

FHWA R&T Now ~ November 2012~

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

GENERAL/ADMINISTRATIVE

FHWA Begins to Implement SHRP2

The Federal Highway Administration (FHWA) is working closely with the American Association of State Highway and Transportation Officials (AASHTO) and the Transportation Research Board (TRB) to begin implementing the priority products included in a joint 3-year plan for the Second Strategic Highway Research Program (SHRP2). The plan calls for approximately six SHRP2 products (or product groupings) to begin implementation each year, based on the assessed priority and readiness of each product. The plan also includes specific programmatic activities necessary to support the overall implementation effort.

Detailed product implementation plans have been finalized for most of the 2012 products in the plan, and deployment efforts are getting underway. Meanwhile, implementation planning workshops are being scheduled to develop strategies and plans for the 2013 priority products.

The new, 2-year transportation authorization, Moving Ahead for Progress in the 21st Century Act (MAP-21), will infuse approximately \$75 million in additional implementation funds for SHRP2 through fiscal year 2014. As the lead implementation agent, FHWA is committed to ensuring that States see an early return on their 4 percent State Planning and Research (SP&R) investment in SHRP2.

For more information, contact Ken Jacoby, 202-493-3186, ken.jacoby@dot.gov.

ADVANCED RESEARCH

FHWA Signs MOU with NSF to Explore Cyber-Physical Systems

FHWA's Office of Research, Development, and Technology signed a Memorandum of Understanding (MOU) with the National Science Foundation (NSF) Computer Science Directorate to cooperate on cyber-physical systems for highway transportation. A cyber-physical system is an emerging field that tightly couples engineered physical and computational elements into large systems. Cyber physical system applications in highway transportation may include networks, roadside equipment, sensors, or controls that connect to vehicles to improve safety, mobility, or energy efficiency. Applications may also be for bridges and pavements with sensors and actuators to increase resilience or durability. The MOU will allow for closer coordination and leveraging of Federal research funding across agencies, academy, and industry.

For more information, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Seeking to Accelerate NDE Innovation

FHWA's Exploratory Advanced Research (EAR) Program and Office of Infrastructure Research and Development (R&D) are seeking organizations interested in contributing to, or participating in a virtual laboratory for nondestructive evaluation (NDE) of highway structures and pavements. A national virtual research laboratory comprised of common physical and virtual experiments could allow researchers from different academic institutions, government agencies, and industries to coordinate and cooperate on NDE research. It could more effectively and quickly allow researchers to build on and advance work conducted by others and increase access to NDE research for new investigators. It also could improve the transition of new methods to practitioners. Elements of a virtual laboratory may include shared access to virtual models of structures, pavements, and sensor and signal

processing equipment; corresponding physical laboratory-based models or in situ structures, pavements, and equipment; data from virtual or physical experiments; or other supporting analysis tools.

For more information, please see the announcement on the EAR Program Web site at <http://www.fhwa.dot.gov/advancedresearch/>. For more information about the EAR Program, please contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Experts Discuss Renewable Energy Transportation Research Projects

On November 7, 2012 the EAR Program convened a panel at the Turner-Fairbank Highway Research Center (TFHRC) to obtain expert feedback on the EAR renewable energy transportation research projects, “Roadway Wind/Solar Hybrid Power Generation and Distribution System: Towards Energy Plus Roadways” with the University of Nebraska at Lincoln, and “Kinetic-to-Electric Energy Conversion (KEEC) Technology as a Roadway Energy Harvester” with Virginia Polytechnic Institute and State University (Virginia Tech).

The feedback will be considered in developing a strategy to maximize success for implementation of the resulting technologies. Staff from State departments of transportation, Federal agencies, nonprofits, and universities participated in the meeting.

For more information about the projects, please contact Eric Weaver, 202-493-3153, eric.weaver@dot.gov. For more information about the EAR Program, please contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Video Analytics Workshop Held at TFHRC

On October 10–11, 2012, FHWA’s EAR Program and the Office of Safety R&D sponsored a workshop on “Applying Automated Feature Extraction to Questions of Driver Behavior” at TFHRC. The purpose was to identify efficient and cost-effective methods and tools to analyze the large amounts of video-related safety data generated by studies such as the SHRP2 Naturalistic Driving Study. Such tools are expected to help the safety community dramatically increase its understanding of relationships between driver behavior and safety, which will advance guide development of safety improvements in infrastructure and other areas. The EAR Program anticipates publishing a workshop summary by January 2013.

