

Executive Summary

EXECUTIVE SUMMARY

ES.1 DESCRIPTION OF THE PROPOSED ACTION

The proposed action evaluated in the Draft Environmental Impact Statement (DEIS) was to either rehabilitate or replace (project purpose) the Sakonnet River Bridge (RI Bridge No. 250) that carries Rhode Island State Route 24 (RI 24) over the Sakonnet River between Portsmouth and Tiverton in Newport County, Rhode Island (Figure ES-1). Based on the analyses presented in the DEIS, published July 2001, a preferred alternative was identified: Alternative 5, a New Bridge constructed south of the existing bridge.

A comment period was held open from the date of publication (July 13, 2001) through October 5, 2001. Comments received during this period are evaluated and addressed in this Final Environmental Impact Statement (FEIS).

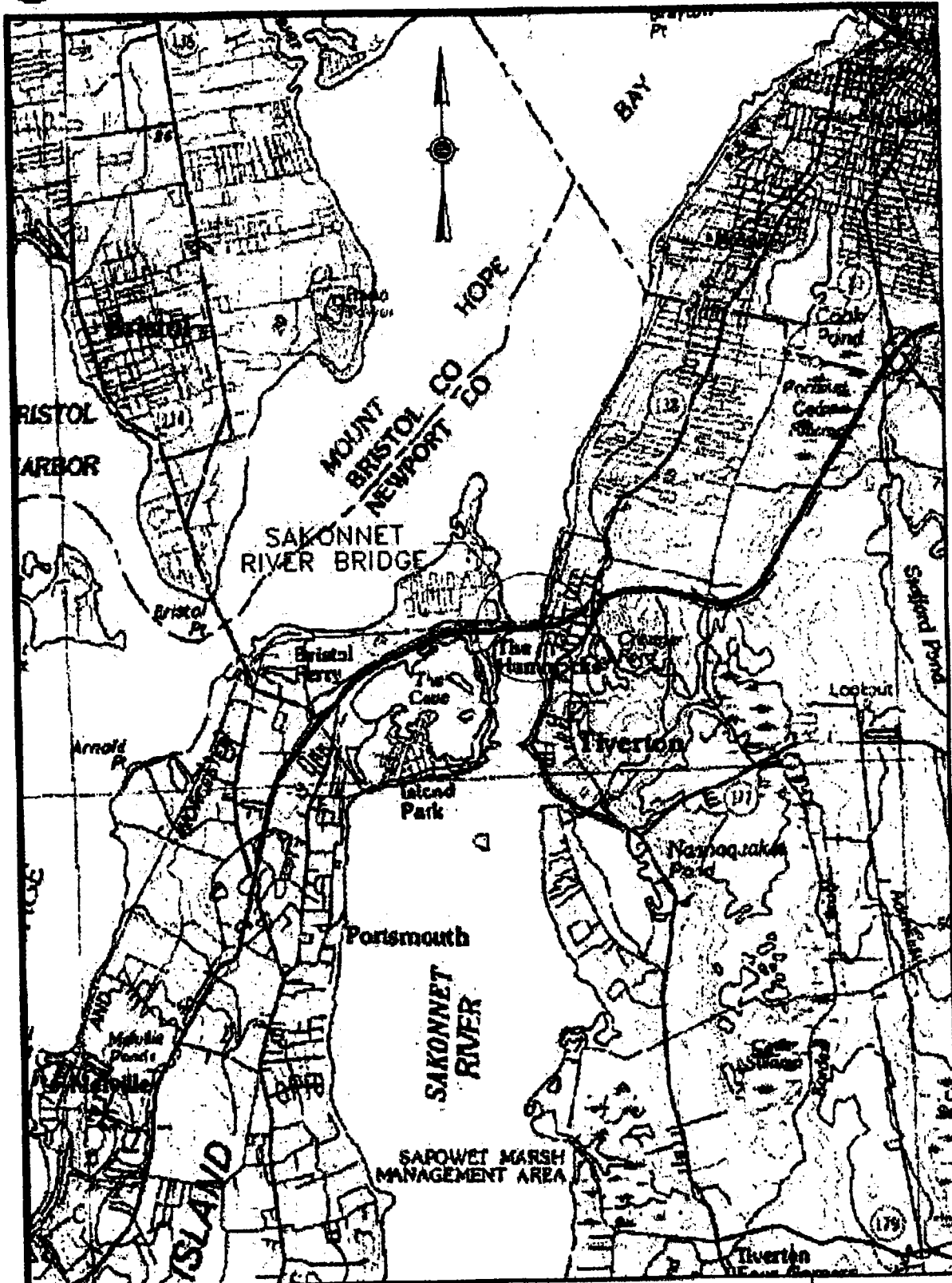
This FEIS has been prepared by the Rhode Island Department of Transportation (RIDOT) and the Federal Highway Administration (FHWA) to meet FHWA environmental regulations which implement the National Environmental Policy Act (NEPA.) The objective of this environmental review process for the Sakonnet River Bridge Rehabilitation or Replacement Project (the Project) is to evaluate the environmental impacts of alternatives and to identify an alternative that will maintain this essential river-crossing component of the regional transportation network.

The following are the project needs which were identified as a basis for selecting a Recommended Alternative:

1. Improve or replace the existing bridge that is structurally deficient, fracture critical, as well as substandard. The bridge does not meet current highway design standards for shoulder width and structural capacity.
2. Maintain the critical north/south transportation system link between Massachusetts and Rhode Island that the existing bridge provides.
3. Provide adequate seismic protection for the vital transportation link that the bridge provides for Aquidneck Island.
4. Support existing and future traffic volumes, with the least disruption during construction.
5. Improve public safety.

Alternative 5 fulfills the project purpose and needs with the least cumulative impacts to the environment. Based on the strongest ability to address the project purpose and needs, FHWA and RIDOT have jointly decided to recommend Alternative 5, New Bridge on South Alignment, in this FEIS (Figure ES-2).

