



## Semi Annual Progress Report for University Transportation Centers

Prepared for the USDOT Office of the Assistant Secretary for Research and  
Technology (OST-R)

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Project title: **Pacific Northwest Transportation Consortium (PacTrans): Providing Data-Driven Solutions for the Diverse Mobility Challenges of the Pacific Northwest**

**Program Director:**

Yinhai Wang, Ph.D.  
Professor and Director  
E-mail: [yinhai@uw.edu](mailto:yinhai@uw.edu)  
Tel: 206.616.2696

**Submitting Official:**

Ryan Avery, Ph.D., PE  
Interim Assistant Director  
E-mail: [rpavery@uw.edu](mailto:rpavery@uw.edu)  
Tel: 206.543.6261

**Organization Name:**

University of Washington  
Pacific Northwest Transportation Consortium (PacTrans)  
University of Washington  
Civil and Environmental Engineering Department  
More Hall 112  
Seattle, WA 98195

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**Report #3, SAPR reporting for six months** (April 1, 2024 – September 30, 2024)

**Project/Grant Period:** June 1, 2023 - May 31, 2029

**Reporting Period End Date:** September 30, 2024

**Report Term:** Semi-Annual

## Accomplishments

### What are the major goals and objectives of the program?

Pacific Northwest Transportation Consortium (PacTrans) consists of institutions from all four states in our region with the University of Washington (UW) as the lead and Northwest Indian College (NWIC), Portland State University (PSU), University of Alaska Anchorage (UAA), University of Idaho (UI), and Washington State University (WSU). PacTrans' theme centers on "Developing human-centered and transformative multimodal mobility solutions for an equitable Pacific Northwest". PacTrans serves as a focal point within Region 10 to develop initiatives and facilitate collaborative activities with regional partners to maximize the effectiveness of their collective services and programs toward the U.S. Department of Transportation (USDOT) strategic goal of mobility. Major goals and objectives of PacTrans include:

**Research** – Serving as Region 10's research engine, PacTrans is committed to funding research in both the categories of advanced and, more importantly, applied research.

**Technology Transfer** – PacTrans strives to be an applied technology showcase, providing additional funds to projects that are deemed as "Success Stories" to ensure dissemination of results to policy makers, educators, practitioners, other transportation professionals, and the general public.

**Education** – As a consortium of six prestigious universities/colleges, PacTrans is devoted to being an education leader. This involves continued evaluation and evolution of our transportation engineering programs as well as providing state-of-the-art research laboratories, student conferences and seminars, mentoring, and scholarship opportunities for our students and future workforce trainees.

**Workforce Development** – PacTrans endeavors to be a workforce development base: hosting activities that focus on the development of transportation professionals, building strong partnerships with transportation agencies and companies in our region, and designing training programs to address the workforce development needs, while connecting our students with quality jobs where they can implement the knowledge they gained through their education.

**Outreach** – Throughout all of these other goals and objectives, PacTrans seeks to be in a continual process of outreach: promoting and building the educational student base, making new industry and agency partners, attracting new research, and providing opportunities to share and learn about key outcomes and achievements that have been learned through research and education activities.

**Collaboration** – PacTrans desires to be a platform for participation and is always on the lookout for potential new partners and new opportunities with current partners to collaborate on transportation related endeavors.

### What was accomplished under these goals?

During the period from April 1, 2024 – September 30, 2024, PacTrans has followed its implementation plan to expedite all the scheduled activities toward its goals and objectives identified above. Although PacTrans has been in the process of filling up the assistant director's position since Cole Kopca's departure and the short handed operation team faced remarkable challenges, PacTrans was able to borrow staff

members from Washington State Transportation Center (TRAC) including the interim assistant director, Dr. Ryan Avery, to carry the planned tasks forward to contribute to the advancement of the region's transportation research, technology transfer, education, workforce development, outreach, and collaboration.

## Research

As Region 10's research engine, PacTrans has been actively engaged in two broader categories of research projects. We engage in multi-institutional research projects that require participation from at least two consortium universities, and typically have a larger budget. Such projects include multi-institutional general research projects, as well as a multi-institutional educational project, and a multi-institutional outreach project. We also engage in single institutional projects (referred to as small research projects) that only require participation from a single consortium university and typically have smaller budgets. Both categories of research are geared towards the goal of advancing the region's transportation mobility research.

