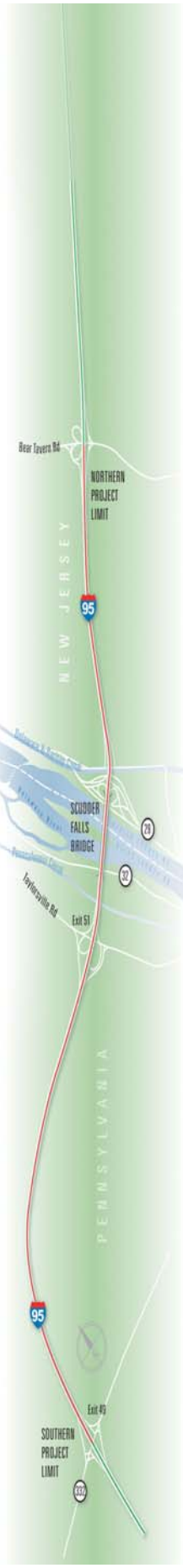
Under the low toll scenario (Build/Low Toll), the "attracted trips" will outweigh the "toll diverted trips." A net increase in traffic is projected for the I-95/Scudder Falls Replacement Bridge, while a net decrease in traffic is projected for the other nearby DRJTBC bridges. These changes are projected to be small for all five bridge crossings, ranging from a two percent increase on the I-95/Scudder Falls Replacement Bridge, to roughly a three percent reduction in traffic volume on the Washington Crossing Toll-supported Bridge.

In addition to the Delaware River crossings, other key roadways in the study area will experience traffic volume changes due to tolling of the I-95/Scudder Falls Replacement Bridge and the proposed roadway improvements. These changes are small, ranging from less than a one percent change to roughly a 3.5% change. None of these changes will affect traffic flow, either positively or negatively, since the magnitude of the changes are so small.

The same AADT trends forecasted for design year 2030 conditions are forecasted for the interim year 2015 conditions.

During peak hours, one-directional traffic volumes are of interest because traffic operations parameters, such as level of service, are generally based upon one direction of traffic flow. In the case of the I-95/Scudder Falls Replacement Bridge and proposed tolling, the southbound direction is the direction of interest because the southbound direction (entering Pennsylvania) is the tolled direction. Peak traffic volumes in the southbound direction occur during the evening peak hour (PM peak hour). Since peak hours tend to be congested periods, "attracted trips" outweigh "toll-diverted trips" during the PM peak hour as motorists seek the least congested route even if it means paying a toll. This will occur under both the 2030 Build/Low Toll and 2030 Build/High Toll conditions, when traffic volumes will be higher on the I-95/Scudder Falls Replacement Bridge than under the No Build/No Toll condition. Volumes on the other four bridge crossings will decrease compared to the No Build/No Toll condition.

A similar occurrence is anticipated under interim year, 2015, traffic conditions, for the Build/Low Toll condition. Traffic volumes on the I-95/Scudder Falls Replacement Bridge will rise slightly as compared to the No Build/No Toll condition indicating the "attracted trips" will



outweigh the "toll-diverted trips." Small reductions in traffic volume are forecast for the four other DRJTBC bridges. However, under the Build/High Toll condition, traffic volumes in 2015 will be approximately 5.66 percent lower on the I-95/Scudder Falls Replacement Bridge than under the No Build/No Toll condition, and traffic volumes on the four other DRJTBC bridges will be greater than under the No Build/No Toll condition. The $3.00 toll under the High Toll condition will tend to divert more traffic away from the I-95/Scudder Falls Replacement Bridge than are attracted to the bridge and its capacity and safety improvements because general roadway congestion on the other bridges is not severe enough for "attracted trips" to outweigh "toll-diverted trips" until after the year 2015 horizon.

The Traffic Diversion Study investigated the traffic diversions under both a Low Toll condition ($1) and the High Toll condition ($4). The results indicate that the higher toll rate is more likely to divert traffic away from the I-95/Scudder Falls Bridge, particularly, throughout the course of the day.

Operational Analysis

Existing

While traffic volumes provide a measure of activity on the area roadway network, it is also important to gauge how well the network can accommodate those volumes. A method of making this assessment is to compare the volumes with the capacity of the roadway. A Level of Service (LOS) is the resultant measure of this volume to capacity calculation. For mainline segments and ramp merges and diverges, the LOS is determined primarily by calculating vehicle densities in the traffic stream. For signalized intersections, the LOS is determined by calculating the average stopped delay per vehicle. The LOS can be determined for both individual lane movements as well as the overall intersection. For unsignalized intersections, a LOS is calculated for only the conflicting movements, and an overall LOS is not calculated.

Levels of Service have been determined for the A.M. and P.M. peak hours for the I-95 mainline, ramps, and cross road and local road intersections. The 2003 Existing A.M. and P.M. peak hour Levels of Service (LOS) are displayed on Table 17, 18, and 19, respectively.

Table 17
I-95 Mainline Levels of Service
2003 Existing Peak Hours

Direction	Location	A.M. Peak	P.M. Peak
NB	Between Exit 46 (US Route 1 Interchange) & Exit 49 (PA 332 Interchange)	C	C
SB		C	D
NB	Between Exit 49 & Exit 51 (Taylorsville Road Interchange)	D	B
SB		B	D
NB	Between Exit 51 & Exit 1 (NJ 29 Interchange)— I-95/Scudder Falls Bridge	F	B
SB		B	E
NB	Between Exit 1 & Exit 2 (Bear Tavern Road Interchange)	C	A
SB		A	C
NB	Between Exit 2 & Exit 3 (Scotch Road Interchange)	C	A
SB		A	C

= Acceptable LOS A-D

= Undesirable LOS E, F

Table 18
I-95 Ramp Levels of Service
2003 Existing Peak Hours

Interchange	Movement	A.M. Peak	P.M. Peak
PA 332 Interchange	I-95 NB off-ramp to PA 332	C	B
	PA 332 on-ramp(s) to I-95 NB	C	B
	I-95 SB off-ramp to PA 332	B	D
	PA 332 on-ramp to I-95 SB	B	C
Taylorsville Road Interchange	I-95 NB off-ramp to Taylorsville Road	C	B
	Taylorsville Road EB on-ramp to I-95 NB	F	B
	Taylorsville Road WB on-ramp to I-95 NB	F	B
	I-95 SB off-ramp to Taylorsville Road WB	B	F
	I-95 SB off-ramp to Taylorsville Road EB	B	E
	Taylorsville Road on-ramp to I-95 SB	B	C
NJ 29/NJ 175 Interchange	I-95 NB on-ramp to NJ 29 (River Road)	F	B
	NJ 29 (River Road) on-ramp to I-95 NB	N / A	N / A
	NJ 175 (Upper River Road) on-ramp to I-95 NB	C	B
	I-95 SB off-ramp to NJ 29 (River Road)	N / A	N / A
	NJ 29 (River Road) on-ramp to I-95 SB	B	F
Bear Tavern Road (CR 579) Interchange	I-95 NB off-ramp to Bear Tavern Road	C	A
	Bear Tavern Road on-ramp to I-95 NB	C	A
	Bear Tavern Road WB on-ramp to I-95 SB	A[2]	C[2]
	I-95 SB off-ramp to Bear Tavern Road		
	Bear Tavern Road EB on-ramp to I-95 SB	A	D

	= Acceptable LOS, A-D
	= Undesirable LOS, E, F
N / A	= Not Applicable due to lane add or drop
1	= Lane add or drop.
2	= Weave for on-ramp followed by off-ramp.

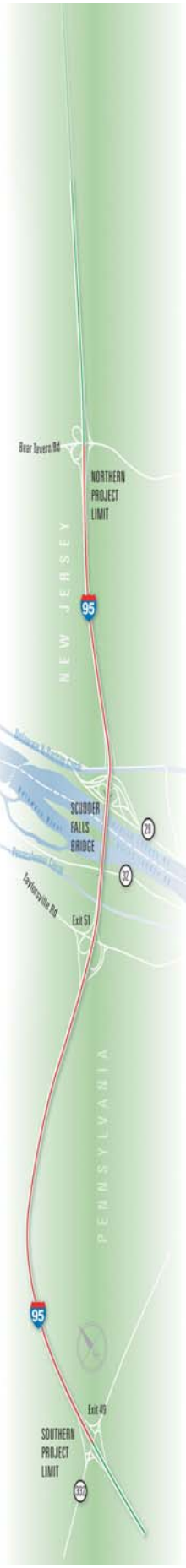


Table 19
Intersection Levels Of Service
2003 Existing Peak Hours

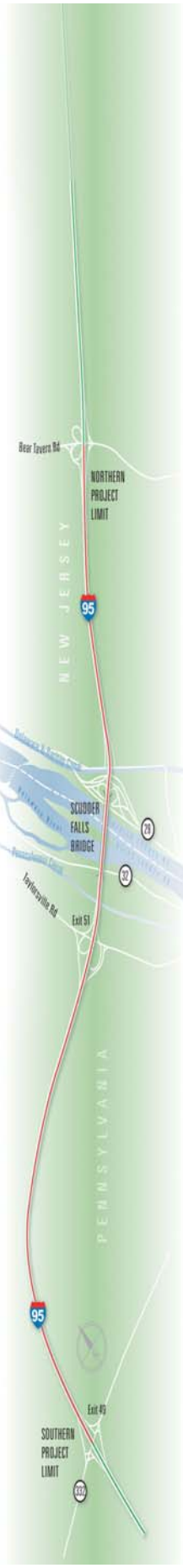
Intersection	Intersection	2003 Existing	
		A.M. Peak	P.M. Peak
1	I-95 NB & PA Route 332	**F**	**C**
2	I-95 SB & PA Route 332	**D**	**A**
3	I-95 NB & Taylorsville Road	**d**	**f**
4	I-95 SB & Taylorsville Road	**c**	**a**
5	Woodside Road & Taylorsville Road	**B**	**B**
6	I-95 NB Off-Ramp & NJ Route 29	**e**	**b**
7	I-95 SB Off-Ramp & NJ Route 29	**b**	**b**
8	I-95 NB& Upper River Road	**a**	**a**
9	Bernard Road & NJ Route 29	**f**	**d**
10	Park Driveway & Upper River Road	**b**	**a**
11	I-95 NB & Bear Tavern Road	**A**	**B**
12	I-95 SB & Bear Tavern Road	**f**	**f**
13	Scenic Drive & Bear Tavern Road	**A**	**B**

	= Acceptable LOS, A-D (a-d)
	= Undesirable LOS, E, F (e, f)
A	= Signalized Intersection LOS letter grade (average delay per vehicle in seconds).
a	= Unsignalized Intersection LOS letter grade (average delay per vehicle in seconds).

