9.0 Study Results and Recommendations

This chapter identifies a) the environmental approvals likely required based on Study results, b) preliminary Section 4(f) evaluation findings, c) the alternatives dismissed from further consideration, d) alternatives recommended to be carried forward and, e) next steps.

9.1. ENVIRONMENTAL APPROVALS

All of the build alternatives considered in the Maine-NH Connections Study require environmental approvals and permits. The specific approvals and permits depend on the alternative chosen to be advanced as the proposed action. A summary of the environmental clearance considerations is included in the Alternatives Evaluation Matrix (Figure 8-18).

Further evaluation of alternatives and documentation of impacts of the proposed action are required under NEPA. Section 4(f) of the U.S. DOT Act of 1966 also applies to all alternatives. See Paragraph 9.2 below for further details regarding Section 4(f) analysis. Under NEPA, FHWA determines the appropriate class of action, either as a Categorical Exclusion, an Environmental Assessment or an Environmental Impact Statement. Preparation of individual Section 4(f) Evaluations are necessary for the alternatives being considered for the Memorial Bridge and the Sarah Mildred Long Bridge.

The USCG has jurisdiction over navigable waters. A Bridge Permit is required for work on the Memorial Bridge and/or the Sarah Mildred Long Bridge if the work would construct a new bridge or reconstruct or modify an existing bridge across navigable waters of the United States. Coordination with the USCG has been ongoing during the course of the Study, and USCG has provided input on the alternatives being considered. As design is advanced, continued coordination with the USCG would occur and filing for a USCG permit could occur with design at approximately a 25 percent level.

A permit from the USACOE is required for discharge of dredge or fill material in waters of the U.S., including wetlands, vernal pools, streams and navigable rivers. Some of these resources are present in the study area. No impact is expected for the No Build alternative. Due to the small areas impacted by the other alternatives, these alternatives likely qualify under a Corps Programmatic General Permit, though this has yet to be confirmed with the USACOE.

Similar approvals by New Hampshire Department of Environmental Service (DES) and Maine Department of Environmental Protection (DEP) may be required.

9.2. PRELIMINARY SECTION 4(F) EVALUATION

Section 4(f) of the Department of Transportation Act of 1966, requires that special effort be made to preserve publicly owned parks, recreation areas, wildlife and waterfowl refuges, as well as historic sites, whether publicly or privately owned.

Before an alternative involving the use of a Section 4(f) property can be selected, avoidance alternatives and minimization measures must be considered. Avoidance alternatives are those

that avoid the use of Section 4(f) property; minimization measures are efforts to minimize the impacts of a Section 4(f) use where it is not prudent or feasible to avoid the Section 4(f) property.

Minimization measures may include mitigation, which is compensation for Section 4(f) impacts that cannot be avoided. Mitigation may entail replacement of Section 4(f) property or facilities. The cost of mitigation should be a reasonable public expenditure in light of the severity of the impact on the Section 4(f) resource.

In this study, both the Memorial Bridge and the Sarah Mildred Long Bridge are Section 4(f) properties and are part of either a federal-aid highway system or a state or local highway system that has continued to evolve over the years. Even though these structures are on or are eligible for inclusion on the National Register of Historic Places, they must perform as an integral part of a modern transportation system. When they do not or cannot, they must be rehabilitated or replaced in order to assure public safety while maintaining system continuity and integrity. If alternatives exist that do not cause impacts, or minimize impacts, they must be considered first.

In addition to the two bridges, numerous parcels at the approaches of both bridges in Portsmouth and Kittery also are or may be eligible for protection under Section 4(f). If there is no feasible or prudent alternative that avoids use to all Section 4(f) properties, FHWA may only approve the alternative that causes the least overall harm. In the Fatal Flaw Analysis phase of this study, a preliminary least harm analysis was performed. None of the alternatives, including the No-Build Alternative, completely avoid all Section 4(f) properties.

The information developed in this study will form the basis for the continuation of the Section 4(f) evaluation and formal Section 4(f) documentation that will be prepared as a part of the subsequent NEPA process.

