



# PacTrans

ISSUE 27 | WINTER 2020

University Transportation Center Newsletter

## IN THIS ISSUE

- 01 PacTrans has Strong Showing at 2020 TRB Annual Meeting
- 02 Multi-camera Car Tracking and Re-identification System (McCTris)
- 03 UAF Team Conducts Research on Ground Penetrating Radar  
PacTrans PI presents on Truck Driver and Freight Safety at TRB
- 04 U of Idaho Master's Student Awarded Women in Transportation SW Idaho Leadership Scholarship  
OSU ITE Student Chapter Team Wins First Place in the ATSSA TCD Challenge
- 05 UW Ph.D. Candidate Receives Outstanding Student of the Year Award  
PacTrans Universities Compete in Construction Management Competition
- 06 Winter Regional Transportation Seminar featuring Professor Henry Liu  
PacTrans Leadership Development Seminar featuring Robert Skinner
- 08 Technology Transfer
- 09 PacTrans External Advisory Board  
PacTrans Board of Directors
- 10 About Pacific NW Transportation Consortium

## PacTrans has another Strong Showing at 2020 TRB Annual Meeting

**The Transportation Research Board (TRB) 99th Annual Meeting was held this past January 12-16, 2020, at the Walter E. Washington Convention Center in Washington, D.C.**

The event attracted more than 13,000 transportation professionals from across the world. Those professionals hosted more than 5,000 presentations in nearly 800 sessions and workshops, addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. This year's meeting was themed, A Century of Progress: A Foundation for the Future.

With policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions in attendance, the TRB annual meeting continues to be an amazing platform for PacTrans to demonstrate our abilities, expertise, innovation, and research as one of the country's leading regional University Transportation Centers (UTCs).

PacTrans student and faculty researchers were in attendance from all seven of our consortium institutions: Boise State University, Gonzaga University, Oregon State University, University of Alaska, Fairbanks, University of Idaho, University of Washington, and Washington State University. In total, PacTrans universities participated in over 100 lectures, poster sessions, workshops, committees, and subcommittees, and submitted over 90 papers to the meeting.



## PacTrans showcases Multi-camera Car Tracking and Re-identification System (McCTris) for Transportation Applications

### In early January, PacTrans researchers and staff attended the Consumer Electronics Show in Las Vegas.

The US Department of Transportation hosted a booth in the Smart Cities section of the show and one component of their booth offered several University Transportation Centers the opportunity to showcase technologies they have been developing.

PacTrans Director, Yin Hai Wang, along with two of his graduate student research assistants, Frank Hao and Ruimin Ke, as well as PacTrans assistant director, Cole Kopca, all attended to showcase the Multi-camera Car Tracking and Re-identification System (McCTris) for Transportation Applications.

Traffic surveillance systems play an irreplaceable role in real-time traffic monitoring, network information estimation and security applications. In the traditional system, road monitoring and data storage are two separate functions where each camera works independently, and the traffic information is extracted manually.

Recent advances in Multi-Camera Multi-Target (MTMC) tracking and re-identification research have brought new potential for the future surveillance system. MTMCT technology enables the surveillance cameras in different locations to detect and track the same objects without vehicle license plate information through a linked network.

This demonstration showcased MTMC tracking and re-identification as well as highlighting all of the potential traffic related metrics that could be gathered by harnessing the power of this technology.



# RESEARCH HIGHLIGHTS

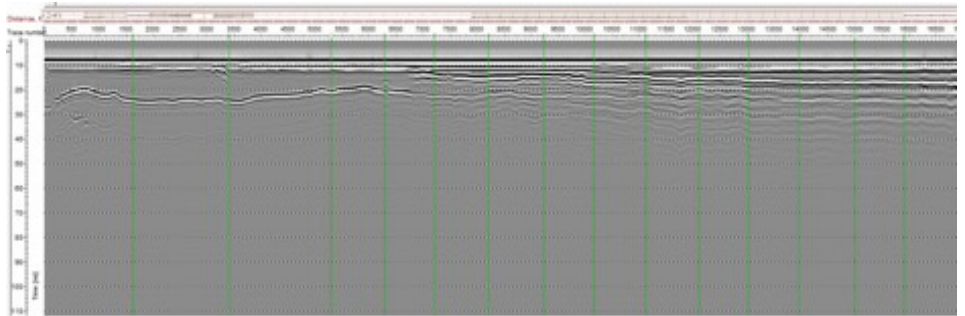
## Uaf Team Conducts Research on Ground Penetrating Radar By Elizabeth Richards