For more information about the workshop, contact Lincoln Cobb, 202-493-3313, lincoln.cobb@dot.gov. For more information about the EAR Program, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

EAR Program Explores Casual Carpooling in Three Cities

In 2010 (between November and December), the EAR Program supported a team of transportation professionals, academics, and entrepreneurs who visited informal carpool lines (also known as slug lines or casual carpool lines) in Washington, DC; Houston, TX; and San Francisco, CA. The team observed “slugs” and compared practices among locations. They also met with private ride-match providers, regional planners, carpool participants, and transportation planners and engineers. Scan team participants produced a report that outlined what they learned at the dynamic ridesharing sites and identified gaps in the data and research.

The scan report is available at <http://www.fhwa.dot.gov/advancedresearch/pubs/12053/index.cfm>. Appendix B in the report, available at <http://www.fhwa.dot.gov/advancedresearch/pubs/13023/index.cfm>, contains the personal observations from scan team members. Foundational knowledge gained from the scan will serve as a springboard for future projects, collaborations, and system expansion.

For more information about casual carpooling, contact Allen Greenberg, 202-366-2425, allen.greenberg@dot.gov. For more information about the EAR Program, contact David Kuehn, 202-493-3414, david.kuehn@dot.gov.

Fact Sheet: Predicting Materials Behavior—Advancing Multiscale Modeling Techniques

This fact sheet discusses “Mechanical and Structural Nanoscale Modeling,” an EAR Program study in partnership with Virginia Tech aimed at improving multiscale modeling techniques. The study explores the use of both chemical and mechanical energy, and the combination of mechanical and electrical engineering. The goal is to develop a generalized multiscale modeling theory and generate computational algorithms and software for implementing the theory.

This document is available at

<http://www.fhwa.dot.gov/advancedresearch/pubs/12070/index.cfm>

For more information, contact Kunik Lee, 202-493-3491, kunik.lee@dot.gov.

Fact Sheet: Modeling Complex Behaviors and Interactions—New Methods to Assist Decisionmaking and System Operations

This fact sheet discusses “VASTO—Evolutionary Agent System for Transportation Outlook,” an EAR Program study focused on understanding interactions between travelers, vehicles, traffic management agencies and transportation policies using agent-based modeling and simulation. The study, conducted in partnership with the University of Arizona and George Mason University, will aid decisionmaking on transportation investments and contribute to effective management strategies, leading to a safer, more efficient transportation system.

For more information contact David Yang, 202-493-3284, david.yang@dot.gov.

This document is available at

<http://www.fhwa.dot.gov/advancedresearch/pubs/12069/index.cfm>

INFRASTRUCTURE

TechBrief: Application of Radiographic Testing to Multilayered Gusset Plate Inspection

Corrosion of gusset plates was noted as an issue of concern by the National Transportation Safety Board at the conclusion of the I-35W bridge collapse investigation. In response, FHWA developed a Technical Advisory to alert owners of this concern and offer suggestions about how these plates could be assessed. When the Technical Advisory was written, there were no technologies that could be suggested for assessing multilayered plates. This TechBrief discusses the efficacy of radiographic inspection for these types of gusset plates.

This document is available at

<http://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/12071/>

For more information, contact Justin Ocel, 202-493-3080, justin.ocel@dot.gov.

Report: Federal Highway Administration 100-Year Coating Study

The Federal Highway Administration 100-Year Coating Study was initiated in August 2009 to identify coating systems that can provide 100 years of virtually maintenance-free service life at comparable costs to the existing coating systems, even in adverse environments. Eight coating systems were selected for the study—three three-coat systems consisting of organic, inorganic, and moisture-cured zinc-based primers; four two-coat systems with various combinations of zinc-based primers and organic top coats; and a single-coat system of calcium sulfonate alkyd. This report presents results of the performance evaluation of the eight coating systems.

This document is available at

<http://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/12044/index.cfm>

For more information, contact Jorge Pagán-Ortiz, 202-493-3021, jorge.pagan@dot.gov.

Report: Performance Testing for Superpave and Structural Validation

This report provides the findings from two Transportation Pooled Fund (TPF) research projects, TPF-5(019): *Full-Scale Accelerated Performance Testing for Superpave and Structural Validation* and SPR-2(174): *Accelerated Pavement Testing of Crumb Rubber Modified Asphalt Pavements*. The research identified candidate purchase specification tests for asphalt binder that better discriminate expected fatigue cracking and rutting performance than current Superior Performing Asphalt Pavement tests. Full-scale accelerated pavement testing and laboratory characterization tests on mixtures and binders provided the basis for the recommendations.

This document is available at

<http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/11045/index.cfm>

For more information, contact Jorge Pagán-Ortiz, 202-493-3021, jorge.pagan@dot.gov.

Report: Long-Term Pavement Performance Ancillary Information Management System (AIMS) Reference Guide

This report presents an overview of the contents of the Long-Term Pavement Performance (LTPP) program ancillary information. Ancillary information consists of data, images, reference materials, resource documents, and other information that support and extend the data stored in the Pavement Performance Database related to understanding the performance of pavement test sections included in the LTPP program. The primary purpose of this document is to explain the types and nature of the available information.

This document is available at

<http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12058/index.cfm>

For more information, contact Jorge Pagán-Ortiz, 202-493-3021, jorge.pagan@dot.gov.

TechBrief: Evaluation of High-Volume Fly Ash Mixtures (Paste and Mortar Components) Using a Dynamic Shear Rheometer and an Isothermal Calorimeter

This document is a technical summary of a study focused on developing a rationale for using a dynamic shear rheometer and an isothermal calorimeter as practical, quick scanning tools for predicting and assessing early-age behavior of concrete mixtures containing different types and levels of cement and fly ash; identifying incompatible blends; and verifying performance.

This document is available at

<http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/12062/index.cfm>

For more information, contact Ahmad Ardani, 202-493-3422, ahmad.ardani@dot.gov.

SAFETY

Report: Crash Data Analyses for Vehicle-To-Infrastructure Communications for Safety Applications

This report documents the results of crash data analyses to assess the potential safety benefits of vehicle-to-infrastructure (V2I) communication applications to improve highway safety. It provides estimates of the frequency and cost of crashes involving precrash scenarios addressed by V2I applications. It also evaluates precrash scenarios

not addressed by those applications. This report will be useful to Federal, State, and local government agencies, research organizations, and private sector firms that research, develop, and deploy V2I technologies and safety applications.

This document is available at

<http://www.fhwa.dot.gov/publications/research/connectedvehicles/11040/index.cfm>

For more information, contact Monique Evans, 202-493-3074, monique.evans@dot.gov.

RECENT PERIODICALS

***Public Roads*—November/December 2012**

This issue includes: The Car of the Future, Today; Managing Traffic Signals During Storms; They're Small But Powerful; and Spotlight on Solar Arrays.

It is available online via <http://www.fhwa.dot.gov/publications/publicroads/13novdec/index.cfm>

For more information, contact Paula Magoulas, paula.magoulas@dot.gov.

***FOCUS* Newsletter November 2012**

The November issue includes: Colorado Rockfall Simulation Program: Modeling Rockfall in 3D; A Guide to Performance Contracting for Construction; Assessing Highway Infrastructure Health Nationwide; Showcasing an Advanced Motorist Warning System in Texas; Infrastructure Innovation Webinars; and Highway Technology Calendar.

The issue is available online via <http://www.fhwa.dot.gov/publications/focus/12nov/12nov00.cfm>

For more information, contact Lisa Pope, lgpope@woodwardcom.com.

***Innovator: Accelerating Innovation for the American Driving Experience*—September/October 2012**

This issue includes: FHWA Launches New Round of Every Day Counts Innovations; Adaptive Signal Control Technology Makes Inroads; Virginia Finds Success in Rapid Pavement Repair; SPMTs Make a Difference on Minnesota Bridge Project; Peer Exchanges Advance Innovation Deployment; and Calendar.

The issue is available online via <http://www.fhwa.dot.gov/hfl/innovator/issue32.cfm>.

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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Suggestions may be submitted to: FHWA_Now@fhwa.dot.gov

