

Historic Bridge Survey and Comprehensive Mitigation



WVDOT/MPO/FHWA
PLANNING CONFERENCE

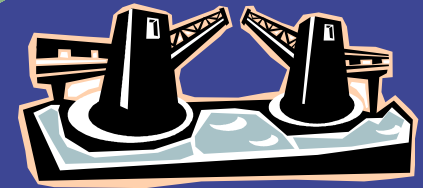
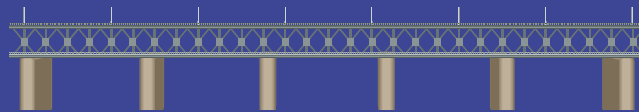
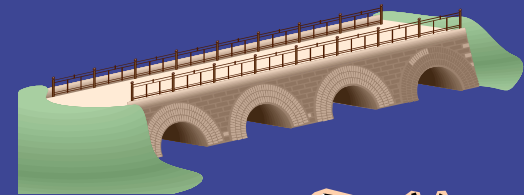
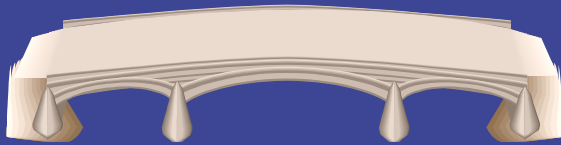
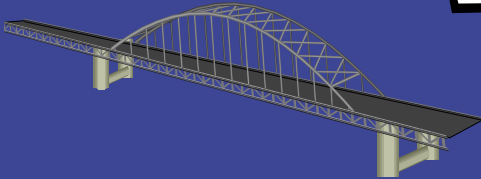
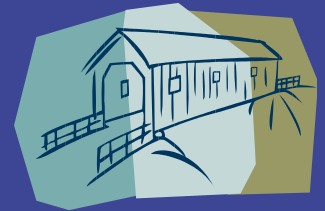
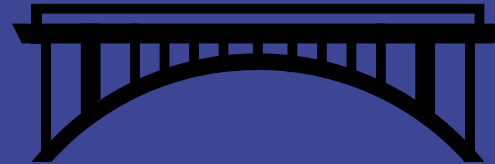
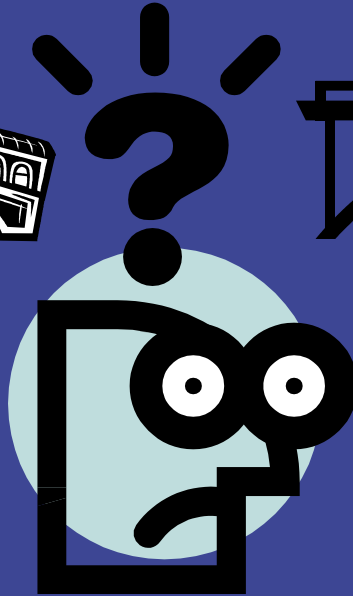
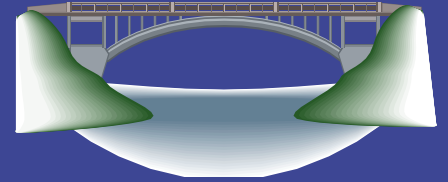
GLADE SPRINGS, WEST VIRGINIA September 20-22, 2011

PRESENTATION OUTLINE

- The West Virginia Statewide Historic Bridge Survey
- Comprehensive Mitigation
 - Bridge Management Plan
 - Other mitigation measures



BRIDGE SURVEYS



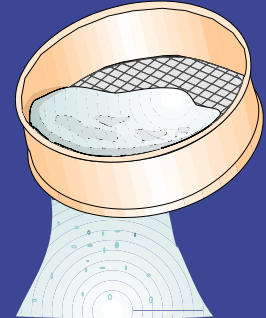
ASPECTS OF THE SURVEY



Research and
Write Historic
Context



Develop
evaluation
system



Narrow down
the field using
historic context,
public
comment.



