Creating the World’s Longest Pedestrian Bridge
Project Location
Bridge Configuration

East Approach (2,640’)

No Deck

Main Span (3,094’)

2,600’ of Deck

West Approach (1,040’)

1,040’ of Deck

EAST (POUGHKEEPSIE)

WEST
Called the “The Great Connector” for linking New England cities with Pennsylvania coal and Midwest grain.
History

1871 – Bridge Chartered
1873 – Cornerstone Laid
1876 – American Bridge Co. Begins Work
1886 – Work Began by Union Bridge Co.
1888 – Bridge Opens in December
1906-1918 – Strengthenings
WWII – 3500+ Train Cars/Day
1974 – Last Train Crossed Bridge
1995 – Walkway Assumes Ownership
<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length over water, anchorage pier to anchorage pier</td>
<td>3094 ft.</td>
</tr>
<tr>
<td>Total length of bridge, including approach viaducts</td>
<td>6768 ft. (1 ¼ mi.)</td>
</tr>
<tr>
<td>Height from water to base of rail track</td>
<td>212 ft.</td>
</tr>
<tr>
<td>Vertical clearance for shipping:</td>
<td></td>
</tr>
<tr>
<td>under connecting truss spans</td>
<td>130 ft.</td>
</tr>
<tr>
<td>under center cantilever span</td>
<td>160 ft.</td>
</tr>
<tr>
<td>Depth of water and sediment to the hard gravel on the rock bottom</td>
<td>130 – 140 ft.</td>
</tr>
<tr>
<td>Width of bridge along main span</td>
<td>35 ft.</td>
</tr>
</tbody>
</table>
Unique Features

- Considered the world’s longest bridge when built (6,768’)
- The 525’ spans are the largest and heaviest trusses in the world
- 10 story underwater timber caissons
- Early use of steel construction
Comparable Bridges

- The Tay Bridge over the Firth of Forth in Scotland (10,710ft, 1887)
- The Forth Railway Bridge in Scotland (8,296ft, 1890)
Original Construction
Original Construction
Original Construction
Original Construction
Original Construction
Original Construction
Original Construction Completed
Strengthening

STEEL LINES CUT ACROSS THE SKY from under the Railroad Bridge. The middle girder seen here was added in 1912 to strengthen the bridge in preparation for the new, heavier, "Sante Fe" engines. Originally, the two slim sidebeams were the entire support for the structure. As it was designed to do, the entire bridge flexes slightly when the rolling freights roll over the rails. Like any bridge, she breathes when her girders feel the load pass over.
1974 Fire
Slumbering Giant
View South
(Mid-Hudson FDR Bridge & Clearwater)
Walkway over the Hudson

1992 – Created
1995 – Assumed Ownership

http://www.walkway.org/
UNDERWATER and STRUCTURAL INSPECTION
Photo 6 – Sonar image showing transverse timber tie and inner wall in place.
Climbing Inspection
Climbing Inspection
Climbing Inspection
Inspection Findings
Bridge Analysis

As-Built Capacity

- Engines = 11,350 lb/ft
- Train cars = 6,000 lb/ft

Proposed Loads

- People & bikes = 2,200 lb/ft

+ Single HS-20 Vehicle, UBIU
Bridge Analysis

ANALYSIS APPROACH
- 3-D SAP model for main spans.
- 2-D model for approach trusses

REHABILITATION APPROACH
- Repair main members with 20% or more loss
- Closely evaluate secondary members with 50% +
Project Objectives

Connecting Communities and Colleges on both sides of the Hudson River
Project Objectives

- Provide a connector, primarily for pedestrians and bicyclists, to link to the greater regional trail networks
- Save and restore a bridge on the National Register of Historic Places
- Be a centerpiece for the State of New York’s 2009 Henry Hudson Quadricentennial Celebration
- Create a new and unique state park that will provide tremendous recreational and educational opportunities for the public
- Create the world’s longest pedestrian/bicycle bridge
Fast Track Design Process

9/07

- Inspection
- Design
- Construction Methods
- Funding Sources

Alternatives

9/09

3/08

Construction Starts

Funding
Environmental Review under the State Environmental Quality Review Act

<table>
<thead>
<tr>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Part I of Environmental Assessment Form</td>
</tr>
<tr>
<td>Designation of Lead Agency for Coordinated Review</td>
</tr>
<tr>
<td>Determination of Resources Present (Records review, field reconnaissance, agency coordination)</td>
</tr>
<tr>
<td>Analysis of potential impacts</td>
</tr>
<tr>
<td>Public / Agency Review</td>
</tr>
<tr>
<td>Determination of Significant Impacts</td>
</tr>
</tbody>
</table>
Fast Track Management Techniques

• Early and Continual Collaboration with Stakeholders
  ▪ Constructability Brainstorming Session
  ▪ Design Brainstorming Session

