



July 2021

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).

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In Memoriam

On June 18th, all of us in the TRAC family were shocked and deeply saddened to learn that Balasingam Muhunthan, Chair of Civil and Environmental Engineering at WSU since 2012 and current TRAC-WSU director, had passed away. Muhunthan, as everyone called him, was originally from Sri Lanka and joined the WSU faculty in 1991 by way of the University of Peradeniya, Sri Lanka, and Purdue University, Indiana. Since 2014 he had led TRAC-WSU in achieving the TRAC mission of coordinating transportation research efforts and in closely cooperating with transportation colleagues at TRAC-UW and WSDOT.

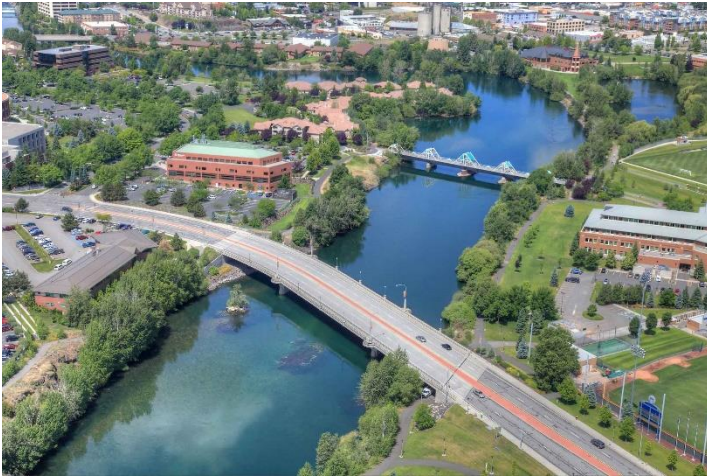
Muhunthan's own research, funded by numerous state and federal agencies and recognized world-wide, included work in thermomechanics and constitutive modeling, bifurcations and instabilities in geomechanics, the microstructure characterization and simulation of geomaterials, pore-scale modeling of fluid flow, micropiles, and the fundamentals of soil behavior, including critical state soil mechanics, micromechanics of soils, and the physico-chemical behavior of clays.

His passing was immediately lamented with an outpouring of love and appreciation. Friends and associates noted not only his professional excellence and moral compass but his personal supportiveness, mentorship, self-sacrifice, charisma, humor, compassion, and kindness. Very quickly, family and friends have begun effort to establish a scholarship in his memory. He will be missed not only by his surviving wife and two daughters, but by all the colleagues and students who were fortunate enough to have known him.



Bridges and Structures

Data-driven assessment of post-earthquake bridge functionality and regional mobility



Research team: [Christopher Motter](#) (WSU) | [Adam Phillips](#) (WSU) | [Marc Eberhard](#) (UW) | [Jeffrey Berman](#) (UW) | [Brett Maurer](#) (UW)

Sponsor: Pactrans

Ongoing: The performance of bridges in an earthquake is critical to the mobility of nearly all transportation modes after the event. The goal of this project is to predict the post-earthquake functionality of the approximately 10,000 bridges in Oregon and Washington following a Cascadia Subduction Zone (CSZ) magnitude-9.0 earthquake. The project will also

evaluate the likelihood that crucial highway lifeline corridors will be available to support post-earthquake mobility. Key results from this project will include a database of bridge performance metrics for 100,000 simulated cases of bridge and intensity measures and maps that show probable bridge functionality and re-opening times following CSZ earthquakes. [Read more...](#)

Freight

Data-driven simulation tool for dynamic curb planning and management

Research team: [Andisheh Ranjbari](#) (UW)

Sponsor: Pacific Northwest National Laboratory

Ongoing: Heightened demand and changing expectations for finite street curb space require the implementation of real-time curb management capabilities to improve occupancy and throughput and decrease traffic disruption caused by cruising for parking and space maneuvering. This project will examine new methods for dynamically reallocating curb space throughout the day and will provide this capability to city and commercial partners through a demonstration. The researchers will develop a city-scale, dynamic curb use simulation tool and an open-source curb management platform. The simulation and management capabilities will include dynamically and concurrently controlling price, number of spaces, allowed parking duration, time of sale or reservation, and curb use type. [Read more...](#)



Characterization of Seattle's commercial traffic patterns: a greater downtown area and Ballard/Interbay vehicle count and evaluation



Research team: [Anne V. Goodchild](#) (UW)
Sponsor: Seattle Department of Transportation
[Report](#)

Completed: As the city of Seattle grows, so do truck volumes in Seattle and the region. This project was designed to deliver crucial granular baseline data on commercial vehicle movements in two key areas of Seattle to help city transportation professionals plan for increasing goods movement and service activities. Researchers at the UW Supply Chain

Transportation and Logistics Center (SCTL) produced Seattle's first complete estimate of greater Downtown Seattle area traffic volumes, and they offered a detailed analysis of commercial vehicle traffic in and around one of the city's major industrial centers, the Ballard-Interbay Northern Manufacturing Industrial Center. The result was a critical snapshot of the detailed data needed for effective policy and planning, which could potentially inform everything from road maintenance and traffic signals to electric vehicle charging station sites and possible proposals for congestion pricing. [Read more...](#)

Intelligent Transportation Systems

An innovative internet of things (IoT) technology for comprehensive traffic sensing and V2X applications

Research team: [Yinhai Wang](#) (UW) | [Matt Neeley](#) (WSDOT) | [Doug Brodin](#) (WSDOT)
Sponsor: WSDOT

Ongoing: Roadway safety can be significantly improved with real-time collection of data on traffic, roadway surface conditions, and environmental conditions and the efficient broadcasting of that information to road users. The UW's Smart Transportation Applications and Research Laboratory (UW STAR Lab) has developed the Mobile Unit for Sensing Traffic (MUST), which can be used for real-time traffic and environmental sensing, data collection, vehicle-to-everything (V2X) applications, roadway monitoring, and infrastructure security. This project will install MUST sensors along four roadways in Lynnwood and Bellevue, Wash., to demonstrate their data collection, condition assessment, and V2X applications capabilities. This project will also investigate the most cost-effective way for MUST sensors to transmit their data to transportation agencies and to broadcast real-time information to road users. [Read more...](#)



Multimodal Travel

Evaluation of the use and performance of Via to Transit in the Puget Sound region



Research team: [Mark E. Hallenbeck](#) (UW) | Casey Gifford (KCM) | Abby Chazanow (Sound Transit)
Sponsors: Federal Transit Administration, Eno Center for Transportation, Sound Transit, King County Metro
[Report](#)

Completed: The Via to Transit service in the Puget Sound region was a pilot trial of an on-demand transit access service that connected riders going to or from five Sound Transit Link light rail stations with their trip origins/destinations. This project

demonstrated the viability of a public agency partnership with a private sector transportation network company and evaluated the results of providing the pilot Via to Transit on-demand service. The independent evaluation concentrated on the ridership impacts of Via service in the Puget Sound area. By analyzing the results of two surveys and ORCA fare card data, the researchers looked at how many people chose to use Via, whether the availability of the Via service changed their use of Link light rail or bus, and whether users represented all segments of the population in the study area. [Read more...](#)

Transportation Planning

Promises of data from emerging technologies for transportation applications, Phase II continuation

Research team: [Jeff Ban](#) (UW) | [Natarajan Janarthanan](#) (WSDOT) | [Doug Brodin](#) (WSDOT)
Sponsor: WSDOT

Ongoing: Emerging technologies such as automated vehicles, advanced data analytics, and on-demand ride services will not only fundamentally alter the transportation landscape but will provide new data that can be used for transportation planning and analysis. This project is examining the properties of these new data and identifying potential applications.

Phase I developed a preliminary framework for integrating emerging and conventional data from diverse sources. Using the Seattle SR 99 Tunnel Tolling Project as a case study, Phase II began to demonstrate the value of emerging big data and their fusion with data from other, conventional sources in evaluating a project's impact on transportation system performance. This continuation of Phase II will focus on investigating other potential data sources and on sharing methodologies created for data processing, origin/destination estimation, and validation. [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. [Previous webinars are available for access here.](#)

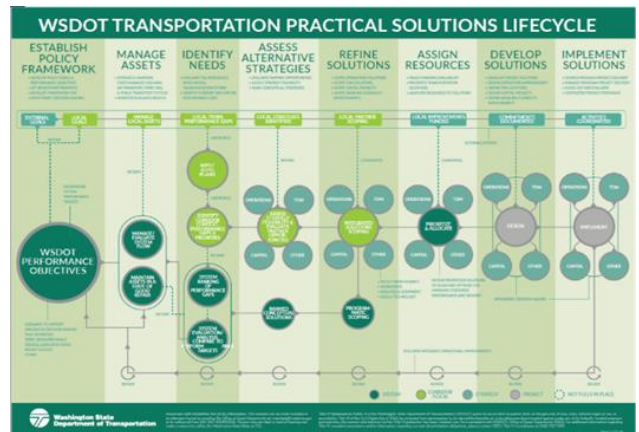
Below is information about recent webinars:

[The interconnected agency: designing for agility and a digital future \(June\)](#)

[Access the recording](#)

Presenters: [Leni Oman](#), WSDOT Knowledge Strategist | [Frances D. Harrison](#), Chief Technical Officer for Spy Pond Partners, LLC.

In 2015, WSDOT received a grant from the FHWA's Accelerated Innovation Deployment (AID) Demonstration Program to advance the use of lean techniques and knowledge management. Through the grant, WSDOT conducted workshops, interviews, pilot projects, and resource reviews about WSDOT's Practical Solutions approach. The Practical Solutions approach is multimodal, multidisciplinary, collaborative, and data driven. Through the project, the agency developed an integrated business process lifecycle model and identified the culture, capabilities, data, and information needed to implement evolving and interconnected business processes. This webinar focuses on some of the essential building blocks created by this project for connecting people, processes, and information to provide a stronger framework for automation and a better experience for employees and others.



[MASH: Assessing roadside safety hardware \(April\)](#)

[Access the recording](#)



Presenters: [John P. Donahue](#), WSDOT Assistant State Design Engineer | [Chiara Silvestri Dobrovolsky](#), Texas A&M Transportation Institute (TTI) Research Scientist for Roadside Safety | [Roger Bligh](#), TTI Senior Research Engineer, Roadside Safety Program | [Nauman Sheikh](#), TTI Associate Research Engineer for Roadside Safety

WSDOT serves as the lead state for the MASH Implementation Pooled Fund, a 28-member initiative focusing on the development of roadside hardware to address the new FHWA standard. This webinar discusses how this pooled fund approach supports collaborative research and innovation. Learn how TTI researchers are supporting transportation agencies around the country in their efforts to align design and construction standards with national guidelines. Watch simulation and crash test videos used to assess a vehicle's response to breakaway structures and barrier components. Explore how technology permits accurate modeling of vehicle interactions with roadside safety devices.

Upcoming Webinars

Stayed tuned for announcements. To be included on the mailing list, email ResearchResults@wsdot.wa.gov.

August 18, 2021: **A Living Flora of the Pacific Northwest**, presented by David E. Giblin, UW Herbarium Collections

October 10, 2021: **Real-Time Truck Parking Information Integration, Visualization and Prediction**, presented by Karthik Murthy and Matt Neeley, WSDOT Traffic, and Yinhai Wang, UW Civil and Environmental Engineering

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](#)

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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