Perform field
survey of bridges
and evaluate



Produce list of
historic West
Virginia bridges

DRAFT EVALUATION SYSTEM

Criterion A – Association with Significant Events

Early Roads and Turnpikes

Growth of Industries

Transportation Improvements

Railroads

Early Twentieth Century Transportation Improvements

Commemorative/Memorial Bridge

City Beautiful Movement

Federal Aid and State Legislation for Roads

CCC/WPA

World War II

DRAFT EVALUATION SYSTEM

Criterion C – Design and Construction

Distinctive type, period, or method of construction

- + Heavy timber covered bridges

- + Stone arches

- + Wrought iron trusses

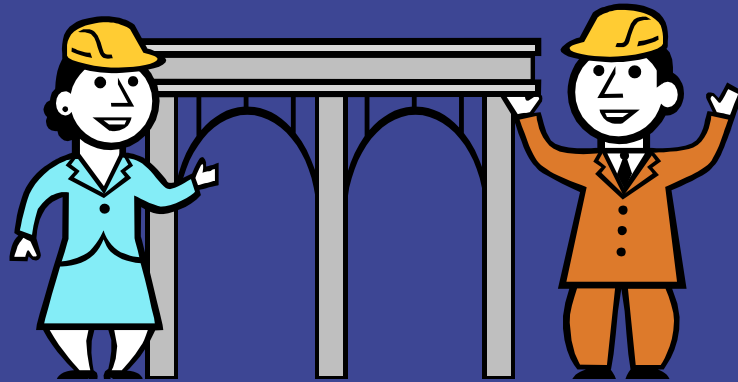
- + Patented truss design

Work of a master

- + Locally, regionally, or nationally known bridge companies.

BRIDGE SURVEY OUTCOMES

- A “big picture” of our state’s historic assets
- An agreed-upon list of historic bridges to aid in project planning and execution
- A method to evaluate bridges in the future
- A comprehensive bridge management plan

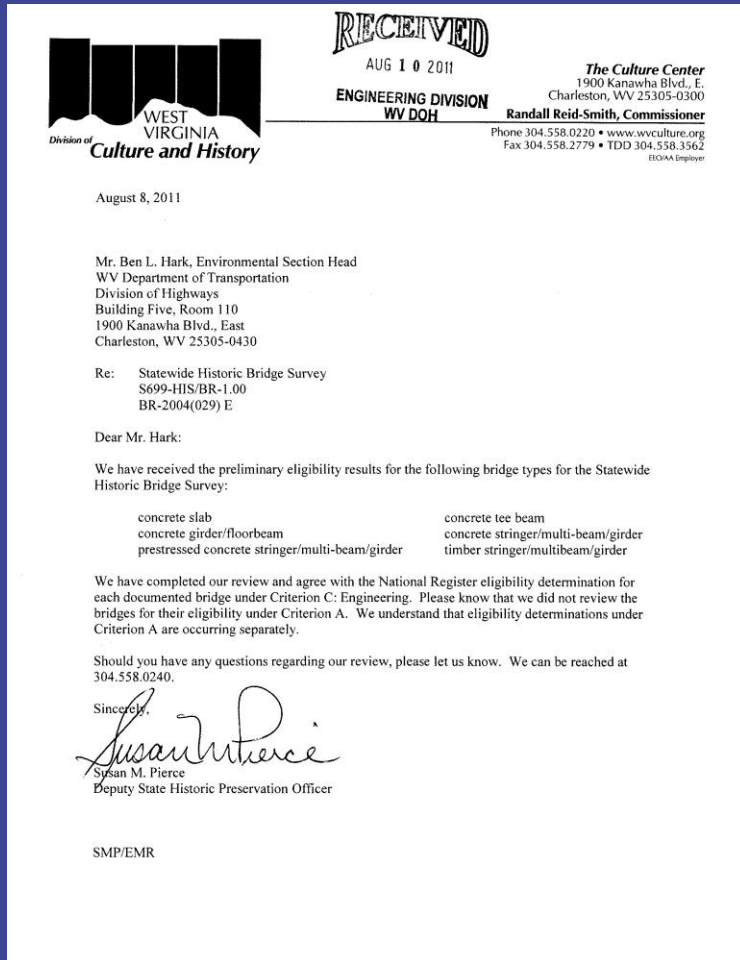


HISTORY OF THE WV BRIDGE SURVEY



- Transportation Enhancement Grant (co-sponsors WVDOH & WVSHPO) awarded on 10/18/2004
- KCI awarded the Historic Bridge Survey in 2004
- List of bridges recommended not eligible to the SHPO in 2008
- February 2008, Letter to Historic Groups about the bridge survey
- 5 Public Meetings held in March 2008
- Revised survey forms in 2009
- Field work begins in 2009
- Results of the field work starting in March 2011

Surveyed and Eligible Bridges



- 2,777 bridges were evaluated as part of the bridge survey

- 803 were field surveyed ...eligibility of the bridges is still ongoing. Current numbers look to have approximately 300 eligible bridges.