The DEIS contained a financial analysis for a new Sakonnet River Bridge project that considered tolling of RI 24 to generate revenues for its construction and maintenance. Due to significant public opposition to tolling expressed at the DEIS Public Hearing and during the official comment



Rhode Island
 Department of Transportation
 Federal Highway Administration

PROJECT REGION MAP
SAKONNET RIVER BRIDGE PROJECT
 Source: USGS QUADRANGLE Scale = 1:25,000

Figure No.
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period thereafter, RIDOT and FHWA have eliminated tolling and the toll plaza from further consideration. Accordingly, the DEIS has been revised to include alternative financing options – Refer to Sections ES.3 and 2.7 of this FEIS. Based on Revised Sections ES.3 and 2.7 of this FEIS, it has been concluded that this project can be financed.

ES.2 ALTERNATIVES CONSIDERED

Potential alternatives considered for replacement or rehabilitation of the Sakonnet River Bridge were evaluated using the following criteria in conjunction with the outlined project purpose and needs as a guideline:

- Maintain four lanes of traffic (two northbound, two southbound) on RI 24 to the greatest extent possible during construction.
- Minimize construction on RI 24 outside of the existing highway alignment and bridge structure abutments, to avoid right-of-way impacts.
- Maintain the existing clearance above the Sakonnet River navigation channel, and maximize the width of the channel.

RIDOT and FHWA considered the former Old Stone Bridge location as both a potential new bridge crossing for RI 24, as well as a temporary crossing. This alignment was the initial crossing of the Sakonnet River, now abandoned. The former Old Stone Bridge location is approximately 0.8 miles (1.3 kilometers (km)) south of the existing Sakonnet River Bridge. Accordingly, this alignment, on either a permanent or a temporary basis, would involve extensive construction and right-of-way impacts, major community impacts, and environmental alterations for a new alignment of the RI 24 four-lane freeway through Tiverton and Portsmouth. In addition, the required minimum 65 ft. (19.8 m) vertical navigational clearance would not be attainable. Therefore, this alignment was eliminated from further consideration for both temporary detour and permanent realignment.

The Project Alternatives that were selected for detailed study are as follows:

Alternative 1:	No Build
Alternative 2:	Full Rehabilitation of the Existing Bridge
Alternative 3:	New Bridge on Existing alignment with a Temporary Bridge (along the railroad right-of-way)
Alternative 4:	New Bridge on North Alignment (along the existing railroad right of way, to the north of the existing bridge)
Alternative 5:	New Bridge on South Alignment (to the south of the existing bridge)

Each alternative could potentially be implemented independently to satisfy some or all of the project objectives, and the alternatives do not restrict consideration of future transportation alternatives in the project area, particularly regarding the potential reactivation of the railroad just to the north of the bridge.

The **No Build Alternative (Alternative 1)** includes routine maintenance of the Sakonnet River Bridge to provide continued operation of RI 24 over the Sakonnet River. Repairs would be completed only as needed to address failing structural or functional elements. Repairs would cause significant traffic delays, and would not address structural and functional deficiencies such as seismic requirements and the presence of fracture critical elements. Weight restrictions would be required, as would be inevitable replacement.

The No Build Alternative is included to provide a benchmark against which the benefits and impacts of the other Alternatives can be compared.

Full Rehabilitation of the Existing Bridge (Alternative 2) includes a comprehensive rehabilitation of the bridge substructure, superstructure, deck, and a complete seismic retrofit. During the anticipated minimum two-year construction period (impacting traffic), two of the four lanes on RI 24 would be closed. This restriction would create an unavoidable impact to traffic on RI 24. Alternative 2 would address the immediate structural safety issues and seismic deficiencies of the existing bridge. However, Alternative 2 would not address the safety concerns associated with the functionally obsolete bridge and highway alignment, nor change the fracture critical nature of the existing structure.

New Bridge on Existing Alignment (Alternative 3) would consist of replacement of the existing Sakonnet River Bridge with a new bridge in approximately the same horizontal alignment. The intent of using the existing alignment is to minimize the right-of-way impacts (e.g., property acquisition).

Due to the nature of the structural design of the existing bridge, it is not practical to build a replacement structure immediately adjacent to the existing bridge while keeping half of the traffic lanes in use. Therefore, the existing bridge would have to be removed prior to construction of the new bridge, resulting in an increase in construction duration. Significant regional traffic impacts would occur during the construction period of a minimum of two years if RI 24 across the Sakonnet River were closed.

Subsequent to the October 1999 Scoping Meeting, the US Environmental Protection Agency (USEPA), Region I Office, commented that a temporary bridge structure at the location of existing Sakonnet River Railroad Bridge should be included as part of Alternative 3 in order to try to mitigate these traffic impacts.

Accordingly, a detour roadway through the secondary streets of Tiverton and Portsmouth, a temporary roadway along the existing railroad causeway, and a temporary bridge structure at the location of the existing Sakonnet River Railroad Bridge would be included in the alternative to route RI 24 traffic around the closed bridge. The temporary bridge structure would be a fixed structure and would therefore severely restrict navigation, particularly for those vessels with high clearance requirements.

The construction of a temporary detour roadway along the railroad causeway would require the high voltage power lines crossing the Sakonnet River at this location to be relocated.

Eleven (11) property acquisitions and seven (7) relocations would be required due to the proposed increased width of the structure, necessary roadway reconstruction to accommodate the detour route, and to relocate the high voltage power lines currently on the railroad causeway. Construction within the Riverside Drive Historic District would be required.

The existing bridge would be removed subsequent to the completion of the new bridge.

New Bridge on North Alignment (Alternative 4) would consist of replacement of the existing Sakonnet River Bridge with a new bridge in an alignment to the north of the existing bridge along the railroad right-of-way.

Twenty-one (21) property acquisitions and eighteen (18) relocations would be required along the new RI 24 alignment, including the taking of four historic structures in the Riverside Drive Historic District. These acquisitions and relocations include those required for the relocation of the high voltage power lines crossing the Sakonnet River at this location.

Since the existing structure could be used during construction of the new bridge, the traffic disruptions would be minimal. The existing bridge would be removed subsequent to the completion of the new bridge.

New Bridge on South Alignment (Alternative 5) would consist of replacement of the existing Sakonnet River Bridge with a new bridge in an alignment to the south of the existing bridge.

