Doing Business Differently — Using a context-sensitive approach to design for unique settings.

Artist's Rendering of View from Proposed Mitchell River Bridge , Chatham

The preliminary design of the Mitchell River Bridge has been greatly shaped by public involvement. It's an example of how MassDOT's Accelerated Bridge Program (ABP) puts safety first while identifying and meeting important cultural needs by reaching out to the community.

Public information meetings, public hearings and small group meetings such as those held and to be held for the Mitchell River Bridge Project are a vital part of the ABP's project planning process.

Public information meetings provide the design team with valuable feedback early on in the design process— where it can have the most effective impact.

Transparency and accountability are among the primary goals of the ABP. MassDOT's website provides a large amount of program and project information. The latest news can be found on MassDOT's blog and Twitter. The latest photos can be found on Flickr. Links to these site are at the bottom of MassDOT's home page.

Visit us at mass.gov/acceleratedbridges

Accelerated Bridge Program Goals and Objectives

- To improve the Conditions of the Commonwealth's Bridges
  - Reduce the number of structurally deficient bridges
  - Improve the overall Bridge Health Index of Massachusetts Bridges
- To stimulate economic development and job creation
  - Create thousands of jobs across the Commonwealth
- To save money by completing projects sooner
  - Repair bridges now before further costly deterioration can occur
  - Hedge against construction cost inflation
- To complete projects efficiently and innovatively
  - Complete projects on time and on budget
  - Complete projects with minimum disruption to people and commerce
  - Use Design-Build and other innovative contracting techniques
  - Focus on preservation and other strategies to improve the long-term condition of all Massachusetts bridges
- To provide transparency and accountability
  - Provide frequent & detailed reports to the public on the progress of the ABP
  - Develop overall project controls to ensure adherence to project schedules and budgets
  - Measure agency performance in streamlining design & construction schedules

Commonwealth of Massachusetts

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Doing Business Differently

Context-Sensitive Solution for Mitchell River Bridge

The Mitchell River Bridge in Chatham, Mass.

All images courtesy of URS

Bridge Owner: Town of Chatham

Project Owner: MassDOT

MassDOT Project Managers: Stephen Soma & Harry Louis-Jacques

Design Consultant: URS

Project Info #: 603690

Structure Description: Chatham—Bridge Replacement, C-07-001, Bridge Street over the Mitchell River

To learn about upcoming meetings and hearings or to see PowerPoint presentations for Accelerated Bridge Program projects, go to www.mass.gov/acceleratedbridges

The Massachusetts Department of Transportation's Highway Division is currently in the preliminary design stage of a project to replace the structurally deficient Mitchell River Bridge in Chatham as part of the Accelerated Bridge Program. The 29-year-old timber drawbridge carries pedestrians, cyclists and motor vehicles along Bridge Street over the Mitchell River. It opens to allow boat passage between Stage Harbor and Mill Pond. It is also enjoyed by people of all ages who fish from its walkways.

Since the existing bridge is made of timber, it has unique visual qualities, but is subject to rapid deterioration and requires frequent maintenance. In replacing this bridge, MassDOT is seeking to echo the aesthetic qualities of the existing bridge while providing the community with a safe, reliable bridge that is better able to meet the varied needs of its users and that will have a life span of at least seventy-five years. The goal is to provide a context-sensitive bridge— one with an appearance that is appropriate to its environment, one that provides the services the community values, meets up-to-date safety access and durability requirements, and that takes advantage of current technology and engineering practices.

To identify the preferences and values of the community regarding the Mitchell River Bridge, MassDOT has met with town officials and held two public information meetings at the Chatham Community Center. At the public information meetings, MassDOT presented a summary of the existing structure's deficiencies, site constraints, and basic design considerations. Preliminary conceptual design sketches were presented in order to assess the community's reaction and preferences.

At the first public information meeting, which was held on September 3, 2009, MassDOT presented two drawbridge designs for public comment. The first was a Dutch-style bascule bridge with an open pier and an overhead counterweight. The second was a trunnion bascule bridge— it has a closed pier and a below-deck counterweight. Both designs included single-leaf draw spans, meaning that one portion of the deck opens vertically as if on a hinge, just like the existing bridge. Both designs had a three-span concrete approach, with concrete deck

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and timber railing. The timber railings in these designs did not extend to cover the exterior façade of the deck.

After the initial presentation, many members of the community expressed a strong desire for the future bridge to have aesthetic qualities similar to the existing timber bridge. MassDOT took the public's feedback into consideration as it adjusted the plans to better reflect the character of the existing bridge. Use of timber was increased and stone facing was added to cover the concrete bascule piers and abutments. Since many members of the community expressed a preference for the visual appeal of spans and piers, the number of spans and piers was increased from three to five. In accordance with the community's opinion regarding drawbridge types, the counterweight for opening and lowering the draw span was changed to be concealed beneath rather than exposed atop the roadway. Since cyclists expressed the need for safer shared use of the road, shoulders were added to both sides of the roadway.

