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### Project Objective

- The objective of the Mitchell River Bridge Project is to remove a structurally deficient bridge from the *Structurally Deficient Bridge List* by providing a structure that meets the latest LRFD design code and current safety standards

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### Project Studies

- Bridge Repair and Rehabilitation Feasibility Study
  - Evaluates Repair & Rehabilitation Alternatives to avoid replacement of the existing structure
- Alternatives Evaluation and Life-Cycle Cost Comparison
  - Evaluates 5 distinct options, with 2 variations for all-wood construction (supplemental)

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### Definitions

- Repair
  - Work needed to restore an element to its original condition
  - Is not intended to correct defects or provide any upgrades to satisfy current design standards
- Rehabilitation
  - Work needed to correct defects and provide upgrades to satisfy current standards

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### Evaluation Criteria

- Satisfy AASHTO loading requirements
- Satisfy current safety standards
- Make accessible for all users (ADA)
- Maximize channel clearance
- Provide for a service life of 75 years
- Be low-maintenance & easy to operate
- Avoid counterweight submergence
- Be context-sensitive

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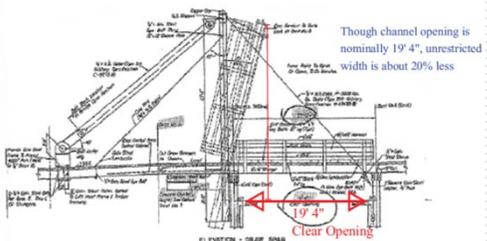
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### Existing Bridge Opening



Excerpt from 1980 Plan Set

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Open Bridge



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Bascule Span Collision Damage



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ADA and Open Machinery Issues



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### Accessibility



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### Bridge Inspection Report (BIR)

NO.	DESCRIPTION	DEF.	NO.	DEF.	NO.	DEF.		
58	DECK	6	59	SUPERSTRUCTURE	6	60	SUBSTRUCTURE	4

ITEM 58	6	ITEM 59	6	ITEM 60	4
DECK	DEF	SUPERSTRUCTURE	DEF	SUBSTRUCTURE	DEF

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### Substructure BIR Remarks

**Item 60.3.a - Pile Caps**  
 The timber pile caps typically have up to 1/16" wide checks on all surfaces. Isolated timber caps have 1/8" to 1/4" wide checks which measure up to 3'-0" long. The south end of the pile caps at bents 3 and 4 exhibit full height splits that extend to the first pile (see photo 15).

**Item 60.3.b - Piles**  
 The timber piles typically have heavy marine growth with minor to moderate brooming and section loss in the tidal zone. Isolated piles exhibit heavy brooming and advanced section loss in the tidal zone, with up to 1 1/2" deep by full circumference areas of soft, punky timber (see photo 16). Above the tidal zone, the piles have vertical checks up to 1/8" wide at random locations. Random piles throughout have had a section removed from the upper portion of the pile, typically 3" deep by 2'-8" high.

**Item 60.3.c - Diagonal Bracing**  
 (DEF-S/A) The diagonal timber bracing for each individual pile bent generally exhibits moderate to heavy deterioration and section loss in the tidal zone. The worst cases are at the north end of bent 5 and the south end of bent 3 where there are 5'-0" sections of the bracing which have completely deteriorated (see photo 20).

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Failed Deck Area - Underside View



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Deterioration at End of Bascule



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Bascule Span Toe Misalignment



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Worn Deck, Protruding Knots and Nails



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Cracking and Deep Spall at East Abutment



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Heavy "Brooming" and Advanced Section Loss



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### Vertical Split in Wood Pile



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### Failed Diagonal Bracing



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### Conclusions: Repair

- Repairing the bridge will not meet the basic project objectives
  - Remove the bridge from the *Structurally Deficient Bridge List*
  - Satisfy the LRFD Design Code
  - Correct safety deficiencies
  - Become compliant with the Americans with Disabilities Act (ADA)

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Conclusions: Rehabilitation

- Rehabilitation is not a practical solution because in order to satisfy the Project Objective, the bridge would essentially have to be replaced

