

## ***FHWA R&T Now* ~ January 2013~**

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

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### **GENERAL/ADMINISTRATIVE**

#### **FHWA Announces SHRP2 Implementation Assistance Program**

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 implement 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 Solutions (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.

FHWA and AASHTO have announced a SHRP2 Implementation Assistance Program for States and other transportation agencies to advance SHRP2 Solutions and to engage in implementing and deploying SHRP2 products. The program includes proof of concept pilots, lead adopter incentives, and user incentives tailored to each product. A solicitation process will get underway in February, with awards to be announced in late spring. Outreach efforts are currently taking place to provide more detailed information about the products being rolled out and the solicitation opportunities available for each product. Also in February, a SHRP2 implementation assistance Web site will be launched to provide further details and ongoing updates.

For more information, contact Carin Michel, 410-962-2530, [carin.michel@dot.gov](mailto:carin.michel@dot.gov).

### **ADVANCED RESEARCH**

#### **New Broad Agency Announcement Solicitation Awarded**

FHWA issued a Broad Agency Announcement soliciting proposals that address exploratory advanced research on two topics: Advanced Cooperative Highway and Vehicle Systems and Automation of Video Feature Extraction for Road Safety. The Broad Agency Announcement (number DTFH61-13-R-00011) is open through March 15, 2013. The announcement includes the following topics:

- Topic 1A, High Performance Vehicle Streams.
- Topic 1B, New Approaches for Testing Connected Highway and Vehicle Systems.
- Topic 1C, Innovative Applications for Emerging Real-Time Data.
- Topic 1D, Partial Automation for Truck Platooning.
- Topic 2A, Automated Feature Extraction.
- Topic 2B, Automated Identity Masking.

For more information and a link to the full announcement, visit [www.fhwa.dot.gov/advancedresearch/](http://www.fhwa.dot.gov/advancedresearch/) and look under “Announcements.”

For more information about the Exploratory Advanced Research (EAR) Program, contact David Kuehn, 202-493-3414, [david.kuehn@dot.gov](mailto:david.kuehn@dot.gov).

## **EAR Program Results Highlighted in Recent Catalog**

The EAR Program has published a catalog of research results to document the output of program effort, a critical link in the chain of research, development, and deployment of new technologies and practices necessary for the United States to have the best transportation system in the world for decades to come. The EAR Program addresses the need for longer term, higher risk research with the potential for long-term improvements to transportation systems in planning, building, renewing, and operating safe, congestion-free, and environmentally sound transportation facilities. Broad scientific participation and extensive coverage of advanced ideas and new technologies are secured by engaging stakeholders throughout the EAR Program's processes—not only in identifying and scoping topics, but also in ensuring the technical quality of sponsored research through expert panels and in communicating research results. The catalog provides detailed information on recently completed projects ranging from driver behavior in traffic to the development of a stiffness measuring device for pad foot roller compaction.

This document is available at [www.fhwa.dot.gov/advancedresearch/pubs/13032/index.cfm](http://www.fhwa.dot.gov/advancedresearch/pubs/13032/index.cfm).

For more information, contact David Kuehn, 202-493-3414, [david.kuehn@dot.gov](mailto:david.kuehn@dot.gov).

## **Video Analytics Workshop Summary Report Published**

On October 10–11, 2012, at the Turner-Fairbank Highway Research Center (TFHRC) in McLean, VA, FHWA's Office of Safety Research and Development (R&D) and EAR Program convened a 2-day workshop on automated video feature extraction. The objective of the workshop was to begin to answer the question: how can Government, academia, and the private sector cooperate to advance the state of the practice in the automated analysis of data from naturalistic driving studies? A panel of expert speakers presented the state of knowledge in video feature extraction and demonstrated and described a range of analytical capabilities that could be automated.

The report is available at [www.fhwa.dot.gov/advancedresearch/pubs/13037/index.cfm](http://www.fhwa.dot.gov/advancedresearch/pubs/13037/index.cfm).

For more information, contact David Kuehn, 202-493-3414, [david.kuehn@dot.gov](mailto:david.kuehn@dot.gov).

## **International Activity on Connected Vehicles Documented**

The EAR Program published a report, *Recent International Activity in Cooperative Vehicle-Highway Automation Systems* (FHWA-HRT-12-033), summarizing the current state of the art in cooperative vehicle-highway automation systems in Europe and Asia. The project is based on a series of meetings, demonstrations, and site visits, combined with the results of a literature review. The review covers systems that provide drivers with a range of automation capabilities, from driver assistance to fully automated driving, with an emphasis on cooperative systems that involve active exchanges of information between the vehicles and the roadside and among separate vehicles. The trends in development and deployment of these systems are examined by country, and the similarities and differences relative to the U.S. situation are noted, leading toward recommendations for future U.S. action.

