Historic Approval of the Dunn Bridge

Presented by:
Bruce Cochran, Mille Lacs County
Brandi Popenhagen, WSB & Associates, Inc.
Project Context

TH 95 Bridge

Dunn Bridge
Project Context

- PM NB Queue extended past south intersection - no right turn lane due to bridge width
- Both bridges structurally deficient
Historic Significance

- **Mn/DOT 2006 Historic Bridge Inventory**
  - Bridge is eligible for National Historic Registrar due to aesthetic features

- **Concrete Structure – Beaux Arts Style – Constructed in 1931**

- **Dunn Memorial Bridge - Robert C. Dunn**
  - Father of Good Roads
  - MN House of Representatives – created the Highway Commission
Historic Significance

2010 photo – pre construction (1931 bridge)
Historic Preservation Act – Sec. 106

- Only applies with a Federal “action”
  - Army Corp of Engineers Permit – Section 404
    - Worked with Brad Johnson (Archeologist) from COE, St. Paul
  - Note: No FHWA funds
    - No involvement with Mn/DOT Cultural Resource Unit
Working through the Process...

- **Time Constraint**
  - Public Involvement with community and businesses including area Historical Society – 2008/2009 This was SIGNIFICANT
  - Began involvement with COE – October 2009
    - COE typically doesn’t get in involved until permitting unless a NEPA study is underway
    - However, permitting is too late to try to work through issues with Sec. 106
  - Construction May 2010 – November 2010
Working through the Process...

- Construction Impacts
  - Two Bridges down for one construction season
  - More than 10 mile detour
  - Emergency response and impacts to area businesses a significant concern
Working through the Process...

- Structural Analysis Reports for COE
  - Structurally Deficient – 39.6 out of 100
  - Functionally Obsolete
  - Memos regarding significant structural issues by three different structural engineers –
    - Scour critical
    - Delamination of deck, railing, girders, piers, and abutments

In summary, we believe there is no rehabilitation scenario that can remove the scour susceptibility of the bridge. The most frequent cause of structural failures in Minnesota Bridges is scour. Leaving the existing bridge in place with spread footings would place an undue liability on Mille Lacs County and would not serve the publics best interest. If you have any questions, please feel free to contact me at __________.

Source: WSB Memo, February 3, 2010
Working through the Process...

- Rehabilitation
  - Typical rehabilitation would not remove the scour critical nature of the bridge
  - Piling would need to be added to the existing spread footings which were placed directly on the soil
  - In order to add piling the entire bridge would need to be removed
  - Has never been done before since it is deemed not economical or technically feasible – asked local bridge contractor (Lunda)
  - Adding piling could also potentially increase the scour susceptibility
Working through the Process...

**Traffic Analysis**

- Existing traffic back-ups into downtown during PM peak hour
- Future (design year -2030) back-ups during peak hours (COE less convinced with this)
- Roundabout design reduced overall bridge width
Working through the Process...

- Alternatives Analysis
  - Adding a new adjacent bridge
  - Adding a new crossing in a new location

Source: WSB Bridge Replacement Memo
1-13-2010
Working through the Process...

- Public Involvement
  - Public support for replacing the bridge was obtained very early on
  - Bridge replacement design helped to obtain public support
  - Solved the traffic problem
Working through the Process...

- Mitigation
  - Memorandum of Agreement
    - Historical narrative and pictures
    - Salvage bridge railing and use it to build a Bridge Memorial / Story Board
    - Reuse bridge monument in new bridge