

# FOCUS

January/  
February  
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## INSIDE

3 Build a geosynthetic bridge with FHWA's sample specifications

4 INVEST in the future with the sustainable highways self-evaluation tool

6 Highway technology calendar

7 Infrastructure innovation webinars

## SHRP 2 Solutions: Tools for the Road Ahead

**G**et ready for SHRP 2 Solutions, the tools you need for the road ahead.

Launched in 2006 as a partnership among the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), and Transportation Research Board, the second Strategic Highway Research Program (SHRP 2) has conducted more than 100 research projects designed to meet a range of pressing problems facing the Nation's roadway system. The result is an array of advanced tools and technologies for improving highway safety, renewal, reliability, and capacity.

FHWA will offer a series of opportunities in 2013 for States and other stakeholders to use new SHRP 2 products as they are rolled out. The first seven products will be introduced in a February 2013 product deployment solicitation from FHWA.

*Integrated Ecological Framework* (Product C06)—The tool provides a step-by-step process

FHWA will offer a series of opportunities in 2013 for States and other stakeholders to use new SHRP 2 products as they are rolled out.

for making timely project decisions within an ecological framework, effectively integrating conservation with transportation planning.

*Organizational Assessment and Leadership to Improve Operation*—This suite of guides and tools will assist transportation agencies in better managing traffic operations and improving travel time reliability. Guides include *Integrating Business Processes to*

*Improve Travel Time Reliability* (Product L01) and *Institutional Architecture to Advance Operational Strategies* (Product L06).

*Accelerated Bridge Construction Design Toolkit* (Product R04)—The toolkit provides standard design details, specifications, and a guide manual, enabling agencies to use prefabricated elements to accelerate bridge replacements more cost effectively.

*Preservation Approaches for High-Traffic-Volume Roadways and Guidelines for Preservation of High-Traffic-Volume Roadways* (Product R26)—Agencies can use this report and its companion guidelines to apply proven pavement preservation strategies to high-volume roads. The publications document successful practices and provide selection matrices to help match specific high-volume

continued on page 2 >

[www.fhwa.dot.gov/publications/focus/index.cfm](http://www.fhwa.dot.gov/publications/focus/index.cfm)



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Federal Highway  
Administration





Information on accelerated bridge construction and other SHRP 2 Solutions is available at <http://shrp2.transportation.org>.

traffic situations with the best available treatments.

*Next Generation Strategies for Managing Complex Projects (Product R10) and Guide for the Process of Managing Risk on Rapid Renewal Contracts (Product R09)*—These guides provide practical tools and techniques to optimize innovation, minimize schedule and budget risks, and build better projects. By applying these approaches to all sizes and types of complex highway projects, project managers can better identify, plan for, and manage risks to reduce schedule and cost impacts.

The FHWA solicitation will advertise technical assistance opportunities for which State transportation agencies, metropolitan planning organizations, and oth-

ers can apply. Opportunities will include hosting a pilot project, serving as an “early adopter” or Lead State for the technology, or receiving assistance from FHWA in using the new product. FHWA expects to offer a second round of technical assistance opportunities this summer.

“We are seeing a lot of interest from States in participating in SHRP 2 product implementation,” said Amy Lucero, Director of Technical Services at FHWA. “Having lead adopter States will go a long way in helping us get to the tipping point that is crucial to successful implementation.”

For more information on SHRP 2 product implementation, visit <http://shrp2.transportation.org>. To sign up for email updates on SHRP 2, visit [www.trb.org/SHRP2/News](http://www.trb.org/SHRP2/News). \*

## SHRP 2 Product Implementation Webinars

FHWA and AASHTO will host three Webinars in February 2013 spotlighting SHRP 2 product implementation. Participants can learn more about SHRP 2 Solutions, find out about upcoming solicitations for product deployment opportunities, and become familiar with the criteria for participating in deployment.

**February 4, 2013, 3–4 p.m. (eastern standard time)**—Capacity products, including *Implementing Eco-Logical* (Product C06B). To register, visit [www.nhi.fhwa.dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25673](http://www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25673).

**February 7, 2013, 2–3 p.m. (eastern standard time)**—Reliability products, including *Organizational Assessment and Leadership to Improve Operation* (Products L01/L06). Registration is available at [www.nhi.fhwa.dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25674](http://www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25674).

**February 8, 2013, 2–4 p.m. (eastern standard time)**—Renewal products, including *Accelerated Bridge Construction Design Toolkit* (Product R04), *Next Generation Project Management Tools for Managing Risks and Complex Projects* (Products R09/R10), and *Pavement Preservation Options for High-Volume Roadways* (Product R26). To register, visit [www.nhi.fhwa.dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25691](http://www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25691).

# Build a Geosynthetic Bridge with FHWA's Sample Specifications

Using the Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS), State and local transportation agencies across the country are redesigning their standard bridge. Now it's easy to start implementing the technology on your bridges with the Federal Highway Administration's (FHWA) *Sample Guide Specifications for Construction of Geosynthetic Reinforced Soil-Integrated Bridge System (GRS-IBS)* (Pub. No. FHWA-HRT-12-051).

Agencies can use the sample specifications as a basic template for developing their own standard specifications for GRS-IBS, incorporating local experiences and practices where applicable.

GRS-IBS can be used to build single span bridges on all types of roads. The technology offers the advantages of being

faster, more economical, and easier to build than standard bridge construction methods. It is also extremely durable and can be built with readily available materials, using common construction equipment, and without the need for highly skilled labor. Defiance County, Ohio, built the world's first GRS-IBS bridge in 2005, followed by more than 20 additional bridges using the technology. New York's St. Lawrence County is now using GRS-IBS to replace many of its bridges, realizing cost savings of 50 to 60 percent.

FHWA selected GRS-IBS as one of the technology innovations for accel-

erated deployment by its Every Day Counts (EDC) initiative in 2010. The technology was included in the second round of EDC under the category of accelerated bridge construction. For more information about EDC, visit [www.fhwa.dot.gov/everydaycounts](http://www.fhwa.dot.gov/everydaycounts).

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GRS-IBS technology consists of three main components: the reinforced soil foundation (RSF), GRS abutment, and GRS integrated approach. The RSF is composed of granular fill material that is compacted and encapsulated with a geotextile fabric. The abutment uses alternating layers of compacted fill and closely spaced (less than or equal to 30 cm or 12 in) geosynthetic reinforcement to provide support for the bridge superstructure, which can be placed directly on

the abutment without the need for a traditional bearing joint or cast-in-place concrete.

To construct the abutment, a row of facing blocks is followed by a layer of compacted granular fill, and then finished with a layer of geosynthetic reinforcement. This process is repeated until the required abutment height is reached. GRS is then also used to construct an integrated approach for the road that leads to the bridge, alleviating the common "bump" caused by differential settlement between the bridge and approach road.

continued on page 5 >



Bridges built using the Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) include the Vine Street Bridge in Defiance County, OH.

# INVEST in the Future with the Sustainable Highways Self-Evaluation Tool

**L**earn how to INVEST in the future of your highway infrastructure. Developed by the Federal Highway Administration (FHWA), INVEST (Infrastructure Voluntary Evaluation Sustainability Tool) is a free Web-based collection of best practices designed to help transportation agencies integrate sustainability into their programs and projects.

Launched in October 2012, INVEST Version 1.0 has three modules agencies can use to evaluate the entire life cycle of transportation projects, beginning with System Planning and then continuing on to Project Development and Operations and Maintenance. Each of these modules is based on a separate collection of criteria and can be used independently. INVEST allows users to self-evaluate programs or projects using the various criteria and obtain a snapshot of the initiative's sustainability. The tool focuses on sustainability actions that go above and beyond what is typically required for a project.

A sustainable highway should satisfy the functional requirements of societal development and economic growth while enhancing the natural environment and reducing consumption of natural resources.

INVEST can be used to evaluate performance after a project is completed, or to consider sustainability options during the project planning and development stage, allowing agencies to better quantify sustainability during the decisionmaking process.

Each of the 60 INVEST criteria describes a particular sustainability best practice and assigns it a point value or weight according to its relative impact on transportation sustainability. Project development criteria, for example, include context sensitive project development,

highway and traffic safety, pedestrian access, freight mobility, energy efficiency, site vegetation, and construction noise mitigation. For each criterion, scoring involves answering a series of questions that relate to specific practices. Points for the various criteria are added together to obtain a total score. The overall score can then be used by agencies for such purposes as tracking progress toward more sustainable infrastructure, tracking integration of sustainable best practices into projects, and conducting stakeholder and community outreach.

Version 1.0 follows a pilot version released in 2011, which was tested and evaluated by transportation agencies and other stakeholders. The new version features substantial enhancements based on the pilot testing.

Use of INVEST is voluntary and not required for Federal-aid funding of highway projects. Data entered into INVEST's modules can only be accessed by the user and will not be used by FHWA.

