Minnesota Timber Bridge Maintenance and Construction – A County Perspective

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UMD/St. Louis County, Minnesota Cooperation

- Training
- Inspections
  - Advanced inspection equipment
  - Hands-on and cooperative
- Research
  - Vibration monitoring approach
  - Load testing
St. Louis County Background

- **Total Size**: 6,860 miles$^2$ (17,767 km$^2$)
- **Land**: 6,225 miles$^2$ (16,123 km$^2$)
- **Water**: 635 miles$^2$ (1,644 km$^2$) 9.25%
Bridge Inventory

- 568 Bridges
- ~100 Timber Bridges
  - Timber girders or stringer
  - Panelized dowel laminated
    - Wheeler Consolidated bridges
  - Timber deck with steel girders
Public Works Structure

Engineering
- Bridge Engineer
- 5 technicians
  - Inspections
  - Design for contractors & maintenance
  - Survey/topos

Maintenance
- Superintendent
- 2 four-man crews
  - Routine maintenance
  - Significant repairs
  - New construction
Bridge Program – Inspections

- Lots to do, not enough time
  - 170 every 12 months
  - Remainder on 24 month schedule

- Recent purchase and use of
  - Stress wave timers
  - Resistance microdrills
Bridge Program – Maintenance / Repairs
Bridge Program Replacement

- Decision factors
  - Cost, site, span length, staffing
- Designs
  - Dowel laminated slab span
    - Panel-Lam from Wheeler
    - Copper naphthenate
    - Steel pilings
Recent Activity

- **2010** Superstructure replacement Bridge 184
- **2009** Replacement Bridge 85.
- **2008** Superstructure replacement Bridge 53; Nichols Lake
- **2007** Repairs to two bridges to replace pile caps and partial repairs to pilings
Bridge 53

- Steel girders with timber deck, timber pile caps and pilings
- 1964
- 22 ft span
- Restricted load ratings
Bridge 85

- 1946
- DF girders
- SYP pilings
- Timber deck
- Creosote
- 40 ft
- 2 spans
- 2 lanes
Summary

- Timber will continue to be used on shorter spans
- Currently using Wheeler Panel-Lam systems installed by their own crews
- Steel pilings will be used for all replacements
- Ongoing emphasis on maintenance/repair
- Strategic research partnership with UMD is a priority
Acknowledgments