March 2020

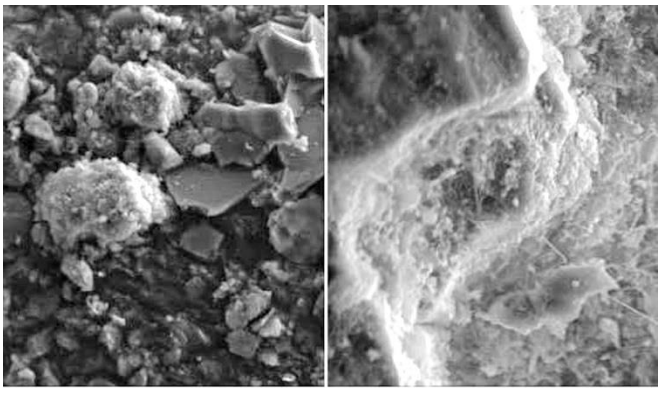
TRAC e-News: Delivering Research Results!

The Washington State Transportation Center (*TRAC*), conducts transportation research through collaborative partnerships among WSDOT, the University of Washington (UW), and Washington State University (WSU).

In this issue

Environment

Cost-effective use of sustainable cementitious materials as reactive filter media



Research team: Xianming Shi (WSU)
Sponsor: Center for Environmentally Sustainable Transportation in Cold Cimates (CESTiCC)
Report

Completed: Transportation agencies need cost-effective tools to address stormwater pollution. In cold climates that require the use of a lot of snow/ice control products, chloride salts are a particular problem in highway runoff. This project assessed the use of crushed fines from recycled concrete (CFRCs), modified with nano silicon dioxide, to passively remove chlorides from polluted stormwater runoff. The modified CFRCs showed good potential to chemically bind chloride. And once saturated with contaminants, these filter media could be recycled in sustainable concrete applications. For these reasons, this passive stormwater treatment method could substantially benefit highway and other agencies that must clean stormwater runoff, particularly in cold climates. Read more…

Freeway and Arterial Management

I-405 express toll lanes analysis: usage, benefits, and equity

Research team: Mark E. Hallenbeck (UW) | Tyler Patterson (WSDOT) | Jon Peterson (WSDOT)
Sponsors: WSDOT, UW eScience Institute
Report

Completed: This study examined how the I-405 express lanes—the WSDOT's newest dynamically tolled facility—are used, the benefits they provide to users, and how these benefits are distributed among different groups of noncommercial users. The project provided unique insight into facility usage patterns and equity impacts associated with different income and geographic groups. The range of information derived by combining several data sets included revealed value of time and value of reliability, price elasticities, usage by income group, total net benefits gained by income group, and per trip benefits by income group, as well as basic usage statistics such as entry/exit patterns by time of day. Read more…

Curb allocation change project

Research team: Anne V. Goodchild (UW) | Don MacKenzie (UW)
Sponsors: Amazon | Challenge Seattle | Seattle Department of Transportaiton | King County Metro | Sound Transit | Mobility Innovation Center at UW CoMotion
Report

Completed: Seattle has experienced a rapid increase in ride-hailing trips by transportation network companies (TNCs) such as Uber and Lyft. That increase has raised broad concerns about congestion, safety, and effective curb use. In response, this study evaluated a strategy of increasing passenger loading zone (PLZ) spaces to manage TNC driver stops and improve traffic flow when passengers are picked up and dropped off in the South Lake Union area of Seattle. Adding PLZs and geofencing was found to increase driver compliance with stopping at the curb rather than stopping in the travel lane to load/unload passengers. Adding PLZs and geofencing also reduced the average amount of time drivers stopped to load/unload passengers. Read more…

Knowledge Management

Creating a knowledge book for WSDOT: lessons and future directions

Research team: Leni Oman (WSDOT) | Frances Harrision (Spy Pond Partners LLC)
Sponsor: WSDOT
WA-RD 897.1

Completed: Capturing and retaining critical knowledge is an important knowledge management strategy. The Method for Acquiring and Structuring Knowledge (MASK) is one approach for capturing knowledge from experts and developing a formal model of this knowledge. The information developed through the MASK methodology can be documented in a knowledge book that experts can maintain and then pass along to their successor(s). This memo documents development of a knowledge book for WSDOT on highway crash diagnostics. Read more…

Maintenance

A new sustainable additive for anti-icing asphalt

Research team: Xianming Shi (WSU)
Sponsor: Center for Environmentally Sustainable Transportation in Cold Climates (CESTiCC)
Report