- In early 2011 began the webinars with consultants (KCI, Mead & Hunt) on the eligibility results of the bridges

- August 2011 cleared the following bridge types:

1. concrete slab,
2. concrete girder/floorbeam, prestressed concrete stringer/multi-beam/girder
3. concrete t-beam
4. concrete stringer/multi-beam/girder
5. timber/multi-beam/girder bridges with a concurrence letter from the SHPO.

TYPICAL MITIGATION



Donating bridge plates





Funds for preservation projects



Documentation on paper

Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY
INVENTORY FORM

Street Address CR 1 Mapase 1.87	Common/Historic Name (Lot) State Road Overpass	Field Survey # #P1 1	Site # (SHPO Only)
Town or Community Martinsburg	County Berkeley	Negative No.	Well Listed Date
Architect/Builder Mount Vernon Bridge Company	Date of Construction 1912	Style (SHPO Only)	
Exterior Siding / Materials Construction material: steel	Roofing Material Deck material: timber	Foundation Abutments: concrete Piers: steel beams	
Property Use or Function Transportation	URM Zone 17 NAD 1983 Easting 783,748 Northing 4,979,028	Quadrangle Name Hedgecroft	
Survey Organization & Date WDCH August 14, 2006	Part of What Survey / FRS		Site No.



Roadside signs or monuments

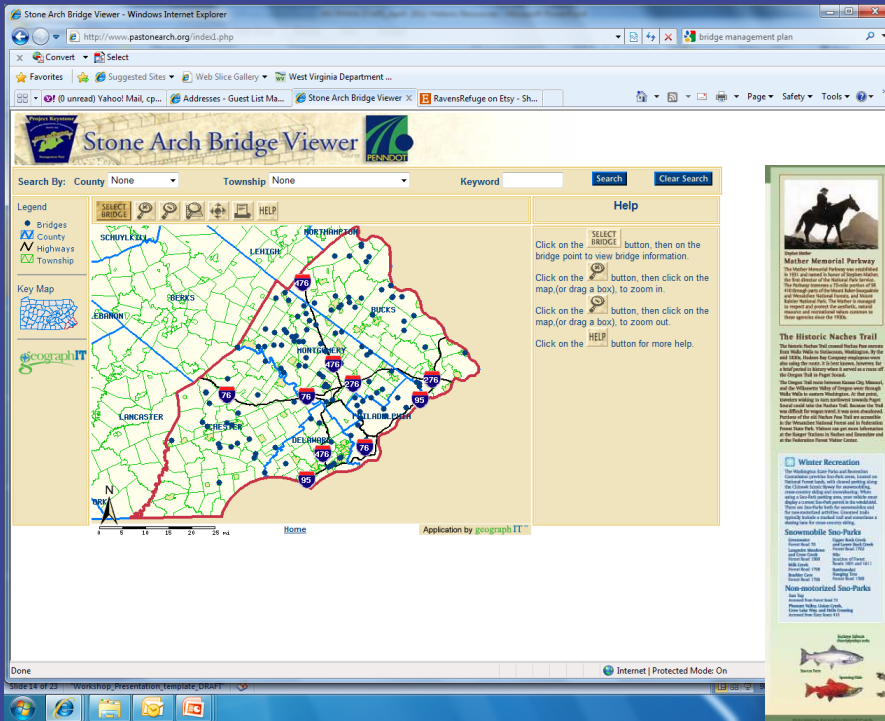
COMPREHENSIVE MITIGATION

Educational Websites



COMPREHENSIVE MITIGATION

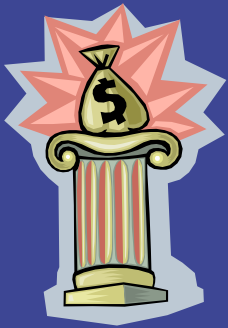
Maps



COMPREHENSIVE MITIGATION

Other Ideas

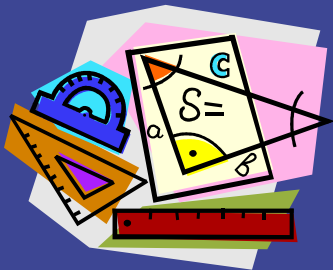
Training in transportation and cultural resources for personnel, consultants and others.



Seminars or workshops in WV engineering schools to increase awareness of environmental topics.



Outreach to public schools, museums, libraries and others, e.g. traveling exhibits.



Publications (electronic and paper) of research results, documentation, photographs and other materials.



Grant program for preservation projects.