In conclusion, there are existing capacity deficiencies on the I-95/Scudder Falls Bridge and on several ramps at the flanking Taylorsville Road Interchange and NJ Route 29 Interchange. These conditions prevail for a total of four hours each day during peak travel periods in the peak flow directions. These facilities have a current need for improvement. It is noteworthy that the existing peak hour Levels of Service on I-95 between Taylorsville Road and PA Route 332 are currently acceptable (LOS D), but are approaching undesirable levels. It is also clear that the two flanking interchanges, Taylorsville Road and NJ Route 29, need to be improved and that those improvements be incorporated into the overall improvement plan for addressing the needs at the I-95/Scudder Falls Bridge.

No-Build Alternative

Levels of Service (LOS) have been determined for the design year (2030) A.M. and P.M. peak hours for I-95 mainline segments and I-95 Interchange ramps within the project area. LOS for the mainline segments are tabulated in Table 20, and LOS for interchange ramps are



tabulated in Table 21. Existing (2003) LOS are included in both tables for comparison purposes.

Whereas existing (2003) operating conditions are undesirable on two segments on I-95 in the project area that represent the I-95/Scudder Falls Bridge, design year (2030) operating conditions are projected to be undesirable on four segments of I-95 in the project area. The three additional affected segments extend west into Pennsylvania to the PA Route 332 Interchange and continue west to the I-95 segment beyond this interchange. Although the duration of congestion has not been estimated for the design year, it is anticipated that congested peak periods will extend beyond the two-hour A.M. and P.M. peak periods that currently occur.

Table 20
I-95 Mainline Levels of Service
2003 and 2030 Future Peak Hours

Direction	Location	2003 Existing		2030 No-Build	
		AM Peak	PM Peak	AM Peak	PM Peak
NB	Between Exit 46 (Route 1) & Exit 49 (PA Route 332)	C	C	D	D
SB		C	D	D	E
NB	Between Exit 49 & Exit 51 (Taylorsville Road)	D	B	D	C
SB		B	D	C	E
NB	Between Exit 51 & Exit 1 (NJ Route 29 Interchange)— I-95/Scudder Falls Bridge	F	B	F	C
SB		B	E	C	F
NB	Between Exit 1 & Exit 2 (Bear Tavern Road Interchange)	C	A	D	B
SB		A	C	B	D
NB	Between Exit 2 & 3 (Scotch Road Interchange)	C	A	D	B
SB		A	C	B	C

= Acceptable LOS, A-D
= Undesirable LOS, E, F

Although the duration of congestion has not been estimated for the design year (2030), it is anticipated that congested peak periods will extend beyond the two-hour A.M. peak period that currently occur on the on-ramp from Taylorsville Road westbound to I-95 northbound and on the off-ramp from I-95 northbound to NJ Route 29.

The ramps flanking the bridge at the Taylorsville Road and NJ Route 29 Interchanges with the highest volumes are the ones that are projected to operate under undesirable conditions (LOS F) during the A.M. and P.M. peak hours. It is noteworthy that two out of the six ramps at the Taylorsville Road Interchange are projected to operate at an undesirable LOS (LOS F) in the A.M. and P.M. peak hours. On the two closest ramps to the I-95/Scudder Falls Bridge, these conditions are expected to prevail for at least two hours each day in the peak flow directions. The only other interchange projected to have undesirable LOS during the A.M. and P.M. peak hours is the NJ Route 29 Interchange, and these conditions are expected to prevail for two hours each day at each of the two interchange ramps closest to the I-95/Scudder Falls Bridge in the peak flow directions.

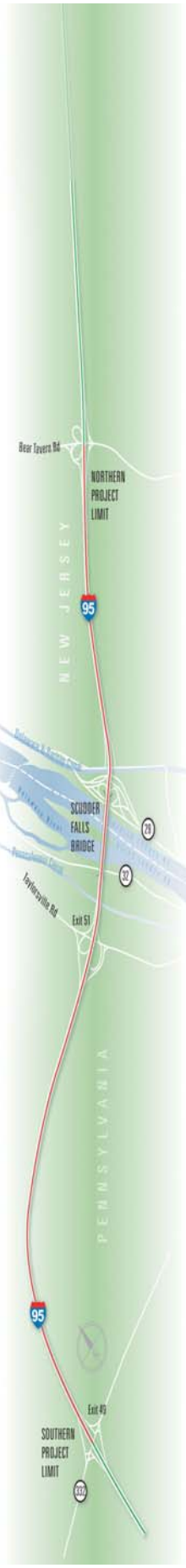
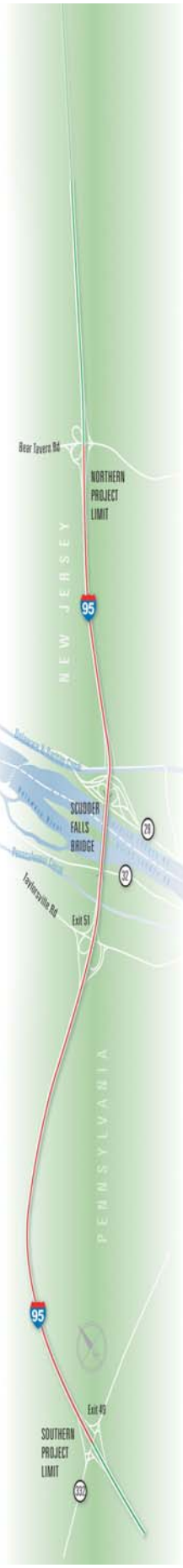


Table 21
I-95 Ramp Levels of Service
2003 and 2030 Future Peak Hours

Inter-change	Location	2003 Existing		2030 No-Build	
		AM Peak	PM Peak	AM Peak	PM Peak
Exit 49 - PA 332	I-95 NB Off-Ramp to PA Route 332	C	B	D	C
	PA Route 332 EB On-Ramp to I-95 NB	C	B	D	B
	PA Route 332 Westbound On-Ramp to I-95 Northbound	N/A[2]	N/A[2]	D	C
	I-95 Southbound Off-Ramp to PA Route 332	B	D	C	D
	PA Route 332 On-Ramp to I-95 Southbound	B	C	C	D
Exit 51 - Taylorsville Road	I-95 Northbound Off-Ramp to Taylorsville Road	C	B	D	C
	Taylorsville Road Eastbound On-Ramp to I-95 Northbound	F	B	F	C
	Taylorsville Road Westbound On-Ramp to I-95 Northbound	F	B	F	C
	I-95 Southbound Off-Ramp to Taylorsville Road Westbound	B	F	C	F
	I-95 Southbound Off-Ramp to Taylorsville Road Eastbound	B	E	C	E
	Taylorsville Road On-Ramp to I-95 Southbound	B	C	B	D
Exit 1 - NJ 29	I-95 Northbound Off-Ramp to NJ Route 29	F	B	F	C
	NJ Route 29 On-Ramp to I-95 Northbound	N / A[1]	N / A[1]	F[1]	C[1]
	Upper River Road On-Ramp to I-95 NB	C	B	D	C
	I-95 SB Off-Ramp to NJ Route 29	N/A[1]	N/A[1]	B[1]	F[1]
	NJ Route 29 On-Ramp to I-95 SB	B	F	C	F
Exit 2 - Bear Tavern Road	I-95 NB Off-Ramp to Bear Tavern Road	C	A	C	B
	Bear Tavern Road On-Ramp to I-95 NB	C	A	D	B
	Bear Tavern Road WB On-Ramp to I-95 SB	A	C	B	C
	I-95 SB Off-Ramp to Bear Tavern Road				
	Bear Tavern Road EB On-Ramp to I-95 SB	A	B	B	C

	= Acceptable LOS, A-D
	= Undesirable LOS, E, F
N / A	= Not Applicable.
1	= Lane add or drop.
2	= New ramp configuration.



Build Condition

Levels of Service have been determined for the design year (2030) A.M. and P.M. peak hours for I-95 mainline segments and I-95 Interchange ramps within the project area. LOS for the mainline segments are tabulated in Table 22, LOS for interchange ramps are tabulated in Table 23, and Taylorsville Road Signalized Intersection LOS in Table 23A.