Completed: This laboratory study developed and tested an anti-icing asphalt pavement that incorporated innovative salt-storage additives with a sustained salt-release rate. Anti-icing asphalt pavement that incorporates salt-storage additives holds promise as an effective strategy to not only prevent ice formation or weaken the bond of snow-ice to the pavement but also to reduce the use of salt chemicals for winter road maintenance. The results indicated that the laboratory prepared additives benefited the anti-icing performance of the asphalt pavement. Read more…

Multimodal Transportation

Longitudinal analyses of Washington state student travel surveys

Research team: Anne Vernez Moudon (UW)
Sponsor: PacTrans

Ongoing: The goal of this project is to provide Washington State Safe Routes to School (SRTS) programs with data that will support future efforts to promote active school travel and to ensure the safety of students traveling to school. Researchers will test three hypotheses using the unique longitudinal data set of Student Travel for Washington State, in combination with data on school characteristics, school neighborhood street infrastructure and land use, SRTS projects, and statewide vehicular collisions. The combination of these data sets will support a data-driven approach to improving student mobility and safety. Read more…

Technology Transfer

Providing training services to address WSDOT's workforce development needs

Research team: Yinhai Wang (UW) | Monica Harwood (WSDOT) | Doug Brodin (WSDOT)
Sponsor: WSDOT

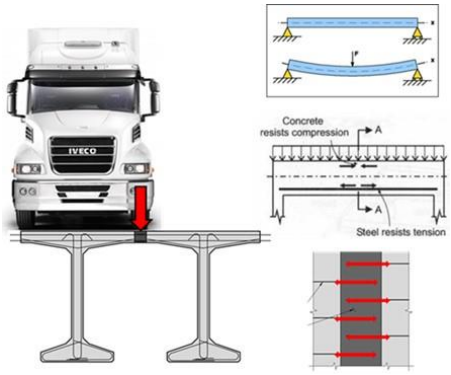
Ongoing: This project will provide training services to WSDOT to address the agency's immediate and long-term workforce development needs. WSDOT recognizes the importance of workforce development to maintain and improve its organizational strength. The PacTrans Workforce Development Institute provides demand-responsive and flexible training services to transportation agencies in the Pacific Northwest. Working with WSDOT, it will offer customized training to the agency's working professionals on three topics of immediate importance: the Manual on Uniform Traffic Control Devices (MUTCD), human factors, and data analysis and tools. Read more…

Webinar Wednesdays

WSDOT's Research & Library Services Office hosts *Webinar Wednesdays*, a series of bimonthly, one-hour webinars. Each webinar showcases a research project whose results could eventually be implemented statewide.

Below is information about upcoming and recent webinars:

Transportation big data: promises, issues, and potential solutions – March 18, 2020



To register (free):
https://register.gotowebinar.com/register/2844833908258304013

Presenters: Jeff Ban, UW Professor of Civil and Environmental Engineering | Cynthia Chen, UW Professor of Civil and Environmental Engineering

Big data and related data analytics methods have received much attention recently in transportation for various planning and operational applications. This webinar will summarize the promises of big data and illustrate potential issues of some commonly used big data sources in transportation. We will also discuss the implications of such issues and suggest a possible pathway that may help address them. We will also briefly present a recent UW project for using big data (supplemented by other data sources) to analyze the impacts of the new Alaska Way Tunnel on regional travel patterns.

Ultra high performance concrete (UHPC) for bridge applications (January)

Access the recording

Presenters: Bijan Khaleghi, WSDOT State Bridge Design Engineer | John Stanton, UW Professor of Civil and Environmental Engineering

Precast decks, and precast girders such as deck bulb tees that incorporate decks, offer superstructure construction options that require less on-site time than conventional cast-in-place decks. Precast decks require joints, and UHPC is an ideal material because of the high bond strength that it can develop at early ages. The presentation addressed the design and construction of such precast elements and joints, including the loading demands on the joints, their expected capacities, design methodologies, and construction requirements. Precast decks may be used in both seismic and non-seismic applications because the loadings are largely controlled by wheel loads. This presentation, held January 29, 2020, attracted nationwide attention and, at 400 registrants, broke attendance records.

TRAC e-News will be delivered about three times a year. For more information about TRAC and the ground-breaking work we are doing, please visit our Current Projects and Research News pages. A downloadable, pdf version of this newsletter is also available.

For contact information, follow these links:

- WSDOT Contacts
- UW Contacts
- WSU Contacts

commercial, public and private—and to develop research opportunities both nationally and locally. TRAC acts as a link among government agencies, university researchers, and the private sector.

This eNews was sent by: Washington State Transportation Center (TRAC) | 1107 NE 45th St | Seattle, WA 98105
http://depts.washington.edu/trac/