A team of four researchers from the University of Alaska Fairbanks (UAF) traveled to Tanana, AK at the end of February to collect Ground Penetrating Radar (GPR) data on the city's ice road across the Yukon River (Figure 1). This community depends on the ice road during the cold season to connect the city to a road six miles upstream. The research team included Elizabeth Richards, Sveta Stuefer, Nathan Belz, and Ronald Daanen.

This data collection is part of a PacTrans-funded research project to determine the applicability of GPR to identify the presence of different ice layers in river ice cover. In addition to the Yukon River, data was also collected over two winter seasons on the Tanana River in Fairbanks, AK. A full dataset includes GPR radar-grams, hand measurements of ice thickness, and ice cores. This data will be used to analyze the accuracy of the GPR system in different settings, and identify river ice layers in the GPR profile (an example profile is shown in Figure 2). River ice types common in northern regions include clear ice, snow ice, and frazil ice, which have varying structural capacities. GPR could replace the time and effort intensive hand measurements it currently requires to check the quality and thickness of river cover through the winter. This will increase safety and save time for rural community residents dependent on winter river travel.



Elizabeth Richards and Stan Zuray (Tanana Resident) Running a GPR Transect on the Yukon River.



Subset of a GPR Profile from the Tanana River in Fairbanks, AK.

## PacTrans PI presents on Truck Driver and Freight Safety at TRB

OSU professor of Civil & Construction Engineering and PacTrans PI, Sal Hernandez, presented his research, titled, "Reducing Unsafe Truck Driver Behavior on Interstate Freight Corridors Through DOT and Law Enforcement Collaboration," at the 2020 Transportation Research Board Annual Meeting.

Oregon has experienced an increase of 29% in truck-related crashes since 2013. Of these crashes, it was determined that the truck was at-fault for approximately 50%. Of that 50%, the driver of the truck was determined to be at-fault for roughly 95% of crashes in which the truck was at-fault. As such, the Oregon Motor Carrier Transportation Division (MCTD) implemented a pilot program to assess behavior and fitness of truck

drivers to focus on this 95%. As part of the program, Oregon MCTD partnered with local law enforcement agencies to increase the number of Level 2 truck inspections. Level 2 inspections took place if the law enforcement officer observed unsafe driving behavior, such as speeding or lane violations. During this program, both data related to inspections and historical crash data were obtained to assess the relationship between increased inspections and truck at-fault crashes. Results show that the program is working and the relationship between inspections and truck at-fault crashes show that as one is increasing, the other is decreasing, and vice-versa. In addition, based on a cost analysis, it was determined that crash harm (comprehensive measure of



societal crash costs) has decreased more than 60% since the beginning of the program. Results suggest that methods from this work can be used by other state agencies to adopt similar programs along similar corridors to mitigate truck at-fault crashes and their corresponding societal costs.

# STUDENTS

## U of Idaho Master's Student Awarded Women in Transportation SW Idaho Leadership Scholarship

University of Idaho and PacTrans supported graduate student, Nuzhat Yamin, is this year's recipient of the Women in Transportation (WTS) SW Idaho Leadership Scholarship. The WTS Scholarship recognizes and awards women in pursuit of a career in transportation based on their transportation goals, academic standing, and leadership abilities.

Along with the \$1,500 scholarship, Yamin will also advance to the national scholarship competition, where she will have the opportunity to win an additional \$5,000.

Yamin originally obtained an undergraduate degree in electrical engineering from the Bangladesh University Engineering and Technology. She later attended the University of Idaho and is currently working towards a doctorate degree in the Department of Electrical and Computer Engineering.

Yamin is also active in the Graduate and Professional Student Association, the Institute of Electrical and Electronics Engineers, and the Bangladeshi Association of Students and Scholars.



Yamin's research is focused on the improvement of communication schemes in smart vehicles on highways and has done work on intelligent transportation systems.

## OSU ITE Student Chapter Team Wins First Place in the ATSSA TCD Challenge

Members of OSU's ITE student chapter received first place in the Traffic Control Device (TCD) Challenge, a competition held by the American Traffic Safety Services Association (ATSSA). The winners were awarded at the Transportation Research Board Annual Meeting last January.

ATSSA's TCD Challenge, titled, "Connected and Autonomous Innovations for Improving Work Zone Safety," invited engineering students from all over the country to design a traffic control solution using connected and/or autonomous technology.

According to the Federal Highway Administration, the amount of total work zone fatalities increased by 2% between 2016 and 2017, with speeding being a factor in 203 of the 799 work zone crashes that occurred in 2017.

"Being able to co-host this competition with TRB not only allows ATSSA to present a pressing issue within the industry and conjure potential solutions, it also provides us the opportunity to encourage

young minds to get more involved within the roadway safety industry and look ahead to possible future innovations," said Eric Perry, ATSSA director of Innovation & Technical Services, on the ATSSA blog.

"This year, challenge winners addressed a serious concern within the industry and we hope their ideas resonate with all those involved with roadway safety," Perry said on the blog.

The OSU team included Travis Larson, a 2nd year M.S. student; Amy Wyman, a 1st year Ph.D. student; and Joe Neils and

Cameron Bennett, both undergraduate students in OSU's Civil and Construction Engineering Program.

Their entry, titled, "Connected Temporary Traffic Control Devices," earned them not only first place, but also a chance to join the other top three finalists in New Orleans, where they presented their work at ATSSA's 50th Annual Convention & Traffic Expo at the end of last January, along with a cash prize of \$1,500 and a plaque commemorating their achievement.



# STUDENTS

## UW Ph.D. Candidate Receives Outstanding Student of the Year Award



Each year, PacTrans awards a student researcher with the Michael Kyte Region 10 Outstanding Student of the Year Award. This year's award went to UW Ph.D. candidate, Ruimin Ke.

To be eligible, the student must be a researcher who has worked on UTC funded research within a UTC that has a consortium member located in Alaska, Idaho, Oregon, or Washington state.

The award is given based on several criteria including: technical merit and research, academic performance, and professionalism and leadership.

This award was presented, as it always is, during the Region 10 Reception at the TRB Annual Meeting.

## PacTrans Universities Compete in Construction Management Competition

A number of students from PacTrans' constituent universities participated in the ASC Regions 6 & 7, 2020 Student Competition and Construction Management Conference last winter. The following teams managed to place within the top three in at least one of the categories:



**REGION 7:** Washington State University: 3rd in Commercial



**OPEN:** University of Washington: 2nd in Sustainable Building



**OPEN:** Oregon State University: 3rd in Electrical



**OPEN:** Washington State University: 3rd in Virtual Design and Construction

## Winter Regional Transportation Seminar featuring Professor Henry Liu

This past February, PacTrans hosted its Winter Regional Transportation Seminar featuring a talk from Henry Liu, a Professor in the Department of Civil and Environmental Engineering at the University of Michigan, Ann Arbor, a Research Professor at the University of Michigan Transportation Research Institute and the Director for the Center for Connected and Automated Transportation (USDOT Region 5 University Transportation Center). His talk was titled, *Critical Scenario Generation for Accelerated Testing of Autonomous Vehicles*.

Testing and evaluation is a critical step for the development and deployment of autonomous vehicles (AVs), and yet there is no systematic framework to generate testing scenarios. Given an operational design domain (ODD) of an autonomous vehicle, the testing scenario library is defined as a set of critical scenarios that can be used to accelerate AV testing and evaluation. In his talk, Professor

Liu provided a general framework for the testing scenario library generation (TSLG) problem.

Each scenario is evaluated by a newly proposed measure, scenario criticality, which can be computed as a combination of maneuver challenge and exposure frequency. To search for critical scenarios, an auxiliary objective function is designed, and a multi-start optimization method along with seed-filling is applied.