Five (5) property acquisitions and seven (7) relocations would be required along the new RI 24 alignment. The high voltage power lines crossing the Sakonnet River would not need to be relocated. Construction would be required in the Riverside Drive Historic District as would the taking of aerial rights; however, it is not anticipated that the activities of the commercial properties in Tiverton that will have air rights acquired would be affected in the long term.

Since the existing structure could be used during construction of the new bridge, the traffic disruptions would be minimal. The existing bridge would be removed subsequent to the completion of the new bridge.

ES.3 FINANCIAL ANALYSIS

The DEIS identified toll collection as a means of financing, and evaluated a potential toll plaza as part of the project. Due to significant public opposition at the DEIS public hearing and through comments received during the official comment period, RIDOT and FHWA have eliminated tolling and the toll plaza from further consideration. Accordingly, this section has been revised to include alternative financing options, including Dedicated Funding and Bonding.

Alternative 5, New Bridge on South Alignment (Recommended Alternative) has been estimated to cost \$109 million. The financial analysis uses a \$110 million figure for illustrative purposes and represents the estimated cost of \$109 million rounded to \$110 million for simplicity. The \$109 million includes construction, right-of-way, and construction engineering and contingencies.

ES.3.1 Dedicated Funding

The State could choose to use dedicated funding to construct the Sakonnet River Bridge. Sources of direct funding are General Revenue, Transportation Improvement Program (TIP) allocation (FHWA highway funds and State match), or an increase in the gas tax dedicated to this project.

It is anticipated that the \$110 million revenue from this source would be spread over four years, or \$27.5 million per year. Regardless of which option was chosen, the impact would be significant as outlined below:

General Revenue: Current economic forecasts predict revenues growing at a slower rate than expenses and potential general revenue deficits are anticipated. This option would require that revenue be diverted from existing uses to fund the project at the rate of \$27.5 million for four years.

This option would require General Assembly Approval.

TIP Allocation: The TIP is the process by which federal highway and transit funds, plus the state match, are allocated to projects and programs. The TIP becomes the defacto work program for the state. This project could be directly funded out of the TIP, but it would require an annual allocation of \$27.5 million for four years, or 12.8 percent of the current program.

This option would require approval by the Transportation Advisory Committee and the State Planning Council.

Gas Tax: Each penny of the gas tax is forecasted to yield \$4,725,000 in fiscal year 2004. If this option were chosen, the gas tax would need to be raised by 6 cents per gallon. The current gas tax of 30 cents per gallon is the highest in the nation.

This would require General Assembly approval.

Combination: If pay-as-go were chosen as the funding method for the project, the most palatable option would be a combination of the three methods outlined above.

ES.3.2 General Obligation Bond

The state could issue General Obligation Bonds (GO) to fund the project. Under this option, bonds would be issued for a fixed time period, usually 20 years, and repaid using either gas tax or general revenue.

Regardless of whether the bonds were paid by General Revenue or Gas Tax, voter approval would be required.

ES.3.3 Revenue Bonds

Revenue Bonds are non-general obligation instruments based on a dedicated revenue stream. Gas tax could be used to repay bonds if a quasi-public agency such as the Turnpike and Bridge Authority issued the bonds based on a General Assembly allocation of gas tax to the agency. For example, the

gas tax allocation could be changed to allocate two cents to the Turnpike and Bridge Authority and revenue bonds issued on that allocation.

General Assembly authorization would be required, but not voter approval.

ES.3.4 GARVEE

Grant Anticipation Revenue Vehicles (GARVEE) are financial instruments that allow states to fund transportation projects based on anticipated future federal funds. States issue GARVEE bonds for transportation projects using future federal revenue streams to repay principal, interest and any other costs associated with underwriting the offering. Criteria for issuing GARVEE bonds are similar to most bond financing and reception from financial markets depends largely on the predictability of future revenue streams.

Under the GARVEE method of funding, the state enters into a Memorandum of Understanding with the FHWA in which the state will advance a project to construction by issuing revenue bonds that will be paid back over a period of time, not to exceed 30 years. These bonds will be paid back using future Federal Aid Apportionments.

One significant feature of the GARVEE approach is the ability to create a financing structure that is distinct and separate from the State's tax-supported debt programs and to avoid adverse impacts on the State's credit that would result from using the State's general obligation debt capacity to support the traditional Advance Construction approach.

Under this option, the debt service would be similar to GO bonds; however the annual payments would be funded through FHWA's highway funds and would be included in the TIP for 20 years.

Federal Highway and General Assembly Approval would be required.

ES.4 CONCURRENT PROJECTS AND STUDIES IN THE STUDY AREA

The projects described below are intended to be implemented independent of the Sakonnet River Bridge Project, and are hence viewed as existing conditions in the study area for this FEIS.

The RI 24/RI 138 (Main Road) ramps at the eastern edge of the Sakonnet River Bridge project area in Tiverton are being reconfigured under a separate RIDOT project. As part of the RI 24/RI 138 (Main Road) ramps project, the RI 138 (Main Road) on-ramp to RI 24 southbound, as well as the Central Avenue on and off-ramp structures (on the existing bridge) would be closed due to their insufficient acceleration / deceleration lanes and inadequate sight distances. Removal of the ramp structures would be incorporated into the removal of the existing bridge after the completion of the new structure constructed on a south alignment (Recommended Alternative 5).

RIDOT is conducting a study of the Aquidneck Island Rail Corridor, which includes the Sakonnet River Railroad Bridge. A draft version of this study was completed in September, 2002 and evaluates the potential future use of this transportation corridor for commuter rail and other purposes.

The need to retain a railroad bridge in service at the location of the existing Sakonnet River Railroad Bridge is currently under review. The alternatives considered in this FEIS would not preclude the future use of the railroad right of way. The Executive Summary of the aforementioned study is attached in Volume IIc of this FEIS.

It should be noted that the US Army Corps of Engineers is conducting a Town Pond Restoration Study. The Town Pond Restoration is scheduled to go to construction this year.

The existing Sakonnet River Railroad Bridge is not functional, and has been identified by RIDOT for removal. Note that the existing Sakonnet River Railroad Bridge will be removed as a separate and independent project with separate environmental documentation and will not be removed as part of the Sakonnet River (highway) Bridge Project.

