



Semi-Annual Progress Report #3

<b>Federal Agency</b>	U.S. Department of Transportation
<b>Federal Grant Number</b>	69A3552348309
<b>Project Title</b>	Pacific Southwest Region 9 University Transportation Center (UTC)
<b>Center Director Name, Title, Contact Information</b>	Marlon Boarnet, Director Sol Price School of Public Policy University of Southern California Lewis Hall, RGL 301-C Los Angeles, California 90089-0626 213-740-3696 boarnet@usc.edu
<b>Name of Submitting Official, Title and Contact Information</b>	Same as above
<b>Submission Date</b>	10/30/2024
<b>DUNS/EIN Numbers</b>	072933393 / 95-1642394
<b>Recipient Organization</b>	University of Southern California Department of Contracts and Grants 3750 S. Flower St. CUB 325 Los Angeles, California 90089-4019
<b>Recipient Identifying Number if any</b>	USC Account #: GR1062944
<b>Project/grant Period</b>	06/30/2023 – 05/29/2029
<b>Reporting Period End Date</b>	09/30/2024
<b>Report Term or Frequency</b>	Semi-Annual. This report covers the period from April 1, 2024 to September 30, 2024 per Exhibit D, Grant Deliverables and requirements for 2023 UTC Grants
<b>Signature of Submitting Official</b>	

**Contents**

- 1. [Accomplishments](#)..... 2
  - A. [Research Accomplishments](#) ..... 3
    - i. [Research dissemination](#)..... 11
    - ii. [Plans for next reporting period](#) ..... 15
  - B. [Educational Accomplishments](#)..... 17
    - [Student Programs](#) ..... 17
    - i. [Workforce development](#) ..... 17
    - ii. [Education and Workforce Development goals for next reporting period](#) ..... 17
  - C. [Outreach Accomplishments](#)..... 18
    - i. [Outreach plans for the next reporting period](#)..... 20
- 2. [Participants & Collaborating Organizations](#)..... 21
  - A. [Financial support](#)..... 21
  - B. [Other support](#) ..... 21
    - [Additional Support](#)..... 22
  - C. [Collaborations](#)..... 22
- 3. [Outputs](#) ..... 24
  - A. [Websites](#) ..... 24
  - B. [New methodologies, technologies, or techniques](#) ..... 25
  - C. [Other products](#)..... 25
- 4. [Outcomes](#)..... 25
- 5. [Impacts](#)..... 27
- 6. [Changes/Problems](#)..... 29
- 7. [Special Reporting Requirements](#)..... 30
- 8. [Appendix A](#)..... 31

## 1. Accomplishments

### Major goals of the program

The Pacific Southwest Region (PSR) University Transportation Center (UTC) serves Region 9 with a comprehensive, integrated program of research, education and technology transfer built upon the priority needs of the region: 1) closing access gaps, 2) increasing the sustainability and resilience of the goods movement system, and 3) expanding workforce opportunities. Our research program includes an important role for sustainability within each of those areas, and is tailored to address the US DOT strategic goals of **equity, economic strength and global competitiveness**, and **climate and sustainability**.

Our consortium of universities and community colleges, together with partnerships with state Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPOs), and industry leaders, forms a comprehensive, region-wide network. The University of Southern California (USC) leads the consortium. Partners include California State University Long Beach (CSULB); University of California, Berkeley (UCB); University of California, Davis (UCD); University of California, Irvine (UCI); University of California, Los Angeles (UCLA); University of Hawai'i at Manoa (UH); Northern Arizona University (NAU); Pima Community College (PCC); and University of Nevada, Las Vegas (UNLV). USC and CSULB are both partners in the METRANS Transportation Center, the entity that houses the PSR UTC.

### Accomplishments under these goals

Our accomplishments are categorized under administrative, research, education, and outreach.

#### Administrative accomplishments

In the previous SAPR, CITT reported that **CSULB** would hire a Grants Coordinator as a shared position between stateside and Center operations. During the reporting period, Tyler Reeb completed the necessary steps to lead a formal search for that position and will chair the hiring committee during the following reporting period.

**PCC** had their second advisory committee meeting was held on June 14, 2024. As TuSimple has left the United States market, engagement in this advisory committee with key partners such as Waabi, Aurora and Kodiak is very exciting to evolve the program.

After 23 years at the helm, Brian D. Taylor stepped down as director of the **UCLA** Institute of Transportation Studies, effective July 1. He is succeeded by Adam Millard-Ball, professor of urban planning at the UCLA Luskin School of Public Affairs. Taylor led UCLA ITS since 2001, playing a critical role in the institute's expansion. Under his tenure, UCLA ITS has transformed from a small operation with limited staff and resources into a nationally influential research center with more than 75 scholars and staff conducting cutting-edge research in eight program areas. The institute has also established partnerships in several consortia, most recently being named the



lead in a five-year, \$7.5 million federally funded Center of Excellence on New Mobility and Automated Vehicles.

### 1) Research Accomplishments

The goal of our Center is to address regional issues, engage in transportation research that will transform both knowledge and practice while supporting US DOT strategic goals, and provide public policy advisement, technical assistance to state and local agencies, and innovative workforce development strategies. Our multi-modal, multi-disciplinary research program is organized around two themes, each with three sub-topics, and a topic that cuts across both themes:

#### Theme 1: Accessibility and Mobility for All

- Topic 1.1: Accessibility for Underserved and Isolated Communities
- Topic 1.2: Improving the Efficiency of the Mobility System
- Topic 1.3: Broadening Access to Low/Zero Carbon Transport

#### Theme 2: Sustainable and Resilient Supply Chains

- Topic 2.1: Addressing Environmental Justice Problems in the Goods Movement System
- Topic 2.2: Goods Movement System Efficiencies and Resilience
- Topic 2.3: Decarbonizing the Goods Movement System

Cross-Cutting Topic (applies to both Theme 1 and Theme 2): Access to Opportunity Through Strategic Workforce Development

Our research program has four parts: 1) research initiated and conducted by PSR faculty; 2) research conducted by researchers inside or outside PSR but within Region 9; and 3) a graduate research fellowship program, and (4) community-partnered research projects which pair PSR faculty and community organizations from the earliest stages of the research. The community-partnered projects, which are new in the BIL UTC, are intended to increase the research focus on equity and community needs and to accelerate technology transfer by working with communities and practice from the earliest stages of research conceptualization. The more traditional faculty-initiated projects are research that is still formative and hence not ready for community partnering at the earliest stages. As with the earlier FAST-Act PSR, we have reserved a small pool fund for a Region 9-wide solicitation with the purpose to promote broader participation across the states and territories. We found that helps PSR maintain vibrant links to scholars throughout Region 9.

Our Year 2 Pacific Southwest Region RFP for faculty research proposals closed on March 27. We received 33 proposals across our 10-university consortium. Of the 33 proposals, there are five cross-university proposals. The proposals were from 8 of our 10 PSR partner universities. We broadened our outreach to faculty and research staff members, and almost half of the proposals are from researchers who have not been funded by PSR before. The universities with the largest number of proposals are USC (8), UC Davis (7), and UC Irvine (6). Overall, this was a very healthy response. We are pleased that researchers across our universities are making links and collaborating.

Following a rigorous external peer review, the PSR executive committee selected 25 projects for funding. Table 3 shows projects which were funded through the Year 2 RFP. (See projects with leading digits "24" in project number in Table 3 for the Year 2 RFP projects.) For completeness, Table 3 also

shows active match projects either selected or in progress in this SAPR reporting period, including a small number of projects that were funded outside of the RFP process (from fund sources Peterson Foundation, California Air Resources Board, and Los Angeles Business Council.) Note that all Caltrans funded projects are peer reviewed through the RFP process.

For historical information, Table 1 includes projects from a Summer 2022 RFP that, due to delays, began in Summer 2023 and hence are claimed as match projects for the current BIL center. Table 2 shows projects completed in a Summer 2023 RFP whose start dates were in Summer 2024 and which are also match projects for the current BIL grant. Hence the combination of Tables 1, 2, and 3 provide an up-to-date view of the research activity in the current PSR BIL grant.

**Table 1: Caltrans match funded projects, competed in summer 2022. Due to a delay in contracting, projects started in summer 2023.**

**Note on Funding Source: CT-PSR= Caltrans funds (for California partners), match funding source**

Partner	Project No.	PI	Title	Funding Source
CSULB	PSR-21-SP94 TO-062	O'Brien, Thomas	Succession planning	CT-PSR
CSULB	PSR-22-02 TO-063	Reeb, Tyler	Implementing a Community-Based Mobility Lab: Improving Traffic, Protecting Data Privacy	CT-PSR
USC	PSR-22-08 TO-064	Boarnet, Marlon	The Impact of Work-from-Home on Job and Housing Location in the Bay Area - Central Valley Region: An Analysis of the Relationship Between Traffic, Telecommuting, and Migration During and After COVID-19	CT-PSR
USC	PSR-22-10 TO-065	Molisch, Andreas	Deep-learning-based radio channel prediction for vehicle-to-vehicle communications	CT-PSR
USC	PSR-22-15 TO-066	Pang, Jong-Shi	A general traffic equilibrium framework with ridesourcing services that considers flow-dependent waiting time and public transit	CT-PSR
UCLA	PSR-22-22 TO-067	Blumenberg, Evelyn	Student Transit Programs and Other Modes-to-School in California	CT-PSR
UCI	PSR-22-23 TO-068	Saphores, Jean-Daniel	How to enhance student outcomes while strengthening transit? An Analysis of LA Metro's GoPass Fareless pilot program	CT-PSR
UCI	PSR-22-24 TO-069	Roy, Avipsa	Developing a data fusion framework to map active transportation usage patterns in Orange County	CT-PSR
UCD	PSR-22-46 TO-070	Jaller, Miguel	Development of Public Dynamic Spatio-Temporal Monitoring and Analysis Tool of Supply Chain Vulnerability, Resilience, and Sustainability	CT-PSR

UCD	PSR-22-47 TO-071	Venkataram, Prashanth	Studying the Effects of Disability on Choices and Desires for Travel and Neighborhood Location	CT-PSR
-----	---------------------	--------------------------	--	--------

**Table 2: Caltrans match funded projects, competed in summer 2023. Due to a delay in contracting, projects started in summer 2024.**

**Note on Funding Source: CT-PSR= Caltrans funds (for California partners), match funding source**

Partner	Project No.	PI	Title	Funding Source
UCLA	PSR-23-02 TO 072	Ma, Jiaqi	Modernize Census Infrastructure Technology	CT-PSR
UCI	PSR-23-03 TO 073	Ritchie, Stephen	Route-based Freight Activity Metrics along the California State Highway System through a Pilot Multi Sensor Fusion System	CT-PSR
USC	PSR-23-04 TO 074	Gencturk, Bora	Development and testing of a novel anchor-profiled FRP jacket system for effective confinement of rectangular concrete columns	CT-PSR
USC	PSR-23-05 TO 075	Comandon, Andre	The Environmental Impact and Policy Implications of Supercommuting in the Northern California Megaregion	CT-PSR
USC	PSR-23-06 TO 076	Shahabi, Cyrus	Traffic Causality Analysis for Robust Road Freight	CT-PSR
USC	PSR-23-07 TO 077	Savla, Ketan	Practical Performance Indices to Enable Ranking of Signalized Corridors	CT-PSR
CSULB	PSR-23-08 TO 078	Reeb, Tyler	Best Practices in Freight Technology Transfer	CT-PSR
USC	PSR-23-01 TO 079	Giuliano, Genevieve	Impacts of e-commerce on warehousing and distribution in California	CT-PSR
UCLA	PSR 23-23 TO 080	Blumenberg, Evelyn	The Equity and Policy Implications of Long-Distance Commuting in the Greater Los Angeles region	CT-PSR

**Table 3: Funded projects (USDOT, Caltrans and others)**

**Note on Funding Source: USDOT= DOT funded**

**CT-PSR= Caltrans funds (for California partners), match funding source**

**LABC= Los Angeles Business Council, match funding source**

**PF= Peterson Foundation, match funding source**

Partner	Project No.	PI	Title	Funding Source
USC	PSR-22- SP50	Boarnet, Marlon	How Remote Work Will Influence GHG Emissions: A National Analysis of the Relationship of the Impact of COVID-19 on Remote Work,	PF

			Commuting, Residential Location, and Greenhouse Gas Emission Reduction	
USC	PSR-23-SP01	Boarnet, Marlon	Zero Emission Heavy Duty Trucks: An Analysis of California’s Advanced Clean Fleets Regulation	LABC
USC	PSR 23-16	Razaviyayn, Meisam	Enhancing Traffic Flow through Private Data Sharing and Incentivizing New Mobility Services	USDOT
USC	PSR 23-18	Boeing, Geoff	Measuring Street Network Disruptions’ Impacts on Real-World Trips to Design More Resilient Infrastructure	USDOT
USC	PSR 23-19	Giuliano, Genevieve	Closing the Gap: A Comparative Study of Transportation Accessibility for Adults with Disabilities in Urban and Rural California	USDOT
UCSB	PSR 23-20	Goulias, Konstadinos	Household Demand for Clean Vehicles in California: Individual Attitudes, Current Car Ownership, and Future Car Ownership.	USDOT
UCD	PSR-23-10	Rodier, Caroline	Grassroots Shared Mobility Community-Partnered Project	USDOT
UCD	PSR-23-11	Nambisan, Shashi	Grassroots Shared Mobility Community-Partnered Project	TBD
CSULB	PSR-23-12	Gregor, Theresa	Tribal Transportation Oral History of Mobility: Understanding the Past to Improve Future Collaborations and Innovations	USDOT
UCI	PSR-24-40	Dean, Matthew	Investigating the Impacts of Smart Charging on Electric Vehicle Charging Choices Within an Activity-based Framework	CT-PSR
UCD	PSR-24-24	Bunch, David	Modeling the impacts of California electric vehicle policies with emphasis on the used vehicle market	CT-PSR
UCI	PSR-24-25	Brownstone, David	Modeling the impacts of California electric vehicle policies with emphasis on the used vehicle market	CT-PSR
CSULB	PSR-24-26	Tanvir, Shams	Machine Learning with Roadside Lidar for Efficient Signalized Intersection Operations	CT-PSR
CSULB	PSR-24-28	Liu, Tairan	Assessing LLM’s Ability to Identify Transient Status in Pedestrian-Involved Traffic Collisions	CT-PSR
UCB	PSR-24-31	Shaheen, Susan	Which Way Forward? Learning from Global Informal Networks to Inform Microtransit Services in California	CT-PSR

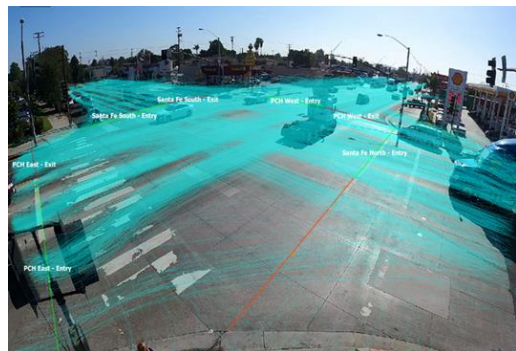
UCD	PSR-24-32	Barajas, Jesus	Disability, mode perceptions, and travel behavior: An intersectional study	CT-PSR
UCD	PSR-24-35	Hardman, Scott	Investigating unmet travel needs in disadvantaged and rural communities: Can sustainable transportation meet these needs?	USDOT
UCI	PSR-24-38	Borowski, Elisa	Framework for participatory evaluation of greenery screens in environmental justice communities	CT-PSR
UCLA	PSR-24-41	Wasserman, Jacob	Considerations for Renaming Caltrans Facilities	CT-PSR
UCLA	PSR-24-42	Ma, Jiaqi	Evaluating Accessibility Changes of Electric Vehicle (EV) Supported Projects through an Agent-based Simulation Approach	CT-PSR
UCSB	PSR-24-43	Goulias, Konstadinos	Strategies to Increase Zero Carbon Vehicles for Underserved and Disadvantaged Communities	USDOT
UNLV	PSR-24-44	Morris, Brendan	Research Experience for Undergraduates (REU): Smart Cities – Advancing Mobility	USDOT
UNLV	PSR-24-45	Erdem, Mehmet	Transportation Needs and Economic Opportunities for Service Employees of Socio-economically Disadvantaged Populations in Las Vegas Hospitality and Tourism Industry	USDOT
UNLV	PSR-24-47	Bein, Wolfgang	Online Competitive Algorithms and Reinforcement Learning for Traffic Management	USDOT
USC	PSR-24-48	Comandon, Andre	Charging station investments’ impact on electric vehicle accessibility and adoption	CT-PSR
USC	PSR-24-49	Comandon, Andre	Insights from Global South paratransit services for applications to microtransit in California	CT-PSR
USC	PSR-24-50	Molisch, Andreas	Integrated Sensing and Communication for intelligent road-traffic management	CT-PSR
USC	PSR-24-51	Parkhomenko, Andrii	Quantifying Public Transit Improvements: A Multimodal Evaluation of Recent Improvements to Los Angeles Rail Infrastructure	CT-PSR
USC	PSR-24-52	Savla, Ketan	Traffic Flow Management for Mixed Modes on Signalized Networks	CT-PSR
USC	PSR-24-53	Dessouky, Maged	Curbing Emissions: Enhancing Sustainability Through Collaborative Shipment in Horizontal Supply Chains	CT-PSR
USC	PSR-24-54	Suen, Sze-Chuan	Optimizing Mobile Health Routing and Scheduling to Enhance Healthcare Access	USDOT
USC	PSR-24-55	Ioannou, Petros	Intersection Control of Connected Vehicles for Mobility and Safety	USDOT

UCB	PSR-24-56	Griswold, Julia	A Time and Space Exploration of Traffic Crash Trends During the Covid Recovery	CT-PSR
-----	-----------	-----------------	--	--------

During the reporting period, **USC** (Marlon Boarnet and Genevieve Giuliano) completed a study of California’s Advanced Clean Fleets (ACF) regulation, which requires that the state’s drayage truck fleet transition to 100 percent zero emission by 2035. The research included interviews from over fifteen experts in industry and government and a detailed analysis of the year-by-year transition path by modeling the number of zero emission trucks required in each year. The results illustrate a pressing need to permit and build new electric charging infrastructure more quickly, manage the cost of electric and hydrogen fuel cell heavy-duty trucks (which cost two to six times the cost of internal combustion engine vehicles), and manage a transition which will be particularly difficult for the almost 70 percent of Southern California drayage firms that operate fewer than 20 trucks. The final report is [here](#).

Also at **USC**, