

FHWA R&T Now

A news update of research, technology, and development from the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA)

May 2014

GENERAL/ADMINISTRATIVE

SHRP2 Announces Recipients of Third Round of Funding

The Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) recently announced the recipients of funding under the third round of the second Strategic Highway Research Program (SHRP2). Organizations in 31 States will receive funds for project implementation and technical assistance.

Program officials also announced the fourth round of SHRP2 products that will move from the research phase to widespread implementation beginning with the Round 4 Implementation Assistance Program. The application process opens March 30, 2014 and closes June 27, 2014.

For more information, contact Carin Michel, 410-962-2530, carin.michel@dot.gov, or visit www.fhwa.dot.gov/goshrp2.

ENVIRONMENT

Report: A Performance-Based Approach to Addressing Greenhouse Gas Emissions through Transportation Planning

The publication, *A Performance-Based Approach to Addressing Greenhouse Gas Emissions through Transportation Planning*, is a practitioner handbook intended to serve as a resource for State departments of transportation and metropolitan planning organizations interested in addressing greenhouse gas (GHG) emissions through performance-based planning and programming (PBPP).

Building on related resources addressing PBPP and mobile source emissions analysis, the handbook describes the use of GHG performance measures and other performance management techniques that support investment choices and decisionmaking.

This document (Publication Number: FHWA-HEP-14-020) is available at www.fhwa.dot.gov/environment/climate_change/mitigation/publications_and_tools/ghg_planning/index.cfm. For more information, contact John Davies, 202-366-6039, johng.davies@dot.gov.

ADVANCED RESEARCH

Fact Sheet: Innovative Neighborhood Transit—Assessing Demand for an Automated Community Shuttle Service

Novel neighborhood transit systems capable of providing the first or last mile of service could revolutionize travelers' use of traditional transit services.



This fact sheet discusses “Effects of Automated Transit and Pedestrian/ Bicycling Facilities on Urban Travel Patterns,” an FHWA Exploratory Advanced Research (EAR) Program study that was awarded to the University of Michigan. The study was aimed at assessing the demand for an innovative transit shuttle service using automated vehicles.

This document is available at www.fhwa.dot.gov/advancedresearch/pubs/14046/index.cfm. For more information on the University of Michigan project, contact Bob Ferlis, 202-493-3268, robert.ferlis@dot.gov. For more information about the EAR Program, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Fact Sheet: Efficient and Safe Merging Solutions—Advanced Freeway Merge Assistance: Harnessing the Potential of Connected Vehicles

One of the major traffic bottlenecks and safety concerns on today’s busy roads occurs during freeway merges. “Advanced Freeway Merge Assistance: Harnessing the Potential of Connected Vehicles” is an EAR Program project designed to improve the efficiency and safety of freeway merges using connected vehicle technology. FHWA awarded the project to the University of Virginia Center for Transportation Studies in 2009.

A fact sheet discussing the project is available at www.fhwa.dot.gov/advancedresearch/pubs/14045/index.cfm. For more information about this project, contact Bob Ferlis, 202-493-3268, robert.ferlis@dot.gov. For more information about the EAR Program, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Workshop Summary Report: Multiscale Materials Modeling

On April 23 and 24, 2013, FHWA’s Office of Infrastructure Research and Development (R&D) and the EAR Program held the workshop, Multiscale Materials Modeling, to explore new scientific approaches for measuring and

modeling materials across multiple length and time scales. The goal of the workshop was to obtain expert feedback on the state of the art and identify EAR Program opportunities for multiscale material modeling.

The workshop focused on how multiscale material modeling applies to the optimization of properties, durability, and the construction of asphalt and cementitious pavement and construction materials. The event allowed researchers who develop material models and engineers who use the results of material models to exchange ideas on the topic. Discussions featured purposes and audiences for current and future models; the state of the art in approaches to model degradation mechanisms across length scales; and technical and programmatic approaches to advance multiscale modeling methods. These conversations are expected to form a basis for the transition of results from research on multiscale material modeling and new plans for EAR Program activities.