ES.5 SUMMARY OF IMPACTS

Many of the potential environmental and socioeconomic impacts of the project would be short-term and temporary, during project construction. The long-term impacts for the New Bridge Alternatives are primarily associated with property relocations. The long-term impacts associated with the No Build and the Full Rehabilitation Alternatives are the socioeconomic impacts due to periodic traffic delays, and the need for a new bridge in the relatively near future. The impacts are summarized by Alternative. Refer also to Figure ES-3, Summary of Alternative Impacts, in matrix format.

ES.5.1 No Build (Alternative 1)

The No Build Alternative would have no local short-term impacts to the environment.

Future repairs would cause significant traffic delays and would not address structural and functional deficiencies nor address the need to keep the structure in service. Weight restrictions would be required, as would inevitable replacement.

Social and economic impacts would be significant since a long-term reliable transportation link would not be provided. Periodic lane closures such as those required for repairs and when accidents occur (since a functional breakdown lane is not provided) would result in traffic restrictions that would have secondary impacts to businesses and tourism on Aquidneck Island. These traffic restrictions would also impact school and transit transportation as well as the mobility of emergency response vehicles on RI 24. As a result, long-term productivity in the study area would likely be adversely affected by the No Build Alternative.

Pedestrian/cyclist facilities would not be provided, and therefore a functional link for these modes would not exist between Portsmouth and Tiverton.

The No Build Alternative requires no relocation and would have no impacts to wetlands, fisheries, cultural resource, and hazardous materials. The noise impacts would remain at current levels, which are considered moderate to high based on complaints from local residents. The coastal impacts would not change since the number of bridge piers in the waterway would remain unchanged.

It can be expected that the existing bridge will eventually be replaced, regardless of routine maintenance and repairs since it is nearing the end of its useful life, is structurally obsolete, and does not meet current seismic standards. Therefore the cumulative impacts identified for the No Build Alternative also need to be evaluated as compounded with the cumulative impacts of any of the new build alternatives as the No Build Alternative will eventually lead to a new bridge alternative over time.

ES.5.2 Full Rehabilitation of the Existing Bridge (Alternative 2)

The short-term impacts would be significant during construction, which would be a minimum of two years (affecting traffic).

Direct impacts due to traffic delays (resulting from accidents, disabled vehicles, and frequent maintenance operations), as well as indirect impacts to businesses, tourism, short-term productivity, and public services including school and transit would occur. Traffic delays also could affect the mobility of emergency response vehicles. Similarly, long-term productivity in the study area may be adversely affected by this alternative. The duration of lane restrictions and subsequent inconvenience to the motoring public would not only be more extensive than during the bridge's 2000-2001 repair project, but also would be continuous for the minimum two-year duration. Air quality in the area of the bridge during periods of traffic congestion, particularly during the summer months, may be degraded.

Pedestrian/cyclist facilities would not be provided, so a functional link for these modes would not exist between Portsmouth and Tiverton.

No property acquisition would be required, and impacts to wetlands, fisheries, coastal, and cultural resources would be minimal. The long-term noise impacts of bridge traffic would be addressed since a new bridge deck riding surface and improved deck joint systems would be provided. The bridge's seismic susceptibility would be addressed.

Despite the work that would be performed under the Alternative 2, the useful life of the bridge would be limited to 25 years, which is considered a short time period for a significant infrastructure investment, and is not the best return of investment in comparison to the other alternatives. It can be expected that, based on the remaining useful life of the bridge, that the bridge will eventually be replaced and therefore the cumulative impacts identified for the Full Rehabilitation alternative also need to be evaluated as compounded with the cumulative impacts of any of the new bridge alternatives as this alternative will eventually lead to a new bridge alternative over time.

The estimated construction cost for the Full Rehabilitation of the Existing Bridge Alternative (Alternative 2) is \$72 million. This is more than half of the construction cost of two of the New Bridge Alternatives evaluated in this FEIS. FHWA guidance indicates that when rehabilitation costs are approximately 50 percent of the cost of providing a new facility, then serious consideration should be given to providing a new facility rather than rehabilitating the existing.

ES.5.3 New Bridge on Existing Alignment with Temporary Bridge (Alternative 3)

The New Bridge on Existing Alignment Alternative (Alternative 3) would require 11 property acquisitions and 7 relocations to accommodate the wider highway, the construction of a temporary detour roadway, and the relocation of the high voltage power lines.

This Alternative has the most significant impacts of any of the Alternatives due to the need for a temporary bridge and roadway on the railroad causeway. The temporary roadway and bridge structure would require fill to be placed in the Sakonnet River, thus affecting the Sakonnet River water quality and the Tautog fishery. The detour would also require the total volume of RI 24 traffic to be restricted to two lanes and be detoured through secondary roads in Tiverton and Portsmouth to the temporary roadway and bridge structure. The railroad causeway for recreational fishing would no longer be available.

Alternative 3 would have significant short-term secondary social and economic impacts during construction since the temporary bridge would only have two lanes and traffic would be routed over local streets to and from RI 24. The temporary bridge would be a fixed structure and would severely restrict navigation. Businesses on Aquidneck Island, schools, transit on RI 24 (including the mobility of emergency response vehicles), local marine-related businesses (due to navigation restrictions), and subsequently short-term productivity in the study area would be adversely affected. In addition, local non-marine businesses would be adversely affected since their customer base would potentially decrease as it seeks similar services elsewhere to avoid traffic restrictions.

Construction period impacts would be the most significant of all Alternatives due to traffic detours and delays, and noise in the work areas and along the Tiverton detour route. Air quality in the area of the bridge and detour route during periods of delayed traffic, particularly during the summer months, may be degraded.

The impacts to wetlands would be moderate as summarized in Revised Table 4-14 in this FEIS and in Figure ES-3. Appropriate disposal procedures would need to be followed to minimize hazardous materials impacts due to the existence of lead-based paint on the existing bridge structure. Fewer piers in the waterway than under existing conditions would reduce long term coastal impacts. The short-term coastal impacts would be moderate to high due to the placement of fill in the Sakonnet River at the railroad causeway for the temporary roadway and bridge, as well as the removal of the existing Sakonnet River Bridge piers, and the construction of new piers. Since the relocation of the power lines would require the construction of at least two towers within the Sakonnet River, additional coastal impacts would occur. New towers for power line relocation would not be constructed within the navigation channel.