Table 22
I-95 Mainline Levels of Service
2030 Future Peak Hours

NB/ SB	Location	2030 No-Build/No Toll		2030 Build/No Toll		2030 Build / Low Toll		2030 Build / High Toll	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
NB	Between Exit 46 (Route 1) & Exit 49 (PA Route 332)	D	D	E[1]	D	E[1]	D	E[1]	D
SB		D	E	D	F[1]	D	E	C	E
NB	Between Exit 49 & Exit 51 (Taylorsville Road)	D	C	C	B	C	B	C	B
SB		C	E	B	C	B	C	B	C
NB	Between Exit 51 & Exit 1 (NJ Route 29)—I-95/Scudder Falls Bridge	F	C	C	A	C	A	C	A
SB		C	F	B	C	A	C	A	C
NB	Between Exit 1 & Exit 2 (Bear Tavern Road)	D	B	C	B	C	B	C	B
SB		B	D	B	D	B	D	B	D
NB	Between Exit 2 & Exit 3 (Scotch Road)	D	B	D	B	D	B	D	B
SB		B	C	B	D[1]	B	C	B	C

= Acceptable LOS, A-D (a-d)

= Undesirable LOS, E, F (e, f)

1 = No change to I-95 mainline geometry, but increased volume causes LOS to deteriorate.

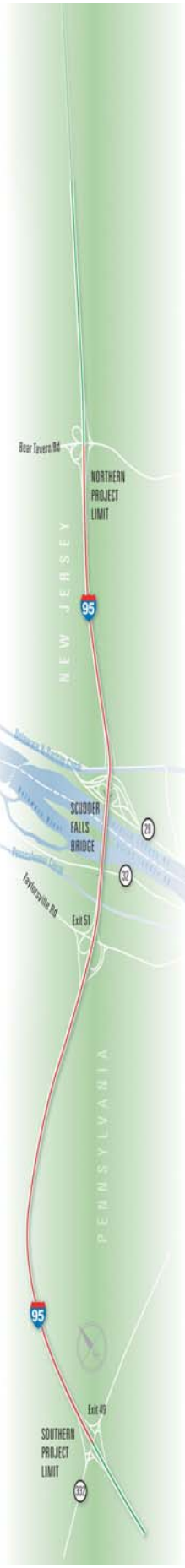


Table 23
I-95 Ramp Levels of Service
2030 Future Peak Hours

Inter-change	Location	2030 No-Build / No Toll		2030 Build / No Toll		2030 Build / Low Toll		2030 Build / High Toll	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Exit 49 - PA Route 332	I-95 NB Off-Ramp to PA Route 332	D	C	D	D	D	D	D	D
	PA Route 332 EB On-Ramp to I-95 NB	D	B	D[1]	C[1]	D[1]	C[1]	D[1]	C[1]
	PA Route 332 WB On-Ramp to I-95 NB	D	C	D[1]	C[1]	D[1]	C[1]	D[1]	C[1]
	I-95 SB Off-Ramp to PA Route 332	C	D	B[1]	C[1]	B[1]	C[1]	B[1]	C[1]
	PA Route 332 On-Ramp to I-95 SB	C	D	C	F	C	D	C	D
Exit 51 - Taylorsville Road	I-95 NB Off-Ramp to Taylorsville Road	D	C	C	B	C	B	C	B
	Taylorsville Road EB On-Ramp to I-95 NB	F	C	D[1]	C[1]	C[1]	C[1]	C[1]	C[1]
	Taylorsville Road WB On-Ramp to I-95 NB	F	C	D[1]	B[1]	D[1]	B[1]	D[1]	B[1]
	I-95 SB Off-Ramp to Taylorsville Road WB	C	F	B[1,2]	D[1,2]	B[1,2]	D[1,2]	B[1,2]	D[1,2]
	I-95 SB Off-Ramp to Taylorsville Road EB	C	E						
	Taylorsville Road On-Ramp to I-95 SB	B	D	B	C	B	C	C	B
Exit 1 - NJ Route 29	I-95 NB Off-Ramp to NJ Route 29	F	C	D[1]	B[1]	D[1]	B[1]	D[1]	B[1]
	NJ Route 29 On-Ramp to I-95 NB	F[1]	C[1]	C[1,2]	B[1,2]	C[1,2]	B[1,2]	C[1,2]	B[1,2]
	Upper River Road On-Ramp to I-95 NB	D	C						
	I-95 SB Off-Ramp to NJ Route 29	B[1]	F[1]	B	D	B	D	B	D
	NJ Route 29 On-Ramp to I-95 SB	C	F	B[1]	D[1]	B[1]	D[1]	B[1]	D[1]
Exit 2 - Bear Tavern Road	I-95 NB Off-Ramp to Bear Tavern Road	C	B	D[1]	B[1]	D[1]	B[1]	D[1]	B[1]
	Bear Tavern Road On-Ramp to I-95 NB	D	B	D[1]	B[1]	D[1]	B[1]	D[1]	B[1]
	Bear Tavern Road WB On-Ramp to I-95 SB	B	C	B	C	B	C	B	C
	I-95 SB Off-Ramp to Bear Tavern Road								
	Bear Tavern Road EB On-Ramp to I-95 SB	B	C	B	C	B	C	B	C

	= Acceptable LOS, A-D
	= Undesirable LOS, E, F
1	= Lane add or drop. Worst case ramp merge/ diverge analyses included for informational purposes.
2	= New ramp configuration.
3	= Ramp Eliminated.

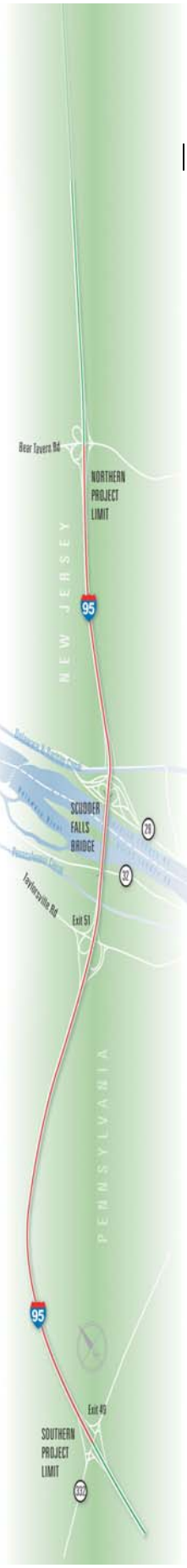
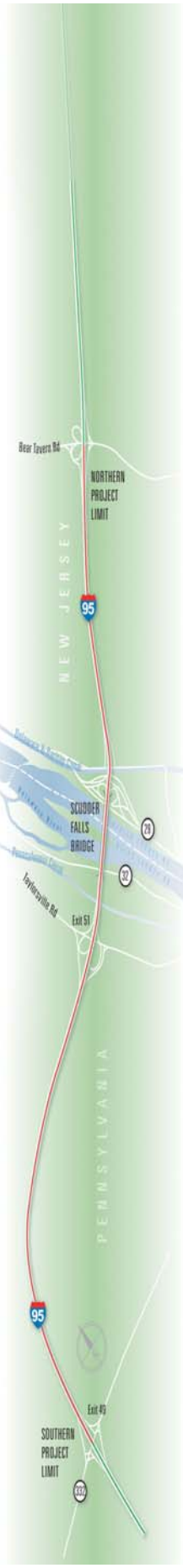


Table 23A
Taylorsville Road Signalized Intersection Level of Service – 2030 Future Peak Hours

Signalized Intersection		2030 Build - No Toll AM Peak			2030 Build with Low Toll AM Peak			2030 Build with High Toll AM Peak		
		LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
Taylorsville Rd and Woodside Ave	Overall	C	21.3	0.79	C	21.9	0.80	C	22.4	0.81
	EBT	B	15.9	0.12	B	15.8	0.12	B	15.8	0.12
	EBR	B	15.6	0.76	B	15.7	0.76	B	15.7	0.76
	WBL	C	30.2	0.77	C	29.7	0.76	C	29.7	0.76
	WBT	B	16.1	0.14	B	16.0	0.14	B	16.0	0.14
	NBL	C	27.6	0.19	C	26.2	0.19	C	26.0	0.19
	NBT	B	13.2	0.34	B	12.8	0.32	B	13.6	0.31
	SBL	C	29.4	0.27	C	29.4	0.27	C	29.4	0.27
	SBT	C	28.0	0.86	C	30.2	0.89	C	31.2	0.90
Taylorsville Rd and I-95 SB on ramps and off ramp	Overall	B	14.6	0.72	B	14.3	0.74	B	13.9	0.74
	EBL	C	21.3	0.42	C	21.3	0.39	C	21.4	0.38
	EBR	A	0.2	0.15	A	0.2	0.15	A	0.2	0.14
	NBL	B	18.3	0.30	B	12.2	0.44	B	11.6	0.49
	NBT	A	6.2	0.15	A	4.8	0.15	A	4.7	0.16
	SBT	B	19.0	0.95	B	19.2	0.95	B	18.7	0.95
	SBR	A	6.2	0.23	A	6.6	0.24	A	6.7	0.25
Taylorsville Rd and I-95 NB off ramp	Overall	A	7.8	0.92	A	8.0	0.92	A	8.1	0.92
	EBL	C	21.5	0.40	C	21.3	0.39	C	21.3	0.39
	EBR	B	19.7	0.05	B	19.5	0.05	B	19.5	0.05
	NBT	A	7.1	0.65	A	7.7	0.68	A	7.8	0.69
	SBT	A	4.7	0.18	A	5.0	0.17	A	4.9	0.17
	SBR	A	6.4	0.92	A	6.3	0.92	A	6.4	0.92