To obtain a summary report about this workshop, visit www.fhwa.dot.gov/advancedresearch/pubs/13103/index.cfm. For more information about the project, contact Jack Youtcheff, 202-493-3090, jack.youtcheff@dot.gov. For more information about the EAR Program, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

INFRASTRUCTURE

ASCE Nominates Gucunski as White House Champion of Change

American Society of Civil Engineers (ASCE) nominated Nenad Gucunski, Ph.D., a professor and chair of the Department of Civil and Environmental Engineering at Rutgers University, as a White House Champion of Change. Gucunski, an FHWA contractor, was nominated for his contribution to the FHWA RABIT™ bridge deck assessment tool research project. Individuals selected as Champions are those who have provided exemplary leadership to ensure that transportation facilities, services,



and jobs help individuals and their communities connect with 21st century opportunities.

For more information on the RABIT™ bridge deck assessment tool, go to <http://www.fhwa.dot.gov/research/tfhrc/programs/infrastructure/structures/ltp/ltpresearch/rabit/index.cfm> and contact Hamid Ghasemi, 202-493-3042, hamid.ghasemi@dot.gov.

Research Leads to Bridge Design Specification Revisions for Modulus of Elasticity of Structural Concrete

AASHTO's Load and Resistance Factor Design (LRFD) Bridge Design Specification provides the basis for the design of highway bridges in the United States. The concrete structures provisions have been developed over decades, with some of the provisions inevitably becoming less than acceptably accurate as concrete material advancements have opened doors to concretes with advanced mechanical properties.

One fundamental provision relates the compressive strength of concrete to the modulus of elasticity; its influence is significant throughout the structural design specifications. Researchers have recognized that this provision provides insufficient accuracy for modern structural concretes. In an effort to address this issue, researchers involved with FHWA's Structural Concrete Research Program compiled and analyzed results from hundreds of research studies in order to develop a new relationship for modulus of elasticity. This new relationship has been vetted by the AASHTO Subcommittee on Bridges and Structures Technical Committee #10 (SCOBS T-10), as well as the broader AASHTO community.

In June 2014, this item will go to AASHTO ballot. For more information, contact Ben Graybeal, 202-493-3122, benjamin.graybeal@dot.gov.

Research Results Call for Bridge Design Specification Revisions for Lightweight Concrete

The extensive provisions relating to concrete structures are recognized to poorly predict the performance of lightweight concrete structures. With strong stakeholder support, FHWA's Structural Concrete Research Program embarked on a research program to address these shortcomings.

Researchers at Turner-Fairbank Highway Research Center (TFHRC) completed nearly 100 full-scale structural tests of a variety of lightweight concrete formulations and have assessed a broad range of structural performance measures. On April 26, 2014, Ben Graybeal, Ph.D., P.E., who heads FHWA's Structural Concrete Research Program, delivered recommended code provision modifications to the AASHTO Subcommittee on Bridges and Structures Technical Committee #10 (SCOBS T-10).

Graybeal delivered these recommendations during AASHTO SCOBS T-10's formal business meeting in Chicago, and the committee appeared to receive them well. In preparation for a 2015 ballot, the recommendations will be vetted by the broader AASHTO community. These specification revisions are expected to allow for consistent treatment of lightweight concrete throughout the bridge design community, enabling economical and appropriate use of an important structural material.

For more information, contact Ben Graybeal, 202-493-3122, benjamin.graybeal@dot.gov.

FHWA's GRS-IBS Guidance Featured in *Civil Engineering Magazine*

In the April 2014 issue of ASCE's *Civil Engineering* magazine, a feature article spotlights a bridge built by the Delaware Department of Transportation (DelDOT) using Geosynthetic Reinforced Soil (GRS) Integrated Bridge System (IBS) technology.



The article, *Rapid Replacement*, illustrates the value of GRS-IBS technology and FHWA's design guidance. At the end of the article, the authors acknowledge FHWA's geotechnical research team for their contributions and technical support. The team helped with the design, layout, development of the instrumentation plan, selection of instruments, and protocols for instrument installation and monitoring. They also provided onsite and on-call construction support.

The bridge project, the first of its kind in Delaware, was carried out using funds from FHWA's Innovative Bridge Research and Deployment Program. The project was one of FHWA's first Every Day Count showcases offered by the GRS deployment team.

For more information, contact Mike Adams, 202-493-3025, mike.adams@dot.gov.

SAFETY

Report: A Guide for Maintaining Pedestrian Facilities for Enhanced Safety

Each year, approximately 4,000 pedestrians are killed and tens of thousands are injured in the United States. Research has demonstrated that pedestrian safety increases when walking facilities, such as sidewalks, walkways, and curb ramps are implemented and properly maintained. However, maintaining pedestrian facilities so they remain safe and accessible is often a difficult undertaking. Walkability and accessibility are big issues. There are also liability consequences related to poor, inadequate, or infrequent inspection and maintenance of pedestrian facilities. This report, which aims to improve safety and mobility, identifies effective and exceptional practices, along with barriers for pedestrian facility maintenance.

This document (Publication Number FHWA-SA-13-037) is available from the Federal Highway Administration Office of Safety.

For more information, contact Tamara Redmon, 202-366-4077, tamara.redmon@dot.gov.

OPERATIONS

FHWA Hosts Public Meeting on Research Data Exchange

On March 26, 2014, FHWA's Office of Operations Research and Development, in partnership with the Data Capture and Management (DCM) Program, hosted a public meeting on the Research Data Exchange (RDE) at TFHRC. The RDE provides access to real-time and archived intelligent transportation systems (ITS) data sets from multiple sources, including connected vehicles; probe messages; traffic monitoring and reporting devices (for example, volumes, speed, and crashes); incidents; traffic signals; weather sensors; and transit vehicles.

The meeting was an opportunity for the public sector, researchers, and the private sector (namely those involved with ITS transportation management systems and connected vehicle applications) to discuss the current functionality and operation of the RDE; the process and plans for collecting, managing, and supporting the use of connected vehicle related data sets to be posted on the RDE; the need and potential priorities for connected vehicle-related data sets to be made available on the RDE; and opportunities to enhance the operation and use of the RDE.

For more information about the workshop, contact Gene McHale, 202-493-3275, gene.mchale@dot.gov. For more information about the RDE, visit <http://www.its.rde-net>.

FHWA Conducts Public Meeting on Data Capture and Management Program

On March 27, 2014, FHWA, in partnership with the DCM Program, held a meeting at the National Highway Institute to seek input on future plans and candidate initiatives for the DCM Program. Participants included public and private sector researchers and stakeholders who will be involved with collecting, developing,



implementing, managing, operating, or sharing multisource and multimodal data with traffic management systems or ITS devices to enhance the performance of the surface transportation system.

Workshop topics included the DCM Program's current and proposed plans and activities; potential private and public sector uses and users of connected vehicle and other sources of multimodal data; potential private and public sector roles and vision for collecting, integrating, managing, and sharing multisource, multimodal data in an operational connected vehicle environment; gaps in practice and knowledge and technologies to assist the public and private sector to collect, use, or integrate connected vehicle data with multisource data; and potential DCM Program initiatives to foster the availability and use of multisource and multimodal data in an operational connected vehicle environment.

For more information about the workshop, contact Jon Obenberger, 202-493-3265, jon.obenberger@dot.gov. For more information about the DCM Program, visit http://www.its.dot.gov/data_capture/data_capture.htm.

FHWA and AASHTO to Present on the National Connected Vehicle Field Infrastructure Footprint Analysis

The National Connected Vehicle Field Infrastructure Footprint Analysis is a joint effort between FHWA and AASHTO aimed at developing a deployment footprint and plan that will describe the need for connected vehicle infrastructure, the form that the infrastructure should take, where and when the infrastructure should be deployed, and the cost, organizational, and institutional implications of deploying the infrastructure. The analysis will result in a policy foundation for a connected vehicle environment.

