FHWA R&T Now

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

January/February 2017

POLICY & PARTNERSHIPS

Over 400 SHRP2 Projects Underway Across Country

The Second Strategic Highway Research Program (SHRP2) aims to accelerate the renewal of U.S. highways, improve highway safety, advance reliable travel times, and provide highway capacity in support of U.S. economic, environmental, and social goals. More than 60 SHRP2 Solutions are in use across the Nation. Since 2013, FHWA and the American Association of State Highway Transportation Officials (AASHTO) have launched seven rounds of the SHRP2 Implementation Assistance Program (IAP), providing more than $130 million in financial support and technical assistance to transportation agencies. Nearly 430 SHRP2 projects are now in progress in all 50 States, the District of Columbia, and Puerto Rico.

In June 2016, FHWA and AASHTO announced the recipients of the seventh and final round of the IAP, and those new projects are getting underway. Moving into 2017 and beyond, SHRP2 will continue to advance the ongoing success and deployment of SHRP2 Solutions through workshops, peer exchanges, showcases, field demonstrations, training sessions, and other activities. As an increasing number of transportation agencies adopt SHRP2 products and practices, all are encouraged to share their expertise with other agencies. To access product reports, case studies, and other resources, visit www.fhwa.dot.gov/goshrp2/.

For more information, contact Carin Michel, 410-962-2530, carin.michel@dot.gov.

ICM Report Points to Smart Cities Strategies and Initiatives

As a concept, integrated corridor management (ICM) can be defined as a practical application of a smart cities objective, but within the defined cordon of a corridor, not necessarily citywide. The ICM approach is based on three fundamental concepts: a corridor-level operations nexus; agency integration through institutional, operational, and technical means; and active management of all available corridor assets and facilities. The vision of ICM is that transportation networks will realize significant improvements in the efficient movement of people and goods through aggressive, proactive integration of existing infrastructure along major corridors.

FHWA's report, "Integrated Corridor Management and the Smart Cities Revolution: Leveraging Synergies" (FHWA-HOP-16-075), examines how ICM can integrate smart cities strategies and investigates how existing ICM approaches can advance, inform, and help lead smart cities initiatives. The report explores opportunities to effectively integrate strategies institutionally,

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operationally, and technically, both by leveraging existing platforms and considering new options for coordination between ICM and smart cities stakeholders. It also identifies potential challenges to integrating ICM and smart cities, along with potential solutions.

The intended audience includes stakeholders from State and local transportation departments, metropolitan planning organizations, city agencies, and other organizations (in the public and private sector) that provide services within a city or metropolitan area and are seeking to provide those services in a smarter, more efficient and sustainable way. The report aims to encourage these groups to think broadly about how to go about creating smart cities and how integrated corridor management can help achieve those goals. It is available to download at www.ops.fhwa.dot.gov/publications/fhwahop16075/fhwahop16075.pdf.

For more information, contact Robert Sheehan, 202-366-6817, robert.sheehan@dot.gov.

EXPLORATORY ADVANCED RESEARCH

WMATA SafeTrack Examined with EAR-Funded Modeling System

The University of Maryland College Park is studying the impact of the Washington Metropolitan Area Transit Authority's (WMATA) SafeTrack using a modeling system that was funded and developed under FHWA's Exploratory Advanced Research (EAR) Program with technical direction from FHWA's Office of Planning. The EAR Program provided funding to University of Maryland for research on new approaches for modeling travel behavior in 2011.

Researchers used agent-based modeling, an approach that simulates interactions among autonomous agents or individuals, providing significantly better results than traditional models (where behavior is deterministic) as agents can learn from experience and change behavior. The EAR Program has funded some of the first applications of agent-based modeling for transportation to demonstrate the potential. Both the National Science Foundation and the U.S. Department of Energy's Advanced Research Projects Agency–Energy (ARPA-E) have funded further studies that rely on research and models created through FHWA's EAR Program.

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

INFRASTRUCTURE

Secretary Foxx Visits Hydraulics Laboratory

During a recent visit to the Turner-Fairbank Highway Research Center (TFHRC), Transportation Secretary Anthony Foxx actuated a robotic arm used to visually record the action of water passing over a scale model in the new multifunctional flume system at FHWA's J. Sterling Jones Hydraulics Research Laboratory.

Secretary Foxx recently visited TFHRC's Hydraulics Laboratory.