Full proposals for the multi-institutional projects were due on March 15, 2024. Of the 13 submitted abstracts, ten of the projects submitted full proposals. These proposals were then reviewed by independent experts we solicited from our reviewer pool. The reviewer pool is a list of experts in various disciplines that PacTrans maintains so that we may select qualified reviewers based on their knowledge in fields related to the proposed research. PacTrans also strives to avoid any conflicts of interest where some reviewers may be close colleagues of the researchers submitting the proposal. Reviewers are expected to provide a timely, fair, and comprehensive review. Two proposals were selected based upon reviewer scores and ensuring different lead universities:

- A Proactive Approach to Examining Transportation Equity and Safety, Kevin Chang, University of Idaho
- Believe the Clear View: Self-Heating Technology for Optimal Winter Sign Visibility, Qiang Zhang, Washington State University

Each consortium member also has funding to select single-institution projects. The process for project selection is left to each member university. These projects have been selected by each member university and work is just getting under way.

In June, PacTrans hosted its 2024 Regional Research Workshop at the Daybreak Star Indian Cultural Center at Discovery Park in Seattle, Washington. This research workshop is conducted periodically to identify critical regional transportation challenges. Nearly 50 participants representing local/state agencies, industry partners, non-profits, and university researchers and students, from the Pacific Northwest (Federal Region 10 that includes Alaska, Idaho, Oregon, Washington) attended. The workshop goal was to discuss major mobility challenges in the region and brainstorm potential solutions, which play a central role in guiding future research directions. Findings of this workshop have been summarized in a report. Key research issues identified in this workshop will be highlighted in future calls for proposals.

## Technology Transfer (T2)

With the success of launching AIWaysion, Inc. in 2022, PacTrans has been facilitating the technology transfer process and encouraging more PIs to move their research product into practice. During the reporting period, another UW spinoff company, JC-TECHS Corp, has been launched and is now in the final stage to complete the paperwork. The USDOT recently completed the Complete Streets AI competition and announced 12 winners. PacTrans is proud to see both AIWaysion and JC-TECHS are on the winner list (<https://www.transportation.gov/briefing-room/usdot-awards-2-million-12-small-businesses-csai-initiative>). In addition, PacTrans and its PIs engaged in several great conferences, workshops, and symposiums during this reporting period that offered a great platform for us to showcase our research to a broader audience.

In April, PacTrans teamed up with the Northwestern Tribal Technical Assistance Program (NW TTAP) to provide three training sessions at the Bureau of Indian Affairs' Northwest Regional Transportation Peer Exchange Event in Spokane, WA. These training sessions include 1) gravel roads maintenance, 2) transportation data collection for safety improvements; and 3) grant proposal writing.

In May, PacTrans jointly hosted the AI in Motion: Shaping the Future of Mobility and Safety Symposium with Southern Plains Transportation Center, Texas Transportation Institute (TTI), and Texas Department of Transportation (TxDOT). Approximately 150 people joined this symposium and discussed promising AI technologies and their potential in solving transportation problems. Seven PacTrans researchers joined the symposium and demonstrated AI-empowered mobility solutions to symposium participants.

In June, PacTrans jointly hosted the 2024 North America Travel Monitoring Exposition and Conference (NaTMEC) with the Idaho Transportation Department. Over 400 people joined this very successful event. Also, PacTrans researchers showcased research products at the 2024 American Society of Civil Engineers' International Conference on Transportation and Development (ASCE ICTD 2024) in Atlanta, Georgia. Furthermore, the PacTrans team participated in the 2024 Council of University Transportation Centers (CUTC) Summer Meeting held in South Padre Island, Texas. These annual gatherings are a valuable opportunity for peer exchange with University Transportation Centers from all across the nation and government agencies. This year's conference focused on enhancing workforce development, advancing technology transfer, strengthening community relationships through advisory boards, and providing general updates on topics such as grants and research databases. PacTrans Director Yinhai Wang was featured on a panel titled "Lasting Effects of UTC Grants." During this session, he shared PacTrans experience in his presentation entitled "Developing Ongoing Collaborations with and Among State DOTs."

In July, PacTrans researchers, including Dr. Yinhai Wang and Mr. Mehrdard Nasri, went to Washington DC to present at the NCHRP 17-100 workshop to introduce AI and other bigdata analytics research products to participants. This research group also conducted a webinar for the same purpose in June.

In mid-August, PacTrans Director Yinhai Wang and Dr. Muhammad Karim, attended the Future of Transportation Summit in Washington D.C. Hosted by the US Department of Transportation (US DOT). This is an annual event organized by National University Transportation Centers led in its inaugural

version by the Safety21 National UTC on Promoting Safety based at Carnegie Mellon University. With around 600 participants, approximately 250 in-person and the rest remote, the Summit brought together university researchers working across the USDOT's priority research focus areas. Dr. Wang and Dr. Karim showcased the Mobile Unit for Sensing Traffic Technology and several other new technologies developed by PacTrans researchers.