The FHWA-AASHTO team presents on the analysis at three upcoming events:

- May 6, 2014: AASHTO Subcommittee on Systems Operations and Management Annual Meeting in Nashville, TN. To register, visit <http://ssom.transportation.org/Pages/default.aspx>.
- May 22, 2014: T3 Webinar on the National Connected Vehicle Field Infrastructure Footprint Analysis. To register, visit http://www.pcb.its.dot.gov/t3/s140522_cv_footprint_analysis.asp.
- May 29, 2014: Cooperative Transportation Systems Pooled Fund Study and AASHTO Connected Vehicle Working Group Meeting. To learn more, contact Jim Wright, AASHTO, jwright@aaashto.org.

For more information about the National Connected Vehicle Field Infrastructure Footprint Analysis, contact Ben McKeever, 202-493-3270, ben.mckeever@dot.gov.

FHWA Begins Data Collection on I-66 for Speed Harmonization Field Experiment

On April 27, 2014, four microwave radar detection trailers were deployed on I-66 eastbound between Route 7 and Fairfax Drive to begin preliminary data collection and algorithm testing for FHWA's Office of Research and Development's speed harmonization field experiment. Speed harmonization is a method of slightly decreasing the speeds of vehicles approaching a bottleneck in order to smooth traffic flow, reduce stop and go traffic, and slow the onset of major congestion.

In this study, researchers will calculate an optimal speed and utilize a remote server at TFHRC to broadcast it to three vehicles in live traffic on I-66 eastbound during the evening peak period. The vehicles are equipped with connected and automated vehicle technologies. This experiment is scheduled to take place during a test window of 9 days, from May 20, 2014 to June 23, 2014.



On May 1, 2014, the FHWA project team met with the Virginia Department of Transportation (VDOT), Virginia State Police, and Virginia Center for Transportation Innovation and Research to discuss how to coordinate safety efforts during testing activities and the field experiment.

For more information, contact Joe Peters, 202-493-3269, joe.peters@dot.gov.

RECENT PERIODICALS

Public Roads—March/April 2014

This issue includes: FHWA's R&T Agenda Addresses National Challenges; Pushing the Limits of Pavement; Where the Water Meets the Road; Making Inroads for Women in Transportation; Traveling the Capital Beltway Is Now E-Zier; and Creating Smarter Work Zones.

It is available online via www.fhwa.dot.gov/publications/publicroads/14marapr/index.cfm. For more information, contact TaMara McCrae, tamara.mccrae@dot.gov.

FOCUS Newsletter April 2014

The April issue includes: Accelerating Infrastructure Innovations: Goodbye *Focus*, Hello *Innovator*; Rock Solid: Rokerries Offer Context-Sensitive Slope Solutions; Protecting Transportation Investments with Risk-Based Asset Management; USDOT Publishes Notices of Proposed Rulemaking; FHWA Offers Highway Friction Tester Demonstrations; Participate in the LTPP Warm-Mix Asphalt Study; Infrastructure Innovation Webinars; and Highway Technology Calendar.

The issue is available online via www.fhwa.dot.gov/publications/focus/14apr/14apr00.cfm. For more information, contact Lisa Pope, lgpope@woodwardcom.com.

Innovator: Accelerating Innovation for the American Driving Experience—March/April 2014

This issue includes: New Hampshire First in Line for STIC Incentives; Warm-Mix Asphalt Comes Up a Winner; Montana Showcases GRS-IBS Benefits; States Innovate; Smart Work Zone System Succeeds in Kansas; Intelligent Compaction Gains Momentum; and Calendar.

The issue is available online via www.fhwa.dot.gov/hfl/innovator/e-version/issue_41/. For more information, contact Kathleen Bergeron, kathleen.bergeron@dot.gov.

Links:

Turner-Fairbank Highway Research Center
<http://www.fhwa.dot.gov/research/>

Resource Center
<http://www.fhwa.dot.gov/resourcecenter/>

National Highway Institute
<http://www.nhi.fhwa.dot.gov/home.aspx>

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