

SAKONNET RIVER BRIDGE REHABILITATION OR REPLACEMENT PROJECT

Portsmouth and Tiverton,
Newport County, Rhode Island

**FINAL ENVIRONMENTAL IMPACT STATEMENT AND
FINAL SECTION 4(f) EVALUATION**

Submitted Pursuant to 42 U.S.C. 4332 (2) (c) and 49 U.S.C. 303

by the

U.S. Department of Transportation
Federal Highway Administration

and the

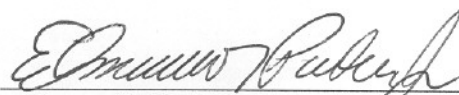
Rhode Island Department of Transportation
and

Cooperating Agencies:

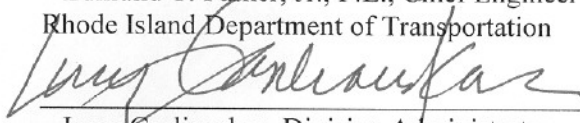
U.S. Coast Guard, First District
U.S. Environmental Protection Agency, Region I
RI Department of Environmental Management

RI Historical Preservation and Heritage Commission
RI State Planning Office
City of Newport, Rhode Island

April 8, 2003
Date of Approval


Edmund T. Parker, Jr., P.E., Chief Engineer
Rhode Island Department of Transportation

April 8, 2003
Date of Approval


Lucy Garliauskas, Division Administrator
Federal Highway Administration, Providence, RI

The following persons may be contacted for additional information concerning this document:

Mr. Edmund T. Parker, Jr., P.E.
Chief Engineer
R. I. Department of Transportation
Two Capitol Hill, Room 224
Providence, Rhode Island 02903
(401) 222-2492

Mr. Daniel J. Berman
Assistant Division Administrator
Federal Highway Administration
380 Westminster Mall
Providence, Rhode Island 02903
(401) 528-4541

Abstract: The purpose of the project is to either rehabilitate or replace the Sakonnet River Bridge between Tiverton and Portsmouth. The existing bridge is in deteriorating condition, structurally deficient, and does not meet seismic protection, shoulder width and structural capacity requirements. Five alternatives were considered in the Draft EIS for the project dated June 25, 2001. These alternatives include No-Build, Full Rehabilitation of the Existing Bridge and three New Bridge alternatives including on, north of and south of the alignment of the existing bridge. The DEIS identified Alternative 5, New Bridge on South Alignment as the preferred alternative to replace the Sakonnet River Bridge which carries RI Route 24 between Portsmouth and Tiverton. The South Alignment (Alternative 5) was selected as the preferred alternative because it has the fewest environmental impacts in comparison to the other build alternatives. RIDOT and FHWA have identified the South Alignment as the recommended alternative in this FEIS based on its strongest ability to address the purpose and needs of the project.

Comments on the FEIS are due by May 26, 2003 and should be sent to Mr. Edmund T. Parker, Jr. P.E. or Mr. Daniel J. Berman.

TABLE OF CONTENTS

VOLUME I FINAL ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(f) EVALUATION

<u>CHAPTER</u>	<u>PAGE</u>
EXECUTIVE SUMMARY	
ES.1 Description of the Proposed Action	ES-1
ES.2 Alternatives Considered	ES-3
ES.3 Financial Analysis	ES-5
ES.3.1 Dedicated Funding	ES-6
ES.3.2 General Obligation Bonds	ES-6
ES.3.3 Revenue Bonds	ES-6
ES.3.4 GARVEE	ES-7
ES.4 Concurrent Projects and Studies in the Study Area	ES-7
ES.5 Summary of Impacts	ES-8
ES.5.1 No-Build (Alternative 1)	ES-8
ES.5.2 Full Rehabilitation of the Existing Bridge (Alternative 2)	ES-9
ES.5.3 New Bridge on Existing Alignment with Temporary Bridge (Alternative 3)	ES-10
ES.5.4 New Bridge on North Alignment (Alternative 4)	ES-11
ES.5.5 New Bridge on South Alignment (Alternative 5) (Recommended Alternative)	ES-11
ES.6 Reasons for Identifying Alt.5 as the Recommended Alternative	ES-12
ES.7 Other Federal Actions Required	ES-16
 1. PURPOSE AND NEED	
1.1 Project Overview and Background	1-1
1.2 Project Purpose and Objectives	1-2
1.3 Project Needs	1-3
1.3.1 Safety	1-3
1.3.2 System Linkage	1-3
1.3.3 Transportation Demand and Capacity	1-3
1.3.4 Intermodal Relationships	1-3
1.3.5 Social Demands and Economic Development	1-3
 2. PROJECT ALTERNATIVES	
2.1 Scoping Process	2-1
2.2 Introduction of Alternatives	2-1