The long-term noise impacts would be low with a new structure, deck, and joints. Cultural resources impacts would be minor, and would result from limited land taking and construction within the Riverside Drive Historic District.

Pedestrian / cyclist facilities would be provided with the new structure, so a functional link for these modes would exist between Portsmouth and Tiverton.

The useful life of the new bridge structure would extend for 75 years and the total estimated construction costs for Alternative 3 is \$161 million. Estimated construction costs include ‘construction-delay’ user costs, power line relocation, property acquisition and relocation, and new bridge/roadway construction, and demolition.

ES.5.4 New Bridge on North Alignment (Alternative 4)

The New Bridge on North Alignment Alternative would require 21 property acquisitions and 18 relocations and would significantly disrupt the integrity and demographics of established neighborhoods in both Tiverton and Portsmouth. The need to relocate the high voltage power lines along the proposed alignment would also involve property relocations as well as coastal and environmental impacts. Four historic structures in the Riverside Drive Historic District would be taken, and construction within the District would be required.

The short-term secondary impacts would also be low during construction since all four lanes of the existing bridge could remain in service for most of the construction period. Pedestrian/cyclist facilities would be provided, so a functional link for these modes would exist between Portsmouth and Tiverton.

The impacts to wetlands would be moderate as summarized in Revised Table 4-14 in this FEIS and in Figure ES-3. Appropriate disposal procedures would need to be followed to minimize hazardous materials impacts due to the existence of lead-based paint on the existing bridge structure. The number of piers in the waterway would be reduced, so long term coastal impacts would be low. The short-term coastal impacts would be moderate due to the removal of the existing Sakonnet River Bridge piers, as well as the construction of new piers. Since the relocation of the power lines would require the construction of at least two towers within the Sakonnet River additional coastal impacts would occur. New towers for power line relocation would not be constructed within the navigation channel.

The long-term noise impacts would be low with a new structure, deck, and joints.

The useful life of the new bridge structure would extend for 75 years and the total estimated construction cost for Alternative 4 is \$122 million. Estimated construction costs include power line relocation, property acquisition and relocation, and new bridge/roadway construction and demolition.

ES.5.5 New Bridge on South Alignment (Alternative 5) - Recommended Alternative

The New Bridge on South Alignment Alternative will require 5 property acquisitions and 7 relocations (one acquired property is a 3-family home requiring three relocations). This alternative also will require the reconfiguration of Evans Avenue into a cul-de-sac altering the Evans Avenue neighborhood in Tiverton. Construction within the Riverside Drive Historic District will be required including the taking of aerial rights within the District.

The impacts to wetlands would be moderate as summarized in Revised Table 4-14 of this FEIS and in Figure ES-3. Appropriate disposal procedures would need to be followed to minimize hazardous

materials impacts due to the existence of lead-based paint on the existing bridge structure. The number of piers in the waterway would be reduced; so long term coastal impacts would be low. The short-term coastal impacts would be moderate due to the removal of the existing Sakonnet River Bridge piers, as well as the construction of new piers. High voltage power line relocation will not be required.

The long-term noise impacts would be low with a new structure, deck, and joints.

The short-term secondary impacts would also be low since the existing bridge could remain in service for most of the construction period. Pedestrian/cyclist facilities would be provided, so a functional link for these modes would exist between Portsmouth and Tiverton.

The useful life of the new bridge structure would extend for 75 years. The total estimated construction cost for Alternative 5 is \$109 million. Estimated construction costs include property acquisition and relocation, and new bridge/roadway construction and demolition

ES.6 REASONS FOR IDENTIFYING ALTERNATIVE 5 AS THE RECOMMENDED ALTERNATIVE

The No-Build Alternative (Alternative 1) does not meet the project purpose and only partially satisfies the project long-term needs. Alternative 1 was included to comply with requirements of the National Environmental Policy Act (NEPA), and to provide a benchmark against which the benefits and impacts of the other alternatives could be compared. The No Build Alternative would maintain the critical transportation link, if only in the short term. It would continue to support traffic volumes but would periodically disrupt traffic during repairs. Repairs completed in 2001 will maintain public safety, but not improve it (an outlined project need – Refer to Section ES.1). The No Build Alternative would not improve or replace the substandard, structurally deficient, fracture critical bridge, and would not provide seismic protection for the vital transportation link. Based on its inability to fulfill all of the outlined project needs, Alternative 1 was eliminated from consideration as the Recommended Alternative.

The Full Rehabilitation of the Existing Bridge (Alternative 2) would result in daily traffic delays and significant inconvenience to the motoring public throughout the minimum two-year duration of the proposed work (impacting traffic). This traffic congestion would have adverse impacts on both the local and regional economies and short term productivity resulting from lost time / increases in transport time, decreases in customer base (i.e. customers avoiding the congested area), and a potential decline in tourism to Aquidneck Island. There would be adverse social impacts, such as the compromising of the mobility of emergency response vehicles and school transport vehicles. Safety would not be improved for stranded motorists as inadequate shoulder widths would remain, as would the current geometric alignment. Pedestrian and bicycle access would not be provided on the rehabilitated bridge.

Subsequent to the full rehabilitation, the bridge would remain fracture critical and would inevitably need complete replacement within 25 years, over which time multiple repair projects would be

required due to the fact that even the fully rehabilitated bridge would remain a maintenance-burdening structure.

Alternative 2 would also require the expenditure of \$72 million in exchange for only another 25 years of useful life; a time period considered short in terms of significant infrastructure investment. In addition, FHWA guidelines encourage the investigation of bridge replacement when rehabilitation costs exceed 50% of the cost of replacement.

Based on the inability to fully fulfill the outlined project long-term needs (i.e. inadequate shoulder widths, geometric alignment, and fracture critical nature), as well as the significant construction costs relative to the cost of a new bridge, traffic delays, economic and social impacts, and highest comparative 50-year life cycle costs, the Full Rehabilitation of the Existing Bridge Alternative, Alternative 2, was not identified as the Recommended Alternative.