Agencies that have used INVEST to date include the North Central Texas Council of Governments (NCTCOG), which serves as the metropolitan planning organization for a 16-county region, including the Dallas-Fort Worth area. NCTCOG used INVEST to assess its long-range transportation plan, Mobility 2035.

"It showed us that we had done a great job thinking more sustainably, but it also pointed out things we had not considered, such as improving the connection between



To start using INVEST, visit [www.sustainablehighways.org](http://www.sustainablehighways.org).

asset management and planning and addressing infrastructure resiliency to natural hazards such as flooding," said Dan Lamers, Senior Program Manager for NCTCOG.

The Ohio Department of Transportation (ODOT) turned to INVEST to evaluate its Innerbelt Bridge project in Cleveland, which involves constructing two new bridges to replace the current I-90 bridge. "When ODOT embarked on this project, we challenged the prospective design/build teams to demonstrate a commitment to sustainability," said project manager David Lastovka. Since then, ODOT has committed to achieving sustainability in seven project categories, known as the "Green 7": Energy and Energy Efficiency, Community Environment, Green Building, Waste Reduction and Recycling, Green Project Administration, Materials and Resources, and Construction Practices.



## Build a Geosynthetic Bridge,

continued from page 3

As part of the largest project in ODOT history, the agency aimed to achieve major savings in diesel fuel, steel, water, and landfill waste. INVEST validated those sustainability goals. To date, the project has saved more than 331,224 L (87,500 gal) of diesel fuel and 83 million L (22 million gal) of water, as well as recycled more than 2,290,641 kg (5,050,000 lb) of steel. Landfill waste has also been reduced by more than 95,569 cubic m (125,000 cubic yd). “The result of our evaluation using INVEST will help us to continue to implement sustainable highway practices,” said Jocelynn Clemings, Public Information Officer for ODOT. To learn more, visit [www.Innerbelt.org](http://www.Innerbelt.org).

Available online at [www.sustainablehighways.org](http://www.sustainablehighways.org), the INVEST Web site offers visitors the opportunity to take a guided tour through the site and learn about sustainable highways and how to integrate sustainability best practices into projects and programs. Visitors can also browse the complete set of INVEST criteria or use the “Score” option to evaluate the sustainability of their own projects and programs. Additional resources include a glossary of sustainability terms, a list of frequently asked questions and answers about using INVEST, and information on FHWA’s Sustainable Highways initiative. A recording of an October 2012 FHWA Webinar introducing INVEST is also available.

For more information on INVEST, contact Michael Culp at FHWA, 202-366-9229 (email: [michael.culp@dot.gov](mailto:michael.culp@dot.gov)). To start using the tool today, visit [www.sustainablehighways.org](http://www.sustainablehighways.org). \*



The Bowman Road Bridge in Defiance County, OH, was the first bridge in the world to use GRS-IBS.

FHWA’s sample specifications cover both material requirements, including backfill material and geosynthetics, and construction requirements. Among the construction topics highlighted are labor and equipment; site layout; excavation; placement of backfill, compaction, geosynthetic reinforcement, and superstructure; integration of the approach road; and site drainage.

Also featured is contractor quality control (QC). Topics include creating a contractor QC plan, personnel and laboratory facility requirements, inspection, sampling and testing, and documentation and data evaluation. Agencies can also find sample specifications for project acceptance and contractor payment.

To download the *Sample Guide Specifications*, visit [www.fhwa.dot.gov/publications/research/infrastructure/structures/12051/12051.pdf](http://www.fhwa.dot.gov/publications/research/infrastructure/structures/12051/12051.pdf). For more information, contact Jennifer Nicks at

FHWA, 202-493-3075 (email: [jennifer.nicks@dot.gov](mailto:jennifer.nicks@dot.gov)), or Daniel Alzamora at FHWA, 720-963-3214 (email: [daniel.alzamora@dot.gov](mailto:daniel.alzamora@dot.gov)). Additional information on implementing GRS-IBS is available in FHWA’s *Geosynthetic Reinforced Soil Integrated Bridge System Interim Implementation Guide* (Pub. No. FHWA-HRT-11-026), which is available at [www.fhwa.dot.gov/publications/research/infrastructure/structures/11026/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/structures/11026/index.cfm). To view a construction video that demonstrates how to use GRS-IBS, visit FHWA’s YouTube channel at [www.youtube.com/user/USDOTFHWA](http://www.youtube.com/user/USDOTFHWA) (select “Turner-Fairbank Highway Research Center” and then choose “Geosynthetic Reinforced Soil-Integrated Bridge System”). The video can also be viewed on the FHWA EDC Web site at [www.fhwa.dot.gov/everydaycounts/technology/grs\\_ibs/multimedia.cfm](http://www.fhwa.dot.gov/everydaycounts/technology/grs_ibs/multimedia.cfm). \*

