

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).

To receive TRAC e-News—about three emails per year—please follow this [subscription link](#).

Bridges and Structures

Increasing seismic safety by extending strands in bridge girder-cap beam connections

Research Team: [John F. Stanton](#) and [Marc O. Eberhard](#) (UW) | [Bijan Khaleghi](#) | [Lu Saechao](#) (WSDOT) | [WA-RD 867.1](#)

Completed: This project sought to increase the seismic safety of the state's bridges by improving the connections among bridge components. A typical Washington state concrete bridge bent consists of cast-in-place piers, precast, pre-stressed girders, and a cap beam. Successful interaction among all three components must be achieved to transfer induced loads effectively and provide adequate resistance to seismic shaking. The goal of this project was to create a reliable, effective, and practically applicable way of anchoring strands extended from the girder into the cap beam. [Read more...](#)



Environment

Using dry plant matter to remove heavy metals from urban stormwater



Research team: [Indranil Chowdhury](#) and [Michael Wolcott](#) (WSU) | [Tom Bertucci](#) | [Lu Saechao](#) (WSDOT) | [WA-RD 816.4](#)

Completed: In the Pacific Northwest, elevated soluble zinc and copper concentrations originating from urban stormwater runoff pose a significant threat to native salmon and steelhead populations. Existing stormwater infrastructure needs to be upgraded to treat non-point source pollution, including soluble metals, before they enter receiving waters such as the Puget Sound. This project sought to provide sustainable

design suggestions for urban stormwater remediation at Washington State Ferry terminals. Researchers conducted laboratory and field-scale column tests to recommend specific types of dry plant filtration media to adsorb copper and zinc. [Read more...](#)

Freeway and Arterial Management

Coordinating traffic incident and congestion management in the Seattle I-5 corridor

Research team: [Mark Haselkorn](#) and [Sarah Yancey](#) (UW) | [Ron Vessey](#) | [Doug Brodin](#) (WSDOT) | [WA-RD 878.1](#)

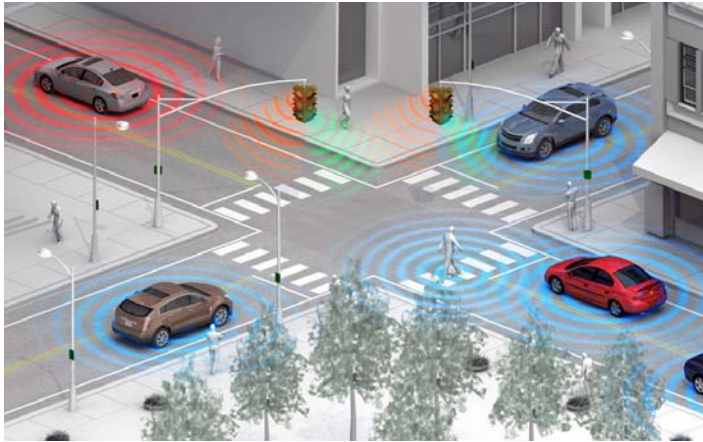
Completed: Within the Seattle metropolitan area, traffic incident management (TIM) operations provide a multi-jurisdictional and coordinated strategy to detect, respond to, and clear traffic incidents so that traffic flow can be restored quickly and safely. There is a need to extend TIM to include congestion management (CM), a complex activity for managing incident-generated congestion and for mitigating regional impacts after the incident has been cleared. This project identified challenges and opportunities to enhance regional TIM by incorporating CM processes and operational coordination along the Seattle I-5 corridor, supported by innovative technologies. [Read more...](#)



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Intelligent Transportation Systems

Operating traffic signals in a connected and autonomous vehicle environment



Research team: [Ali Hajbabaie](#) (WSU) | [Ted Bailey](#) | [Doug Brodin](#) (WSDOT)

Ongoing: Connected and autonomous vehicle (CAV) technology and information may greatly help reduce congestion, especially in urban settings. However, currently no real-time, reliable, and multimodal approach exists for controlling the timing of signalized intersections in a connected or semi-connected arterial or urban street network. WSDOT maintains 1,000 signalized intersections throughout the state. This project will help WSDOT identify the

technological issues and requirements of integrating CAV hardware in existing traffic signal systems. [Read more...](#)

Multimodal Travel

New tools will help keep transit users safe from crime

Research team: [Anne Vernez Moudon](#) (UW) | [Alan Soicher](#) | [Jon Peterson](#) (WSDOT) | WA-RD 882.1

Completed: Although transit operators monitor crime and are aware of high incident locations, they lack data-driven tools to easily match crime events with the individual transit facility locations and service periods. This pilot project explored the use of data-driven tools to identify concentrations of criminal activity near transit facilities and illustrated how novel



sets of disaggregated data on both crime and transit ridership can be used to develop models that can assess the safety of transit riders at specific locations. New data and tools will help transit agency planners in crime surveillance and prevention and will help agencies better protect transit riders on their way to and from stops and while waiting for transit. [Read more...](#)

Pavements

Software helps states strategize on preservation projects



Research Team: [Eric L. Jessup \(WSU\)](#) | [Wenjuan Zhao](#) | [Doug Brodin \(WSDOT\)](#) | [WA-RD 877.1](#)

Completed: Washington State DOT considers user and maintenance costs in selecting transportation investments with help from FHWA's Highway Economic Requirements System (HERS-ST) software. Because that software is best suited to new construction, this project developed an Excel-based application tool as an add-on to that FHWA package that will allow the state to make more strategic choices about preservation and maintenance projects and maximize long-term benefits to road

users, regional economies, and the highway system. [Read more...](#)

Transportation Planning

Optimizing public investments in electric vehicle charging infrastructure

Research Team: [Don MacKenzie \(UW\)](#) | [Tonia Buell](#) | [Doug Brodin \(WSDOT\)](#)

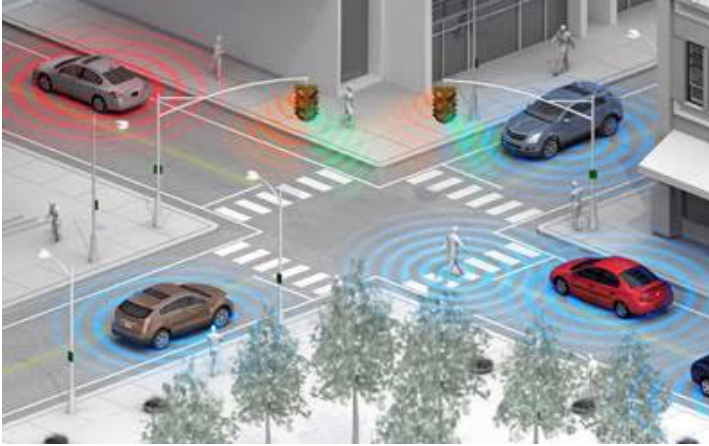
Ongoing: Electric vehicle registrations in Washington state increased by 38 percent between June 2015 and June 2016, after having increased by 34 percent in the preceding year. Washington is anticipating considerable investment in DC fast charger (DCFC) infrastructure over the next several years. However, given that funding is limited and DCFC stations are expensive, public investments must be made where they will have the most impact on electric vehicle adoption and travel. This project will develop simulation software to help WSDOT staff prioritize investments in DCFC infrastructure for plug-in electric vehicles. [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. The latest in the series, which attracted nearly 200 attendees nationwide, was held on September 12, 2018:

Innovation in Action — Cooperative Automated Transportation (CAT) — WSDOT's efforts to prepare for connected and automated vehicles



Presenters: [Ted Bailey](#) PE, CAT Program Manager
| [Daniela Bremmer](#), CAT Development Manager
(WSDOT)

This webinar overviews WSDOT's efforts to prepare for a future of Cooperative Automated Transportation (CAT). WSDOT is working to enable the deployment of automated technologies that encourage all modes of transportation to cooperate and communicate. Such systems will be accomplished in part by automating some or all of the functions of, or access to, various vehicle types

(automobile, van, plane, truck, bus, rail, ferry), integrating vehicles with infrastructure, and implementing shared mobility. Ultimately, such systems will better leverage limited funding for infrastructure, make our communities more livable, improve economic vitality, and improve the safety of our entire multimodal transportation system. [Access the recording...](#)

TRAC e-News will be delivered about three times a year. For more information about TRAC and the groundbreaking work we are doing, please visit our [Current Projects](#) and [Research News](#) pages. A printable, pdf version of this newsletter is also available.

For contact information, follow these links:

- [WSDOT Contacts](#)
- [UW Contacts](#)
- [WSU Contacts](#)

The Washington State Transportation Center (TRAC) is a cooperative, interdisciplinary transportation research agency. Its members, the Washington State Department of Transportation (WSDOT), Washington State University (WSU), and the University of Washington (UW), formed TRAC in 1983 to coordinate transportation research efforts—both state and 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.

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