

FHWA R&T Now

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

March/April 2017

POLICY & PARTNERSHIPS

AASHTO's Research Advisory Committee, the Federal Motor Carrier Safety Administration, and the Korea Transportation Safety Authority Tour Turner-Fairbank

FHWA's Office of Research, Development and Technology recently hosted a laboratory tour of the Turner-Fairbank Highway Research Center (TFHRC) for the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee. Comprised of managers from research programs of each of the State departments of transportation (DOTs), the committee supports the activities of the Standing Committee on Research, which acts as AASHTO's driving force for high-quality transportation research and innovation to improve the Nation's mobility of people and goods. The Research Advisory Committee is committed to promoting quality and excellence in research and in the application of research findings to improve State transportation systems. The tour included representatives from 10 State DOTs.

TFHRC also hosted representatives from the Federal Motor Carrier Safety Administration's (FMCSA) Office of the Administrator, Office of Field Operations, and Office of Research for a tour of the facilities. FMCSA met with subject matter experts in safety, operations, and infrastructure to discuss broad issues related to truck platooning and truck automation. FMCSA toured the Safety Training and Analysis Center, the Aggregate and Petrographic Labs (including the Accelerated Load Facility), the Human Factors Laboratory, and the Federal Outdoor Impact Laboratory.

Also, three representatives from the Korea Transportation Safety Authority (KTSA)—a central government agency in South Korea in charge of transportation safety policy and program development—toured Turner-Fairbank's Human Factors laboratory. The purpose of the visit was to share knowledge and research experiences and encourage future collaboration. The representatives learned about the various labs and research tools employed by researchers in the Human Factors laboratory. These include the new Virtual Reality Lab, Sign lab, the MiniSim, Field Research Vehicles, and Highway Driving Simulator. KTSA is also working to improve safety through the use of driving simulation aimed at evaluating highway design and studying driver behavior.

For more information about the Research Advisory Committee tour contact, Jack Jernigan, 202-493-3363, jack.jernigan@dot.gov. For more information about the FMCSA tour, contact James Pol, 202-493-3371, james.pol@dot.gov. For more information about the KTSA tour, contact Michelle Arnold, 202-493-3990, michelle.arnold@dot.gov.



EXPLORATORY ADVANCED RESEARCH

FHWA Publishes EAR Program Results for 2016

FHWA recently published the catalog, “EAR Program Research Results—Updated Through 2016” (FHWA-HRT-17-021), which documents research results through 2016.



As part of a video analytics project, researchers developed an identity masking system to replace a driver's face in a video with an avatar's face for identity protection. Photo: © SRI International.

Results of Exploratory Advanced Research (EAR) Program-funded projects may include new fundamental insights and how they can be applied in highway transportation; new research methods, models, or data that can accelerate applied research; or new system concepts or prototypes, including laboratory testing and possibly limited field testing.

FHWA is committed to transitioning the results of EAR Program-funded projects and takes an active role in demonstrating results to audiences critical to continuing the research and development cycle. The catalog is available online at www.fhwa.dot.gov/advancedresearch/pubs/17021/index.cfm, or in print by calling FHWA's Product Distribution Center at 814-239-1160.

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

Updated EAR Program Brochure Available

FHWA recently published the brochure, “Exploratory Advanced Research Program” (FHWA-HRT-17-022), which offers an overview of its EAR Program and how it focuses on longer

term, higher risk research with a high payoff potential by matching opportunities from discoveries in science and technology with the needs of specific industries.

The uncertainties in the research approach and outcomes challenge organizations and researchers to be innovative problem solvers, which can lead to new research techniques, instruments, and processes that can be of value to future advanced or applied research projects. The brochure, now in its sixth edition, explains how the program handles international collaborations, discusses focus areas that are critical to the transportation industry, provides insight into overall program results, and explains how to get involved. It is available online at www.fhwa.dot.gov/advancedresearch/pubs/17022/index.cfm, or in print by calling FHWA's Product Distribution Center at 814-239-1160.

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

INFRASTRUCTURE

FHWA Releases New Version of Deep Foundation Load Test Database

FHWA's Office of Infrastructure Research and Development has released an updated version of its Deep Foundation Load Test Database (DFLTD). The new version, DFLTD v.2, contains over 1,600 research quality load test results on various types of piles and drilled shafts. Records can be queried in numerous ways to include foundation type and size, subsurface soil information, location, and more. Functionalities in the software will help facilitate best practice and greater reliability in the design and construction of different deep foundation elements. DFLTD v.2 replaces the previous version (DFLTD v.1) to meet current operating system requirements and also adds new information on over 150 load tests on Large Diameter Open-End Piles (LDOEPs). DFLTD v.2 was developed as part of an ongoing research study to evaluate the bearing resistance of LDOEPs and calibrate resistance factors for both



static and dynamic analysis methods. To download DFLTD v.2 and the user manual, visit www.fhwa.dot.gov/publications/research/infrastucture/structures/bridge/dfltd/.

For more information, contact Jennifer Nicks, 202-493-3075, jennifer.nicks@dot.gov.

FHWA Sponsors Webinar on Pavement Friction Management Program

FHWA recently sponsored a webinar in which staff from the Virginia Tech Transportation Institute (VTTI), under contract to conduct the “FHWA Pavement Friction Management Study,” presented the Pavement Friction Management Program (PFMP) to pavement and safety professionals at the Washington Department of Transportation. The goal of the project is to reduce the number of highway fatalities and serious injuries through the implementation of proactive PFMPs by owner agencies. Through this research project, FHWA assisted four States to develop a PFMP by grouping their highway network (about 750 miles per State) into friction demand categories, testing these roads with Continuous Friction Measurement Equipment (CFME) and continuous macrotexture measurement equipment, and comparing with test results from the States’ locked wheel skid trailers. Roadway geometric and pavement surface type, environmental, crash, and traffic data for the selected highway networks were obtained to relate crashes to road surface friction and macrotexture.

For more information, contact Jim Sherwood, 202-493-3150, jim.sherwood@dot.gov.

LTPP Program Releases New Version of InfoPave

FHWA’s Long-Term Pavement Performance (LTPP) program released an updated version of LTPP InfoPave™. The new version includes several features to improve access to LTPP data, as well as an enhancement of other features based on user feedback.

Some of the most exciting features include a “Virtual Section,” which is used to visualize LTPP test sections in three dimensions. Another feature that can immediately be used by the States is a Forward Calculated Stiffness tool, which generates a ball-park estimate of the stiffness of the surface asphalt or concrete layer(s) and the subgrade soils based on user-input falling weight deflectometer data. Pavement performance data, as well as the accompanying reports from the FHWA Rigid Pavement Performance and Rehabilitation study are now part of the Non-LTPP module. Another important addition is a set of National Pavement Performance Measures. This new web-based tool displays the calculated national pavement performance measures based on LTPP data using the interpretation methods from the Highway Performance Monitoring System and FHWA’s Notice of Proposed Rule Making.

A full list of updates is available at <https://infopave.fhwa.dot.gov/Page/Type/ReleaseNotes>. For more information, contact Deborah Walker, 202-493-3068, deborah.walker@dot.gov.

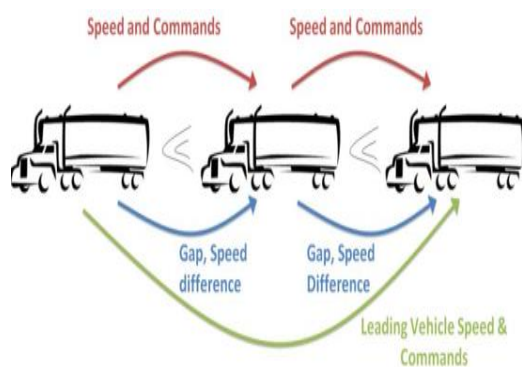
OPERATIONS

Event in California Demonstrates Benefits of Truck Platooning

On March 8, 2017, a truck platooning demonstration was held in San Pedro, California. Implemented by the PATH Program of the University of California Berkeley and the Volvo Group under the sponsorship of FHWA’s EAR Program and Caltrans, the demonstration featured a three truck platoon using onboard sensors and vehicle-to-vehicle communications to control spacing between trucks. About 10 people from the U.S. Department of Transportation (including 3 from TFHRC) attended the event. Participants were able to ride in a heavy truck that drove on a freeway as part of a platoon, with the followers’ speed under cooperative adaptive cruise control (CACC).