# Highway Technology Calendar

*The following events provide opportunities to learn more about products and technologies for accelerating infrastructure innovations.*

## **2013 Design-Build in Transportation Conference**

March 18–20, 2013, Orlando, FL

Join transportation leaders in discussing lessons learned in the use of the design-build project delivery method for transportation projects. Discussions will cover choosing the right delivery method, contracting approaches, innovative financing solutions, risk allocation, and performance contracting.

*Contact:* Jerry Yakowenko at the Federal Highway Administration (FHWA), 202-366-1562 (email: gerald.yakowenko@dot.gov), or visit [www.dbtranspo.com](http://www.dbtranspo.com).

## **Seventh National Seismic Conference on Bridges and Highways**

May 20–22, 2013, Oakland, CA

Conference sessions will focus on understanding and mitigating damage to the Nation's highway infrastructure from earthquakes and other natural hazards. Sponsors include FHWA; the California Department of Transportation; Transportation Research Board; American Association of State Highway and Transportation Officials;

University at Buffalo, The State University of New York; and the Multidisciplinary Center for Earthquake Engineering Research.

*Contact:* Phillip Yen at FHWA, 202-366-5604 (email: wen-huei.yen@dot.gov), or visit <http://7nsc.info>.

## **Second National Covered Bridge Conference**

June 5–8, 2013, Dayton, OH

The FHWA National Historic Covered Bridge Preservation Program is sponsoring the conference in partnership with the National Park Service and U.S. Forest Service. Themes include research and rehabilitation projects, best practices for rehabilitation, and continuing threats and challenges to covered bridges, including damage caused by Hurricane Irene and Tropical Storm Lee in 2011. Participants will have the opportunity to tour several historic covered bridges.

*Contact:* Everett Matias at FHWA, 202-366-6712 (email: everett.matias@dot.gov), or visit [www.woodcenter.org/2013-national-covered-bridge-conference](http://www.woodcenter.org/2013-national-covered-bridge-conference).

## **Fiftieth Annual Petersen Asphalt Research Conference**

July 15–17, 2013, Laramie, WY

Organized by the Western Research Institute (WRI), the conference presents current research aimed at understanding and improving asphalt performance. Topics range from fundamental compositional research to applied field engineering. Participants are invited to take part in an open mic discussion.

*Contact:* Steve Salmans at WRI, 307-721-2306 (email: ssalmans@uwyo.edu), or Jack Youtcheff at FHWA, 202-493-3090 (email: jack.youtcheff@dot.gov). Information is also available at [www.petersenasphaltconference.org](http://www.petersenasphaltconference.org).

## **2013 Pavement Performance Prediction Symposium**

July 18, 2013, Laramie, WY

Presented by WRI in cooperation with FHWA's Turner-Fairbank Highway Research Center, the symposium will take an indepth look at a single asphalt-related topic.

*Contact:* Steve Salmans at WRI, 307-721-2306 (email: ssalmans@uwyo.edu), or Jack Youtcheff at FHWA, 202-493-3090 (email: jack.youtcheff@dot.gov). More information on the selected topic will be available at [www.petersenasphaltconference.org](http://www.petersenasphaltconference.org).\*

# Infrastructure Innovation Webinars

These free Webinars provide a quick introduction to the latest infrastructure innovations and technologies.

## Strategic Highway Research Program 2 (SHRP 2) Webinar Series

The Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) are hosting a Webinar series spotlighting SHRP 2 product implementation. Participants can learn more about SHRP 2 Solutions, find out about upcoming solicitations for product deployment opportunities, and become familiar with the criteria for participating in deployment.

February 4, 2013, 3–4 p.m.  
(eastern standard time)

Capacity products, including *Implementing Eco-Logical* (Product C06B). To register, visit [www.nhi.fhwa.dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25673](http://www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25673).

February 7, 2013, 2–3 p.m.  
(eastern standard time)

Reliability products, including *Organizational Assessment and Leadership to Improve Operation* (Products L01/L06). Registration is available at [www.nhi.fhwa.dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25674](http://www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25674).

February 8, 2013, 2–4 p.m.  
(eastern standard time)

Renewal products, including *Accelerated Bridge Construction Design Toolkit* (Product R04), *Next Generation Project Management Tools for Managing Risks and Complex Projects* (Products R09/R10), and *Pavement Preservation Options for High-Volume Roadways* (Product R26). To register, visit [www.nhi.fhwa](http://www.nhi.fhwa).