COMPREHENSIVE MITIGATION

Toolkit: Branded Brochures, Posters, Signs, Kiosks, Postcards

Edwight is a former coal camp located in northwestern Raleigh County. The area's first reported commercial mine, called Edwight No. 1 Drift, was opened in 1916 under the ownership of the Raleigh-Wyoming Coal Company. The town, which was called Launa prior to coal activities, was renamed Edwight around 1920 after Mr. Edward W. Knight, a prominent Charleston attorney and legal advisor for Raleigh-Wyoming. Edwight gained fame as one of the top coal-producing areas of the state, but this achievement came at a price, as at least 60 miners were killed during the service of the Edwight-Hazy mining operations, 1916-1959. Miners from Edwight joined the march to the Battle of Blair Mountain in 1921. In its heyday, the town had a company store, soda fountain, pool hall, doctor's office, barber shop, boarding houses, grocery store, movie theatre, a number of bars and restaurants, and dozens of company houses.

Edwight History

Edwight Truss was determined eligible for the National Register of Historic Places as a result of its association with the development of the town of Edwight. The bridge provided an important local transportation link between the town and various mine sites, including the Sundial Refuse Pile, which was also considered eligible for the National Register. Edwight Truss was also a locally significant example of the camelback Parker Truss, a rare bridge type in Raleigh County. A camelback truss is distinguished by its sloped, rather than straight, top chords. Although the bridge will be replaced in 2012-13 due to deterioration, its role in Edwight's history has been studied and documented by the West Virginia Division of Highways.

edwight
bridge
raleigh county



Historical Services Unit does

- Write Historic Reports
- National Register Eligibility
- Historic Boundaries
- Access to Historic Properties
- Assess Effects to Historic Properties
- Public Documentations for Specific Properties
- Historic Site Research and Analysis
- Workshops for Specific Bridge and Historic Sites

contact us

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Location: County Route 3/2 near the intersection of WV Route 3, spanning Marsh Fork
Type: One-span steel camelback through-truss
Length: 150 feet
Year constructed: 1920
Contractor: Unknown



edwight
bridge
raleigh county

COMPREHENSIVE MITIGATION

Combining mitigation funds and resources for multiple projects means better quality and greater benefit to the public.

Eligibility known up front for planning purposes.

Additional review may be necessary, but framework is in place.

Input from many different experts and others make the plan feasible.


Some bridges are actually preserved.

Others can be replaced with less argument.

Highways Through History

METAL TRUSS BRIDGES

Metal truss and bridge building is a traditional technology in the United States, where railroad men at the forefront of bridge building. Early bridges were constructed of wrought or cast iron. It was not until the advancement of the steel-making process after about 1870 that steel bridges became economical for common use on roads. The steel bridge makes use of steel's properties to both compress and resist strength. When a load is applied to a span, some of the reaction force is "spread" from the load and supported on some "spreader" members. Engineers can use the fact that stresses occur in varying different configurations of spans to make a bridge longer and lighter and can be used in a variety of ways. The steel bridge is a very strong and durable structure. Just a few examples of the many types of spans constructed over the years, the Virginia State House stands from the Capon Lake Whipple Truss, the Virginia State Capitol, built in 1878, the State House, although through the years, the main entrance was type for highway structures, was built through the 1930s, and many very large spans, such as the Vigeo Bridge on the West Virginia Turnpike in Charleston, continued to be built through the 20th century.



CATALOG BRIDGES

Some companies, including the Wright Iron Bridge Company of Canton, Ohio, produced catalogs of designs of various truss spans, and clients could refer to them to select the bridge that suited their needs and budget. In West Virginia, the county courts were responsible for road improvement prior to the establishment of the West Road Commission in 1917, and many counties purchased bridges through catalogs.

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ROSS BOOTH MEMORIAL BRIDGE

(Winfield Toll Bridge)

LOCATION: WV 11, Winfield, Putnam County, spanning Kanawha River
 LENGTH: 1,662' 0"
 YEAR CONSTRUCTED: 1915
 DESIGNER: Harbridge and Corbridge, Inc.
 CONTRACTOR: John J. Harbridge Construction Company


The Ross Booth Memorial Bridge, which is a three-span cantilever Warren through truss, was replaced in 1915 with the steel cantilever truss Winfield and Red House spans the Kanawha River, greatly increasing efficiency of travel on the river. The length, span, and aesthetic design made the bridge a center for the community over time. This bridge qualified for the National Register of Historic Places and was the first to be listed and regional recognition and its innovative engineering technology. The structure underwent a major rehabilitation in 2010 at the cost of approximately \$11,000,000.