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R&R Study Final Conclusions

- MassDOT determined that advancing the Repair or the Rehabilitation Option is not prudent

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5 Replacement Alternatives

- Alt 1 – All Wood Replacement/Replication 19' channel
- Alt 2 – All Wood Bridge w/Concrete & Steel Bascule Span, 25' channel
- Alt 3 – Wood Superstructure on Concrete/Steel Substructure, 25' channel
- Alt 4 – Wood Deck on Steel Beams and Concrete/Steel Substructure, 25' channel
- Alt 5 – All Concrete/Steel Replacement Structure, 25' channel with wood features

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### Supplemental Evaluation

- After MassDOT/FHWA comments, 2 additional alternatives were developed for “apples to apples” comparison
  - Alternative 1A – All Wood Bridge with 25’ span
  - Alternative 1B – All Wood Bridge with 25’ span and protective pier

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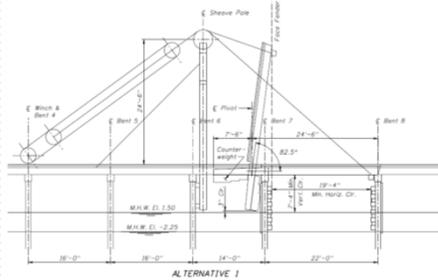
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### Alternative 1 Bascule Span



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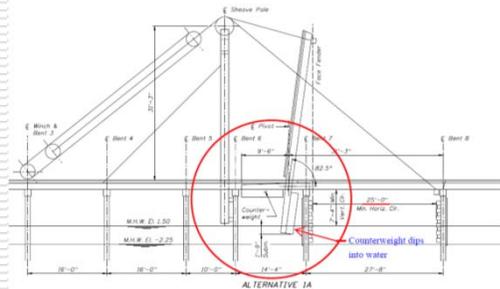
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### Alternative 1A Bascule Span



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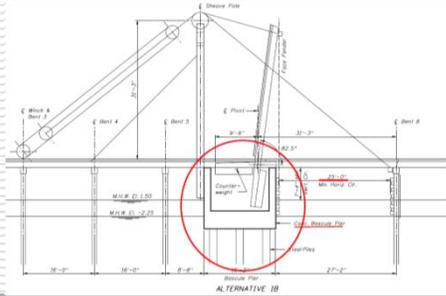
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### Alternative 1B Bascule Span



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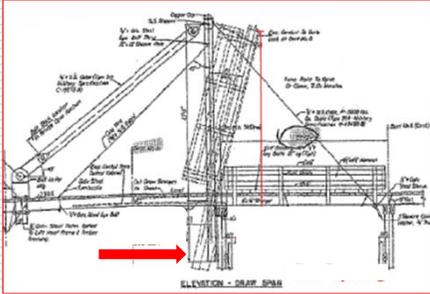
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### Counterweight Position



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### Corroded Counterweight



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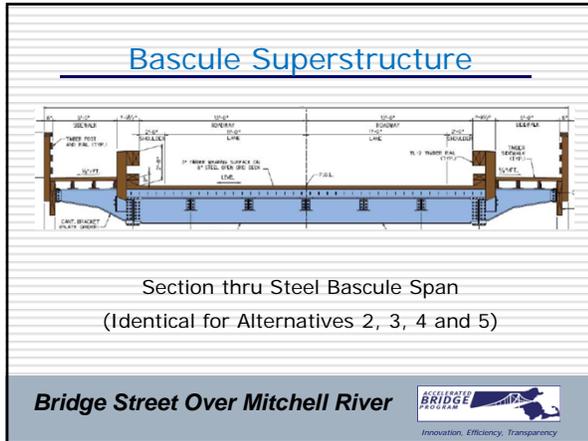
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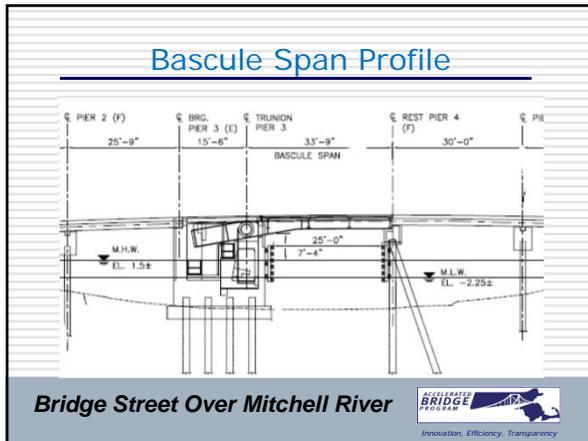
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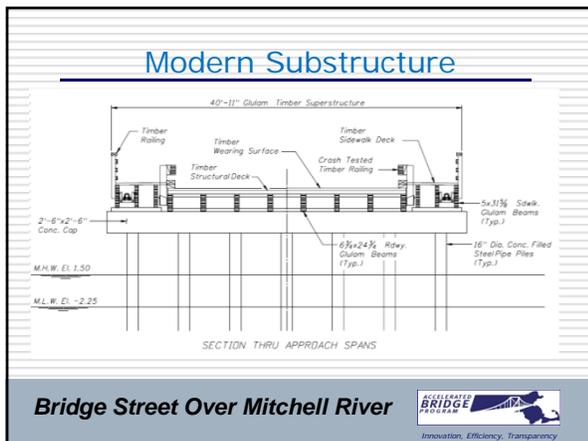
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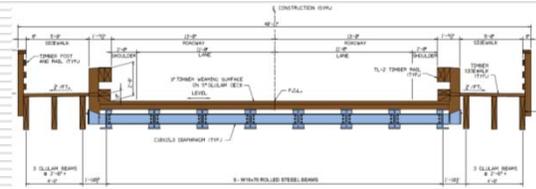
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### Alternative 4 Superstructure



Wood Deck with Steel Beams

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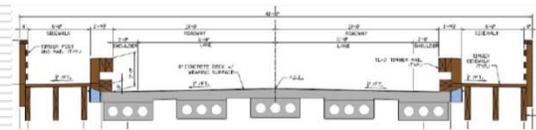
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### Alternative 5 Superstructure



Section thru Approach Span

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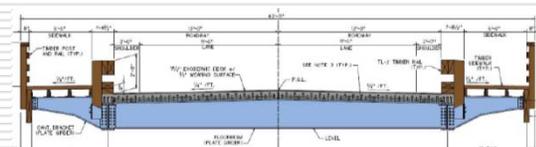
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### Alternative 5



Section thru Bascule Span

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### Sheave Poles Outboard of Bridge



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### Alt's 3-5 Profile Simulation



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### Technical Factors Considered

- Roadway Function and Safety
- Context Sensitivity
- Navigation Function & Safety
- Initial Construction Cost
- Life Cycle Costs
- Maintenance & Service Life
- Environment/Protected Resources

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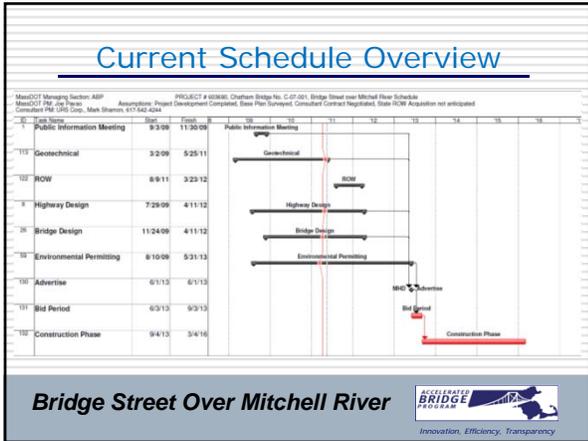
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### Comments/Questions

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## Next Steps

- Written comment period for Consulting Parties of 2 weeks
- MassDOT/FHWA to address comments
- MassDOT requests Class of Action and selects Preferred Alternative to advance under NEPA
- Make affect finding under Section 106
- Public Information meeting to solicit comment on selected alternative
- Continue coordination with Consulting Parties regarding Section 106 mitigation measures
- Complete Design and Permitting – Construction Advertisement Date May 2013

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