In late August, PacTrans and WSDOT hosted a pivotal Technology Transfer Peer Exchange event at the University Tower, University of Washington, Seattle, Washington. Among the participants were representatives from various Region 10 local and state agencies including the Idaho Transportation Department, Alaska Department of Transportation, Oregon Department of Transportation, and the Federal Highway Administration.

### Education

The UW has welcomed a cohort of six new PacTrans Fellows and five new UW WSDOT Fellows. The WSDOT Fellowship program is particularly worth mentioning. The Region 10 UTC and WSDOT had such a program for many years until the 2009 financial crisis that caused the WSDOT Fellowship program to stop due to the lack of funding. This program was hugely successful because it trained many current leaders at WSDOT. Since 2018, PacTrans has seen the need and been working with WSDOT to reactivate this program. Finally, we were successful in getting some funding from the Washington State Legislature to support this effort. However, this funding is just a one-time allocation. It is our sincere hope that this funding becomes recurrent to make this WSDOT Fellowship program permanent once again. This fellowship is made possible by a partnership among PacTrans, the UW CEE department, and WSDOT to offer promising master's students covered tuition and full salary while they complete their studies.

Several other student- and faculty-related highlights from this reporting period included:

- UW ITE Student Chapter awarded the ITE International Student Chapter Momentum Award
- UW Smart Transportation Application and Research (STAR) Lab research spotlighted in USDOT UTC newsletter
- WSU student awarded the Graduate Research Award on Public-Sector Aviation
- WSU professor Dr. Kishor Shrestha awarded AASHTO High Value Research Project
- PSU Toulon School Assistant Professor Dr. Ozcan Tunalilar received the Arthur C. and Monika Z. Nelson Endowed Scholar Award
- PSU Urban Studies doctoral candidate Minju Kim received the Nelson Endowed Doctoral Award
- PacTrans Associate Director and PSU TREC Director Jennifer Dill named Editor-in-Chief of Transportation Research Record (TRR)
- PSU students, Linden Faye and Allie Hopper, presented their work at the Summer Research Symposium held by the Virtual Alternative Research Experience for Undergraduates (altREU) Site on Computational Modeling

During this reporting period, PacTrans also offered webinars/seminars to our students and our broader community:

1. In May, we hosted Petros Ioannou, Ph.D. (Professor Electrical Engineering Systems at University of Southern California), for a talk titled, Control of Vehicles and Traffic for Safety, Mobility, and

Efficiency

2. In September, we hosted Dr. Jerry Lutin, Ph.D. (Transportation Planner and Engineer), for a talk titled, Principles for Effectively Responding to Competitive Transportation Research Funding Opportunities

### Workforce Development (WDI)

PacTrans is actively engaged in several workforce development initiatives this reporting period.

During the last six months WDI has engaged transportation stakeholders in identifying and developing multiple new short courses. We have contracted with over six consultants to develop new training courses. The following professional development courses were developed during this grant time period:

- Active Transportation (Introduction to Active Transportation and Safe Systems Integration)
- Active Transportation (Complete Streets Field Class)
- Active Transportation (Design Innovations in Active Transportation)
- What is the MUTCD?
- 2024 MUTCD Update
- Where Traffic Engineering Meets the Law
- Introduction to Road Safety
- Intersection of Public Health and Law Enforcement

In the past few months, WDI has also rebuilt the online registration system and created our own online course system. This new registration system will support the development and offering of new online live and on-demand courses. Content experts and instructional designers are currently collaborating to build new online courses.

In early-May, PacTrans shared our WDI initiatives at Engineering Discovery Days held at UW. At Engineering Discovery Days, students and faculty from all UW engineering departments share their work with upwards of 10,000 students, teachers, families and the community. Our operations team, combined with volunteers from the PacTrans fellowship program, had a great time informing visitors about the PacTrans mission and WDI summer programs for K-12 students.

In mid-May, PacTrans offered two specialized courses focused on transportation data and analysis tools, each consisting of 8 hours of online instruction over two days. The titles were “Introduction to Transportation Data & Analysis Tools” and “Intermediate Transportation Data & Analysis Tools.” Interim Assistant Director Dr. Ryan Avery instructed both courses. Students valued the interactive nature of the courses, particularly the opportunities to share experiences and discuss data challenges.

PacTrans once again offered a summer camp program for middle-school students. We partner with the UW Teen and Youth Program to deliver this course, titled *Introduction to Autonomous Cars*. It was offered to sixth through eighth graders from July 15-29. A total of 24 students attended, and we hope to offer two sections of the camp next summer along with a potential advanced course.

In August, the 2024 PacTrans-WSDOT Washington Transportation Camp wrapped up its second successful year, taking place at WSU and UW. WA Transportation Camp is a one-week residential high school summer

program covering transportation topics such as urban planning, traffic safety, supply chain logistics, and the cutting-edge realm of connected and autonomous vehicles. The primary objective of the program is to increase the number of students pursuing advanced degrees and careers in STEM-related fields associated with transportation.