Signalized Intersection		2030 Build - No Toll PM Peak			2030 Build with Low Toll PM Peak			2030 Build with High Toll PM Peak		
		LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
Taylorsville Rd and Woodside Ave	Overall	B	14.5	0.59	B	15.2	0.57	B	15.1	0.57
	EBT	B	19.3	0.32	B	19.0	0.31	B	19.0	0.31
	EBR	A	5.4	0.15	A	5.0	0.16	A	5.0	0.16
	WBL	C	23.0	0.58	C	22.4	0.56	C	22.4	0.56
	WBT	B	18.4	0.19	B	18.2	0.18	B	18.2	0.18
	NBL	B	19.9	0.71	B	20.0	0.69	B	19.8	0.69
	NBT	A	8.8	0.54	B	10.1	0.50	A	9.8	0.48
	SBL	C	28.2	0.13	C	28.2	0.13	C	28.2	0.13
	SBT	B	19.3	0.39	C	20.3	0.43	C	20.3	0.43
Taylorsville Rd and I-95 SB on ramps and off ramp	Overall	A	9.4	0.55	A	9.6	0.54	A	9.5	0.53
	EBL	B	18.2	0.72	B	18.4	0.71	B	18.4	0.70
	EBR	A	0.9	0.44	A	0.9	0.43	A	0.8	0.42
	NBL	A	7.6	0.17	A	8.9	0.22	A	8.6	0.23
	NBT	A	7.2	0.36	A	8.2	0.36	A	7.9	0.35
	SBT	B	13.1	0.42	B	13.4	0.43	B	13.2	0.43
	SBR	A	0.2	0.16	A	0.2	0.17	A	0.2	0.17
Taylorsville Rd and I-95 NB off ramp	Overall	A	7.3	0.41	A	7.7	0.40	A	7.6	0.40
	EBL	C	20.8	0.48	C	20.3	0.46	C	20.3	0.46
	EBR	B	18.3	0.04	B	17.9	0.04	B	17.9	0.04
	NBT	A	5.0	0.29	A	5.3	0.30	A	5.3	0.30
	SBT	A	5.5	0.38	A	6.6	0.38	A	6.6	0.37
	SBR	A	0.3	0.23	A	0.3	0.23	A	0.4	0.25

Note: HCM results reported from Synchro traffic analysis of interchange



Taylorsville Road Interchange

For the selected interchange alternative, there are three signalized intersections along Taylorsville Road. This includes the two on/off ramp T-intersections and the four-leg Woodside Road intersection. All three intersections operate at acceptable Level of Service during both the A.M. and P.M. peak hours under the selected improvement for all Build Options.

Based upon the current frontage along Woodside Road, the park-and-ride lot driveway could be moved approximately an additional 100 feet away from the Taylorsville Road / Woodside Road intersection along the eastern property line. During final design, the driveway will be evaluated to determine the final location that would permit optimal traffic operations on Woodside Road.

NJ Route 29 Interchange

For the selected interchange alternative, there are two roundabouts, one for the northbound on/off ramps, and one for the southbound on/off ramps. Both of these roundabouts operate at acceptable Levels of Service during both the A.M. and P.M. peak hours under the selected improvement for all Build Options.

The I-95 NB on-ramp from Upper River Road is eliminated in the options because the design criteria for distance between two successive on-ramps is not met. The volume from this on-ramp is redistributed to the I-95 Northbound on-ramp from NJ Route 29. The local roads impacted by the ramp elimination as well as the interchange operate at acceptable Levels of Service.

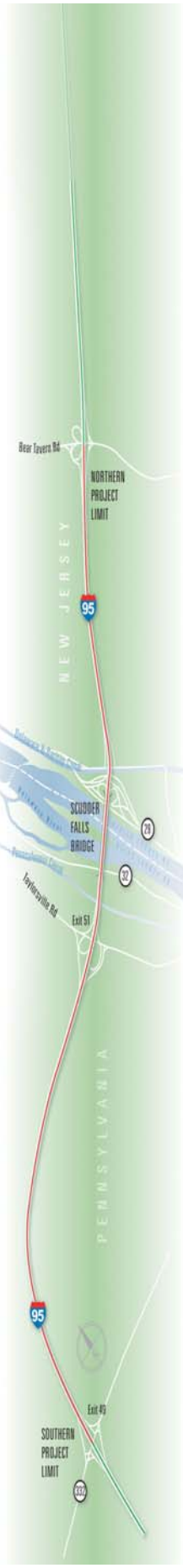
The proposed interchange provides for all movements to and from I-95 Northbound and Southbound, and to and from NJ Route 29.

The Upper River Road ramp is adjacent to the access for the New Jersey State Police facility. This facility operates the State's emergency and Homeland Security operations from the new Emergency Operations Center. Access to I-95 for immediate response to emergency and/or Homeland Security operations is critical. Coordination with the New Jersey State Police has resulted in the provision of an emergency gated access for use only under emergency response. It is expected that formal approval will be given after completion of the NEPA document and review of the formal design and plans.

Mainline I-95

The selected alternative for the mainline I-95 includes three through travel lanes plus auxiliary lanes to facilitate the smooth flow of traffic onto and off of I-95 at the Taylorsville Road and NJ Route 29 Interchanges. For the southbound direction, the auxiliary lane begins as an on-ramp from NJ Route 29 which becomes the off-ramp to Taylorsville Road. The auxiliary lane length is 3,400 feet. This creates an area with weaving, however the Highway Capacity Manual only considers a distance of 2,500 feet or less a weave condition. The analysis indicates this area will have acceptable operating conditions for all Build Options.

For the northbound direction, there are two northbound on-ramps from Taylorsville Road. The on-ramp (loop ramp) from eastbound Taylorsville Road is an add lane followed by an auxiliary



lane for the westbound Taylorsville Road on-ramp. This auxiliary lane becomes the off-ramp to NJ Route 29. This creates a five-lane section northbound across the Scudder Falls Bridge. The auxiliary lane length is 2,526 feet. This creates an area with weaving, however the Highway Capacity Manual only considers a distance of 2,500 feet or less a weave condition. The analysis indicates this area will have acceptable operating conditions for all Build Options.

The fourth lane merges into mainline I-95 prior to the NJ Route 29 NB on-ramp auxiliary lane. The NJ Route 29 Northbound on-ramp auxiliary lane becomes the off-ramp to Bear Tavern Road. The auxiliary lane length is 5,754 feet.

The LOS on I-95 south of the PA 332 Interchange degrades as follows:

- from LOS D in No Build/No Toll to LOS E in 2030 Build/No Toll, 2030 Build/Low Toll, and 2030 Build/High Toll during the A.M. peak period.
- from LOS E in No Build/No Toll to LOS F in 2030 Build/No Toll, and remains LOS E in 2030 Build/Low Toll, and 2030 Build/High Toll during the P.M. peak period.

These sections are beyond the project area. Based on meetings with the District 6-0 Executive Committee, PennDOT is coordinating with Bucks County and the DVRPC to program improvements for I-95 south of the PA 332 Interchange into the Long Range Plan.

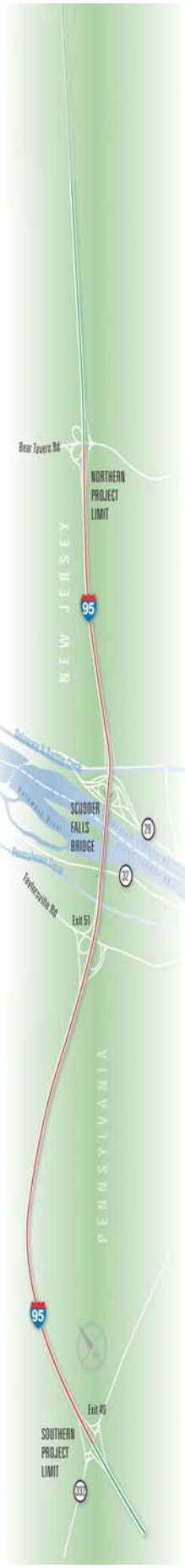
Diversion Route Analysis

The overall findings indicate that the traffic diversions resulting from the tolling of the new Scudder Falls Bridge will cause minimal traffic impacts to the adjacent roadways and bridge crossings within the region during both peak and non-peak periods.

For the most critical operational period (the peak hour), there is actually a reduction in traffic on alternative crossings for the low-toll scenario, and an increase in traffic in 2030 for the high-toll scenario. In both scenarios and during all periods of the day, the impact of tolling in terms of congestion (as measured by volume-to-capacity ratios for roadways and bridges) remains at or very close to 2030 No Build/No Toll levels. These findings are a result of the limited capacity of alternative crossings and the significant operational and safety improvements associated with a new Scudder Falls Bridge.

The Diversion Study Estimated volume to capacity ratios on the regional roadway network is included in Appendix K. As shown in the Appendix, for 2015 and 2030 peak hours, the majority of the roadway network will experience v/c ratios that are very similar to the No Build/No Toll conditions. A summary of v/c ratios for roadways within the study area indicate the following:

- V/C ratios on the four alternate bridges decrease from the No Build/ No Toll for all Build conditions due to the attracted volume due to widening of the I-95/Scudder Falls Bridge for both 2015 and 2030.
- V/C ratios are 0.59 or less, except the US 1 link west of I-95 which is 0.73 to 0.74 for all 2015 conditions, and 0.64 or less, except the US 1 link west of I-95 which is 0.78 for all 20930 conditions.
- V/C ratios change from 2015 and 2030 No Build/No Toll to Build/No Toll, Build/Low Toll and Build/High Toll range from -10% to +10%.
- V/C ratios for the Build, Low Toll and Build/High Toll are higher than the Build/No Toll condition, however, they are still lower than the No Build condition.



Conformance with Transportation Plans

The proposed improvements are consistent with the DVRPC Long Range Transportation Plan. The I-95 Scudder Falls Bridge is included in the plan as project ID#36. The Long Range Plan shows this as an externally funded major regional project. Funding would be provided by the DRJTBC with no federal or state funding.

Evaluation Matrix

A summary of the analysis of alternatives and key evaluation criteria is included in the Technical Memorandum #26, Alternatives Analysis. Discussions of the various options considered is included in the proposed roadway improvement section of this report, pages 26 to 33, and the Options Development and Screening section, pages 35-38.

Design Exceptions

Improvements proposed conform to current design criteria with the following potential design exceptions anticipated as identified in the Technical Memorandum No. 33 Preliminary Design Report, revised December 2009.

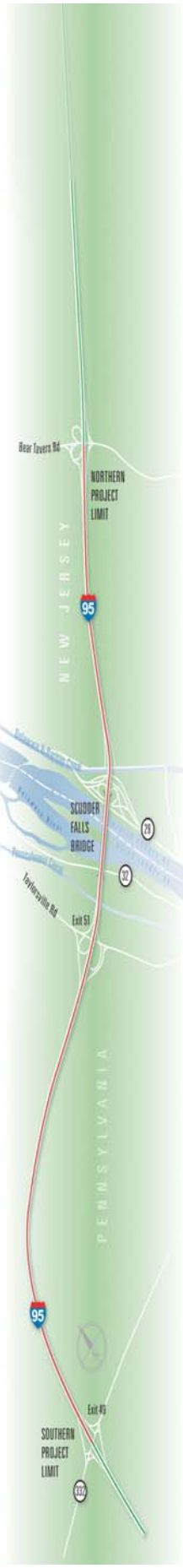
I-95 mainline: Minimum vertical grade criteria are improved over existing 0.40% but are below current design criteria in the following areas.

Sta. 151+50 to 177+95 NB Minimum Required = 0.50%; Provided = 0.45%
Sta. 151+50 to 180+85 SB Minimum Required = 0.50%; Provided = 0.45%
Sta. 183+35 to 216+25 SB Minimum Required = 0.50%; Provided = 0.49%

Taylorsville Road Interchange:
Headlight sight distance (HLSD) at the intersection of Woodside and Taylorsville Road: Minimum required 155 feet; provided 91 feet. Lighting exists and is proposed to remain.

NJ 29 Interchange:
NJ 175 Shoulder width; Minimum required 8 feet ; provided 0 feet
NJ 175 Vertical clearance; Minimum required 16 feet 6 inches; provided 14 feet 6 inches
NJ 29NB Vertical clearance; Minimum required 16 feet 6 inches; provided 14 feet 6 inches
Ramp E Tie in geometry with mainline; Minimum required R=1000 feet L=200 feet; provided R=150 feet Potential mitigation measures for design exceptions include signing, lighting, and high friction pavement as appropriate for each design exception.

Current design criteria were utilized for the project along the I-95 corridor as well as the interchanges with a few exceptions. Design criteria followed the guidelines set in the 2004 AASHTO publication, as well the New Jersey Department of Transportation (NJDOT), and the Pennsylvania Department of Transportation (PennDOT) Design Manuals, where applicable. The substandard design issues identified above will be coordinated with PennDOT and NJDOT during preliminary/final design to determine if design exceptions will be required.



C. ESTIMATE, FUNDING, AND SCHEDULE

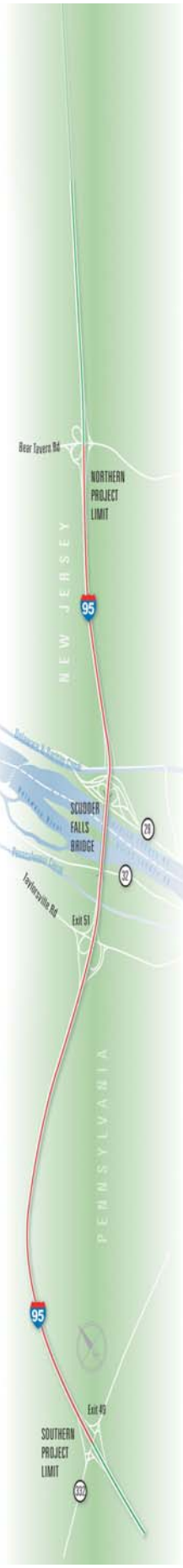
The improvements proposed under the Scudder Falls Bridge project are currently estimated at $310.37 million. The breakdown of estimated costs is as follows:

COST (in millions)	DESCRIPTION
$5.72	Study/Environmental Permitting
$54.84	Engineering & Legal
$241.78	Construction (Including Construction Inspection)
$5.61	Right of Way Acquisition
$2.42	Utilities
$310.37 Million	**TOTAL ESTIMATED COST**

The Commission examined a range of options for financing and delivering the project, including the pursuit of Federal and State funding. However, no funding was available from the federal government or either state. Additionally, neither state has plans to improve the roadways adjacent to the Scudder Falls Bridge in their current capital programs. The Commission applied for Federal stimulus funds in the form of a TIGER Grant and a TIFIA Loan, both from the USDOT but they were unsuccessful in securing federal funds to support the project.

The Commission intends to implement tolling on the new Scudder Falls Bridge to support the capital costs and ongoing maintenance and operations of the bridge. On December 21, 2009 the Commission's Board authorized the implementation of tolls on the Scudder Falls Replacement Bridge. The Commission rendered its tolling decision after making an assessment of its overall capital program needs, its current system of financing the capital program, and -- most notably – the lack of sufficient outside sources of funding to support the project.

The project is currently undergoing review in accordance with the National Environmental Policy Act (NEPA). Final design is scheduled to begin after completion of the (NEPA) process. The project schedule reflects a 2011 issuance of a NEPA decision by the Federal Highway Administration (FHWA). Should the NEPA decision result in the issuance of a Finding of No Significant Impact (FONSI), final design could begin in 2012 and construction could begin in 2013. The start of construction could be affected if the Delaware River Joint Toll Bridge Commission decides to carry out the project as a public-private partnership [P3], which is being assessed. Once construction begins, it is estimated that it will take three to four years to complete the project.



D. LAND USE AND ACCESS MANAGEMENT

Transportation System Benefits

The current conditions in the project area include extensive traffic congestion and safety concerns at the bridge and the adjacent interchange on and off-ramps which have substandard or no acceleration and deceleration lanes. The proposed improvements will alleviate the recurring traffic congestion that occurs in the corridor during peak commuting periods, enhance safety by upgrading I-95 in the project area to meet current highway design and safety standards, and improve mobility on this segment of I-95 to provide for interstate commerce and to accommodate movement of people and goods between Pennsylvania and New Jersey. The proposed improvements will benefit the transportation system.

Public Interest / Public Involvement

The public and agency coordination process for this project conforms to the process outlined in the PennDOT Transportation Development Process, and requirements under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. Coordination has included Section 106 Consulting/Interested Parties, Stakeholder Meetings (Environmental Group, Transportation Group, Business and Industry Group, Smart Growth Group), Public Open Houses and Township Meetings, Local Organization Meetings, Local Media Relations, newsletters, Project Media (website, hotline, and highway signs).

Federal, state, regional, and local agency input was obtained throughout the course of the project through individual consultation meetings and correspondence, and regularly scheduled meetings in two forums, the Special Agency Coordination Meetings (SACM) and the Interagency Coordination Meetings. In addition to meetings and consultations, field views were conducted with resource and regulatory agencies.

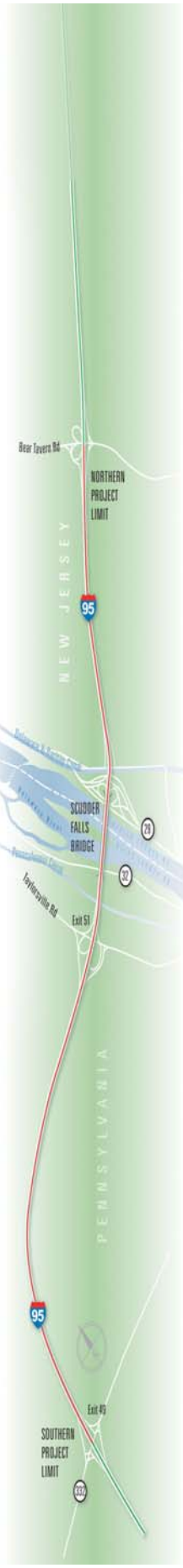
Further details of the public involvement are included in the EA document.

Access Management

Sound access management and congestion management principals have been utilized for the project and developing proposed improvements. Two specific related areas where these principles apply include the combining of the Taylorsville Road southbound off ramps from the current two ramps to a single ramp. This alleviates the weaving activity and congestions that occurs from the current southbound I-95 ramp to northbound Taylorsville Road. Secondly, the current NJ 29 northbound on-ramp is followed by a NJ175 (Upper River Road) on-ramp. The spacing of these two on-ramps is not sufficient to meet current design standards. The proposed improvements combine these two ramps into a single northbound on-ramp at NJ 29.

Environmental Impacts

Environmental impacts have been identified and considered, as indicated in Section D and detailed in the EA.



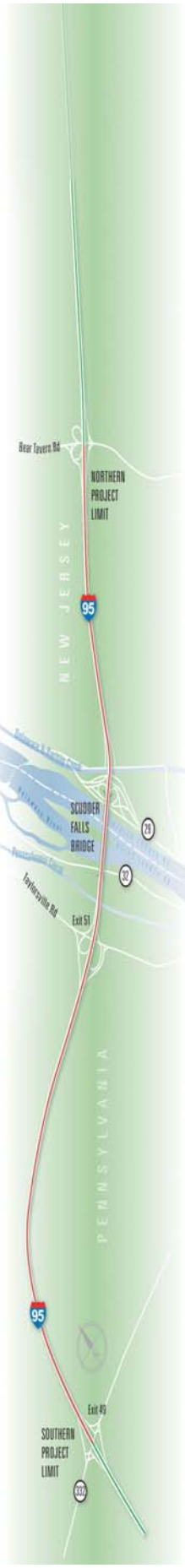
Consistency with Comprehensive Plans, Current Zoning, and Local Land Use Ordinances

The proposed improvements are consistent with comprehensive plans, current zoning, and local land use ordinances. The proposed action will not change access, so no changes in land use patterns are expected as a result of the project. Land use patterns in the project area are well established, and the corridor is largely built up, with the exception of preserved areas of farmland or parkland.

The proposed I-95/Scudder Falls Bridge improvements are consistent with the goals and policies of Bucks County and Lower Makefield Township Comprehensive Plans and the Mercer County and Ewing Township Master Plans, as the project will promote traffic safety and allow for continued movement of people and goods through the I-95 corridor and the region. The project addresses the regional goals of promoting access both to the I-95/I-295 Transportation Development District and accessibility to the Trenton-Mercer Airport and continued economic development. The planned improvements are needed to address traffic congestion related to both existing and future planned development in the region. Moreover, the proposed action evaluated in the EA Addendum includes implementation of the pedestrian/bicycle facility, which is consistent with local plans for trail linkages, and TSM/TDM measures, such as accommodations for Route 1 Bus Rapid Transit.

Consistency with Local Access Management Plans and Ordinances

The proposed improvements consider local access management plans and ordinances including the County of Mercer Roadway Access Management Code, and Lower Makefield and Ewing Township plans and codes.



E. ENVIRONMENTAL COMPLIANCE

Table 24 summarizes the environmental impacts associated with the project. These impacts and appropriate mitigation measures are detailed in the Environmental Assessment (EA) Chapter IV and the EA Addendum.

Table 24
Summary and Comparison of Impacts: No Build, Proposed Action, Pedestrian/Bicycle Facility and Construction

Impact Category	No Build	Proposed Action	Pedestrian/ Bicycle Facility	Construction
Traffic and Transportation	Level of Service (LOS) E to F for 2 hours (2003) for peak direction in peak periods on the I-95/ Scudder Falls Bridge. LOS F in 2030 with additional hours of congestion.	LOS A to C in 2030 on I-95/Scudder Falls Bridge. Accommodations for shoulder use by Bus Rapid Transit service.	Only crossing for pedestrians and bicycles within 12 miles of Delaware River between the New Hope-Lambertville Bridge and the Calhoun Street Bridge in Trenton.	Traffic staged to maintain two to three lanes in each direction in peak periods. Temporary causeway (four stages) across Delaware River with access from PA Route 32 and NJ Route 29.
Community and Economic Conditions	Severe traffic congestion would adversely affect economic development, local businesses, and quality of life for area residents.	Congestion relieved. Impact on 3.1 acres of public land and 3.8 acres of private land. One residence in PA displaced.	Additional impact to 0.2 acre of parkland within the Delaware and Raritan Canal State Park.	Temporary traffic disruption, but increase in construction jobs. Temporary easement for causeway required across privately owned Park Island.
Utilities and Infrastructure	None	Affected utilities will be relocated (fiber optic cable on the bridge), and no impacts to utility service.	None	Affected utilities will be relocated.

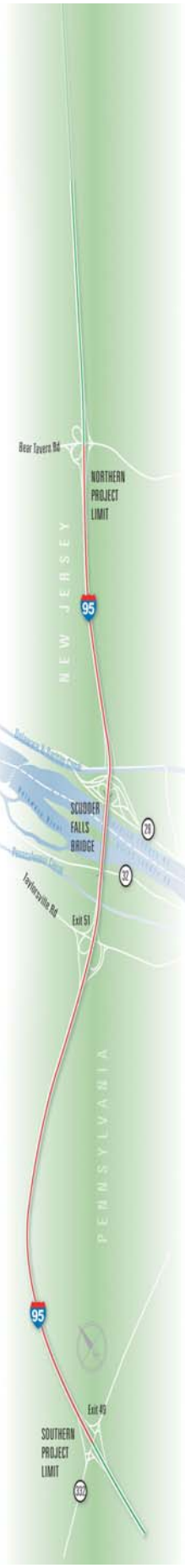


Table 24
Summary and Comparison of Impacts: No Build, Proposed Action, Pedestrian/Bicycle Facility and Construction

Impact Category	No Build	Proposed Action	Pedestrian/ Bicycle Facility	Construction
Parklands and Recreation Facilities	None	Impact on 0.4 acre of Delaware and Raritan Canal State Park	Impact on 0.2 additional acres of Delaware and Raritan Canal State Park.	Public access to the Delaware River Water Trail will be maintained. At any given time, about half of the river would be available for recreation use. Temporary, short-term closures of the canal towpaths during overhead bridge construction.
Farmlands	None	Impact on 0.9 acre of preserved farmland, of which 0.08 acre is actively farmed.	None	Temporary impact to additional ½ acre of preserved farmland.
Aesthetic and Visual Characteristics	None	Views of a wider I-95 mainline, views from the bridge may be obstructed by safety/noise barriers. Additional shading of Delaware River and canals.	Increased width of the I-95/Scudder Falls Bridge.	Construction areas will be visible to drivers and residents.
Surface Waters	None	Permanent loss of 0.3 acre of Delaware River bottom and 0.04 acre along 3 streams. Increased shading of 2.8 acres for river and 0.7 acre for the canals.	Additional shading of 0.3 acre of the Delaware River.	Impact on 0.33 acres of river bottom for causeways and cofferdams. Siltation controls will be used.
Groundwater	None	Increase in impervious area (20 acres), but the stormwater system will be designed to maintain existing drainage patterns.	1.5 acre increase in impervious surfaces.	Dewatering will be directed to sediment basins, filter bags, and sediment traps.
Geology and Soils	None	Impact to 60 acres of erodible soils.	Minor additional impacts to erodible soils.	Erosion and Sedimentation Control Plan will be prepared to minimize siltation.

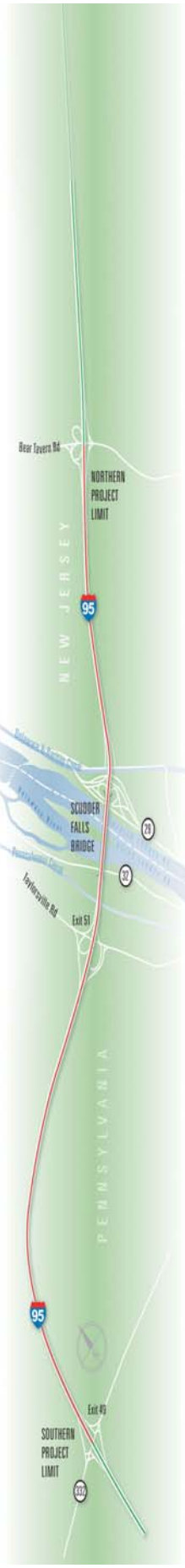


Table 24
Summary and Comparison of Impacts: No Build, Proposed Action, Pedestrian/Bicycle Facility and Construction

Impact Category	No Build	Proposed Action	Pedestrian/ Bicycle Facility	Construction
Floodplains	None	Impacts to 2.17 acres of regulatory floodway and 10.3 acres of 100-year floodplain. Proposed bridge would be less of an obstruction to flooding and flood elevations would be 0.03 feet (1-year flood) to 0.07 feet lower (500-year flood) than existing	Impact to an additional 0.01 regulatory floodway and 0.12 acre of 100-year floodplain.	Causeway used over the 4-year construction period would result in a 0.51-foot rise in 1.4-year design storm, and overtopping of PA Route 32 in a 17-year storm.
Wetlands	None	Permanent impact to 0.88 acres of wetland	Pedestrian/bicycle facility would affect an additional 0.02 acre of wetland.	Temporary impact to 0.10 acre of wetland during construction.
Terrestrial and Aquatic Habitats	None	Clearing of 8 acres of forest and loss of 0.34 acre of river or stream bottom.	Additional clearing of 0.66 acre of forest.	Temporary impact to 0.33 acres of Delaware River bottom for causeway and cofferdams.
Threatened and Endangered Species	None	Loss of 0.03% of spawning habitat for shortnose sturgeon. Potential nesting for peregrine falcon. Habitats for Atlantic sturgeon (not spawning), listed mussels species and red-bellied turtle will be affected.	None	Temporary effect on 0.04% of the spawning habitat for the shortnose sturgeon, moratorium on in-river silt-producing work during sturgeon spawning season. A mitigation plan will be developed for protected mussel species.
Historic Resources	None	Adverse effect on the Delaware and Raritan Canal and an effect (not considered adverse) on the Delaware Canal.	Landings within historical boundaries of the canals.	Temporary impact within the historic canal districts.