CAPON LAKE WHIPPLE TRUSS

LOCATION: WV 205, Silver Spring, Boone County, spanning the Capon River
 YEAR CONSTRUCTED: 1871
 CONTRACTOR: E.B. Whipple and Sons of New Brighton, Pennsylvania

The Capon Lake Whipple Truss was built near Romney, WV, in 1874 on US 11, which follows the route of the Transatlantic Telegraph. James Whipple invented the Whipple truss in 1847 and was one of the first designers to use specific analysis for structural design. Whipple's truss is a full arch truss, but a cast-iron arch bridge engineering. Metal truss bridges are used in a variety of spans that could be dismantled and re-assembled elsewhere. This bridge was named from its original location on the Capon River in 1930 and was listed on National Register in 1978. It is an outstanding structural design and significant bridge. It is included in a National Historic Landmark by the West Virginia Division of Highways.




KANAWHA FALLS BRIDGE

LOCATION: OH 13, near Candy Ridge, DeWitt County, spanning the Kanawha River, R 100, CAN National Wildlife Refuge, National Wildlife Refuge

LENGTH: 1,041' 0"
 YEAR CONSTRUCTED: 1938
 CONTRACTOR: McKinnis, Marshall of Pittsburgh


The Kanawha Falls Bridge in the New River Gorge originally opened as a toll bridge built for the Kanawha Falls Bridge Company, Inc. The opening of the bridge in 1938 resulted in the end of the Kanawha Falls Ferry. The bridge had been in operation for 120 years. The West Virginia Division of Highways acquired the bridge in 1971. A number of false spans were constructed through time spans and one single and several false spans were. The Pennsylvania stone was developed by the Pennsylvania Railroad in 1875 and was long commonly used for highway bridges. The Kanawha Falls Bridge is one of the few remaining Pennsylvania stone highway bridges in the state and eligible for the National Register of Historic Places for its architectural and engineering work.



GLENNVILLE TRUSS BRIDGE

LOCATION: OH, Glenn County, spanning the Little Kanawha River
 LENGTH: 1,042' 0"
 YEAR CONSTRUCTED: 1887
 DESIGNER: Stevens, Shreve & Co. of Richmond, Virginia
 BUILDER: Wright Iron Bridge Company of Canton, Ohio


The Glennville Truss Bridge was built in 1887 as part of a series of transportation improvements proposed by Michael Stevens, who was elected the first Governor of Ohio by Glenn County in 1885. Stevens, Shreve & Co. received a contract from the Glenn County Court to design a single span bridge to cross a ravine at different parts of the county. Glennville Truss Bridge is the only remaining of such an arch truss, and serves as a reminder of the challenges faced by western bridge and improvement programs were undertaken on a large scale by local and state governments. Structures such as the Glennville Truss Bridge, as well as others in road construction, were essential in the development of routes, routes, and road construction throughout the state.



PARK'S GAP BRIDGE

LOCATION: OH 8, Sandusky, western Sandusky County, spanning Rock Creek
 LENGTH: 98' 0"
 YEAR CONSTRUCTED: 1882
 CONTRACTOR: Mather Road Machine Company / Charles Town, WV


The Park's Gap Bridge consisted of an 1882 single span truss span supported on false bridge stone masonry abutments. The bridge is constructed entirely of red brick, but only a portion of the bridge and "spreader" from the load and supported on some "spreader" members. The bridge is listed on the National Register of Historic Places. The bridge is significant as an excellent example of a masonry arch bridge and a masonry truss bridge. The bridge is listed on the Ohio State Register of Historic Sites. The bridge is listed on the National Register of Historic Places. The bridge is listed on the National Register of Historic Places. The bridge is listed on the National Register of Historic Places.



BRIDGEPORT BRIDGE

LOCATION: VA 10, Bridgeport, Giles County, spanning the Ohio River
 LENGTH: 639' 0"
 YEAR CONSTRUCTED: 1915
 BUILDER: Wright Iron Bridge Company of Canton, Ohio

The Bridgeport Bridge was built to improve the connection between West Virginia and Ohio. It is a steel cantilever truss bridge that was built in 1915. The Bridgeport and Harbridge Bridge Company replaced the bridge and changed the name of the bridge to the Bridgeport Bridge. The bridge was built by the Wright Iron Bridge Company. The bridge consisted of three modified cantilever truss spans and included architectural features such as brick and decorative arching. The bridge was designed with photographs, historical drawings and historical photographs by the Harbridge Iron Bridge Company. The bridge was built in 1915. Although very early, the bridge can be preserved in place, and it is a significant example of early steel cantilever bridge design. Important information about history and design for future generations.



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