Historical Review
15 Year US Forest Service Timber Bridge Program Demonstration/Technology Transfer Perspective

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Purpose of Presentation:
- To provide an overview of the USDA Forest Service’s Wood In Transportation Program from a Demonstration/Technology transfer perspective.
- 1989 thru 2004
WOOD IN TRANSPORTATION

Key Topics

A. Background and Related Items
B. Research
C. Demonstration Projects
D. Technology Transfer
Key Topic

A. Background and Related Items
Focus:

- To revitalize local economies by finding means and methods for using local wood, particularly under-utilized wood, for highway bridges and related applications
- Improve Stewardship of our Nation’s forest
Recycling Municipal Trees
A Guide for Marketing Sawlogs from Street Tree Removals in Municipalities
Budget

$2.4 million early years of program
$1.7 million in middle years
$1.0 million towards the end of program
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Partnerships

- County & local gov’ts
- State & federal gov’ts
- Universities
- Resource Conservation and Development Councils
- Private industry
- Foreign governments & organizations
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Program Components:

- Research
- Demonstration Projects
- Technology Transfer
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Key Topics

B. Research
Key Topics

C. Demonstration Projects
Demonstration Projects

Annual Competitive Grants Program
About $750,000 per year
Request for Proposals
Review & selection process
Implementation
Projects selected for funding are based on:

- structural adequacy
- longevity
- serviceability
- environmental sensitivity
- economics
- approved design standards
Demonstration Projects

- Emphasis on using local timber species, ie. hardwoods in eastern US and secondary softwood species
- Hardwoods – red maple, red oak, cottonwood, mixed hardwoods, black locust
- Secondary softwoods – red pine, ponderosa pine, eastern hemlock, yellow-cedar, white spruce
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Demonstration Projects

- Single Structure Projects
- Special Projects
- Commercialization Projects
Single Structure Projects

- Vehicular Bridges
  over 200 projects funded

White County, GA, southern pine glulam timber bridge
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Single Structure Projects

- Pedestrian Bridges
  over 100 projects funded

2002 Olympic Pedestrian Bridge
Heber City, Utah
2002 Olympic Pedestrian Bridge
Heber City, Utah

Specifications:
- Year Constructed: 2001
- Length – 125 ft. Width – 12 ft.
- Design Live Load: 85 psf
- Wood Species: Coast Douglas fir
- UME supplied glulam/FRP beams
Rattlesnake Creek Bridge, Missoula, MT

- Small diameter ponderosa pine and lodgepole pine
- Wood fiber - plastic composite decking
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Special Projects

- Over 100 Projects funded
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Bar Harbor Pier Project, Maine
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Student Design Competition
Commercialization Projects

- 1996 – demonstration projects
  - greater focus on economics by funding multi-structure projects
- Projects showcase wood-in-transportation technology
  - provide useful design and cost information
Commercialization Projects

- 31 projects funded
- 2 highlighted completed projects:
  - *Ida County, Iowa*
  - *West Virginia Division of Highways*
Commercialization Project
Ida County, Iowa

- Farm country in northwest Iowa
- 725 miles of roads
- 175+ bridges
- 8,365 county residents
Commercialization project included:

- 4 glulam cottonwood decks supported by steel beams
- 1 glulam cottonwood deck supported by wood beams

Focus on using locally-grown cottonwood
Bridge design details:

- HS-20-44 live loads; span lengths of 25 ft, 35 ft
- Out-to-out width 26 ft with travel width of 24 ft
- Cottonwood deck panels – 7 inch thick glulam
Bridge design details (cont.):

- Minimum of five steel beams spaced at 5.6 ft on center with flange widths of 10.2 in. Beams were salvaged.
- Treatment – Pentachlorophenol
- Wearing surface – asphalt
- Installation – Ida County Secondary Roads crew
- Abutments – steel H piling and sheet
## Costs for 25 ft. Bridge

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Design &amp; Related Work</td>
<td>5,028</td>
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<tr>
<td>Substructure</td>
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<td>Superstructure</td>
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<td>Site/Approach Work</td>
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<td>Surfacing</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$61,539</strong></td>
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Commercialization Project
West Virginia Division of Highways

- Numerous low-volume roads and bridges not maintained by any government entity
Commercialization Project
West Virginia Division of Highways

- 1998 West Virginia Legislature began the Orphan Road and Bridge Program
  - 3,216 orphan roads adopted
  - 769+ miles serving 25,000 families
  - Over 25 bridges completed
Bridge design details:

- HS-20-44 live loads; average length is 25 ft, average width is 14 ft
- Superstructure includes steel beams supporting plank timber deck
- Wood type is southern pine or red oak; treated with chromated copper arsenate
- Wearing surface – none
Bridge design details (cont.):

- Railing system – curbing
- Abutments – primarily gabion baskets filled with stone
- Installation – Division of Highways maintenance crews within one week
- Average cost – $25,000 per bridge
Gabion Basket Abutments
Steel Stringers
Pressure Treated Plank Deck
Results

Projects become more effective as cooperators learn to improve the process with each additional bridge designed and constructed.
Michigan’s Timber Bridge Program

- Over 20 structures completed
- Emphasis on using red pine
- Stress-lamination technology
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Michigan’s Timber Bridge Program
Michigan’s Timber Bridge Program

- Best Management Practices
- Serves as a guide for engineers and highway officials
- Minimize environmental risks
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Key Topic

D. Technology Transfer & Information Management
National Wood In Transportation Information Center, Morgantown, West Virginia – provides technical and educational information to bridge engineers and highway officials.
Technology and Information Transfer

Development & distribution of pubs:

- National Wood In Transportation Information Center, Morgantown, WV
- Forest Products Laboratory, Madison, WI
- Federal Highway Administration, Washington, DC
Welcome!
National Wood In Transportation Program

Interactive Website

This site provides information on projects that the Program has funded since 1989. Please provide us feedback about this site after searching for your individual informational needs.

Summary Program Information
- Funding history, matching funding, etc.
- By project type and geographic location

Project Information
- Project location, number of structures, contact information, etc.

Structure Information
- Structure type, superstructure cost, structure design, wood species, etc.

Website designed and managed by the National Wood In Transportation Information Center and the West Virginia University Department of Accounting, both located in Morgantown, WV.
### Wisconsin Wood In Transportation Funded Projects

<table>
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<tr>
<th>State</th>
<th>Congressional District</th>
<th>WIT Number</th>
<th>Federal ID Number</th>
<th>Project Type</th>
<th>Project Status</th>
<th>Number Structures</th>
<th>Federal Funding</th>
<th>Cooperative Funding</th>
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Questions and/or Comments

Where do we go from here?