9.3. ALTERNATIVES DISMISSED FROM FURTHER CONSIDERATION

The remaining ten build alternatives have been evaluated collectively and, where possible, comparatively. Based on findings documented in this report and in supporting Technical Memoranda and Reports provided in the Appendices, and the ratings summarized in the Alternative Evaluation Matrix (Figure 8-18), the following alternatives are recommended to be dismissed from further consideration.

Dismissal #1: Six-lane River Crossing Bridge Alternatives. Appendix #45, Bridge Capacity Analysis Summary Report, evaluated future Piscataqua River crossing volumes for determining needed river crossing capacity. This Technical Report determined that six lanes (a four-lane Sarah Mildred Long Bridge plus a two-lane Memorial Bridge), besides the I-95 High-Level Bridge, were not needed for accommodating future river crossing traffic needs within the Study timeframe (2035). Therefore, it was recommended that alternatives that provide six lanes of river crossing capacity at the Memorial Bridge and Sarah Mildred Long Bridge combined be

dismissed from further consideration. This dismisses Alternative 5b and Alternative 6b from further consideration. This reduces the number of build alternatives from ten to eight.

Dismissal #2: On-line Sarah Mildred Long Bridge Replacement Alternatives. Two of the remaining eight alternatives would replace the Sarah Mildred Long Bridge on existing alignment. The duration of the Sarah Mildred Long Bridge closure during construction for these alternatives (estimated to be greater than two years) would:

- Require temporary maintenance of traffic during construction for traffic along the U.S. 1 Bypass which would reroute traffic to either the I-95 High Level Bridge or the Memorial Bridge;
- Have long term impacts to vehicle mobility and result in reduced level of traffic operations within the Study Area;
- Require coordination with Pan Am Railways and the PNSY relative to timing of closures and duration of rail line closures for current rail materials shipped to and from PNSY;
- Have adverse impacts to certain businesses located at the approaches to the Sarah Mildred Long Bridge due to the temporary loss of vehicular traffic; and
- Would have temporary impacts to emergency and evacuation access routes during the construction duration.

A summary of construction impacts relative to vehicle mobility and traffic operations associated with these alternatives can be found in Appendix 28, 2015 Construction Impacts.

As opposed to these two alternatives, the upstream Sarah Mildred Long Bridge replacement alternatives were carried forward during the Fatal Flaw Process and evaluated further. The upstream bridge replacement alternatives provide the same long term benefits as the on-line replacement alternatives, have minimal to no short-term impact to local businesses and to emergency and evacuation access routing during construction, and have minimal increase in resource and property impacts (noted below).

In reviewing the Alternatives Evaluation Matrix (Figure 8-18), information provided in six of the nine "Evaluation Criteria Category's" are essentially the same for all of the alternatives. The six "Evaluation Criteria Category's" in which there is no substantial difference in identified benefits or impacts are:

- The Structural Improvement Category;
- The Historic Evaluation Category;
- The Natural Environment Category;
- The Physical Environment Category;
- The Environmental Clearances Category; and
- The Use of Section 4(f) Properties Category.

It is recommended that the two remaining Sarah Mildred Long Bridge alternatives that replace the bridge on existing alignment (Alternative 5a and Alternative 7) be dismissed from further consideration. This reduces the number of build alternatives from eight to six.

Dismissal #3: One Four-Lane Vehicle Bridge as Compared to One Two-Lane Hybrid Vehicle Bridge. In comparing Alternative 8 to Alternative 10, the principal comparison is a four-lane, low level Sarah Mildred Long Bridge to a two-lane hybrid, mid-level Sarah Mildred Long Bridge. Both provide the necessary bridge traffic capacity required with the Memorial Bicycle/Pedestrian only bridge, and are similar in rating for mobility and accessibility [17] criteria, and have the same rating for the categories identified above under Dismissal #2.