The report is available at [www.fhwa.dot.gov/advancedresearch/pubs/12033/12033.pdf](http://www.fhwa.dot.gov/advancedresearch/pubs/12033/12033.pdf). Published separately, *Literature Review on Recent International Activity in Cooperative Vehicle-Highway Automation Systems* (FHWA-HRT-13-025) is available at [www.fhwa.dot.gov/advancedresearch/pubs/13025/index.cfm](http://www.fhwa.dot.gov/advancedresearch/pubs/13025/index.cfm).

For more information, contact David Kuehn, 202-493-3414, [david.kuehn@dot.gov](mailto:david.kuehn@dot.gov).

## **INFRASTRUCTURE**

### **Report: Curl and Warp Analysis of The LTPP SPS-2 Site in Arizona**

This study examined the roughness and roughness progression of 21 test sections on the Long-Term Pavement Performance (LTPP) Specific Pavement Studies (SPS)-2 site in Arizona over the first 16 years of the experiment. The site included 12 test sections from the standard experiment and 9 supplemental test sections selected by the Arizona Department of Transportation.

This document is available at

[www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12068/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12068/index.cfm)

For more information, contact Larry Wiser, 202-493-3079, [larry.wiser@dot.gov](mailto:larry.wiser@dot.gov).

### **Report: Relating Ride Quality and Structural Adequacy for Pavement Rehabilitation/Design Decisions**

This report presents the results of a study undertaken to identify and verify the relationship, if any, between two performance indicators—ride quality and structural adequacy—using the Long-Term Pavement Performance program and other pavement performance data sources. The study was aimed at improving the evaluation and use of pavement condition data in pavement rehabilitation and design decisions.

This document is available at

[www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12035/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12035/index.cfm)

For more information, contact Nadarajah Sivaneswaran, 202-493-3147, [nadarajah.sivaneswaran@dot.gov](mailto:nadarajah.sivaneswaran@dot.gov).

### **Report: Simplified Techniques for Evaluation and Interpretation of Pavement Deflections for Network-Level Analysis**

This report discusses a study focused on developing an approach for incorporating techniques used to interpret and evaluate deflection data for network-level pavement management system applications. Findings suggest that it is possible and, in fact, advantageous to define simplified techniques for the evaluation and interpretation of pavement deflections for network-level analysis.

This document is available at

[www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12023/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/12023/index.cfm)

For more information, contact Larry Wiser, 202-493-3079, [larry.wiser@dot.gov](mailto:larry.wiser@dot.gov).

### **Report: Summary Report On The FHWA LTBP Workshop To Identify Bridge Substructure Performance Issues: March 4-6, 2010, In Orlando, FL**

This report presents an overview of the “Federal Highway Administration Workshop to Identify Bridge Substructure Performance Issues.” The purpose of the workshop, held March 4–6, 2010 in Orlando, FL, was to consider overall bridge performance and identify geotechnical performance metrics that may correspond to good and poor performance. This report describes the results of the workshop and presents them in the larger perspective of designing and implementing the Long-Term Bridge Performance program.

This document is available at

[www.fhwa.dot.gov/publications/research/infrastructure/structures/ltp/11037/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/structures/ltp/11037/index.cfm)

For more information, contact Hamid Ghasemi, 202-493-3042, [hamid.ghasemi@dot.gov](mailto:hamid.ghasemi@dot.gov).

## **SAFETY**

### **Assessing Geographic Information Systems Needs and Obstacles in Traffic Safety Programs**

FHWA's Office of Safety R&D is investigating the needs of State departments of transportation, local agencies, and metropolitan planning organizations as they adopt or develop geographic information systems (GIS) to support their safety data collection, maintenance, and analysis activities. Geographic information systems allow agencies to advance from often fragmented two-dimensional legacy data location approaches to geospatial systems where diverse data types including crash, volume, roadway, demographic, and asset data can be brought together. Once those data sets are incorporated on a common platform, the relationships between them can be visualized and analyzed in ways that would otherwise not be possible. This results in data-driven decisions for improved safety informed by the identification of relationships between disparate data sources.

This project will explore the opportunities associated with GIS-based safety data programs, identify the needs of agencies which are considering the transition to GIS, and address the obstacles those agencies will face as they adopt this technology. Major products of this effort will be a literature review, a marketing and outreach plan, and a final report. The final report is expected in the first quarter of fiscal year 2014.

For more information, contact Craig Thor, 202-493-3338, [craig.thor@dot.gov](mailto:craig.thor@dot.gov).