The New Bridge on Existing Alignment Alternative (Alternative 3) would address the purpose and needs of the project. However, it would also have the highest construction cost and would have the most significant impacts of any of the build alternatives due to the need for a temporary bridge and roadway on the railroad causeway for temporary re-routing of RI 24 traffic through Tiverton and Portsmouth.

Alternative 3 would require a temporary roadway and bridge structure that would require fill to be placed in the Sakonnet River, thus affecting the Tautog fishery and impacting the largest area of wetlands. The RI 24 detour would also require the total volume of RI 24 traffic to be restricted to two lanes and be detoured through secondary roads in Tiverton and Portsmouth to the temporary roadway and temporary bridge structure. The temporary bridge structure would be a fixed structure and would severely restrict navigation, particularly for vessels with high clearance requirements.

The vehicular and marine traffic restrictions would have significant short-term secondary social and economic impacts during construction. Businesses on Aquidneck Island, schools, transit on RI 24 including the mobility of emergency response vehicles, local marine-related businesses (due to navigation restrictions), and subsequently short-term productivity in the study area as well as the surrounding communities would be adversely affected. In addition, local non-marine businesses would be adversely affected since their customer base would potentially decrease as it seeks similar services elsewhere to avoid these traffic restrictions.

Due to their current location on the railroad causeway, the high voltage power lines would need to be relocated at a cost of \$2.3 million (this cost does not include the acquisition and relocation of the additional properties required for the relocation of the power lines). Power line relocation would require the relocation of properties. Power line relocation would require at least two towers be constructed in the Sakonnet River and would therefore have additional environmental consequences similar to those described for the construction of new bridge piers. Removal of the existing towers would also have environmental impacts.

Alternative 3 would have the longest construction duration (impacting traffic) due to the fact that the existing bridge would need to be completely removed prior to the construction of the new bridge.

Based on the fact that Alternative 3 (New Bridge on Existing Alignment) would have the highest construction costs, the highest impacts (social, economic, environmental), and the highest comparative 50-year life cycle costs of the New Bridge Alternatives, it was not identified as the Recommended Alternative.

Alternative 4, New Bridge on North Alignment, would address both the purpose and the needs of the project. When compared to the other remaining alternative (Alternative 5, New Bridge on South Alignment) it has a higher initial construction cost as well as a higher life-cycle cost.

The higher costs for Alternative 4 are primarily due to the fact although that the limits of construction are larger than for Alternative 5, the actual bridge limits for Alternative 4 are greater. Construction costs for bridge structure are significantly higher than for roadway work. Also adding to the cost of Alternative 4 is the fact that the existing high voltage power lines would require relocation at an estimated cost of \$2.3 million. Power line relocation would also require property acquisitions and relocations at additional costs. Special support piers would need to be constructed at the railroad causeway (to straddle the right-of-way in order to provide for future reactivation of the railroad) also contributing to higher construction costs for Alternative 4.

Real estate relocation impacts are the highest for Alternative 4 due to 18 required relocations versus 7 required for Alternative 5. These 18 required relocations would significantly disrupt the demographics, integrity, and character of established neighborhoods in Tiverton and Portsmouth. Alternative 4 would also impact the Riverside Drive Historic District, with the required acquisition of four historic structures versus one structure in Alternative 5 which is only potentially eligible for listing on the National Register.

There would be environmental impacts resulting from both the removal of the high voltage power lines as well as for the required construction of at least two new power line towers in the Sakonnet River. Bridge and ramp construction for Alternative 4 would impact 3 beach areas and Wetlands F-12 and C-4. The Sakonnet River would be impacted by the construction / removal of bridge piers. The possibility exists for wetland compensation within the project.

The existing bridge structure could be used during the construction of the new bridge structure, and with the exception of the transition from old bridge to new bridge, there would be minimal impacts to traffic.

Alternative 5, New Bridge on South Alignment (Recommended Alternative) would address both the purpose and needs of the project. It has lower construction and life cycle costs than Alternative 4 due to the fact that the actual bridge length would be shorter under Alternative 5, specialized piers to straddle the railroad would not be required, Alternative 5 requires less property acquisition and relocation than does Alternative 4, and the relocation of the high voltage power lines would not be required.

One historic complex in the Riverside Drive Historic District would be impacted by the taking of aerial rights (as compared to the acquisition of four historic structures with Alternative 4).

The relocation of the high voltage power lines and the associated impacts (i.e. additional property acquisitions and environmental impacts) would not be required for Alternative 5.

Impacts to wetlands would be higher than under Alternative 4. Impacts to wetlands C-4 and F-12 would be the same as for Alternative 4, but there would be additional impacts to the Sakonnet River, as well as impacts to Wetland C-5. Wetland C-5 is considered to be of limited value due to its fragmented nature and small size. Implementation of Alternative 5 would impact one beach area, as compared to three beach areas with the implementation of Alternative 4.

The possibility exists for wetland compensation within the project area.

Modifications to the RI 24 overpass at Anthony Road as well as the RI 138 (Main Road) overpass would be required for Alternative 5.

The existing bridge structure could be used during the construction of the new bridge structure, and with the exception of the transition from old bridge to new bridge, there would be minimal impacts to traffic.

Comparison of Alternatives 4 and 5

Alternative 4 would cost an estimated \$122 Million. Alternative 5 would cost an estimated \$109 Million.

Alternative 4 would have \$123 Million in comparative 50-year life cycle costs. Alternative 5 would have \$112 Million in comparative 50-year life cycle costs.

Alternative 4 would require the relocation of the high voltage power lines existing on the railroad causeway at a cost of \$2.3 Million resulting in property relocations and the associated environmental impacts.

Alternative 5 would not require the relocation of the high voltage power lines.

Alternative 4 would require the acquisition of 21 properties and 18 relocations significantly disrupting the integrity, demographics, and character of established neighborhoods in Portsmouth and Tiverton. Alternative 5 would require the acquisition of 5 properties and 7 relocations.