Comparing the four-lane low level and the two-lane hybrid bridge designs (shown in Figures 8-11 and 8-14 respectively), two key benefits for Alternative 10 (two-lane hybrid bridge design) are identified that separate these two alternatives. These key benefits are:

- Improves both horizontal and closed position vertical marine clearance (86'± clearance over mean high water, a reduction of approx. 87 percent of bridge openings as noted in Appendix 3) providing reductions in travel time delays; and
- Has reduced capital and life cycle costs.

Based on these two key benefits for Alternative 10, Alternative 8 is dismissed from further consideration. This reduces the number of build alternatives from six to five.

Dismissal #4: Alternative 10 - Memorial Bridge Bicycle/Pedestrian Replacement with Sarah Mildred Long Bridge Replacement Hybrid upstream with 6 percent grade and Alternative 11 - Transit Alternative, Memorial Bridge Closed with Sarah Mildred Long Bridge Replacement Hybrid upstream with 5 percent grade.

After further analysis measured against the goals of the study, two alternatives were determined to be inferior to the remaining five. For the reasons set forth below, Alternative 10 (a pedestrian/bicycle replacement for the Memorial Bridge) and Alternative 11 (transit service in place of the Memorial Bridge) will not be analyzed further.

- Alternatives 10 and 11 do not adequately meet the goals established by the Study process. Specifically, these alternatives (a) would not maintain or improve access to Portsmouth and Kittery downtowns and the Portsmouth Naval Shipyard, (b) would not improve bicycle and pedestrian access across the Piscataqua River, (c) would not maintain or improve emergency evacuation efficiency across the Piscataqua River, and (d) could preclude future transportation alternatives.
- NH DOT indicates it has no funding sources for pedestrian/bicycle bridges or transit services.

[17] Modifications from current design could be readily incorporated to meet ADA accessibility requirements, current design standards, and maintain mid-level marine clearance benefits.

- There is virtually no community support, as evidenced by Stakeholder and local public meetings, for any option that does not include a highway Memorial Bridge replacement.

Therefore, three alternatives (4, 6a and 9) will immediately proceed to further environmental documentation, permitting, conceptual design, estimated cost refinement, funding feasibility and project delivery.

9.4. ALTERNATIVES RECOMMENDED TO BE CARRIED FORWARD

The following three alternatives are recommended to be carried forward:

- Alternative 4: Memorial Bridge Replaced on Existing Alignment and Sarah Mildred Long Bridge Rehabilitated;
- Alternative 6a: Memorial Bridge Replaced on Existing Alignment and Sarah Mildred Long Bridge Replaced on Upstream Alignment (two-lane); and
- Alternative 9: Memorial Bridge Replaced on Existing Alignment and Sarah Mildred Long Bridge Replaced on Upstream Alignment (two-lane) with Hybrid Bridge with 6 percent grade.

A summary of the key advantages and disadvantages of each Alternative is noted below:

Alternative 4: Memorial Bridge Replacement with Sarah Mildred Long Bridge Rehabilitation	
Advantages	Disadvantages
• Maintains/improves mobility to Portsmouth, Kittery, and PNSY	• Rehabilitated Sarah Mildred Long does not fully address lift span reliability
• Improvements to Memorial Bridge: vehicle, bicycle, pedestrian	• No improvement to Sarah Mildred Long Bridge marine vessel clearances in the open or closed position
• Limited resource impacts	• Removal of Memorial Bridge – National Register eligible bridge
• No impacts to local businesses, except during construction	• Traffic impacts from both bridges being closed separately during construction
• Low Life Cycle cost	• No sidewalk on Sarah Mildred Long Bridge
• Maintains current emergency and evacuation access, and bridge redundancy, except during construction	• Does not accommodate bicycles on lift span section of Sarah Mildred Long Bridge (3 foot shoulder)

• Maintains Sarah Mildred Long Bridge – National Register eligible bridge	• Rehabilitation of Sarah Mildred Long Bridge will require additional operation and maintenance investment compared to a new structure

Alternative 6a: Memorial Bridge Replacement with Sarah Mildred Long Bridge Replacement upstream	
Advantages	Disadvantages
• Fully addresses structural deficiencies	• Removal of Memorial and Sarah Mildred Long Bridges – National Register Eligible Bridges
• Maintains/improves mobility to Portsmouth, Kittery, and PNSY	• Greater natural and physical environment impacts
• Improvements to Memorial Bridge (vehicle, bicycle/pedestrian) and Sarah Mildred Long Bridge (vehicle, bicycle)	• Memorial Bridge closed to traffic during construction of new Memorial Bridge
• Improves Sarah Mildred Long Bridge marine vessel clearances – horizontal only	• No sidewalk on Sarah Mildred Long Bridge
• Traffic maintained on existing Sarah Mildred Long Bridge during construction and on new Memorial Bridge	• High Life Cycle Cost
• No impacts to local businesses, except during construction	• No vertical clearance improvement for marine vessels in closed position
• Maintain current emergency and evacuation access and bridge redundancy, except during construction	

Alternative 9: Memorial Bridge Replacement with Sarah Mildred Long Bridge Replacement Hybrid upstream with 6 percent grade	
Advantages	Disadvantages
• Fully addresses structural deficiencies	• Removal of Memorial and Sarah Mildred Long Bridges – National Register Eligible Bridges
• Maintains/improves mobility to Portsmouth, Kittery, and PNSY	• Greater natural and physical environmental impacts

• Improvements to Memorial Bridge (vehicle, bicycle/pedestrian) and Sarah Mildred Long Bridge (vehicle, bicycle)	• Sarah Mildred Long Bridge can only accommodate one mode at a time (rail or road)
• Improves Sarah Mildred Long Bridge marine vessel clearances – vertical (closed) and horizontal	• Rail in road at Sarah Mildred Long Bridge
• Reduction in # of Sarah Mildred Long Bridge openings vs. low level two-lane Sarah Mildred Long	• Memorial Bridge closed to traffic during construction of new Memorial Bridge
• Increases bridge vehicle capacity compared to low-level options	• No sidewalk on Sarah Mildred Long Bridge
• Traffic maintained on Sarah Mildred Long Bridge during construction and on new Memorial Bridge	• High Life Cycle Cost
• No impacts to local businesses, except during construction	
• Maintain current emergency and evacuation access and bridge redundancy, except during construction	

Discussions and recommendations regarding proposed bicycle/pedestrian facilities should be considered during the development of final design plans for each bridge.

9.5. DOCUMENTATION FOR REMAINING ALTERNATIVES

Documentation is an essential component of the NEPA project development process, which supports and complements public involvement and interagency coordination. It is understood that FHWA will determine the level of documentation required for the remaining alternatives.

The following describes the levels of NEPA documentation for Transportation Projects. Transportation project effects can vary from very minor to significant impacts on the human environment. To account for the variability of project impacts, three basic "classes of action" are allowed and determine how compliance with NEPA is carried out and documented:

- An Environmental Impact Statement (EIS) is prepared for projects where it is known that the action will have a significant effect on the environment.
- An Environmental Assessment (EA) is prepared for actions in which the significance of the environmental impact is not clearly established. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a Finding of No Significant Impact (FONSI) is issued.
- Categorical Exclusions (CE) are issued for actions that do not individually or cumulatively have a significant effect on the environment.

Each bridge serves a different purpose (Memorial Bridge – local, Sarah Mildred Long Bridge - Regional) and due to the documented mobility issues with having both bridges out of service at the same time, it is recommended that the remaining alternatives be separated following acceptance of the study findings so that each bridge project may proceed on a separate NEPA schedule. Each of the remaining bridge options appear to have both logical termini and independent utility and may be classified as Categorical Exclusions if the appropriate studies substantiate this classification.

9.6. CONCLUSION/RECOMMENDATION

It is recommended that the remaining alternatives be separated for independent Section 106, Section 4(f), and NEPA analyses. Each of the remaining bridge options appear to have both logical termini and independent utility and may be classified as Categorical Exclusions if the appropriate studies substantiate this classification.

The Maine-New Hampshire Connections Study is a feasibility planning study with no direct FHWA approval or action.

9.7. NEXT STEPS

This Report culminates the feasibility analysis phase of the Maine-New Hampshire Connections Study. A joint Executive Order was issued on October 5, 2010 by the Governors of Maine and New Hampshire to form a Bi-State Bridge Funding Task Force to address the financial challenges involving the Memorial and Sarah Mildred Long Bridge, as well as future work on the I-95 High Level Piscataqua River Bridge (see Appendix 57). The duties of the Task Force are:

- Identify mechanisms that would allow the two states to jointly identify and maximize funding for the replacement, rehabilitation, repair, maintenance, and operations of the three bridges;
- Identify methods to jointly structure financing for the replacement of Memorial Bridge, the replacement or rehabilitation of Sarah Mildred Long Bridge and the repair of the I-95 High Level Bridge;
- Propose such legislation that may be necessary in each state to facilitate the funding structure and other contractual authority for state agencies or authorities consistent with each state's laws; and
- Deliver a report to the Governors of the States of Maine and New Hampshire no later than December 15, 2010 with the proposals and recommended legislation required by the Order.
    - On December 15, 2010, the Task Force delivered a report with the following recommendations:
        - Construct the Memorial Bridge replacement beginning in 2011 using a combination of TIGER II Grant funds, FHWA funds, and MaineDOT and NHDOT Bridge funds;

- Construct the recommended Sarah Mildred Long Bridge option beginning in 2016 using a combination of FHWA funds, NH Bureau of Turnpike funds, Maine Turnpike Authority funds, MaineDOT and NHDOT funds, and Department of Defense funds;
- Create a sinking fund that would be contributed to equally by each state to be used for the continued Capital Repair and Rehabilitation (R&R) of the Sarah Mildred Long and I-95 High Level Bridges, using state and federal funding when necessary to address short falls;
- No recommendation is being made by the Task Force on tolling, which if thought to be necessary would be considered by future Legislatures of the two States;
- Continue to share Operation and Maintenance (O&M) costs for all three bridges equally between the two states. Combine bridge operator duties to significantly reduce operator costs; and
- Revitalize the Interstate Bridge Authority (IBA) to oversee all three bridges and to serve as Funds' Administrator of Sinking Fund. This includes a re-establishment of the IBA, extending its charter to include the High Level Bridge, use the IBA to oversee and manage the Sarah Mildred Long and High Level bridges, and to act as an entity to oversee, manage and distribute monies from the sinking fund. IBA members will be selected from each state.

While the Task Force conducted its work, the Connections Study Report was being finalized. Additionally:

- NH DOT is taking the lead on the Memorial Bridge to:
  - Work with a consultant to conduct environmental documentation to satisfy National Environmental Policy Act, Section 106 (historic) and Section 4(f) (public lands) analyses and documentation.
  - Work with a consultant on a design-build approach to replace the Memorial Bridge.
  - Continue these activities with full public involvement, including Steering and Stakeholder Committees and Section 106 Consulting Parties, similar to what has been done on the Maine-New Hampshire Connections Study.

- MaineDOT is taking the lead on the Sarah Mildred Long Bridge to:
  - Work with a consultant to develop 30 percent design plans and detailed cost estimates for the rehabilitation option and mid-level Hybrid two-lane replacement bridge option immediately upstream. The Connections Report costs prepared by HDR are being used for the upstream low-level, two-lane bridge replacement option.

- Conduct environmental documentation to satisfy National Environmental Policy Act, Section 106 (historic) and Section 4(f) (public lands) analyses and documentation.
- Continue these activities with full public involvement, including Steering and Stakeholder Committees and Section 106 Consulting Parties, similar to what has been done on the Maine – New Hampshire Connections Study.

All of the activities noted above will occur concurrently so as to expedite delivery of the Memorial Bridge construction and determination of final recommended actions regarding the Sarah Mildred Long Bridge. The work is expected to begin immediately.