### **Development of Crash Modification Factors**

FHWA's Office of Safety R&D is undertaking a major, long-term effort to evaluate previously unproven priority safety countermeasures. The work involves developing for each countermeasure a benefit/cost ratio and a crash modification factor (CMF) that would receive a high quality rating in the CMF Clearinghouse and meet the criteria for inclusion in the AASHTO Highway Safety Manual. Researchers will analyze crash, road geometry, and other related data collected before and after a given countermeasure is installed to estimate the countermeasure's safety effectiveness. The Development of Crash Modification Factors (DCMF) program will also examine methods used to develop and apply CMFs and assess their quality.

The initial list of countermeasures to be considered includes:

- Pedestrian signals, signs, markings, etc.
- Driver feedback signs.
- Active intersection conflict warning systems/dynamic signing.
- Pavement marking types and characteristics.
- Surface friction treatment on curves and ramps.

Going forward, the selection of countermeasures to be evaluated will be guided by stakeholder priorities. This project is expected to continue well into 2017.

For more information, contact Roya Amjadi, 202-493-3383, [roya.amjadi@dot.gov](mailto:roya.amjadi@dot.gov).

### **Report: Evaluating Driver Performance on Rural Two-Lane Horizontal Curved Roadways Using A Driving Simulator**

This report discusses a study that addresses how being inattentive or in a hurry affects the performance of drivers who are familiar with a roadway. Researchers investigated the efficacy of eliciting these conditions in a driving simulation environment and whether these elicitations affect driving behavior in measureable ways. They also examined the potential for using these driving simulator elicitation methods to evaluate engineering countermeasures to run-off-road crashes on two-lane rural-roadway horizontal curves.

This document is available at [www.fhwa.dot.gov/publications/research/safety/12073/index.cfm](http://www.fhwa.dot.gov/publications/research/safety/12073/index.cfm)

For more information, contact David Yang, 202-493-3284, [david.yang@dot.gov](mailto:david.yang@dot.gov).

## **Report: A Distance-Based Method to Estimate Annual Pedestrian and Bicyclist Exposure in An Urban Environment**

This report describes a methodology for measuring pedestrian and bicyclist exposure based on counts of pedestrian and bicyclist volumes as well as the distances that pedestrians and bicyclists travel on facilities shared with motor vehicles. The distances that pedestrians and bicyclists travel on these facilities represent a measure of their exposure to the risk of having a crash with a motor vehicle. This methodology has the potential to fill a long-standing technical need for a commonly accepted measure of pedestrian and bicyclist exposure, thereby assisting in evaluating the effectiveness of pedestrian/bicyclist safety programs.

This document is available at  
[www.fhwa.dot.gov/publications/research/safety/pedbike/11043/index.cfm](http://www.fhwa.dot.gov/publications/research/safety/pedbike/11043/index.cfm)

For more information, contact David Yang, 202-493-3284, [david.yang@dot.gov](mailto:david.yang@dot.gov).

## **OPERATIONS**

### **Effective Integration of Analysis Modeling and Simulation Tools**

Simulation models used in transportation analysis are not well integrated among different domains (e.g., operations, safety, and environment) and for different levels of analysis (macro, meso, and micro). “Effective Integration of Analysis Modeling and Simulation Tools,” an FHWA Office of Operations R&D project, developed a prototype data hub and data schema using the NeXTA open-source software tool to save users time inputting data and modeling and displaying results in a common format. The research team tested the newly developed model integration approach to address real-world transportation planning, operations, and management problems and demonstrated the approach to transportation planners at Portland Metro and Pima Association of Governments. Preliminary results from this real-world testing showed that the NeXTA data hub prototype overcame many of the previous shortcomings associated with integrated modeling applications and provided up to 80 percent time savings in conducting the analyses.

For more information, contact Joe Bared, 202-493-3314, [joe.bared@dot.gov](mailto:joe.bared@dot.gov).

### **ITE Journal Publication: Mini-Roundabouts for the United States and Traffic Capacity Models**

FHWA’s Office of Operations R&D published an article in the November 2012 issue of the Institute of Transportation Engineers (ITE) Journal that provided design recommendations and approaches for estimating the traffic capacity of mini-roundabouts for sites in the United States. The mini-roundabout design has been used for decades in Europe but the capacity models developed for them may not be applicable to U.S. settings and drivers. Its innovative design has been shown to improve safety at U.S. intersections while reducing delays and encouraging slower speeds. The study suggested essential design recommendations and derived planning models for capacity analysis for both the 50-foot and 75-foot inscribed circle diameter roundabouts.