• Permittees/ Regulators
  ▪ NEPA/ SEQR
  ▪ NYS Department of State
  ▪ NYS Department of Transportation
  ▪ U.S. Coast Guard
  ▪ U.S. Army Corps Of Engineers
  ▪ Central Hudson
  ▪ MTA/Metro-North and CSX Railroad
  ▪ Counties/ City/ Town
  ▪ NYS Department of Environmental Conservation
  ▪ NYS Department of Labor
  ▪ Other
Public & Private Collaboration
Public/Private Collaboration

- New York State Office of Parks and Recreation
- Governor Patterson’s Office
- Dyson Foundation
- United States Senator Charles Schumer
- Congressman Maurice Hinchey
- Scenic Hudson
- State Senator Stephen Saland
- Dutchess County Industrial Development Agency
Public/Private Collaboration (cont’d)

- New York State Bridge Authority
- National Parks Service
- Dutchess and Ulster Counties
- City of Poughkeepsie
- Town of Lloyd
- Individual Donations
- Others
Vision
Proposed
## Economic Benefits

### Visitation & Direct Spending in Dutchess & Ulster Counties

<table>
<thead>
<tr>
<th>Type of Attendee</th>
<th>Visits</th>
<th>New Direct Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Users (hiking, biking, jogging)</td>
<td>157,699</td>
<td>$ -</td>
</tr>
<tr>
<td>Visitors (outside Dutchess &amp; Ulster)</td>
<td>110,000</td>
<td>$14,617,969</td>
</tr>
<tr>
<td>Total Local Users &amp; Visitors</td>
<td>267,699</td>
<td>$14,617,969</td>
</tr>
</tbody>
</table>

### Total New Economic & Fiscal Impact

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Local Jobs</td>
<td>258</td>
</tr>
<tr>
<td>Local Visitor Spending</td>
<td>$21 million</td>
</tr>
<tr>
<td>Local Tax Revenue</td>
<td>$727,411</td>
</tr>
<tr>
<td>State &amp; Local Tax Revenue</td>
<td>$1.3 million</td>
</tr>
</tbody>
</table>
Bridge Access
Proposed elevator and stair access via Washington Street entrance

Future elevator and stair access via waterfront entrance
Fast Track Management Techniques

- Distinct, Overlapping Construction Contracts to Compress Schedule
  - Demolition Contract
  - Pre-Purchase of West Approach Deck Panels
  - General Contact
# Fast Track Schedule

<table>
<thead>
<tr>
<th>Panel Pre-Purchase Agreement with Fort Miller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization to Proceed</td>
</tr>
<tr>
<td>Shop Drawing Preparation (by Fort Miller)</td>
</tr>
<tr>
<td>Shop Drawing Approval (by BA)</td>
</tr>
<tr>
<td>Form Preparation and Material Procurement</td>
</tr>
<tr>
<td>Full Scale Mock-up</td>
</tr>
<tr>
<td>Production (+/- 151 panels @3/day + cure time)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demolition Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Selection</td>
</tr>
<tr>
<td>Begin Advertising</td>
</tr>
<tr>
<td>Mandatory Pre-Bid Site Review Meeting</td>
</tr>
<tr>
<td>Bid Opening</td>
</tr>
<tr>
<td>Award</td>
</tr>
<tr>
<td>Demolition Work</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Pre-Qualification</td>
</tr>
<tr>
<td>Advertise (30% Plans) - RFQ</td>
</tr>
<tr>
<td>Mandatory Pre-Bid Site Review Meeting</td>
</tr>
<tr>
<td>Statement of Qualifications Due</td>
</tr>
<tr>
<td>Short List Finalized</td>
</tr>
<tr>
<td>Contractor Final Selection</td>
</tr>
<tr>
<td>Plans and Proposal (90%) to Short List</td>
</tr>
<tr>
<td>Bid Proposals Due</td>
</tr>
<tr>
<td>Select &quot;Best Value&quot; Team</td>
</tr>
<tr>
<td>Final Design Details and Final Bid Proposal</td>
</tr>
<tr>
<td>Contract Awarded</td>
</tr>
<tr>
<td>Panel Fabrication &amp; Delivery</td>
</tr>
<tr>
<td>General Construction</td>
</tr>
</tbody>
</table>

Bridge Opening
• General Contract Components
  ▪ Mandatory Bidder Site Visit
  ▪ Pre-Qualification of Contractor Teams
  ▪ “Best Value” (Cost and Quality)
  ▪ Bids Based on 90% Plans. Designer and contractor work together to achieve 100% using selected contractor’s means and methods.
  ▪ Work Collaboratively through Construction
Demolition Contract

- ERSI from Schenectady, NY
Demolition Contract
Pre-cast Concrete Deck Panels
Pre-cast Concrete Deck Panels
General Construction
General Construction
Thank You