Attendees from TFHRC included Associate Administrator for Research, Development, and Technology (RD&T) and Director of TFHRC, Michael Trentacoste; Chief Scientist, Jonathan Porter; and the Director of FHWA's Office of Operations R&D, Brian Cronin.

The new flume system is expected to advance the lab's ability to predict flooding-related damages and improve design guidance for

mitigating impacts on bridges and other hydraulic structures.

The lab's robotic arm can be used to visually record water passing over a scale model.

Boasting a 90-foot-long and 13-foot-wide tiltable working platform for setting up experiments, the flume system features a 27-foot-long flow inlet headworks, an outlet section, and a sediment recirculating system that is nationally unique.

The new flume system is expected to advance the lab's ability to predict flooding-related damages.

The recirculating system allows for sediment infeed from the bottom of the flume channel sections. The flume system supports the hydraulics research program's vision to enhance experimental work and use computational fluid dynamics modeling for a large part of its research.

For more information, contact Kornel Kerenyi, 202-493-3142, kornel.kerenyi@dot.gov.

OPERATIONS

Report Covers Research on Traffic Bottlenecks

FWHA recently published the report, "Traffic Bottlenecks: Identification and Solutions" (FHWA-HRT-16-064), which discusses a research project aimed at developing practical methods for prioritizing and mitigating traffic bottlenecks, which are one of the top causes of surface transportation congestion in the United States. Researchers developed a new approach for ranking traffic bottlenecks, a new playbook of 70 bottleneck mitigation strategies, a benefit-cost analysis of 5 low-cost bottleneck mitigation strategies, and 3 new bottleneck mitigation strategies.

In advancing a new approach for ranking traffic bottlenecks, researchers created a data-driven congestion and bottleneck identification software tool with numerous performance measures. In parallel, researchers conducted extensive traffic simulations to assess the operational benefits of underrated strategies as opposed to popular strategies, such as ramp metering, which have been extensively researched and implemented in recent decades. The project also focused on low-cost solutions as opposed to solutions requiring excessive infrastructure investments or advanced vehicle technologies. These solutions involved dynamic lane use, contraflow or reversible lane use, hard shoulder lane use, lane width reduction, and a modest extension of auxiliary lanes.

This report, which is expected to be of interest to practitioners involved in the transportation operations discipline, is available to download at www.fhwa.dot.gov/publications/research/operations/16064/index.cfm.

For more information, contact Joe Bared, 202-493-3314, joe.bared@dot.gov.

SAFETY

Administrator Nadeau Opens Safety Training and Analysis Center

On December 20, 2016, FHWA Administrator Greg Nadeau and Deputy Administrator David Kim attended a ribbon cutting event at TFHRC to formally open the new Safety Training and Analysis Center (STAC). FHWA established STAC to help the research community and State departments of transportation make use of data

from SHRP2's Naturalistic Driving Study (NDS) and Roadway Information Database (RID).

The SHRP2 NDS data provides information on the driver and driving behavior, individual trip characteristics, including events (crashes and near-crashes), non-event 'normal' driving (exposure data), and vehicle characteristics and performance. Over 3,500 volunteer-participants in 6 U.S. locations participated in the 1 to 2-year study.

A ribbon-cutting ceremony marked the opening of the Safety Training and Analysis Center.

The SHRP2 RID is a geospatial database that provides the context for the SHRP2 NDS trips, including roadway characteristics and features, crash histories, traffic volumes, weather, 511 information (including work zones), and railroad crossings.

Researchers demonstrated additional software to show capabilities for automated identity masking (to protect personally identifiable information) and automated feature extraction, which accelerates processing of over 1,000,000 hours of video and extracts relevant data for analysis.

For more information, contact Charles Fay, 202-493-3336, charles.fay@dot.gov.

RECENT PERIODICALS

***Public Roads*—January/February 2017**
This issue includes: Peering Into the Crystal Ball; Encouraging Best Behavior; Leading on the International Stage; Making Every Place Count; Preparing for Change; Championing Safety on Local Roads; and Did You Hear That?

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

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

Innovator: Accelerating Innovation for the American Driving Experience—January/February 2017

This issue includes: Summits Launch Newest Round of Highway Innovations; Using Data to Improve Traffic Incident Management; National Innovation Council Meeting Showcases Massachusetts Success Stories; Innovation Councils Recognized for Excellence; States Innovate!; and Events.

The issue is available online via www.fhwa.dot.gov/innovation/innovator/issue58/3dIssue/.

For more information, contact Melissa Yu, melissa.yu@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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