This document is available  
at <http://digitaleditions.sheridan.com/publication/index.php?i=133443&m=&l=&p=4&pre=&ver=flex>

For more information, contact Taylor Lochrane, 202-493- 3293, [Taylor.Lochrane@dot.gov](mailto:Taylor.Lochrane@dot.gov), or Joe Bared, 202-493-3314, [Joe.Bared@dot.gov](mailto:Joe.Bared@dot.gov).

### **Emission Reductions and Fuel Savings Demonstrated at TFHRC**

On August 23, 2012 researchers from FHWA’s Office of Operations R&D and the University of California, Riverside used TFHRC’s intelligent intersection to provide Signal Phase and Timing and Geometric Intersection

Description data to a test vehicle equipped with an onboard dedicated short-range communication modem, onboard computer processor, and a display device to provide the driver with speed advice. These tests were conducted as part of the U.S. Department of Transportation initiative, Applications for the Environment: Real-Time Information Synthesis, to identify transformative concepts to improve environmental performance. Using these connected vehicle technologies, researchers were able to achieve a reduction of harmful emissions of up to 12 percent and fuel savings between 10 and 20 percent. These savings are based on the energy a vehicle can conserve by approaching and moving through an intelligent intersection strategically using vehicle-to-infrastructure technology.

To read more, visit [www.fhwa.dot.gov/research/resources/emission\\_reductions.cfm](http://www.fhwa.dot.gov/research/resources/emission_reductions.cfm).

For more information, contact Robert Ferlis, 202-493-3268, [robert.ferlis@dot.gov](mailto:robert.ferlis@dot.gov).

### **FHWA Launches AASHTO Connected Vehicle Infrastructure Deployment Footprint Analysis**

In coordination with AASHTO, FHWA's Office of Operations R&D began a project on November 13, 2012 to conduct analysis leading to a preliminary, general concept of a national connected vehicle field infrastructure footprint. Describing such a footprint satisfies many requirements in developing a policy foundation for the connected vehicle environment. The resulting deployment footprint and plan for connected vehicle field infrastructure will be described in a final report that will discuss the need for connected vehicle field infrastructure, locations and timelines for deployment, and cost, organizational, and institutional implications for deployment, operations, and management of the infrastructure.

For more information, contact Ben McKeever, 202-493-3270, [ben.mckeever@dot.gov](mailto:ben.mckeever@dot.gov).

### **RECENT PERIODICALS**

#### ***Public Roads—January/February 2013***

This issue includes: Linking Drivers and Roads; An Eight-Lane, Four-Bore Hole in One; Why Drivers Do What They Do; From Milepost to Milestone: Innovative Mitigation; and America's Byways Pay Off in Authentic Experiences, But How About Dollars?

It is available online via [www.fhwa.dot.gov/publications/publicroads/13janfeb/index.cfm](http://www.fhwa.dot.gov/publications/publicroads/13janfeb/index.cfm)

For more information, contact Paula Magoulas, [paula.magoulas@dot.gov](mailto:paula.magoulas@dot.gov).

#### ***FOCUS Newsletter December 2012***

The December issue includes: Advancing Bridge Safety Through FHWA's New Data-Driven Inspection Program; FHWA Hydraulic Toolbox Offers Fast and Efficient Project Design; Extend Your Roadway Network with Asphalt Pavement In-Place Recycling Techniques; FHWA Awards Funding for Innovative Bridge Research and Deployment Program; Infrastructure Innovation Webinars; and Highway Technology Calendar.

The issue is available online via [www.fhwa.dot.gov/publications/focus/12dec/12dec00.cfm](http://www.fhwa.dot.gov/publications/focus/12dec/12dec00.cfm)

For more information, contact Lisa Pope, [lgpope@woodwardcom.com](mailto:lgpope@woodwardcom.com).

#### ***Innovator: Accelerating Innovation for the American Driving Experience—November/December 2012***

This issue includes: Every Day Counts Summits Explore Project Delivery Strategies; Puerto Rico Moves Ahead on Every Day Counts; Utah DOT to Build Twin GRS-IBS Bridges; Designing Bridges for Resilience Helps Avoid Future Failures; Visit Us at TRB; Design-Build Cuts Years and Millions of Dollars From Missouri Project; States

Get Grants to Try Project Innovations; States Innovate: Agencies Use New Approaches to Build Roads Better; and Calendar

The issue is available online via [www.fhwa.dot.gov/hfl/innovator/issue33.cfm](http://www.fhwa.dot.gov/hfl/innovator/issue33.cfm).

For more information, contact Kathleen Bergeron, [kathleen.bergeron@dot.gov](mailto: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](mailto:FHWA_Now@fhwa.dot.gov)