TABLE OF CONTENTS - *Continued*

<u>CHAPTER</u>	<u>PAGE</u>
2. PROJECT ALTERNATIVES – <i>Continued</i>	
2.2.1 Alternatives Removed From Consideration.....	2-1
2.2.2 Project Alternatives Considered	2-1
2.3 Discussion of Alternatives Considered.....	2-2
2.3.1 No Build (Alternative 1)	2-2
2.3.2 Full Rehabilitation of the Existing Bridge (Alternative 2).....	2-2
2.3.3 New Bridge on Existing Alignment with Temporary Bridge (Alternative 3)	2-2
2.3.4 New Bridge on North Alignment (Alternative 4)	2-2
2.3.5 New Bridge on South Alignment (Alternative 5)	2-2
2.4 New Bridge Alternatives Cross Section.....	2-2
2.4.1 Bicycle and Pedestrian Considerations	2-2
2.4.2 Bridge Railing	2-2
2.5 New Bridge Alternatives Potential Structure Types	2-2
2.5.1 Segmental Concrete (Mid-Span Range)	2-3
2.5.2 Steel Box Girders (Mid-Span Range)	2-3
2.5.3 Cable-Stayed (Long-Span Range).....	2-3
2.6 Estimated Construction Costs	2-3
2.6.1 Construction Costs	2-3
2.6.2 Life Cycle Costs	2-6
2.7 Financial Analysis.....	2-6
2.7.1 Dedicated Funding	2-6
2.7.2 General Obligation Bonds.....	2-7
2.7.3 Revenue Bonds	2-8
2.7.4 GARVEE	2-8
2.8 Concurrent Projects and Studies in the Study Area	2-9
2.8.1 RI24 / RI138 Ramps	2-9
2.8.2 Removal of Sakonnet Railroad Swing Bridge	2-9
2.8.3 Aquidneck Island Rail Corridor Study.....	2-9
2.8.4 RI138 / RI24 & Anthony Road / RI24 Bridge Upgrades	2-9
3. AFFECTED ENVIRONMENT	
3.1 Land Use and Zoning.....	3-1
3.1.1 Tiverton Zoning and Land Use	3-1
3.1.2 Portsmouth Zoning and Land Use	3-1
3.2 Socioeconomics and Demographics	3-1
3.2.1 Population and Housing.....	3-1
3.2.2 Community Facilities.....	3-1
3.2.3 Economic Conditions.....	3-1

TABLE OF CONTENTS - *Continued*

<u>CHAPTER</u>	<u>PAGE</u>
3. AFFECTED ENVIRONMENT – <i>Continued</i>	
3.2.4 Environmental Justice	3-2
3.3 Transportation Facilities	3-2
3.3.1 Traffic Patterns and Volumes	3-2
3.3.2 Traffic Safety	3-2
3.3.3 Public Transportation.....	3-2
3.3.4 Pedestrian and Bicycle Facilities	3-2
3.4 Physical Environment	3-2
3.4.1 Topography, Soils and Geology.....	3-2
3.4.2 Wildlife	3-2
3.4.3 Climate.....	3-4
3.4.4 Air Quality	3-4
3.4.5 Noise	3-4
3.4.6 Hazardous Materials and Waste.....	3-4
3.4.7 Visual Resources.....	3-4
3.5 Water Resources	3-5
3.5.1 Water Quality.....	3-5
3.5.2 Navigation.....	3-5
3.5.3 Freshwater Wetlands.....	3-5
3.5.4 Coastal Features	3-5
3.5.5 Floodplain	3-5
3.5.6 Groundwater	3-5
3.5.7 Wild and Scenic Rivers.....	3-7
3.5.8 Ecology and Vegetation	3-7
3.6 Cultural Resources	3-7
3.6.1 Historic and Architectural Resources	3-7
3.6.2 Archaeological Resources.....	3-10
3.6.3 Marine Archaeological Resources	3-11
4. ENVIRONMENTAL CONSEQUENCES	
4.1 Land Use Impacts.....	4-1
4.1.1 Current Development Trends.....	4-1
4.1.2 Secondary or Induced Impacts	4-1
4.2 Social Impacts.....	4-1
4.2.1 Neighborhood Cohesion	4-1
4.2.2 Schools and Public Facilities	4-2
4.2.3 Social Groups and Environmental Justice	4-2
4.3 Relocation Impacts.....	4-2