The demonstration, which took place on the I-110 freeway near the Los Angeles and Long Beach Port complex, displayed the use of dedicated short-range communications (DSRC) vehicle-to-vehicle communication. This technology coordinated the speeds of the trucks so they could accurately follow each other at constant time gaps. Participants rode in the second and third trucks of the platoon and observed the safe separation of the CACC string when a passenger car cut in between the trucks and then the resumption of short-gap CACC operations after the intruding car departed.



Conceptual diagram of the sensor, communication, and control aspects of CACC for truck platooning.

Source: California PATH Program.

By using CACC, heavy trucks are enabled to travel safely and smoothly at significantly shorter gaps than they can under conventional manual driving today. Drivers control the steering and are able to deal with any hazards in the driving environment. The technology makes it possible to save energy, reduce emissions, and significantly increase the capacity of a dedicated truck lane facility. Considerable benefits are also possible for the movement of goods over long-haul, cross-country routes, as well as to and from major ports.

Close coordination of the CACC system results in reduced aerodynamic drag, enabling energy savings and greenhouse gas reductions; enhanced stability of vehicle following, damping out traffic disturbances; shorter than normal gaps discouraging (but not eliminating) cut-ins by drivers of other vehicles; and faster

responses to hard braking by preceding trucks, improving safety.

For more information, contact Osman Altan, 202-493-3391, osman.altan@dot.gov.

Report Focuses on Data Access, Sharing, and Integration

The effective analysis of transportation operations strategies for planning and investment decisions requires an accurate and complete understanding of transportation system performance obtained by integrating multiple sources of transportation data from multiple stakeholders. FHWA recently published the report, “State of the Practice on Data Access, Sharing, and Integration” (FHWA-HRT-15-072), which examines the state of the practice in data sharing and integration, specifically current data sharing and integration practices among State and local agencies, example data environments, technical integration formats, and business rules for integration and sharing. The report is available to download at

www.fhwa.dot.gov/publications/research/operations/15072/15072.pdf.

For more information, contact Govindarajan Vadakpat, 202-493-3283, g.vadakpat@dot.gov.

SAFETY

Report Covers Research on Rumble Strips

FHWA recently published “State of the Practice for Shoulder and Center Line Rumble Strip Implementation on Non-Freeway Facilities” (FHWA-HRT-17-026), a report that discusses research aimed at providing agencies with a framework for making decisions on how to implement rumble strips. The report includes a literature review detailing research related to rumble strip design, noise and vibration testing methods and findings, impacts on bicyclists and motorcyclists, pavement condition impacts, pavement marking visibility, operational effectiveness, and safety effectiveness. It also provides a review of current department policies and standard drawings for rumble strip



implementation strategies, systematic installation criteria, currently used rumble strip dimensions, high-crash corridor installation practices, special considerations, and rumble strip modifications. This document is available at www.fhwa.dot.gov/publications/research/safety/17026/index.cfm.

For more information, contact Abdul Zineddin, 202-493-3288, abdul.zineddin@dot.gov.

RECENT PERIODICALS

Public Roads—March/April 2017

This issue includes: Providing a Shoulder to Drive On; The Times They Are Definitely Changing; Doubling Down on Safety Innovations; States Learning From Each Other; Onward and Upward; and Working Smarter, Together.

It is available online via www.fhwa.dot.gov/publications/publicroads/17marapr/index.cfm.

For more information, contact Lisa Shuler, lisa.a.shuler@dot.gov.

Innovator: Accelerating Innovation for the American Driving Experience—March/April 2017

This issue includes: Weather-Savvy Roads; Modernizing Traffic Signal Management; Tapping Innovation Councils to Lead Change; Programmatic Agreement Streamlines Virginia Project Reviews; Project Tests Technology to Measure Pavement Marking Safety; States Innovate!; and Events.

The issue is available online via www.fhwa.dot.gov/innovation/innovator/issue59/3dlssue/.

For more information, contact Nichole Causey, nichole.causey@dot.gov.

LINKS

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

Resource Center:
www.fhwa.dot.gov/resourcecenter/

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

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