## What opportunities for training and professional development have the program provided?

Many of the specific details of these opportunities are discussed above. More generally, PacTrans provides training and professional development opportunities through multiple channels:

**Research:** Through the lifespan of this grant, PacTrans annually selects research projects that offer faculty and student researchers funding to conduct cutting edge research in a variety of areas directly tied to the USDOT strategic goals.

**Education:** PacTrans consortium partners offer a variety of other on-campus and online courses designed for professional development in addition to the regular degree programs. The online programs, such as the online master's program of sustainable transportation, are particularly good for working professionals because of the flexibility in schedule and location. PacTrans also supports a wide variety of student activities geared toward enhancing their education. Several examples include supporting ITE student chapter activities, travel support for students to present accepted work at conferences, sponsorship of student competition teams, and so much more.

**Outreach:** PacTrans offers training and educational opportunities to K-12 students through its outreach activities. Three quick examples include: (1) UW partners with the UW Teen and Youth Program to deliver a course titled *Introduction to Autonomous Cars* that is offered to sixth through eighth graders during the summer months, and (2) PacTrans consortium partners UW and WSU have partnered with WSDOT to offer a week long, high school transportation summer camp, and (3) PSU participates in the National Summer Transportation Institute (NSTI) program to bring roughly 25 students to campus each summer for a week long transportation experience.

**Funding assistance:** PacTrans financially supports students through their participation in research activities, as well as fellowships. During this past reporting period, PacTrans welcomed six new graduate fellows and continues to offer undergraduate research fellows. The Undergraduate Research Fellowship offers undergraduate students the opportunity to participate in research while receiving a stipend for things like conference travel, or research supplies.

**Seminars, workshops, and conferences:** As outlined above, PacTrans offers many opportunities for training and professional development through its webinar series and various workshops. PacTrans also emphasizes our Region 10 Transportation Conference and Region 10 Student Conference as important opportunities for training and professional development.

**Internships:** PacTrans regularly posts internship opportunities on our website as a student resource. During this reporting period for example, PacTrans circulated thirteen separate announcements for internship opportunities. Further, we regularly work with our external partners to develop internship

programs for our students. With the WSDOT for example, we have set up internship opportunities both with their traffic management center and their tolling operations group.

**Partnerships:** PacTrans has developed strong partnerships with many agencies, companies, and non-profit organizations. For example, PacTrans has developed strong partnerships with local ITE chapters in student mentoring and training. ITE Washington has a mentor program for university students. They offer student fellowships and host events for student training. PacTrans is also in a strong partnership with ASCE in organizing the International Conference on Transportation and Development and partnership with Southern Plains Transportation Center, ITTI, and Texas TxDOT in organizing the AI in Motion: Shaping the Future of Mobility and Safety Symposium.

### **How have the results been disseminated? If so, in what way/s?**

PacTrans has a strong outreach program to local and state transportation agencies and private partners in the region, where PacTrans research outcomes are presented and demonstrated. Research outcomes are posted on the PacTrans website, distributed through our monthly newsletter and annual reports, and promoted through social media such as LinkedIn and Facebook and the University of Washington press media. We also disseminate news, events and results via our website at [www.pactrans.org](http://www.pactrans.org).

Another avenue for dissemination that PacTrans leans on heavily is presentations at conferences, workshops, and symposia. Each year we send roughly one hundred PIs and students (about 70 students) to the TRB annual meeting where we participate in over 120 committee meetings, poster presentations, workshops, and lecterns. Our annual conference each October also provides an invaluable platform for our researchers to present work either through presentation or poster.

PacTrans also encourages new, innovative dissemination materials through the identification of success stories, where PacTrans offers limited additional funds to projects that have results with potentially strong impacts. These funds can then be used to explore new and innovative opportunities to get knowledge, methods, and products into the hands of practitioners. This year these funds have been used to host workshops/training, produce informational videos, build online tools and procedure manuals, etc.

Finally, per our obligation as a UTC, research results are posted on our website and are disseminated to all of the required repositories that include, TRID, USDOT, Transportation Library, Volpe National Transportation Systems Center, Federal Highway Administration Research Library and the US Department of Commerce National Technical Information Service.

### **What do you plan to do during the next reporting period to accomplish the goals and objectives?**

PacTrans is working hard to get second year funding distributed to our consortium partner universities. Here are some of the specific items we hope to accomplish in the coming six-month performance period.

#### **Research**

During this next reporting period PacTrans will follow the priority research directions identified through the Regional Research Workshop to initiate our Year 3 (2025 – 2027) call for proposals and identify research projects, including multi-institution and single-institution projects as we have done in the past.

