COMMENTS OF GEORGE MYERS, CHATHAM CITIZEN AND MRB CONSULTING PARTY

Response to MassDOT's Bridge Repair/Rehabilitation Feasibility Study, Bridge Alternatives Evaluation and Life Cycle Cost Comparison and Addendum and the May 17, 2011 Submission of the Friends of the Mitchell River Wooden Drawbridge

Bridge Repair/Rehabilitation Feasibility Study

I agree with the Conclusions and Recommendations of MassDOT's Bridge Repair/Rehabilitation Feasibility Study set forth in Section 7.0 of the Study (pp. 55-57), particularly in view of the $9.4 million cost to repair the MRB for an expected service life of only 10-20 years and the $4.9 million cost to rehabilitate the MRB for an expected service life of only 20-30 years. In addition, because neither repair nor rehabilitation of the MRB will meet the 75-year design life specified in the *AASHTO LRFD Bridge Design Specifications* and in MassDOT's *LRFD Bridge Manual* 2.1.2, in my opinion, it would not be prudent nor in the financial interests of the Town of Chatham to proceed with either the repair or rehabilitation alternative.

MassDOT's determination of the expected service life of a repaired or rehabilitated all-wood MRB is consistent with the actual service lives of the original 1871 wood MRB and the several wood redesigns and reconstructions of the MRB since 1871. The service lives of those reconstructions are generally: 1871-1907 (36 years); 1907-1925 (18 years); 1925-1949 (24 years); 1949-1980 (31 years) and 1980-2011 (31 years). Those service lives do not take into account the many costly and sometime extensive additional repairs made to the several reconstructed versions of the MRB over its 140 year life span.

I also agree with MassDOT's determination that neither repair nor rehabilitation of the MRB is a prudent alternative, and that complete replacement of the bridge will provide "a more cost effective long-term solution that better addresses future maintenance, functional and safety concerns including navigation that can also address the historical significance of the bridge." Study at p. 57.

Bridge Alternatives Evaluation and Life Cycle Cost Comparison and Addendum

At the May 17, 2011 Section 106 meeting, MassDOT tentatively indicated its support for the Alternative 3 design with a substantially all-timber superstructure and a steel and concrete substructure. On May 31, 2011, the Chatham Board of Selectmen voted 4-1 to send a letter to MassDOT supporting the Alternative 3 design as historically appropriate and an acceptable compromise between the all-timber or substantially all-timber Alternative 1, 1A, 1B and 2 designs and the Alternative 5 concrete and steel design with timber walkways, guardrails and timber cladding. The Board rejected a proposal by the

dissenting selectman to specify the Alternative 1B design as a “suitable substitute for Alternative 3.”

The Alternative 5 design, in my opinion, still best serves the requirements of longevity, navigation and fiscal responsibility and reasonably honors the historical evolution of the MRB since the first bridge was built in 1871. To most casual observers, tourists and many Chatham residents, a bridge constructed according to the Alternative 5 design will appear to be identical to the existing MRB, except for the absence of the sheave poles, sheaves, cables and lift machinery. The water view of the Alternative 5 bridge will be substantially identical to the water view of the Alternative 3 and 4 designs, except from beneath the bridge.

The Alternative 5 substructure with its concrete-filled tubular steel pilings can also be made to look virtually identical to the creosoted timber pilings of the existing MRB by applying a black coating to the steel tubes, such as coal tar epoxy or another acceptable corrosion protective coating.

I also propose increasing the shoulders of the alternative selected by MassDOT to 4-feet from 2-feet to provide a safer accommodation for bike traffic on the MRB. It is puzzling that Chatham’s Bikeways Committee did not welcome and approve MassDOT’s originally proposed 4-foot bike lanes, despite the present lack of bike lanes on Bridge Street. Notably, the Bikeways Committee has included Bridge Street and the MRB as part of its Shore Road Bike Spur in Chatham according to the draft of its Bikeways Committee Working Map of 2009. Moreover, as the Committee itself has noted, long term plans include bike lanes on Bridge Street. In view of those long term plans and the inclusion of Bridge Street and the MRB in the Shore Road Bike Spur, it is shortsighted not to include 4-foot bike lanes on the MRB replacement. A 4-foot shoulder on each side of the bridge, even if not formally designated as bike lanes, would be substantially safer for cyclists who occasionally stop on the bridge to photograph or enjoy the view of Stage Harbor or watch the fishermen on the bridge walkways.

Alternative 5 is the only one of the seven alternative designs that has a crowned roadway (1/4” per foot from center) to provide for water runoff. All of the timber roadway alternatives (1, 1A, 1B, 2, 3, and 4) have a wooden decking with a level surface in cross-section (zero cross grade). The wooden decking comprises a 3” thick wood wear surface fastened to a 5 1/8” laminated wood (GLULAM) deck with no apparent provision for water runoff, except longitudinally of the bridge, and no apparent drainage for water that seeps into and is retained in the interface between the wear surface and the GLULAM deck. This type of wooden decking was cited as a primary reason for the deterioration of the wooden decking on the existing MRB. See the Bridge Repair/Rehabilitation Feasibility Study at pp. 13-17.

If a design other than Alternative 5 is selected by MassDOT, in view of the likelihood of rapid deterioration of the two-layer wooden deck structure on the bridge approach spans, it would be appropriate for MassDOT to consider a modification of the deck structure for that other alternative. Such modification could comprise, for example, a

simulated timber, crowned concrete or asphalt wear surface over the GLULAM deck rather than the 3" timber wear surface, assuming that combination is a technically acceptable design.

A bridge similar to Alternatives 3 and 4 with a modified decking described above was recently constructed by NHDOT across Seavey Creek, a tidal saltwater creek in U.S. navigable waters, in Rye, NH. The Seavey Creek Bridge was a National Register eligible, all timber bridge that was replaced in May 2009 with "a hybrid timber/concrete/steel bridge." The entire 45-page "Environmental Study Section 4(f) Evaluations" prepared by NHDOT in June 2007 is very instructive regarding the Section 106 and Section 4(f) processes with respect to replacement of a NR eligible timber bridge. The Study and Evaluations ("NH Study") can be found on the internet at: http://www.nh.gov/dot/org/projectdevelopment/environment/documents/13269_es.pdf.

At page 2 of the NH Study it is stated that: "The existing bridge deck is constructed with no cross slope and no mechanism for road draining. To facilitate deck drainage, a cross slope, created by a variable depth asphalt overlay, would be constructed [,] along with no curb, to allow the free fall discharge of roadway runoff along the entire bridge length." In the bridge cross section of Exhibit 6D of the NH Study, the asphalt wear surface is shown applied directly to the upper surface of the prefabricated, dowel-laminated wooden deck panels.

Although it is worthwhile to review the entire NH Study, of particular relevance to the present Section 106 and Section 4(f) proceeding regarding the Mitchell River Bridge project are the following:

1. Except for the draw span, the Seavey Creek Bridge is remarkably similar in length, width, environment, design and use as the Mitchell River Bridge (NH Study pp.2-3, 6-7);
2. The new Seavey Creek Bridge is supported on concrete filled steel piles coated with a black 3-coat paint system (NH Study pp. 3, 11, 27);
3. The Natural Resource Agencies stated that they would not grant wetlands permits if the proposed bridge structure included "treated wood pilings in the tidal waters" (NH Study pp. 2-4, 11);
4. The Adverse Effect Memo concluded that replacement of the Seavey Creek Bridge would have an adverse effect on the bridge, but that the adverse effects would be minimized and mitigated by replacement of the bridge with a structure similar in appearance to the existing bridge (NH Study p. 44);
5. The new Seavey Creek Bridge is provided with an 11-foot travel lane and a 4-foot shoulder (for bike travel) in each direction of travel and two 5-foot sidewalks on each side of the bridge separated from the travel lanes by a wooden crash railing (NH Study pp. 2, 8).

See the attached photos of the completed Seavey Creek Bridge.

Should MassDOT select any of the Alternative 1, 1A, 1B or 2 designs that include preservative treated wooden pilings in tidal waters, the Massachusetts natural resource agencies may determine (as the New Hampshire agencies did in the case of the Seavey Creek Bridge) not to permit the MRB project, which will cause further delay and perhaps redesign of the bridge. MassDOT and its consultant URS have recognized this possibility in light of, among other things, the September 18, 2009 letter to URS from the Massachusetts Division of Fisheries & Wildlife in Appendix D of the Bridge Alternatives Evaluation. MassDOT and URS have specifically noted that there is a risk that timber piles with preservative treatments will not be permitted for this project. See, e.g., Bridge Alternatives Evaluation pp. 3, 8, 31-32. Because of that risk, the Alternative 1, 1A, 1B and 2 designs are not appropriate and should not be selected by MassDOT for the MRB project.

The Alternative 1, 1A and 1B designs incorporate a cable/pulley operating system with two sheave poles, a very large diameter (45") deflector sheave at the top of each pole, wire rope and two electric winches for operating an all timber bascule span. The entire cable/pulley bascule span operating equipment is exposed to the weather, unlike the weather protected, direct drive operating equipment for the span proposed for the remaining Alternatives 2, 3, 4 and 5. I agree with MassDOT's analysis of disadvantages of the cable/pulley operating system and the advantages of the direct drive operating system as set forth on page 26 of the Bridge Alternatives Evaluation report.

As between Alternatives 3 and 4, it was noted at the May 17, 2011 Section 106 meeting that visually there is very little difference between those two alternatives. In addition, the Bridge Alternative Evaluation states that "Alternatives 3 and 4 are virtually equal to each other in construction cost, life-cycle costs, and in meeting project design criteria. However, Alternative 3 provides a slightly more context sensitive solution than Alternative 4 with the use of approach span timber stringers in lieu of approach span steel stringers." Nevertheless, of those two alternatives, I agree with MassDOT's conclusion that Alternative 3 is the better choice because of the more context sensitive use of timber stringers rather than steel stringers and the slightly better cost analysis for Alternative 3, especially the potential $190,000 to $484,000 cost savings for Chatham.

The 91-Page Submission of the Friends of the Mitchell River Wooden Drawbridge

At the May 17, 2011 Section 106 meeting, the Friends of the Mitchell River Wooden Drawbridge submitted a 91-page document criticizing as "incorrect," "unfair" and "exaggerated" many of the statements and conclusions of MassDOT's Bridge Repair/Rehabilitation Feasibility Study and Bridge Alternatives Evaluation and Life Cycle Cost Comparison. The Friends also accuse MassDOT of prejudice against a timber replacement for the MRB. I disagree with the Friends' criticisms and responded to a number of them at the aforementioned May 31, 2011 Chatham Board of Selectmen's meeting. To the extent my responses at that meeting are relevant to MassDOT's reports, I have included them below.

In Section VI of its submission, the Friends take MassDOT to task for not including information in its reports about a wood pile product treated with chromated copper arsenate (CCA) and wrapped with a fiber-reinforced polymer. That product is made under the trade name Strong-Seal® by Wood Preservers, Inc., a small, privately-owned lumber treating and landscaping company located in Warsaw, Virginia. Based on the company's website, Strong-Seal® piles were first produced in 2002, less than 10 years ago and have been used primarily for private piers, docks and seawalls and for residential and commercial utility poles. Neither the company's website nor the Friends submission gives any life cycle information for the Strong-Seal® product and makes no claim that it has ever been used for vehicular bridge pilings. Apart from any other reason for not using preservative treated wood pilings for the MRB replacement, using a product like Strong-Seal® for the MRB pilings is what MassDOT's Mr. Shoukry Elnahal characterized as an "experimental project" that MassDOT will not engage in with ABP funding.

In Section VII, the Friends contend that MassDOT has exaggerated the service life of steel and concrete pilings apparently based solely on electrolysis problems associated with steel pilings at the Chatham Fish Pier. MassDOT's Alternatives 3, 4 and 5 are all designed with concrete-filled tubular steel pilings in the water. These are the same type of standard pilings that have been used in FHWA and other state DOT bridge projects for many years in countless bridges constructed in both salt and fresh water. See, e.g., the discussion above regarding the pilings for the Seavey Creek Bridge. The pilings supporting the designed 150-year service life Skyway portion of the San Francisco-Oakland Bay Bridge are 8 ½ foot diameter steel tubes driven 300 feet deep into the bottom of the bay, then cleaned out and filled with steel and concrete. The caisson foundations of the Tappan Zee Bridge built over the Hudson River in the 1950s are supported on concrete-filled steel tubes. The Union Pacific Railroad Bridge over the Salt River in Arizona is supported on 105-year old concrete-filled steel tubes. There are other examples too numerous to list here of the greater longevity of this commonplace bridge construction technology over preservative treated wood pilings.

The Friends' claim of MassDOT's alleged "prejudice against a timber drawbridge" in Section III is unfounded. At the May 17 meeting, MassDOT tentatively supported the Alternative 3 design, which has an all timber superstructure. In addition, with respect to the substructure pilings, MassDOT has repeatedly explained that, based on its experience, sound engineering practices, potential permitting problems and the required 75-year service life of the MRB, the use of preservative treated wood pilings in the water is not a recommended alternative for replacement of the MRB.

Conclusion

For the reasons set forth above, I continue to support the Alternative 5 design for the MRB. With an appropriate solution to what I perceive to be a potential retained moisture problem with all the remaining alternatives, I would support either one of the Alternative 3 or 4 designs if selected to advance under NEPA. I do not support any design,

including the Alternative 1, 1A, 1B and 2 designs, that has a timber substructure in the water. I also do not support any of the Alternatives 1, 1A and 1B for the further reason that those designs incorporate a weather-exposed cable/pulley operating system rather than a weather-protected direct drive operating system.

Respectfully,

George Myers
MRB Consulting Party

SEAVEY CREEK BRIDGE – RYE, NH 2009

Refurbished Seavey Creek Bridge opened in May 2009. Now eight feet wider than the all timber bridge it replaced with allowance for two 4-foot bicycle lanes, the bridge on Route 1A at the north end of Odiorne State Park also has a five-foot wide walkway with a 42-inch high rail (top photo). Piles are concrete-filled steel tubes painted with a black corrosion resistant coating (bottom photo). Structure should be free of major repairs for at least 50 years, according to the New Hampshire Department of Transportation