Alternative 4 would require the taking of four historic structures in the Riverside Drive Historic District. Alternative 5 would not take any historic structures in the Riverside Drive Historic District, and would only require the taking of aerial rights. Alternative 5 would take one potentially historic structure outside of the Riverside Drive Historic District.

Alternative 4 would impact three areas of beach; Alternative 5 would impact one.

Traffic impacts would be minimal under both Alternatives 4 and 5.

Alternative 5 would impact more wetlands than would Alternative 4, but compensation for the affected wetland is available within the project area.

Based on the above discussions, the only advantage that Alternative 4 has over Alternative 5 is the smaller area of wetlands impacted. Alternative 4 (New Bridge on North Alignment) would require 18 relocations, would require the relocation of the high voltage power lines, would require the acquisition of 4 historic structures within the Riverside Drive Historic District, and would significantly disrupt the demographics, integrity, and character of established neighborhoods in both Tiverton and Portsmouth.

The Recommended Alternative (Alternative 5 – New Bridge on South Alignment) demonstrates the strongest ability to address the project purpose and needs with the least cumulative impact to the environment and is also the least costly.

Therefore, the Recommended Alternative in this FEIS is Alternative 5 – New Bridge on South Alignment.

ES.7 OTHER FEDERAL ACTIONS REQUIRED

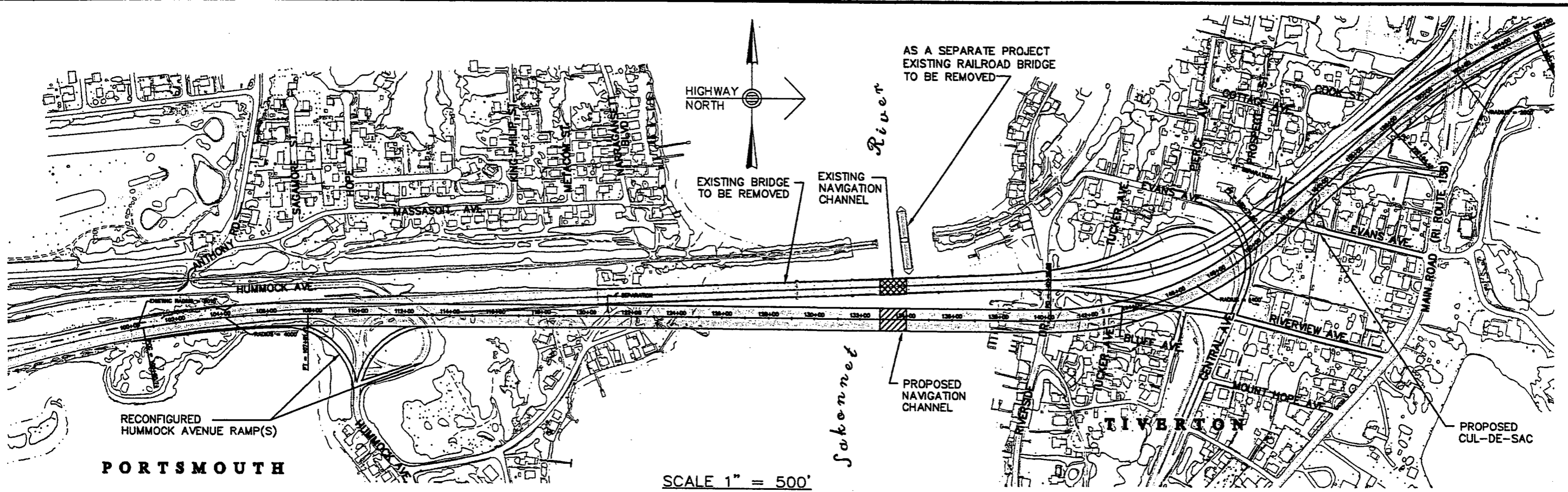
The following permits are required

Alternatives 1 and 2:

State:	Coastal Resources Management Council (CRMC) Maintenance Permit
Federal:	N/A

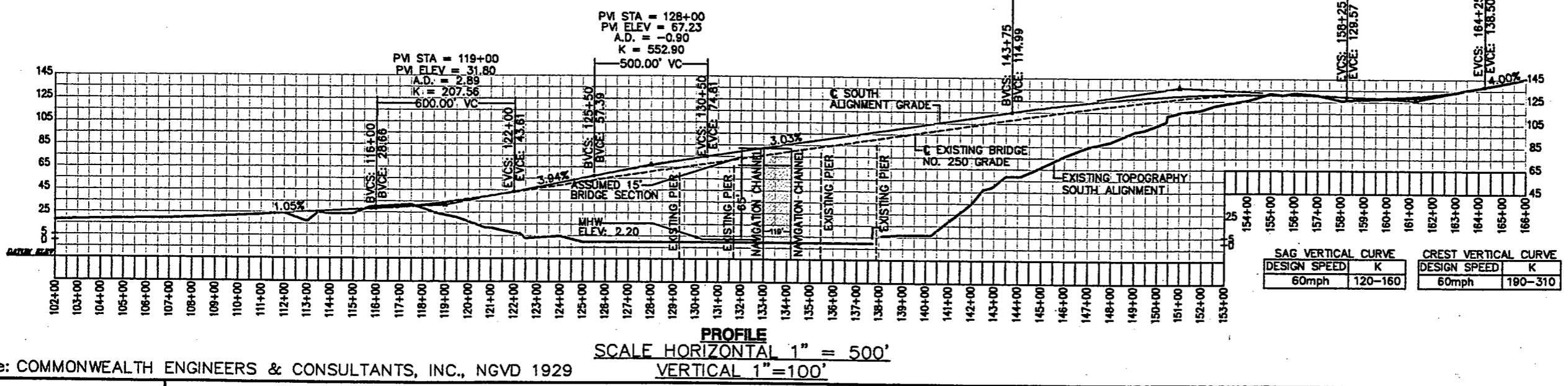
Alternatives 3, 4, and 5:

State:	CRMC Category B
Federal:	Water Quality Certification, Section 401 Army Corps of Engineers (ACOE), Section 404 U.S. Coast Guard (USCG) Permit



HIGH POINT ELEV = 131.44
 HIGH POINT STA = 154+59.37
 PVI STA = 151+00
 PVI ELEV = 136.98
 A.D. = -4.06
 K = 357.57
 1450.00' VC