For high dimensional scenarios, reinforcement learning based technique is applied to enhance the searching method. The proposed framework is theoretically proved to obtain accurate evaluation results with much fewer number of tests, if compared with the on-road test method.

From July 2017 to August 2019, Professor Liu was on leave from the University of Michigan and served as Vice President and Chief Scientist on Smart Transportation for DiDi Chuxing in China, one of



the largest mobility service providers in the world. While he was with DiDi, he established and led the Urban Transportation Business Unit. Dr. Liu received his Ph.D. degree in Civil and Environmental Engineering from the University of Wisconsin at Madison in 2000 and his Bachelor degree in Automotive Engineering from Tsinghua University (China) in 1993. His research interests focus on transportation network monitoring, modeling, and control, as well as mobility and safety applications with connected and automated vehicles.

## PacTrans Leadership Development Seminar featuring Robert Skinner

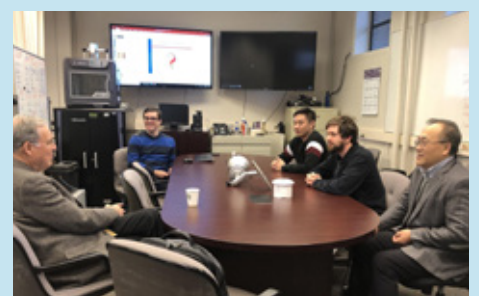
This past March, PacTrans hosted a Leadership Development Seminar featuring former Executive Director of the Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine, Robert Skinner. His long and distinguished career in transportation included time spent as a travel demand modeler, transportation planner, researcher, policy analyst, and executive director of the Transportation Research Board from 1994 to 2015.

Reflecting back, Skinner was invited to the UW campus early last March to discuss some of the lessons—the takeaways—from this career that he wished someone told him at the outset. They included task-specific items related to topics such as mathematical modeling/forecasting, approaches to policy analysis, the nature of the transportation enterprise, and research policy in transportation.

Skinner's talk also focused on more broadly applicable lessons related to such topics as communication skills, within-field career choices, involvement in professional organizations, and leadership.

Prior to becoming Executive Director, Skinner directed TRB's policy study activities and managed two of the first policy studies assigned to TRB by the Congress. Before joining TRB in 1983, Skinner was a Vice President of Alan M. Voorhees and Associates, a transportation consulting firm where he managed transportation studies for local, state and federal clients.

Skinner earned his bachelor's degree in civil engineering from the University of Virginia and received a master's degree in civil engineering from the Massachusetts Institute of Technology.



A registered professional engineer, Skinner has received the Director's Research Champion Award from the Texas Transportation Institute, the James Laurie Prize from the American Society of Civil Engineers, and the P.D. McLean Memorial Award from the Road Gang in 2001.

He was the 2015 recipient of the Frank Turner Medal for Lifetime Achievement in Transportation, and in 2016 he received the George S. Bartlett Award for Outstanding Contribution to Highway Progress.

# TECHNOLOGY TRANSFER

**Late last year PacTrans put out its annual call for Success Stories which is an RFP for supplemental funds specifically for PIs to engage in technology transfer activities beyond the scope of their funded research projects.**

Common application of these funds has included websites, promotional materials, workshops, webinars, and even commercialization/patenting of research methods and results. PacTrans further encourages PIs to think outside the box and try to identify the most effective way(s) that you can communicate their meaningful research findings with the practicing transportation communities that would most benefit from newly developed technologies and techniques.

These proposals are vetted by our board and then put through review by our Technology Transfer Advisory Board before selections are made. This year, a total of seven proposals were selected for funding from a pool of fifteen proposals. The following are brief summaries of the activities that were funded:



**Chris Parrish (OSU)**—*Unmanned Aircraft Systems in Transportation: Research-to-Operation (R2O) Peer Exchange*—Recognizing the expanding use of UAS across state DOTs, US DOT's FHWA has declared UAS to be one of their Every Day Counts 5 (EDC5) Innovation topics for 2019-2020. In support of the FHWA EDC5 UAS Innovation topic, ODOT is planning

a one-day Peer Exchange to gather interested parties, including state and local transportation agencies, vendors, and consultants to collaborate on UAS opportunities and share lessons learned from current UAS operations. The ODOT organizers of the event have expressed great interest in extending the Peer Exchange to include an additional day focused on: 1) sharing the results of the recent PacTrans multi-institution project on UAS and lidar for traffic network monitoring with State DOTs and industry and university partners from throughout the Pacific Northwest, and 2) facilitating the transition of the procedures developed in the PacTrans research to operational use. To meet these goals, this Success Stories project will plan, organize and present a PacTrans UAS Research-to-Operations (R2O) Workshop, as a one-day extension to the ODOT/FHWA Every Day Counts Peer Exchange. Focus areas will include: 1) comparison of post-processed kinematic (PPK) and real-time kinematic (RTK) GNSS on drones; 2) direct georeferencing via GNSS-aided insertional navigation systems (INS); 3) operational aspects of UAS for traffic network monitoring, including regulations, safety, planning, and operational procedures; and 4) auto-extraction of features of interest from UAS data using machine learning. To facilitate multi-directional information exchange, participating State DOTs will be invited to deliver presentations on their UAS projects and programs, followed by open discussion of lessons learned and solutions to operational challenges.



**David Hurwitz (OSU)**—*Advancement of a Heavy Vehicle Driving Simulator*—Professor Hurwitz and his team will engage OSU Media services to help us produce high end videos documenting the capabilities of the new lab equipment, the research team in the driving and bicycling simulator laboratory, and the threads of research that the new tools will allow us to contribute to. Specifically, they

will produce one 2.5 to 3-minute video to be disseminated via OSU COE, OSU CCE, and PacTrans via website and other means. Additionally, we will produce three 30 second videos that are more targeted which will be intended to be distributed via social media (e.g. facebook, twitter, linkedin).



**Haizhong Wang (OSU)**—*An Integrated Web Platform to Communicate the Risks of the Cascadia Subduction Zone in the Pacific Northwest*—Professor Wang and his team will be making the already developed Agent-Based Tsunami Evacuation Model (ABTEM) accessible to the professionals, city officials, and policy and decision makers, through an online web platform. The output will be a

cloud-based and open-source web platform to be used by city engineers/planners, emergency managers, community leaders and practitioners for evacuation planning purposes. Upon the completion of this project, users will be able to critically assess the effectiveness of current and future evacuation strategies, and analyze the evacuation options for their study site by simply providing necessary inputs as GIS data layers to the platform and specifying behavioral characteristics of the evacuees.

# TECHNOLOGY TRANSFER



**Michael Olsen (OSU)**—*Extraction and Classification of Pavement Marking Program*—In previous work, this project team has developed the Road Marking Extractor (RoME) tool to extract near-linear pavement markings from mobile lidar data. In current Pactrans-funded research, the team has expanded the capabilities of the RoME tool to implement complex

marking extraction (e.g., insertion lanes, arrows, text), improved noise filtering, deep learning-based classification, and rigorous tests on real-world data in various noise and road conditions. Professor Olsen's team believes the developed algorithm has great potential for supporting the extraction of road marking for many transportation agencies worldwide. This tech-transfer project will achieve this goal by improving the current research tool into a fully-functional prototype tool that can extract and classify various types of road markings. The prototype tool will then be ready for a start-up company to develop into a commercial product. The tool has high potential to streamline the production of a key layer of HD maps using lidar data as well as support departments of transportation with maintaining high-quality markings at the levels needed for autonomous vehicles.



**Don MacKenzie (UW)**—*Simulation Environment to Optimize Public Investments in Electric Vehicle Charging Infrastructure*—Washington is anticipating considerable investment in DCFC infrastructure over the next several years. Given that funding is finite and DCFC stations are expensive, public investments must be

made where they can generate the biggest impact on EV adoption and travel. Through an ongoing PacTrans-funded project, the team developed a decision support system to guide WSDOT's infrastructure development process. EVI-DSS is a model-view-controller application capable of supporting multiple users concurrently. It employs a PostgreSQL database as a model, two R Shiny web-apps as views and a NodeJS server for managing analysis execution requests. While the examples in the documentation and elsewhere use data from the state of Washington, EVI-DSS can be used for any geography, small or big. It is planned to release EVI-DSS as an open-source system, so various public and private agencies can benefit from its use. To promote wider distribution and rapid dissemination of the program, Professor MacKenzie's team is cleaning, optimizing, packaging, and disseminating the code into an easy to use format, so that agencies can deploy it locally to benefit from its use.