Planning work is underway now, and it is expected that the call for abstracts will occur shortly after the Transportation Research Board Annual Meeting in January 2025.

During this next reporting period PacTrans is hosting another research workshop, featuring invited talks from visiting scholars from Chalmers University of Technology in Sweden. Also, PacTrans will twill facilitate collaborations between regional partners to go after major RFPs from USDOT and other relevant agencies, such as Strengthening Mobility and Revolutionizing Transportation (SMART), Advanced Transportation Technology and Innovation (ATTAIN), Safe Streets for All (SS4A), etc.

### **Technology Transfer**

PacTrans will provide technology transfer related training and assistance to those who are interested in pushing their research products into practice. Although PacTrans typically does not begin offering Success Story funding until after our first year of research projects has been completed, we are open to supporting promising research products to complete the last step to make them practical.

PacTrans will also team up with the NW TTAP Center to help the Bureau of Indian Affairs to organize the Northwest Regional Transportation Peer Exchange event in April 2025.

In addition, PacTrans foresees several great opportunities for technology transfer, including: the 2024 PacTrans Region 10 Transportation Conference, the 2025 TRB Annual Meeting, TRB Data and AI Conference, ASCE ICTD, etc.

### **Education**

PacTrans will continue its multi-institution educational research project entitled “Understanding Human-centered AI through Data Integration and Analytics.” Also, PacTrans consortium partners will support our students in a variety of ways, including but not limited to:

1. Supporting professional organization student chapters, such as the Institute of Transportation Engineers, and student competition teams, such as UI’s clean snowmobile team, and UW’s Hyperloop team.
2. Sponsoring travels of students to conferences such as the Region 10 Transportation Conference and 2025 TRB Annual Meeting to present their work.
3. Funding the 2024 Region 10 Student Conference on the University of Idaho campus this October.

Also, PacTrans will invite distinguished speakers to talk to our faculty and students on the cutting edge research topics and provide training on important skills for future success. Finally, PacTrans will continue the operation of our quarterly Doctoral Webinar Series with a Fall and Winter installment of the series.

### **Workforce Development**

PacTrans will continue our quarterly Regional Transportation Seminar where we invite top experts from agencies, industry, and academia to come to campus and present in-person to students, faculty, and local industry professionals about their research. These seminars are also live streamed via YouTube. This Fall PacTrans will host Dr. José Holguín-Veras, William H. Hart Professor and Director of the Center of Excellence for Sustainable Urban Freight Systems at Rensselaer Polytechnic Institute, to present at one such seminar. PacTrans will also be hosting Karen Philbrick, Executive Director of the Mineta

Transportation Institute (MTI) at San José State University, to present at our yearly Leadership Seminar this Fall.

We are in the process of hiring a new Program Coordinator to support education and workforce development efforts. This person will also help drive the Workforce Development Institute (WDI) courses and provide timely responses to trainees.

The Workforce Development Institute will continue to develop and offer a wider range of short courses to meet the evolving needs of the transportation workforce including the following courses:

- Workplace Road Safety Training
- Grant writing for tribes and local entities
- Safety Analysis Process
- Introduction to Traffic Safety Culture
- Reading the Roadway

In addition, the WDI will continue to focus on the following four key areas:

- Program Evaluation: Implement a robust evaluation process to assess the effectiveness of courses and identify areas for improvement.
- Advisory Board Engagement: Actively seek input from the advisory board to inform strategic decision-making.
- Marketing and Outreach: A major effort is underway to enhance marketing efforts to increase awareness of WDI and attract a diverse student population.
- Financial Sustainability: Develop a sustainable financial model to ensure the long-term viability of the institute.

By focusing on these areas, WDI aims to solidify its position as a leading provider of workforce development training for the transportation industry.

## Participant and Collaborating Organizations: Who has been involved?

### What individuals have worked on the program?

- PacTrans Director, **Yinhai Wang**, Ph.D., Professor of Civil and Environmental Engineering at the UW, devotes 50 percent of his time directing PacTrans. Dr. Wang has overall responsibility for program management, oversight of PacTrans operations, including the Research Committee, the Education and Workforce Development Committee, and the Outreach and Technology Transfer Committee, and Student Leadership Council. He is the regional and national leadership for PacTrans, and the contact person for management relationships with USDOT Research and Innovative Administration (RITA) and other USDOT organizations.
- PacTrans Associate Director in Research, **Jeff Ban**, Ph.D., Associate Professor of Transportation Engineering in Civil and Environmental Engineering at the UW spends 5 percent of her time managing the research program for PacTrans and coordinates the research collaboration across the five partner institutions.
- PacTrans Associate Director in Education and Workforce Development, **Anne Vernez-Moudon**, Dr. es SC, Professor of Architecture, Landscape Architecture, and Urban Design and Planning, Adjunct

Professor of Epidemiology and in Civil and Environmental Engineering, devotes 5 percent of her time leading the Education and Workforce Development Committee. She is involved in curriculum changes, training program development, and educational enhancements among the partner institutions.