[dot.gov/resources/webconference/web\\_conf\\_learner\\_reg.aspx?webconfid=25691](http://dot.gov/resources/webconference/web_conf_learner_reg.aspx?webconfid=25691).

## Alkali-Aggregate Reactivity (AAR) Webinar Series

Sponsored by FHWA, the Webinars will provide information on alkali-silica reaction (ASR) and alkali-carbonate reaction (ACR) prevention and mitigation techniques. Case studies will highlight rehabilitation strategies for concrete structures affected by AAR.

Part I, February 6, 2013, 1–3:30 p.m.  
(eastern standard time)

Fundamentals and Symptoms of AAR, Test Methods.

Part II, February 13, 2013, 1–3:30 p.m. (eastern standard time)  
ASR Prevention, AAR Specifications.

Part III, February 20, 2013, 1–3:30 p.m. (eastern standard time)  
Diagnosis of AAR, Repair Methods.

Participants will have the opportunity to download reference materials. To register for the Webinar series, visit <https://www3.gotomeeting.com/register/829273358>. For more information, visit the FHWA ASR Web site at [www.fhwa.dot.gov/pavement/concrete/asr.cfm](http://www.fhwa.dot.gov/pavement/concrete/asr.cfm), or contact Gary Crawford at FHWA, 202-366-1286 (email: [gary.crawford@dot.gov](mailto:gary.crawford@dot.gov)).

## ABC Bridges from a County Perspective

February 14, 2013, 1–2 p.m.  
(eastern standard time)

Sponsored by the Accelerated Bridge Construction (ABC) Center at Florida

International University in Miami, the Webinar will feature examples of how counties are using ABC to replace their aging structures. A question and answer period will follow the presentations. To register, visit [www.abc.fiu.edu](http://www.abc.fiu.edu). For more information, contact the ABC Center at 305-348-2824 (email: [abc@fiu.edu](mailto:abc@fiu.edu)).

## Asset Management Book Club

February 27, 2013, 2–3:30 p.m.

(eastern standard time)

March 27, 2013, 2–3:30 p.m.  
(eastern daylight time)

April 24, 2013, 2–3:30 p.m.  
(eastern daylight time)

May 22, 2013, 2–3:30 p.m.  
(eastern daylight time)

June 26, 2013, 2–3:30 p.m.  
(eastern daylight time)

July 24, 2013, 2–3:30 p.m.  
(eastern daylight time)

August 28, 2013, 2–3:30 p.m.  
(eastern daylight time)

September 25, 2013, 2–3:30 p.m.  
(eastern daylight time)

In 2011 AASHTO published the *Transportation Asset Management Guide: A Focus on Implementation*, which encourages transportation agencies to use asset management principles. Sponsored by FHWA and AASHTO, this Webinar series will review the content of the guide and share experiences from practitioners. To register, visit [www.fhwa.dot.gov/asset/bookclub.cfm](http://www.fhwa.dot.gov/asset/bookclub.cfm). For additional information, con-

continued on page 8 >

# FOCUS

*Focus* (ISSN 1060-6637), which is published monthly by the U.S. Department of Transportation's Federal Highway Administration (FHWA), covers the implementation of innovative technologies in all areas of infrastructure.

Its primary mission is twofold: (1) to serve the providers of highway infrastructure with innovations and support to improve the quality, safety, and service of our roads and bridges; and (2) to help promote and market programs and projects of the various offices of FHWA's Office of Infrastructure.

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## Infrastructure Innovation Webinars, continued from page 7

tact Nastaran Saadatmand at FHWA, 202-366-1337 (email: nastaran.saadatmand@dot.gov).

**Transportation Asset Management (AM) Webinar Series**  
*Asset Management Business Models and Barriers to Implementation*  
March 13, 2013, 2–3:30 p.m.  
(eastern daylight time)

Presentations will explore the strengths and limitations of specific AM business models and share lessons learned in overcoming barriers to implementation. Discussions will focus on integrating

organizational units, systems, and data with agencies' AM business models. State agency representatives will also discuss how strong AM practices can help in building the case for needed funding.

The Webinar series is sponsored by AASHTO and FHWA. For more information or to register, visit <http://tam.transportation.org/Pages/Webinars.aspx>. Information is also available by contacting Steve Gaj at FHWA, 202-366-1336 (email: stephen.gaj@dot.gov). \*