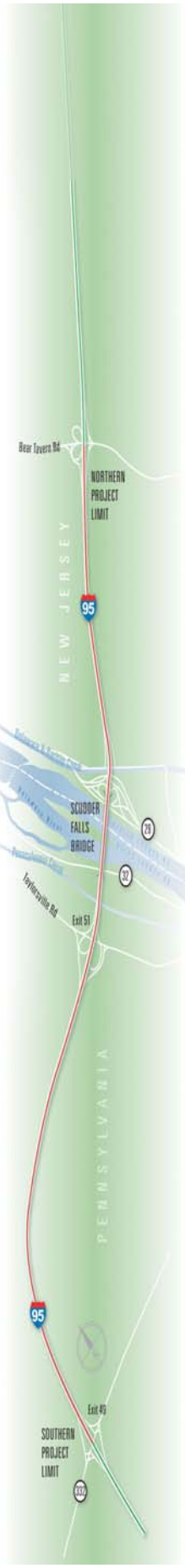
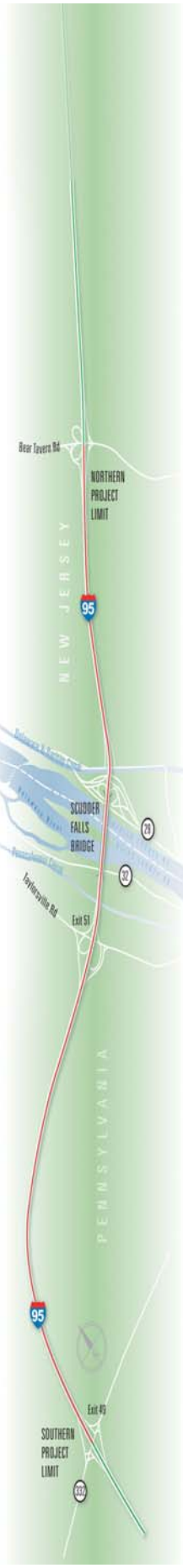


Table 24
Summary and Comparison of Impacts: No Build, Proposed Action, Pedestrian/Bicycle Facility and Construction

Impact Category	No Build	Proposed Action	Pedestrian/ Bicycle Facility	Construction
Archaeological Resources	None	Impact to several areas along Delaware River with high archaeological sensitivity. Additional study and recovery will be performed.	Additional impacts will be further evaluated during final design.	Potential impacts on archaeological resources may occur in areas of deep bridge foundations and for causeway construction across Park Island.
Air Quality	None	Future CO levels will be well below NAAQS in 2030, and particulate matter not be of concern.	None	Use of dust controls for temporary emissions.
Noise	In 2030, 0 to 3 dBA Leq(h) increase over existing conditions and 34 impacted receptors.	Increase of 1 to 5 dBA Leq(h) over existing conditions, 1 to 4 dBA Leq(h) over 2030 No Build, and 74 impacted receptors.	None	Temporary noise increases, but most of the construction will occur during daytime hours.
Hazardous Waste	None	Lead paint on existing bridge, and potential for asbestos will be determined	None	Lead paint abatement measures will be used
Secondary Development and Cumulative Impacts	None	Project supports planned economic development and access to designated growth centers within PA and NJ, but the project will not change well-established land use and development patterns	None	None



F. SUMMARY AND RECOMMENDATIONS

Description of Proposed Alternative

Of the options evaluated for the I-95/Scudder Falls Bridge and approaches, a full bridge replacement on a single-bridge structure with standard auxiliary lanes on an upstream alignment were found to best meet transportation objectives of improving safety and operational conditions while minimizing costs and impacts on the environment. These preferred bridge options are combined with the preferred design options for other project segments to compose project-wide Alternative 3:

- Pennsylvania I-95 mainline inside widening;
- Taylorsville Road Interchange Design Option 2 (retains three ramps); and,
- NJ Route 29 Interchange Design Option 1c Modified (NJDOT Roundabouts Modified with NJ Route 29 bypass).
- Tolling in the I-95 Mainline southbound direction only. The tolling option would be cashless. Electronic toll equipment will be mounted on an overhead gantry structure that is on or adjacent to the new Scudder Falls Bridge on the Pennsylvania side of the bridge.

In addition to the Build Alternatives, the EA will evaluate the No-Build and TSM/TDM measures (including provision of a 14-foot inside shoulder to accommodate the Route 1 Bus Rapid Transit (described later in this report) and incorporation of pedestrian/bicycle access on the bridge).

Need for Tolling

The DRJTBC's operations and capital program are financed solely by the revenues it collects from its seven current toll bridges. In the absence of federal and state transportation funding, the cost of the I-95/Scudder Falls Bridge Improvement Project necessitates that the DRJTBC employ tolling at the facility to assure the financial integrity of its capital programs, of which the I-95/Scudder Falls Bridge Improvement project is the single, largest initiative.

Preliminary Design Evaluation

A preliminary design evaluation was conducted for the proposed roadway design based on the design criteria in PENNDOT and NJDOT design manuals for an Urban Interstate. The preliminary design evaluation indicates the proposed roadway improvements can be designed to meet all design criteria.

Preliminary Signing

A preliminary signing plan has been prepared to demonstrate that the proposed roadway improvements can be signed to comply with PENNDOT and NJDOT signing requirements. The preliminary signing plan addresses the signing requirements on I-95 with All Electronic Cashless Tolling and the directional signing requirements on the exit ramps for both northbound and southbound for the Taylorsville Road and Route 29 interchanges as well as the PA Route 332 and Bear Tavern Road Interchanges. During final design all origin and

destination signs and route signs will be developed to accommodate three digits based upon the future re-designation of I-95 to I-195. The Toll signing and the roundabout signing reflect the latest standards from the 2009 MUTCD (Manual on Uniform Traffic Control Devices).

Traffic Data

To understand existing traffic patterns in the study area and to provide a basis for traffic forecasts, a comprehensive traffic data collection program was conducted for this project. The traffic counts were collected in 2003 for I-95, all ramps and surrounding roadways. A license plate survey was conducted to gain an understanding into the use of the interchange on- and off-ramps between the closely spaced interchanges on each side of the bridge.

2010 traffic data was also collected to support the Traffic Diversion Study prepared by Jacobs in September 8, 2010, revised April 2011. Since the existing bridge is free of tolls, the diversion study was conducted to forecast the amount of traffic that will divert to other roadways and bridge crossings once tolls are implemented. The overall AADT decreased slightly between 2003 and 2010, while the peak hour traffic volumes increased. During the AM peak hour, the northbound volume (peak travel direction) increased 1.70% while the southbound volume increased 15.77%. During the PM peak hour, the southbound volume (peak travel direction) increased 3.26% while the northbound volume increased 15.86%. The lower increases in the peak travel directions reflect the observed roadway conditions which operate near capacity.

The decrease in AADT is a reflection of the current economic conditions with overall traffic growth in recent years slower than projected. The slight decrease in AADT along with the increase in peak hour travel is indicative of a recession, with motorists giving up non-essential trips and/or combining multiple trips into a single trip. As a result of the current economic recession, a decline in daily traffic is forecasted for the short-term, with a return to anticipated levels occurring in the future.

Traffic Forecasts

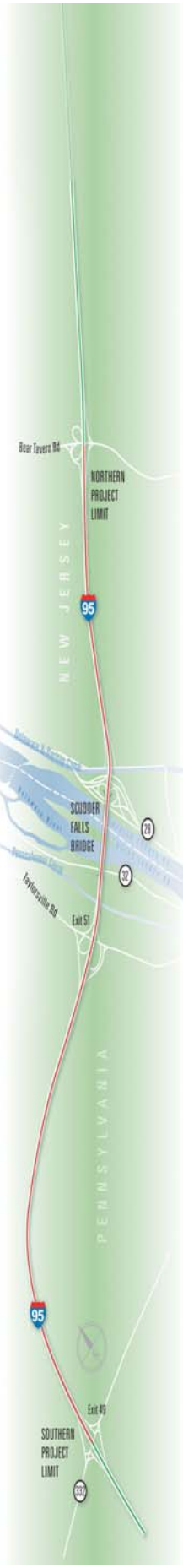
Traffic volume projections for the year 2030 were developed for the following conditions:

- 2030 No Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/No Toll Daily, AM and PM Peak Hour
- 2030 Build/Low Toll Daily, AM and PM Peak Hour
- 2030 Build/High Toll Daily, AM and PM Peak Hour

The year 2030 traffic projections for the project area and the regional diversions were developed utilizing the following main sources of information:

- Jacobs' Traffic and Revenue Study, dated September 8, 2011 and revised April 2011 which estimated traffic diversion percentages for the two toll levels, and conducted an origin-destination survey of Scudder Falls Bridge customers to predict diversion routes
- DVRPC's September 2004 Interstate 95 / Scudder Falls Bridge Traffic Study

Growth in traffic volumes from 2003 traffic to 2030 No Build/No Toll are forecasted to range from 13% to 24% along the I-95 mainline, with the higher growth rates occurring in the northern sections of the project area. Growth for 2030 no-build to build is approximately 9%



to 11%. The I-95/PA Turnpike Interchange currently in design was included as a constructed improvement in the model. The future volumes account for the impact of this improvement on through traffic in the I-95/Scudder Falls Bridge project area.

The Build/Low Toll Alternative results in an increase in volume of 2 to 3% for various sections of I-95 within the project area compared to the No Build/No Toll Alternative. The Build/High Toll Alternative results in a reduction in volume of 1 to 3% for various sections I-95 within the project area compared to the No Build/No Toll Alternative.

