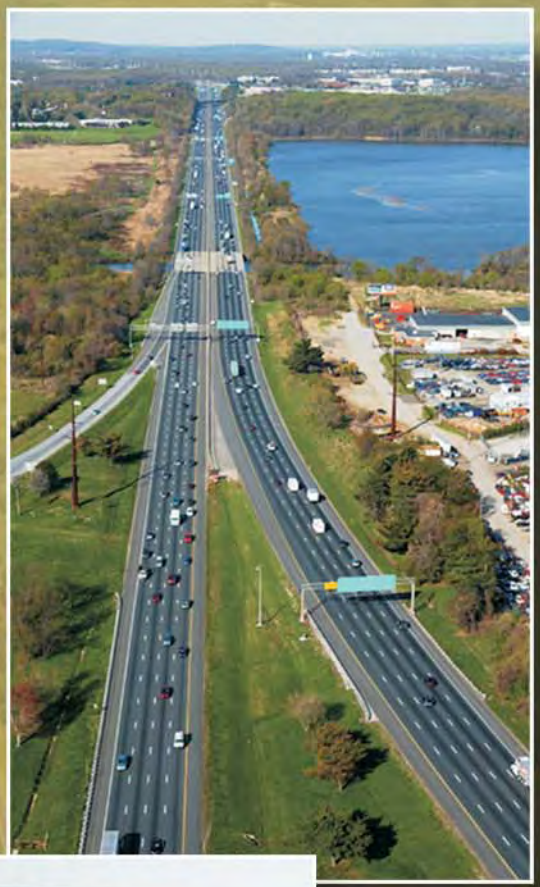
I-95 / SR 1 Interchange
I-95 Turnpike Mainline

New Castle County, Delaware

ENVIRONMENTAL ASSESSMENT



January 2005

Federal Highway Administration

Delaware Department of Transportation

Federal Aid Project Number IM-N056(27)
DelDOT Contract Number: 95-090-01

I-95 Turnpike Mainline/I-95/SR 1 Interchange
New Castle County, Delaware

FINAL
ENVIRONMENTAL ASSESSMENT

Submitted Pursuant To 42 U.S.C. 4332(2)(C) and
CEQ Regulations (40 CFR 1500 et seq.) by the

U.S. Department of Transportation
Federal Highway Administration

and

Delaware Department of Transportation

This project involves the provision of an additional lane (5th) on the I-95 (Delaware Turnpike) mainline between the SR 1 Interchange and the SR 141 Interchange as well as modifications to the I-95/SR 1 Interchange. Modifications to the I-95/SR 1 Interchange will construct separated northbound-to-northbound and southbound-to-southbound directional ramps between I-95 and SR 1 in order to separate freeway-to-freeway traffic from local traffic. The need for the project is based on existing and projected traffic congestion on I-95 from SR 1 to SR 141 and at the SR 1 Interchange and high accident locations in the vicinity of the two interchanges (SR 1 and SR 141). Existing design deficiencies that prevent efficient vehicular operation through the SR 1 interchange will also be addressed. The action is proposed to relieve congestion and improve safety and design deficiencies while considering environmental and community resources in the study area.

The Preferred Alternative includes Turnpike Mainline Alternative 2 Option 2, which provides widening to the north and south of the existing roadway using mechanically-stabilized earth walls on the outside, and I-95/SR 1 Interchange Alternative 3, which provides for construction of the southbound-to-southbound ramp (Ramp A) to the inside of the existing interchange. The Preferred Alternative was selected based on its ability to meet project needs cost effectively, while providing minimal adverse effects to both the natural and socioeconomic environments in the project area.

The draft Environmental Assessment noted Alternative 2 as preferred for the I-95/SR 1 Interchange. However, upon more detailed study and evaluation, Alternative 3 was determined preferable, due to its reduced natural environmental impacts, reduced construction time, reduced impacts on the traveling public, improved maintenance of traffic, provision of desirable 60 mph design speed for Ramp A and improved geometric design. In addition, further study reduced the estimated difference in construction costs between Alternatives 2 and 3 from $10 million to $5 million. Although more costly, Alternative 3 is preferred for the reasons noted above and provided in more detail herein.