LOW POINT ELEV = 128.94
 LOW POINT STA = 159+47.15
 PVI STA = 161+25
 PVI ELEV = 126.50
 A.D. = 5.02
 K = 119.46
 600.00' VC



PROFILE
 SCALE HORIZONTAL 1" = 500'
 VERTICAL 1" = 100'

Source: COMMONWEALTH ENGINEERS & CONSULTANTS, INC., NGVD 1929

Rhode Island
 Department of Transportation
 Federal Highway Administration

NEW BRIDGE ON SOUTH ALIGNMENT (ALTERNATIVE 5) - RECOMMENDED ALTERNATIVE

SAKONNET RIVER BRIDGE PROJECT

Figure No.
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	Construction Cost	50-Year Life Cycle Cost	Total Number of Property Relocations Required and Associated Costs	Power Line Relocation Cost	Construction of a Temporary Bridge Required?	Impacts to Traffic	Impacts to Navigation**	Impacts to Historical Resources	Estimated Average Impacts to Wetlands	Impacts to Beach Areas	Impacts to Fisheries***	Impacts to Stormwater Runoff****	Impacts to Water Quality	Economic Impacts
Alternative 1 - No Build	N/A	N/A*	NR	NR	No	•Periodic Significant Delays due to future repairs. •Weight Restrictions Required	N/A	N/A	N/A	N/A	N/A	Existing Conditions = 10.2 acres (4.13 hectares)	N/A	•Will not provide adequate infrastructure and could negatively impact economic growth (i.e. weight restrictions). •Would impair long-term productivity. •Negative impacts associated with periodic traffic disruptions for repair, maintenance, and breakdowns.
Alternative 2 - Full Rehabilitation	\$72 M	\$210 M	NR	NR	No	•Lane restrictions for minimum of 2 year construction period. •Delays similar to those experienced during 2000-2001 repairs.	Potential for temporary restrictions for barge maneuvering.	NR	N/A	N/A	N/A	Existing Conditions = 10.2 acres (4.13 hectares)	N/A	•Short Term impacts associated with severe traffic delays over 2 year (min.) construction period. •Long term would not directly impact land use or businesses in area. •Could impair long term productivity by not providing long term solution to structural limits of the bridge.
Alternative 3 - New Bridge on Existing Alignment	\$161 M	\$156M	•7 Relocations •11 Acquisitions •\$2.62 M	\$2.3 M	Yes	•Severe impacts. •RI 24 reduced to 2 lanes •RI 24 detoured along secondary surface streets of Thorton and Portsmouth. •Roadway along causeway very narrow.	•Temporary bridge would be a fixed structure. •Navigation in area severely restricted during construction.	•Requires construction and land taking in Riverside Drive Historic District. •No historic structures in the district taken.	•F-12 / C-4 / Sakonnet River •1.05 Acres (0.42 Hectares)	2 Acres	•Fill required along causeway would impact fouling community driving local fish population away. •Removal of existing piers would be a temporary loss of habitat.	12.4 acres (5.02 hectares)	•Severe localized impacts due to installation and later removal of fill along causeway. •Minor impacts during construction of new and removal of old piers •Minor impacts during construction of new power line towers in River.	•Severe negative short-term impacts to marine related businesses in the area due to navigation restrictions. •Severe short-term impacts to businesses due to traffic restrictions. •Would provide for long-term productivity.
Alternative 4 - New Bridge on North Alignment	\$122 M	\$123 M	•18 Relocations •21 Acquisitions •\$5.36 M	\$2.3 M	No	•Existing structure utilized during construction. •Impacts negligible.	Potential for temporary restrictions for barge maneuvering and/or material delivery.	•Requires construction in Riverside Drive Historic District. •4 Historic Structures in Riverside Drive Historic District taken.	•F-12 / C-4 / Sakonnet River •0.61 Acres (0.25 Hectares)	3 Acres	Removal of existing piers would be a temporary loss of habitat.	11.6 acres (4.69 hectares)	•Minor impacts during construction of new and removal of old piers. •Minor impacts during construction of new power line towers in River.	•Would provide long-term productivity. •Negligible traffic impacts and only minor navigation restrictions therefore negligible economic impacts to area.
Alternative 5 - New Bridge on South Alignment	\$109 M	\$112 M	•7 Relocations •5 Acquisitions •Aerial Rights •\$2.60 M	NR	No	•Existing structure utilized during construction. •Impacts negligible.	Potential for temporary restrictions for barge maneuvering and/or material delivery.	•Requires construction in Riverside Drive Historic District. •Requires Aerial Rights in Riverside Drive Historic District taken. •Would take a potentially eligible historic property at 59 Evans Avenue (Cotrell House).	•F-12 / C-4 / C-5 / Sakonnet River •0.96 Acres (0.39 Hectares)	1 Area	Removal of existing piers would be a temporary loss of habitat.	13.4 acres (5.42 hectares)	Minor impacts during construction of new and removal of old piers.	•Would provide long-term productivity. •Negligible traffic impacts and only minor navigation restrictions therefore negligible economic impacts to area.

NR = Not Required
 NA = Not Applicable
 * Was not considered for 50-Year Life Cycle Cost Analysis.
 ** New Bridge Alternatives would, at minimum, maintain existing navigational clearances.
 *** Use of explosives is not proposed.
 **** Long-Term (i.e. post-construction) Impacts Listed.

THERE WOULD BE NEGLIGIBLE OR NO LONG-TERM IMPACTS TO THE FOLLOWING UNDER ANY ALTERNATIVE:

- Wild and Scenic Rivers
- Floodplains
- Threatened or Endangered Species
- Air Quality
- Special Groups

NOTES: •Causeways not to be removed under any alternative.
 •All Build Alternatives require irreversible commitment of materials and labor and require the consumption of energy to varying degrees.
 •No hazardous materials problems anticipated. All Build Alternatives require BMP's for handling / disposal of lead paint.
 •Sakonnet River Railroad Bridge will be removed as a separate project with separate environmental documentation

SUMMARY OF ALTERNATIVE IMPACTS