To gain an understanding of the potential impacts of the traffic diversions on the local roadways and adjacent river crossings, the DRJTBC commissioned a study to forecast the volume of traffic that would divert from the Scudder Falls Replacement Bridge to alternate locations once tolls are implemented. This report, entitled *Scudder Falls Bridge Traffic Diversion Study*, dated September 8, 2010 and revised April, 2011, was prepared by Jacobs Engineering Group, Inc. under contract with AECOM to conduct this analysis. The adjacent river crossings evaluated as part of this study included Washington Crossing Toll Supported Bridge to the north; and Calhoun Street Toll Supported Bridge, Lower Trenton Toll Supported Bridge and Trenton-Morrisville (Route 1) Toll Bridge to the south.

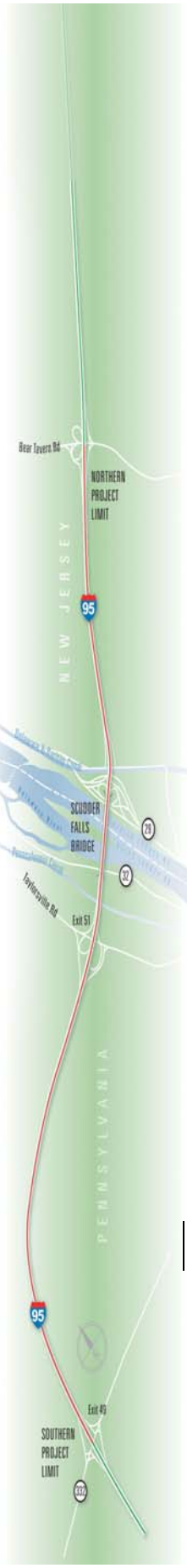
The estimated traffic diversion was developed for the interim year (2015) and future year 2030, assuming both a low toll scenario ($1.00 for passenger vehicles) and a high toll scenario ($3.00 for passenger vehicles) for the Scudder Falls Bridge. The truck toll for both scenarios was assumed to be $4 per axle for each truck. The diverted volumes for these scenarios were compared to traffic volumes projected to occur on the existing Scudder Falls Bridge without a toll.

The results of the analysis show that, during the peak hour, the volume of traffic using the newly completed I-95/Scudder Falls Replacement Bridge will not be appreciably different than the volume of traffic that would use the existing bridge without a toll. In fact, the new Scudder Falls Bridge is expected to see a slight increase in traffic during the peak hour while the adjacent river crossings will each see a slight decrease in volume during the peak hour for the $1.00 and $3.00 toll scenarios in the year 2030. A similar result is obtained for the peak hour in the year 2015 under the $1.00 toll scenario, but under the $3.00 toll scenario, traffic on the I-95/Scudder Falls Replacement Bridge will decrease slightly while traffic on the other four DRJTBC bridges will increase slightly.

The reasons for these results may not be obvious at first glance. However, upon further examination, including observations of traffic conditions at alternative crossings, it is apparent that additional traffic will be attracted to using the newly completed Scudder Falls Bridge due to the combined improvements (additional travel lanes, safer ramp entrance and exit conditions) and the unacceptable travel delays associated with utilizing the alternative crossings. In essence the study reveals that motorists, who are already experiencing delays at these alternates, will be willing to pay a relatively modest toll in exchange for the reduced travel times and increased safety which will be provided by the new Scudder Falls Bridge.

Operational Analysis

To evaluate the Level of Service and overall traffic performance of I-95, traffic operations were evaluated on the I-95 mainline, the ramps, and the surrounding roadways for the year 2030 peak hour traffic conditions for the No-Build and Build Alternative. The operational analysis developed Levels of Service using the latest Highway Capacity Manual (HCM) and



associated software (Highway Capacity Software). For signalized intersections the Synchro software tool was utilized.

The operational analysis presented in the Point of Access Study demonstrates that the proposed roadway improvements, for the mainline, interchanges and ramps, and the cross streets, will operate at an acceptable Level of Service (LOS D during peak hours) in build year 2030 conditions and will meet the needs of the project.

The LOS on I-95 south of the PA 332 Interchange degrades as follows:

- from LOS D in No Build/No Toll to LOS E in 2030 Build/No Toll, 2030 Build/Low Toll, and 2030 Build/High Toll during the A.M. peak period.
- from LOS E in No Build/No Toll to LOS F in 2030 Build/No Toll, and remains LOS E in 2030 Build/Low Toll, and 2030 Build/High Toll during the P.M. peak period.

These sections are beyond the project area. Based on meetings with the District 6-0 Executive Committee, PennDOT is coordinating with Bucks County and the DVRPC to program improvements for I-95 south of the PA 332 Interchange into the Long Range Plan.

The overall findings of this study indicate that the traffic diversions resulting from the tolling of the new Scudder Falls Bridge will cause minimal traffic impacts to the adjacent roadways and bridge crossings within the region during both peak and non-peak periods.

For the most critical operational period (the peak hour), there is actually a reduction in traffic on alternative crossings for the low-toll scenario, and an increase in traffic in 2030 for the high-toll scenario. In both scenarios and during all periods of the day, the impact of tolling in terms of congestion (as measured by volume-to-capacity ratios for roadways and bridges) remains at or very close to current levels. These findings are a result of the limited capacity of alternative crossings and the significant operational and safety improvements associated with a new Scudder Falls Bridge.

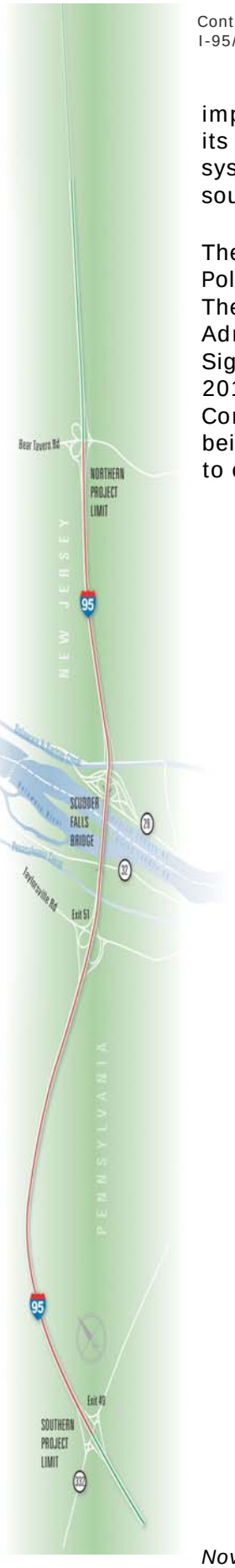
The DRJTBC has conducted an analysis of the traffic diversions anticipated as a result of the tolling of the I-95/Scudder Falls Replacement Bridge. The DRJTBC agrees to conduct pre-construction and post-construction traffic study and analysis as outlined in an Interagency Agreement currently being negotiated and to be entered into between and among the DRJTBC, PennDOT and NJDOT. The DRJTBC agrees to take reasonable measures to mitigate for traffic diversion impacts on Pennsylvania and New Jersey state roads in the event the traffic study and analysis identifies traffic issues, not identified in this POA or in the Addendum to the EA, which are attributed to the tolling of the I-95/Scudder Falls Replacement Bridge. Details regarding those mitigation commitments will be found in the Interagency Agreement.

Estimate, Funding and Schedule

The improvements proposed under the Scudder Falls Bridge project are currently estimated at $310.37 million.
The Commission examined a range of options for financing and delivering the project, including the pursuit of Federal and State funding. The Commission intends to implement tolling on the new Scudder Falls Bridge to support the capital costs and ongoing maintenance and operations of the bridge. On December 21, 2009 the Commission's Board authorized the

implementation of tolls on the Scudder Falls Replacement Bridge. The Commission rendered its tolling decision after making an assessment of its overall capital program needs, its current system of financing the capital program, and -- most notably – the lack of sufficient outside sources of funding to support the project.

The project is currently undergoing review in accordance with the National Environmental Policy Act (NEPA). Final design is scheduled to begin after completion of the (NEPA) process. The project schedule reflects a 2011 issuance of a NEPA decision by the Federal Highway Administration (FHWA). Should the NEPA decision result in the issuance of a Finding of No Significant Impact (FONSI), final design could begin in 2012 and construction could begin in 2013. The start of construction could be affected if the Delaware River Joint Toll Bridge Commission decides to carry out the project as a public-private partnership [P3], which is being assessed. Once construction begins, it is estimated that it will take three to four years to complete the project.



G. LOCAL GOVERNMENT AGREEMENTS

The Delaware River Joint Toll Bridge Commission is a bi-state agency established in December 1934 by legislation enacted by the Commonwealth of Pennsylvania and the State of New Jersey. The Commission operates under a compact authorized by the United States Congress in August, 1935. As a bi-state agency operating under a compact authorized by the Federal government, the Commission is the applicant for the POA request and the provision for a local government endorsement does not apply.

The Delaware River Joint Toll Bridge Commission has completed extensive transportation and environmental studies and believes this project is in the public interest including highway users.

Local government endorsement letters do not apply to this project, however, extensive public involvement and coordination has occurred with these agencies.

The Delaware River Joint Toll Bridge Commission currently owns and maintains the bridge, and will continue to at completion of the project.

The Delaware River Joint Toll Bridge Commission is working to obtain environmental clearances (EA) for the project, and will obtain all necessary permits during final design.