- PacTrans Associate Director in Technology Transfer, **Jon Froehlich**, PhD, Professor of Computer Science Engineering, devotes 5 percent of his time leading the Technology Transfer Committee.
- PacTrans Associate Director in Portland State University (PSU), **Jennifer Dill**, Ph.D., Professor of Urban Studies & Planning at PSU, devotes 5 percent of his time to managing and organizing the education, outreach, and research activities within PSU. She coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in the University of Alaska Anchorage (UAA), **Osama Abaza**, PhD, Professor of Civil Engineering at UAA, devotes 5 percent of his time to managing and organizing the education, outreach, and research activities within UAA. He coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in University of Idaho (UI), **Ahmed Abdel-Rahim**, Ph.D., Professor of Civil Engineering at UI, devotes 5 percent of his time to managing and organizing the education, outreach, and research activities within UI. He coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in Washington State University (WSU), **Xianming Shi**, Ph.D., Professor of Civil and Environmental Engineering at WSU, devotes 5 percent of his time to managing and organizing the education, outreach, and research activities within WSU. He coordinates all results and outcomes with the UW on a regular basis.
- PacTrans representative from Northwest Indian College (NWIC), **Victoria Retasket**, Dean of Student Life at NWIC, devotes 5 percent of her time to managing and organizing the education and outreach activities within NWIC. She coordinates all results and outcomes with the UW on a regular basis.
- Interim Assistant Director, **Ryan Avery**, devoted 30 percent of his time to the day-to-day operations in support of the PacTrans mission. His responsibilities include project management, grant management, events coordination and outreach, and managing the PacTrans operations team.
- PacTrans full-time Finance, Grants, and Research Manager, **Christina Yarbrough**, devoted 100 percent of her time to the Center's budget, expenditure, and research management.
- PacTrans part-time Assistant Director of the Workforce Development Institute (WDI), **Melissa Amrhein**, devotes 80 percent of her time to daily operations of the PacTrans WDI. Her responsibilities include partnership building, needs assessment, and coordination of course development and facilitation.
- PacTrans full-time Communications and Marketing Specialist, **Kristine Pham**, devoted 100 percent of her time to the Center's communications and marketing work.
- PacTrans part-time Program Coordinator, **Melanie Paredes**, devoted 40 percent of her time to the Center's fiscal matters, support with events coordination and outreach and day to day administration.
- PacTrans has 28 full-time faculty at UW engaged in transportation research. Our consortium partners (NWIC, PSU, UAA, UI, WSU) have 41 full-time faculty directly involved in PacTrans research.

## What other organizations have been involved as partners?

Because this is a relatively new Center, we do not yet have funding match partners to report during this reporting period. However, PacTrans has continuing relationships with many partners that have been cultivated over the years. The table below highlights the many partnerships that PacTrans has built over the duration of the center:

| Partner   | Type                    |
|---|-------------------------|
| Alaska Department of Transportation and Public Facilities | Government              |
| Idaho Transportation Department                           | Government              |
| Oregon State Department of Transportation                 | Government              |
| Washington State Department of Transportation             | Government              |
| City of Bellingham  | Government              |
| City of Seattle   | Government              |
| City of Lynnwood  | Government              |
| City of Bellevue  | Government              |
| City of Everett   | Government              |
| City of Kenmore   | Government              |
| King County   | Government              |
| Snohomish County  | Government              |
| Pierce County   | Government              |
| Sound Transit   | Government Agency       |
| Washington Traffic Safety Commission                      | Government Agency       |
| Washington State Transportation Insurance Pool            | Government Agency       |
| University of Alaska, Anchorage                           | Educational Institution |
| University of Washington Transportation Services          | Educational Institution |
| Washington State Department of Ecology                    | Government              |
| Puget Sound Regional Council                              | Government              |
| Washington State Transportation Investment Board          | Government Agency       |