**Joe Wartman (UW)**—*Development of Workshop Curricula to Support Professional Use of the Rockfall Activity Index (RAI) and the RAMBO Software Platform*—Having implemented the RAI system into an easy-to-use software platform (RAMBO), the research team is utilizing funds to promote the use of the system and to train transportation professionals to use the new software platform properly. Accordingly, Professor Wartman and his team are

developing an RAI/RAMBO training curriculum (including a basic user manual and presentation materials) that will be presented for the first time at an upcoming instructional workshop hosted by the Oregon Department of Transportation (ODOT). The workshop is slated to take place in Portland in early 2020. The workshop will focus on training ODOT personnel, who recently adopted the RAI system to assess five problematic rock slopes sites across the state. The training curricula developed in this project will be made openly available online and will serve as a template for teaching the platform to transportation agencies in the Pacific Northwest, and other parts of the U.S.



**Yin Hai Wang (UW)**—*Curb Space Monitoring and Management using Mobile Unit for Sensing Traffic (MUST) Sensors*—Downtown Bellevue, WA, is situated on a street grid with oversized "superblocks," fewer streets compared to other downtowns of a similar size, and scarce on-street parking. In recent years the city has experienced unprecedented job and population growth. In addition to handling traditional traffic pressure, a new wave of

TNC rideshare and freight delivery services have emerged, adding operational and safety challenges to the system. Besides, numerous companies – such as Amazon, Microsoft, Expedia, and Facebook – offer commuter shuttle service for their employees. These services require dedicated curbside space for loading and unloading passengers. Limited dynamic curbside space, coupled with an increasing TNC user base, has strained the limited roadway system in Bellevue. Safe areas for freight and passenger loading, such as 3-minute or 15-minute zones, are currently extremely limited downtown. To demonstrate the feasibility and reliability of the MUST sensor in curbside space monitoring and management, the MUST sensors will be installed on 106th Avenue NE in Downtown Bellevue to set up a testbed for obtaining unprecedented information to better understand car vs truck occupancy and dwell times at the curbside space. The information provided by the MUST sensor must help in answering the real-time status of curbside space usage in such a complex environment. By starting with the testbed in Bellevue, leveraging the information of the MUST sensor will point us to where we need to go next with curbside management policies and practices. This pilot will demonstrate the utility of the MUST sensor in curbside space management to the public, thereby triggering the industrialization and commercialization of the product offering.



# PacTrans Board of Directors



**Yinhai Wang, PhD**  
*Professor, Civil & Environmental Engineering*  
*Adjunct Professor, Electrical Engineering*  
*Director, Pacific Northwest Transportation Consortium (PacTrans)*  
*Director and Founder, Smart Transportation Applications and Research (STAR) Laboratory*  
 University of Washington



**Billy Connor, MS**  
*Director, Center for Safety Equity in Transportation (CSET)*  
*Director, Alaska University Transportation Center*  
*Associate Director, Pacific Northwest Transportation Consortium (PacTrans)*  
 University of Alaska - Fairbanks



**Xuegang (Jeff) Ban, PhD**  
*Associate Professor, Civil & Environmental Engineering*  
*Affiliate Associate Professor, eScience Institute*  
*Associate Director of Research, Pacific Northwest Transportation Consortium (PacTrans)*  
 University of Washington



**Ahmed Abdel-Rahim, PhD, PE**  
*Professor, Civil & Environmental Engineering*  
*Director, National Institute for Advanced Transportation Technology (NIATT)*  
*Associate Director, Pacific Northwest Transportation Consortium (PacTrans)*  
 University of Idaho



**Anne Vernez Moudon, PhD**  
*Professor Emeritus*  
*Architecture, Landscape Architecture, and Urban Design and Planning*  
*Associate Director of Education*  
 Pacific Northwest Transportation Consortium (PacTrans)  
 University of Washington