TABLE OF CONTENTS - *Continued*

<u>CHAPTER</u>	<u>PAGE</u>
4. ENVIRONMENTAL CONSEQUENCES – <i>Continued</i>	
4.3.1 Relocation Impacts.....	4-2
4.3.2 Available Relocation Properties	4-3
4.3.3 Special Groups Affected	4-4
4.3.4 Acquisition (Heading New to FEIS).....	4-4
4.3.5 Relocation Assistance (Heading New to FEIS)	4-5
4.4 Economic Impacts.....	4-5
4.5 Transportation Impacts	4-5
4.5.1 Traffic Operations	4-21
4.5.2 Highway Capacity Analysis	4-21
4.5.3 Intersection Capacity Analysis.....	4-21
4.5.4 Ramps Analysis.....	4-21
4.5.5 Public Transportation.....	4-21
4.5.6 Pedestrian and Bicycle Facility.....	4-21
4.5.7 Mitigation Measures	4-21
4.5.8 Toll Plaza Analysis	4-21
4.5.9 Circulation Study	4-22
4.6 Navigation.....	4-22
4.7 Air Quality	4-24
4.7.1 Microscale Analysis Results	4-24
4.7.2 Mesoscale Analysis Results	4-25
4.7.3 Construction Impacts	4-26
4.7.4 Conclusions.....	4-26
4.8 Noise Impacts.....	4-27
4.9 Water Resources	4-27
4.9.1 Stormwater Runoff.....	4-27
4.9.2 Water Quality Impacts	4-29
4.9.3 Water Quality Mitigation	4-29
4.10 Wetlands	4-30
4.10.1 Potential Toll Plaza.....	4-33
4.11 Wildlife	4-33
4.11.1 Fisheries	4-33
4.11.2 Non-Fisheries Wildlife.....	4-34
4.12 Floodplain	4-34
4.13 Wild and Scenic Rivers.....	4-34
4.14 Coastal Barriers and Coastal Zones	4-34
4.14.1 Potential Toll Plaza.....	4-35
4.15 Threatened and Endangered Species.....	4-36
4.16 Cultural Resources	4-36

TABLE OF CONTENTS - *Continued*

<u>CHAPTER</u>	<u>PAGE</u>
4. ENVIRONMENTAL CONSEQUENCES – <i>Continued</i>	
4.16.1 Historical Resources	4-36
4.16.2 Archaeological Resources.....	4-38
4.17 Hazardous Materials	4-38
4.18 Visual Resources.....	4-38
4.18.1 Bridge Railing.....	4-39
4.18.2 Potential Toll Plaza.....	4-39
4.19 Energy Use.....	4-39
4.20 Bridge Construction.....	4-39
4.21 Short Term Impacts and Long Term Productivity	4-39
4.22 Irreversible Commitment of Resources	4-40
4.23 Secondary and Cumulative Impacts.....	4-40
4.24 Permits	4-42
 5. EVALUATION OF ALTERNATIVES	
5.1 Summary of Environmental Consequences	5-1
5.1.1 No-build (Alternative 1)	5-1
5.1.2 Full Rehabilitation of the Existing Bridge (Alternative 2).....	5-1
5.1.3 New Bridge on Existing Alignment with Temporary Bridge (Alternative 3).....	5-1
5.1.4 New Bridge on North Alignment (Alternative 4)	5-2
5.1.5 New Bridge on South Alignment (Alternative 5)	5-3
5.2 Reasons for Identifying Alternative 5 (New Bridge on South Alignment) as the Recommended Alternative	5-4
 6. FINAL SECTION 4(f) EVALUATION	
6.1 Introduction.....	6-1
6.2 Proposed Action.....	6-3
6.2.1 Project Alternatives.....	6-3
6.3 Section 4(f) Resources and Impacts.....	6-5
6.3.1 Historic Districts	6-7
6.3.2 Individual Historic Properties	6-8
6.3.3 Section 4(f) Impacts	6-10
6.4 Avoidance Alternatives.....	6-13
6.5 Measures to Minimize Harm	6-13
6.6 Coordination	6-13
6.7 Conclusion	6-13

TABLE OF CONTENTS - *Continued*

<u>CHAPTER</u>	<u>PAGE</u>
7. LIST OF PREPARERS	7-1
8. DISTRIBUTION LIST	8-1
8.1 Federal Agencies	8-1
8.2 State Agencies	8-1
8.3 Cities and Towns	8-2
8.3.1 Town of Bristol	8-2
8.3.2 Town of Middletown	8-2
8.3.3 City of Newport	8-2
8.3.4 Town of Portsmouth	8-2
8.3.5 Town of Tiverton	8-2
8.3.6 Town of Little Compton	8-2
8.4 Organizations and Individuals	8-3
8.5 Native American Tribes	8-4
9. COMMENTS AND COORDINATION	
9.1 Scoping Meeting	9-1
9.2 Outreach Meetings	9-1
9.3 Internet Access	9-1
9.4 Key Comments During Preparation of the DEIS	9-1
9.5 DEIS Comments	9-1
9.5.1 Summary of Recurrent Comments	9-2
9.5.2 Responses to Recurrent Comments	9-2
9.6 DEIS Comments Received	9-6
9.6.1 Telephone Calls	9-6
9.6.2 Letters	9-13
9.6.3 E-mail	9-61
9.6.4 Public Comment Forms	9-69
9.6.5 Public Hearing Testimony	9-91
10. INDEX	10-1

TABLE OF CONTENTS - *Continued***VOLUME I (APPENDICES)**

- A. Public Hearing Resources
 - a. Sign in Sheet
 - b. Speakers Sign in Sheet
 - c. Public Hearing Transcript
- B. RIDOT Conceptual Phase Relocation Plan
- C. Revised 50-Year Life Cycle Cost Analysis
- D. Revised RIDOT Real Estate / Relocation Cost Sheets
- E. Draft Memorandum of Agreement

VOLUME II SUPPLEMENTAL INFORMATION (Bound Separately)**Volume IIa:*****Correspondence and Comments***

- Requests for Copies of DEIS (Post Publication)
- DEIS Telephone Logs
- DEIS Comment Letters
- DEIS e-mail comments
- DEIS Public Comment Forms

Volume IIb:**APPENDIX A:**

- Phase 1(c) Archaeological
- Marine Intensive Remote Sensing Survey

APPENDIX B:

- Supplemental Phase II - Historical and Archaeological Resources
- Consensus Determination of Eligibility Documentation

Volume IIc:

- Sakonnet River Bridge Circulation Study
- Aquidneck Island Passenger Rail / Bicycle Path Project (Executive Summary Only)
- Draft Arsenic Background Evaluation
- Initial Site Assessment
- Power Line Relocation Study

LIST OF FIGURES

Following is a complete list of figures. However, with the exception of the Executive Summary and Chapter 6, only those figures that have been revised are included in the FEIS and are noted as **REVISED**. Figures that have not been revised are re-listed and referenced to the DEIS.

FIGURE	EXECUTIVE SUMMARY	PAGE
ES-1	Project Region Map	FEIS ES-2
ES-2	New Bridge on South Alignment (Alternative 5 – Recommended Alternative)	FEIS ES-17
ES-3	Summary of Alternative Impacts	FEIS ES-18

CHAPTER 1

1-1	Project Region Map (Unchanged).....	DEIS 1-2
1-2	Traffic Impacts Study Area (Unchanged)	DEIS 1-3
1-3	Existing Sakonnet River Bridge (Unchanged).....	DEIS 1-4

CHAPTER 2

2-1	New Bridge on Existing Alignment (Alternative 3) REVISED	FEIS 2-10
2-2	New Bridge on Existing Alignment (Alternative 3) Profile REVISED .	FEIS 2-11
2-3	New Bridge on North Alignment (Alternative 4) REVISED	FEIS 2-12
2-4	New Bridge on South Alignment (Alternative 5) REVISED	FEIS 2-13
2-5	New Bridge Alternative Proposed Typical Highway Cross-Section (Unchanged)	DEIS 2-12
2-6	New Bridge Alternatives - Potential Bridge Types (Unchanged)	DEIS 2-15
2-7	RI Route 24 - Toll Plaza Studied Location*	DEIS 2-20

*NOTE: Figure 2-7 is deleted from the FEIS

CHAPTER 3

3-1	Sakonnet River Bridge Setting (Unchanged).....	DEIS 3-1
3-2	Tiverton Zoning (Unchanged).....	DEIS 3-2
3-3	Portsmouth Zoning (Unchanged).....	DEIS 3-3
3-4	1999/2020 Average Daily Traffic Volumes - No Build REVISED	FEIS 3-3

LIST OF FIGURES

FIGURE	CHAPTER 3 (CONT...)	PAGE
3-5	Noise Measurement Receptor Locations (Unchanged).....	DEIS 3-16
3-6	Wetlands Plan REVISED	FEIS 3-6
3-7	RICRMC Water Use Categories (Unchanged)	DEIS 3-24
3-8	Floodplain Map (Unchanged)	DEIS 3-27
3-9	Proposed Historic Districts and Properties (Unchanged)	DEIS 3-29

CHAPTER 4

4-1	New Bridge on Existing Alignment (Alternative 3) Right-of-Way Impacts REVISED	FEIS 4-12
4-2	New Bridge on Existing Alignment (Alternative 3) Right-of-Way Impacts REVISED	FEIS 4-13
4-3	New Bridge on Existing Alignment (Alternative 3) Right-of-Way Impacts REVISED	FEIS 4-14
4-4	New Bridge on North Alignment (Alternative 4) Right-of-Way Impacts REVISED	FEIS 4-15
4-5	New Bridge on North Alignment (Alternative 4) Right-of-Way Impacts REVISED	FEIS 4-16
4-6	New Bridge on South Alignment (Alternative 5) Right-of-Way Impacts REVISED	FEIS 4-17
4-7	New Bridge on South Alignment (Alternative 5) Right-of-Way Impacts REVISED	FEIS 4-18
4-8	2000 AM and PM Peak Hour Traffic Volumes Model Predictions for Existing Alignment (Alternative 3) REVISED	FEIS 4-19
4-9	2020 AM and PM Peak Hour Traffic Volumes REVISED	FEIS 4-20

CHAPTER 6

6-1	Project Region Map	FEIS 6-2
6-2	Proposed Historic Districts and Properties	FEIS 6-6

LIST OF TABLES

Following is a complete list of tables. However, only those tables that have been revised or added are included in the FEIS and are so noted as **REVISED** or **NEW TABLE**. Tables that have not been revised are re-listed and referenced to the appropriate page of the DEIS.

TABLE	CHAPTER 1	PAGE
1-1	1998/1999 Traffic Data Summary (Unchanged).....	DEIS 1-8
CHAPTER 2		
2-1	Full Bridge Rehabilitation (Alternative 2) Construction Cost Estimate (Year 2000 Dollars) REVISED	FEIS 2-4
2-2	New Bridge Construction Cost Estimates (Year 2000 Dollars) REVISED	FEIS 2-5
CHAPTER 3		
3-1	Project Area Population Data (Unchanged)	DEIS 3-4
3-2	Project Area Minority and Poverty Data (Unchanged)	DEIS 3-6
3-3	Summary of Crash Rates Per Million Vehicle Miles (Unchanged)	DEIS 3-8
3-4	Soils Types in the Project Area (Unchanged)	DEIS 3-10
3-5	Existing Noise Levels (Unchanged)	DEIS 3-17
3-6	Summary of Wetlands and Coastal Features REVISED	FEIS 3-7
CHAPTER 4		
4-1	Property Acquisitions-Alternative 3 (New Bridge on Existing Alignment) REVISED	FEIS 4-6
4-2	Property Acquisitions-Alternative 4 (New Bridge on North Alignment) REVISED	FEIS 4-8
4-3	Property Acquisitions-Alternative 5 (New Bridge on South Alignment) REVISED	FEIS 4-10
4-4	Roadway Capacity Analysis, Level of Service Summary (Unchanged) .	DEIS 4-19

LIST OF TABLES

TABLE	CHAPTER 4 (CONT...)	PAGE
4-5	Intersection Capacity Analysis, Level of Service Summary (Unchanged).....	DEIS 4-20
4-6	Ramp Junctions Capacity Analysis Summary (Unchanged).....	DEIS 4-21
4-7	Toll Plaza Scenarios (Unchanged, but deleted from FEIS)	DEIS 4-23
4-8	Predicted Maximum 1-Hour CO Concentrations (Unchanged)	DEIS 4-27
4-9	Predicted Maximum 8-Hour CO Concentrations REVISED	FEIS 4-25
4-10	Mesoscale Emission Results (Unchanged)	DEIS 4-29
4-11	Toll Plaza Scenario Emissions (Unchanged, but deleted from FEIS)	DEIS 4-29
4-12	Predicted 2020 Noise Levels (Unchanged).....	DEIS 4-32
4-13	Summary of Water Quality Effects REVISED	FEIS 4-28
4-14	Summary of Wetlands Effects REVISED	FEIS 4-32
 CHAPTER 5 		
5-1	Comparison of Alternatives 4 & 5 Impacts (NEW TABLE).....	FEIS 5-7
 CHAPTER 9 		
9.6.1	Telephone Logs - Comments and Responses (NEW TABLE)	FEIS 9-7
9.6.2	Letters – Comments and Responses (NEW TABLE).....	FEIS 9-14
9.6.3	E-mails – Comments and Responses (NEW TABLE)	FEIS 9-62
9.6.4	Public Comment Forms – Comments and Responses (NEW TABLE) .	FEIS 9-70
9.6.5	Public Hearing Testimony – Comments and Responses (NEW TABLE)	FEIS 9-92