|   |                                  |
|---|----------------------------------|
| American Society of Civil Engineers                                       | Professional Association         |
| Institute of Electrical and Electronics Engineers                         | Professional Association         |
| Institute of Transportation Engineers                                     | Professional Association         |
| Yakama Nation   | Federated Tribe                  |
| Northwestern Tribal Technical Assistance Program (NW TTAP) Center         | University Center                |
| ITS Washington  | Professional Association         |
| HDR Engineering   | Private Industry                 |
| Port of Portland  | Government                       |
| BMW Group   | Private Industry                 |
| Western Trailers  | Private Industry                 |
| Coral Sales Co.   | Private Industry                 |
| National Institute for Transportation and Communities                     | University Transportation Center |
| Transportation for Livability by Integrating Vehicles and the Environment | University Transportation Center |
| Center for Environmentally Sustainable Transportation in Cold Climates    | University Transportation Center |
| Aichele and Associates  | Private Industry                 |
| Alstom Grid Inc.  | Private Industry                 |
| Alta Planning and Design  | Private Industry                 |
| Battelle  | Private Industry                 |
| Cascade Bicycle Club  | Non-profit/ Foundation           |
| Feet First  | Non-profit/ Foundation           |
| DENSO   | Private Industry                 |
| T Mobile  | Private Industry                 |
| DKS Associates  | Private Industry                 |
| Fehr and Peers  | Private Industry                 |
| FLIR  | Private Industry                 |
| Inrix Inc.  | Private Industry                 |

|  |                          |
|--|--------------------------|
| Wejo   | Private Industry         |
| AIWaysion  | Private Industry         |
| Tom Tom  | Private Industry         |
| Amazon   | Private Industry         |
| Nokia  | Private Industry         |
| Transpo Group                                    | Private Industry         |
| Intelligent Transportation Systems of Washington | Professional Association |
| Luum   | Private Industry         |
| Kittelson and Associates                         | Private Industry         |
| Microsoft  | Private Industry         |
| BlackBerry                                       | Private Industry         |
| Verizon  | Private Industry         |
| Q-Free   | Private Industry         |
| PACCAR, Inc.                                     | Private Industry         |
| West Salem High School                           | Educational Institution  |
| The Bush School                                  | Educational Institution  |

### Outputs

|  | Total | UW | PSU | UAA | UI | WSU | NWIC |
|--|-------|----|-----|-----|----|-----|------|
| Publications: peer reviewed journal articles             | 17    | 15 | 0   | 1   | 0  | 1   | 0    |
| Publications: Book chapters and other edited manuscripts | 1     | 1  | 0   | 0   | 0  | 0   | 0    |
| Conference papers  | 47    | 26 | 2   | 3   | 5  | 11  | 0    |
| Conference presentations                                 | 58    | 46 | 1   | 1   | 4  | 6   | 0    |
| Lectures/Seminars /Workshops/ Invited Talks              | 24    | 20 | 0   | 0   | 0  | 4   | 0    |
| Policy Papers  | 4     | 1  | 0   | 0   | 0  | 3   | 0    |

|   |    |    |   |   |   |   |   |
|---|----|----|---|---|---|---|---|
| Websites or Other Internet Sites  | 2  | 2  | 0 | 0 | 0 | 0 | 0 |
| New Methodologies, Technologies or Techniques   | 7  | 6  | 0 | 0 | 0 | 1 | 0 |
| Inventions, patent applications, and/or licenses  | 0  | 0  | 0 | 0 | 0 | 0 | 0 |
| Other products: data or databases, physical collections, audio or video products, software or NetWare, models, educational aids or curricula, instruments, or equipment | 11 | 10 | 0 | 0 | 0 | 1 | 0 |

| OUTPUTS: Technology Transfer Plan Output Metrics   | Annual Targets | Numbers for Reporting Period |
|--|----------------|------------------------------|
| Number of publications, presentations, and posters made at conferences or workshops explaining or promoting the research outputs | 100            | 103                          |
| Number of software tools and technologies made available to practitioners  | 10             | 11                           |

**Examples of peer reviewed journal articles**

Askari, S., Snyder, D., Li, C., Saugstad, M., Froehlich, J. E., & Eisenberg, Y. (2025). Gold standard? Comparison of virtual audits using an online platform and government audits of accessible pedestrian infrastructure. The 104th Transportation Research Board (TRB) Annual Meeting, January 5–9, Washington, DC.

Young, R., Chang, K., and Hurwitz, D. (2024). “Characterizations of Expert and Public Perception of Bicycle Rolling Stop Laws: Public Hazard or Practical Convenience?” Transportation Research Board, Washington, DC.

McCabe, D., Ban, X., Kulcsár, B., 2024. Minimum-delay opportunity charging scheduling for electric buses. Submitted to Transportation Research Part E.

Monjurul Karim, M., Qin, R., & Wang, Y. (2024). Fusion-GRU: A Deep Learning Model for Future Bounding Box Prediction of Traffic Agents in Risky Driving Videos. Transportation Research Record, 2678(9), 699-709.

**Examples of conference papers and presentations**

Eapen, Neeta A., Robert B. Heckendorn, and Ahmed Abdel-Rahim. "Fast Machine Learning-Based High Fidelity Mesoscopic Modeling Tool for Traffic Simulation." In International Conference on Transportation and Development 2024, pp. 417-430. 2024.

Barati-Nia, A., Parrott, A.E., Sorenson, K., Moug, D.M., Khosravifar, A. (2025). "Comparing cyclic direct simple shear behavior of fine-grained soil prepared with SHANSEP or Recompression approaches." Proceedings of the 2025 ASCE GeoFrontiers, Louisville, Kentucky.

Lowry, M. (2024). Bicycle and Pedestrian Computer Vision: Comparing Proprietary CV Sensors and Open-Source CV Tools. Presented at the NatMEC Conference, Boise, Idaho.

Wang, B., Karim, M. M., Liu, C., & Wang, Y. (2024). Traffic Performance GPT (TP-GPT): Real-Time Data Informed Intelligent ChatBot for Transportation Surveillance and Management. IEEE ITSC.

### **Example of lectures/seminars/workshops/invited talks**

Wang, Y. TRB 2<sup>nd</sup> International Conference and Peer Exchange on Roadside Safety. "Computer Vision Advances: Extracting Safety Data from Video Images." June 23, 2024. Orlando, Florida.

Wang, Y. MS2 NatMEC 2024 Dinner Event Speech. "Edge AI for Traffic Sensing and Monitoring." June 3, 2024. Boise, Idaho.

Data Driven Solutions and AI Technologies for Safer and Smarter Mobility Workshop. "Revolutionizing Road Transportation with AI: Challenges and Opportunities." May 30, 2024.

PacTrans Research Workshop, June 14, 2024. The workshop gathered about 50 participants representing academic researchers, public agencies, and the private sector from all states of the Pacific Northwest (WA, ID, OR, AL) to discuss mobility related challenges and brainstorm possible solutions.

### **Examples of Website(s) or other Internet site(s)**

<https://projectsidewalk.org/>

<https://localhost> (TP-GPT)

### **Examples of New Methodologies, Technologies or Techniques**

Liu, C. Trajectory Prediction and Conflict Estimation on Edge Computing Device

Zhang, S. Damaged Sign Recognition Using Computer Vision

Shi, Y. Machine Learning based Approach for 13-Bin Vehicle Classification

### **Examples of Data/Database/Video/Software/Educational Aids/Curricula/Equipment**

[https://github.com/angxu1/bike\\_sharing](https://github.com/angxu1/bike_sharing)

Trajectory Prediction and Conflict Estimation Visualization System

## **Outcomes**

| OUTCOMES: Technology Transfer Plan Outcomes Metrics   | Annual Targets | Numbers for Reporting Period |
|---|----------------|------------------------------|
| Number of early adopters of our research outputs  | 10             | 10                           |
| Changes made to the transportation system, or its regulatory, legislative, practice manuals, design standards, or policy frameworks | 1              | 0                            |

Over the years PacTrans research has been implemented into practice dozens of times. PacTrans PIs utilize research and/or technology transfer (Success Story) funds, and leverage match resources from external partners, to create new techniques and technologies that solve real world problems. While we are early in the grant, a couple of examples of outcomes from this grant during this reporting period are as follows:

The Project Sidewalk research supported by PacTrans has engaged with several aldermanic wards in Chicago who have authority to maintain and improve the pedestrian infrastructure in their ward. The project has worked with four wards interested in using Project Sidewalk to understand sidewalk problems more holistically. The data collected by residents through Project Sidewalk was used to make decisions about infrastructure funds and prioritize sidewalk improvements in an equitable manner, ensuring they were spread out throughout the Ward and addressed highly problematic areas. Two of the wards used the data to allocate funding in the previous fiscal year and two wards plan to do so in the upcoming year. The alderman’s office shared several specific locations where they used the data and made improvements.

Eight AI tools developed by the PacTrans STAR Lab have been highlighted in TRB workshops and webinars. Six transportation agencies and multiple cities and Tribes have shown their interests to use these tools. Professor Qing Shen noted that King County Metro has shown interest in using his team's research results as a reference for their micro-transit service planning. The Seattle Department of Transportation is again using their commute survey questionnaire for its required commute trip reduction (CTR) survey.

**Impact**

Nothing to report at this time.

**Changes/Problems**

None.

**Special Reporting Requirements**

## **Research Project Requirements**

Per our research update above, PacTrans is working diligently to initiate our second year of funded projects. They will be uploaded to RiP and put on our website in short order. Further, PacTrans will continue to include the requirement for an ORCID number from each PI before their project funds are released.

## **Submission of Final Research Reports**

As final versions of technical project reports are completed and checked for ADA compliance, they will be uploaded to our repository and linked on the research project profiles on the PacTrans website. Then they will be submitted to TRID, NTL Research HUB, etc. This process will not begin until our first-year projects are wrapped up (likely middle of 2025).