**Eric Jessup, PhD**  
*Research Associate Professor and Associated Director*  
 Freight Policy Transportation Institute  
*Associate Director, Pacific Northwest Transportation Center (PacTrans)*  
 Washington State University

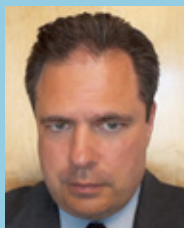


**David S. Hurwitz, PhD**  
*Associate Professor, Civil & Construction Engineering*  
*Director, OSU Driving and Bicycling Simulator Laboratory*  
*Associate Director, Pacific Northwest Transportation Consortium (PacTrans)*  
 Oregon State University

# PacTrans External Advisory Board



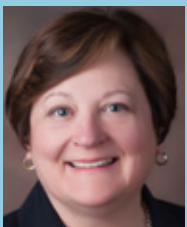
**Michael Bufalino, MURP**  
*Research Manager*  
 Office of Research  
 Oregon Department of Transportation  
 Research Advisory Committee



**Brian Brooke**  
*Senior Manager of Innovation and Performance*  
 Sound Transit



**Anna Bosin, PE**  
*Chief of Research, Development & Technology Transfer*  
 Statewide Design and Engineering Services  
 Alaska Department of Transportation & Public Facilities



**Anne Freeman**  
*Program Administrator of Research and Library Services,*  
 Washington State Department of Transportation, WSDOT



**Wayne Kittelson, PE**  
*Founding Principal*  
 Kittelson & Associates, Inc.



**Ned Parrish, MPA**  
*Research Program Manager*  
 Idaho Transportation Department



**Scott Drumm, MUP**  
*Director, Research and Strategic Analysis*  
 Port of Portland



**Angela Konert, MPA**  
*Vice President, Government and External Affairs*  
 BMW Group Representative Office,  
 Sacramento, California



**Jerry Whitehead**  
*President and CEO*  
 Western Trailer  
*Chairman, Idaho Transportation Board*  
 Idaho Transportation Department

## About Pacific NW Transportation Consortium

The Pacific Northwest Transportation Consortium (PacTrans) is the Region 10 University Transportation Center (UTC) established in January 2012 with funding from the US Department of Transportation (USDOT).

PacTrans is a combined effort of transportation professionals and educators from the University of Washington (UW), Oregon State University (OSU), the University of Alaska Fairbanks (UAF), the University of Idaho (UI), Washington State University (WSU), Boise State University (BSU), and Gonzaga University (GU). With two active centers focusing on both Safety and Mobility, PacTrans serves as an engine and showcase for research, education, and workforce development in the Pacific Northwest.

The goal of PacTrans is to create an environment where consortium universities and transportation agencies within Region 10 work together synergistically. The PacTrans program

focuses on the USDOT-identified priority of Improving the Mobility of People and Goods. This priority includes the following nonexclusive topic areas:

- Increase access to opportunities that promote equity in connecting regions and communities, including urban and rural communities;
- Smart cities;
- Innovations to improve multimodal connections, system integration, and security;
- Assistive technologies for those with physical or cognitive disabilities;
- Data modeling and analytical tools to optimize passenger and freight movements;
- Innovations in multi-modal planning and modeling for high growth regions;
- Novel (non-traditional or alternative) modes of transport and shared use of infrastructure; and
- Regional planning and setting of transportation priorities.

The Pacific Northwest offers a unique blend of opportunities to examine a variety of transportation issues, including those related to urban centers, rural communities, diverse geographic features (e.g., coastal plains, mountain ranges), and a growing population of pedestrians and bicyclists. This diversity makes the Pacific Northwest a natural laboratory in which to investigate transportation solutions that are applicable both locally and nationally.

PacTrans is dedicated to collaborating with transportation agencies, companies, and research institutions to jointly develop safe and sustain-able solutions for the diverse transportation needs of the Pacific Northwest.

Contact: Dr. Yin Hai Wang University of Washington More Hall, Room 112

**PacTrans.org** Email: [PacTrans@uw.edu](mailto:PacTrans@uw.edu) Phone: (206) 685-0395 Find us on Twitter @PacTrans UTC