Impacts to the natural environment include 1.60 acres of forest impact, 0.26 acre/54 linear feet of impact to tidal waters of the US, 0.87 acre of non-tidal wetland impact and impacts to 0.93 acre/5,420 linear feet of nontidal waters of the US (drainage ditches) and 0.11 acre/743 linear feet non-tidal waters of the US (channels). Nineteen and nine tenths (19.9) acres of the 100-year floodplain are located within the limits of disturbance. Less than ten acres (9.41 acres) of property acquisition (no displacements) are required. Existing noise impacts will not change noticeably. There are no impacts to Section 4(f) resources.

The following person(s) may be contacted for additional information concerning this document:

Mr. Darren O'Neill
Project Manager
Delaware Department of Transportation
800 Bay Road
Dover, Delaware 19901

Mr. Robert Kleinburd
Realty and Environmental Specialist
Federal Highway Administration
300 South New Street, Room 2101
Dover, Delaware 19904

FINAL
ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

I. PROJECT PURPOSE AND NEED 1
A. Introduction and Background 1
B. Project Area 1
C. Project Purpose 1
D. Project Need 1
1. Traffic 4
a. Historical Traffic Growth 4
b. Current Traffic Conditions 4
c. Existing Design Deficiencies 4
d. Projected 2025 Design Year Traffic Conditions 5
2. Safety 6
3. Population Growth and Economic Development 6
a. Population Growth 6
b. Regional Economic Development 7
4. Connection to SR 1 to the Turnpike 8
5. Other Transportation Projects 8
E. Conclusion 8

II. ALTERNATIVES CONSIDERED 9
A. Existing Conditions 9
B. Alternatives Considered 9
1. I-95/SR 1 Interchange Alternatives Considered 10
a. No-Build Alternative (Alternative 1) 10
b. Build Alternatives 10
(1) I-95/SR 1 Interchange Alternative 2 – Ramp 'A' Outside Alignment 12
(2) I-95/SR 1 Interchange Alternative 3 – Ramp 'A' Inside Alignment 18
(3) I-95/SR 1 Interchange Alternatives Comparison 25
c. Preferred Alternative for I-95/SR 1 Interchange 26
2. I-95/Turnpike Mainline Alternatives Considered 26
a. No-Build Alternative (Alternative 1) 26
b. Build Alternatives 26
(1) Turnpike Mainline Alternative 2 – Additional 5th Lane – Widening North and South 27
(2) Turnpike Mainline Alternative 3 – Additional 5th Lane – Widening South Side Only 30
(3) Turnpike Mainline Alternatives Comparison 33
c. Preferred Alternative for I-95 from SR 1 to SR 141 35

III. ENVIRONMENTAL RESOURCES AND CONSEQUENCES 40
A. Social Environment 41
1. Land Use and Zoning 41
a. Existing Conditions 41
b. Consequences 41
2. Consistency with Local Plans 44

3. Population and Housing 45
a. Existing Conditions 45
b. Consequences 45
4. Environmental Justice 45
a. Existing Conditions 47
b. Consequences 47
5. Communities and Facilities in Project Area 48
a. Existing Conditions 48
b. Consequences 48
6. Parks and Recreation Areas 48
a. Existing Conditions 48
b. Consequences 48
7. Noise 50
a. Existing Conditions 50
b. Noise Criteria, Field Measurements and Modeling Results 50
c. Consequences 50
8. Air Quality 51
a. Existing Conditions 51
b. Consequences 52
9. Hazardous Waste Investigation 52
a. Existing Conditions 52
b. Consequences 52
10. Utilities and Construction 52
11. Traffic 53
a. Existing Conditions 53
b. Consequences 54
B. Natural Environment 55
1. Surface and Subsurface Geology 55
a. Existing Conditions – General Topography and Geology 55
b. Consequences 59
c. Mitigation 59
2. Water Resources 59
a. Surface Water 59
(1) Existing Conditions 59
(2) Consequences 61
(3) Mitigation 61
b. Groundwater 62
(1) Existing Conditions 62
(2) Consequences 64
(3) Mitigation 64
3. Hydrology and Stormwater Management 65
a. Existing Conditions 65
b. Consequences 65
4. Floodplains 68
a. Existing Conditions 68
b. Consequences 69
c. Mitigation 69
5. Navigable Waterways 71
a. Existing Conditions 71
b. Consequences 71

c. Mitigation 71
6. Coastal Zones 71
a. Existing Conditions 71
b. Consequences 72
c. Mitigation 72
7. Water of the US including Wetlands 72
a. Existing Conditions 72
b. Consequences 75
c, Mitigation 76
8. Woodlands, Wildlife and Habitat 79
a. Woodlands Identified in the SR 1 Interchange Area 79
b. Woodlands Identified in the Mainline Project Area 79
c. Consequences 81
d. Mitigation 81
9. Rare, Threatened and Endangered Species 82
a. Existing Conditions 82
b. Consequences 85
c. Mitigation 85
10. Birds 85
a. Existing Conditions 85
b. Consequences 85
c. Mitigation 85
11. Aquatic Resources 85
a. Existing Conditions 85
b. Consequences 86
c. Mitigation 86
12. Permits Required 86
C. Cultural Resources 86
1. Architectural Resources 87
2. Archaeological Resources 87
3. Consequences 87
D. Conclusion 89

V. CHRONOLOGY OF COORDINATION 90
A. Agency Coordination 90
1. Agency Joint Permit Review Meetings 90
2. Other Agency Coordination Meetings 91
B. Public Involvement 92

Appendices

List of Contributors
List of Technical Reports
Agency Correspondence

List of Tables

Table 1 Highway Level of Service (LOS) 5
Table 2 Employment Growth Projections in the Project Area 7
Table 3 I-95/ SR 1 Interchange Build Alternatives Comparison 25
Table 4 Turnpike Mainline Build Alternatives Comparison 33
Table 5 Summary of Environmental Impacts Associated with Preferred Alternative 40
Table 6 Population and Housing, 2000 45
Table 7 Demographic Profile of the Project Area 47
Table 8 Income Profile of Project Area 47
Table 9 Soil Units with the Project Area 58
Table 10 Uses Supported by Surface Waters in the Vicinity of the Project Area 60
Table 11 Water Quality Data for Eagle Run and Christiana River (1997-1999) 60
Table 12 Preliminary Stormwater Management Summary 68
Table 13 Waters of US including Wetlands 74
Table 14 Waters of the US including Wetlands Preferred Alternative Impacts 76
Table 15 Nontidal Wetland Mitigation Requirements 76
Table 16 Nontidal Waters of the US Mitigation Requirements 76
Table 17 Tidal Waters of the US Mitigation Requirements 77
Table 18 Tidal and Nontidal Wetland Mitigation Sites 78

List of Figures

Figure 1 Project Location - Delaware Turnpike Corridor 2
Figure 2 Project Area 3
Figure 3 I-95/SR 1 Interchange - No Build Alternative 11
Figure 4 I-95/SR 1 Interchange - Alternative 2 Ramp A Outside Alignment (5 sheets) 13
Figure 5 I-95/SR 1 Interchange - Alternative 3 Ramp A Inside Alignment (Preferred Alternative) (5 sheets) 19
Figure 6 Mainline - Alternative 2, Option 2 Typical Section 28
Figure 7 Mainline – Alternative 2, Outside Options 1, 2 and 3 29
Figure 8 Mainline - Alternative 3, Option 2 Typical Section 31
Figure 9 Preferred Alternative, I-95 Mainline (4 sheets) 36
Figure 10 Land Use 42
Figure 11 I-95/SR 1 Interchange - Right-of-Way Requirements 43
Figure 12 Transportation Analysis Zones (TAZ) and 2000 U. S. Census Blocks 46
Figure 13 Communities and Community Facilities 49
Figure 14 New Castle County Soil Survey 57
Figure 15 Water Resource Protection Area 63
Figure 16 Potential SWM Facility Locations 66
Figure 17 100 and 500 Year Floodplains 70
Figure 18 Wetland Delineation Plan 73
Figure 19 Forest Resources 80
Figure 20 Area of Potential Effects and Cultural Resources 88