At the second public information meeting, held on November 19, 2009, MassDOT presented two design options which were revised to address issues identified in the first meeting.

Roadway view of bridge in Option 2

Current roadway view of bridge

Both options presented have closed piers so that the counterweight and mechanism for raising and lowering the draw span will be hidden. Both options have steel pipe piers and hot mix asphalt road surfaces. In order to retain the feel and look of the existing bridge in Option 1, the bascule piers have stone facings and the walkways feature a timber railing which extends to completely cover the roadway façade.

The preliminary design presented as Option 2 is a combination of three structures— it is a concrete vehicular bridge flanked by two independently-supported, 100% timber sidewalk structures. Option 2 has the same widened roadway and sidewalk dimensions as Option 1. It also has stone-clad bascule piers and a concealed counterweight. The look of the vehicular portion of the Option 2 bridge is similar to the Option 1 design, but it has the additional timber structures along its sides.

The Mitchell River Bridge is frequented by pedestrians, cyclists, and fisherman who all expressed the desire for enhanced usability and increased safety. Both options provide access to all users in accordance with the Americans with Disabilities Act. Fishermen, cyclists, and pedestrians will have more space to enjoy the bridge, and the space will be better protected from vehicular traffic. Options 1 and 2 feature wider walkways, the addition of shoulders, and crash-tested railings, all of which will result in much safer and more pleasant shared use of the bridge.

All options presented at the second public information meeting addressed the boating community's need to improve clearance and channel width for passage of nautical traffic. We are happy to say that our preliminary design plans fulfill the desires of the boating community by including a fully-opening draw span with unlimited vertical clearance and a wider channel. This will allow for greater ease of navigation and use by a wider range of boats. In addition, the deteriorating fender will be replaced, and a new navigational lighting system will be provided to increase safety and to make sure that all the requirements of the United States Coast Guard are being met.

MassDOT is further revising their preliminary plans based upon feedback given during the second public information meeting and its meeting with town officials. Timber is being increased as a design element in order to better echo the aesthetic of the existing bridge. In response to concerns about speed, traffic calming measures are being considered for possible incorporation into the deck design. MassDOT is also investigating the possibility of an all-timber bridge design to have the 75-year service life required by the Accelerated Bridge Program. MassDOT's design guide, used for all projects, has won numerous awards, including AASHTO's 2006 Excellence in Context Sensitive Design Award and the 2006 Outstanding Achievement Award from the National Conference on Preservation of Historic Roads.

The design resulting from MassDOT's current revisions and investigation will be presented at an upcoming public hearing at a date to be announced in early 2010. The date of the public hearing will be announced on the MassDOT website and in a local newspaper.

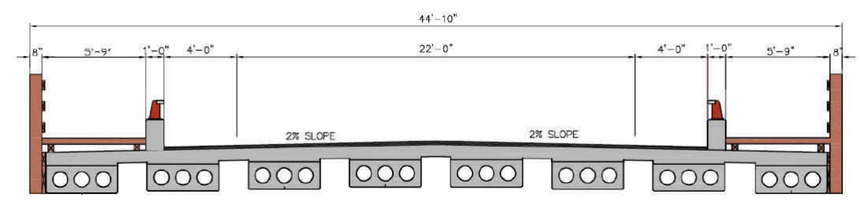
Context-Sensitive design

Existing Conditions, Mitchell River Bridge

Both proposed design options, below, extend the timber railing and enhance the appearance of the abutments by adding stone cladding.

Rendering of Option 1 Elevation.

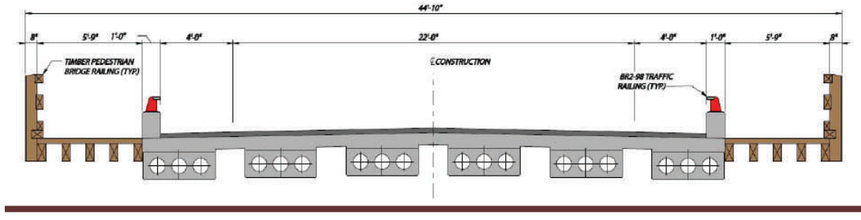
Option 1 features stone-clad abutments and bascule piers as well as timber walkways and railings attached to the main structure.



Option 1 Cross Section

Rendering of Option 2 Elevation.

In this option, the timber walkways are two additional structures. The roadway bridge features the same stone cladding as Option 1.



Option 2 Cross Section. Note that the timber walkway is a separate, but attached structure, while the overall dimensions are maintained.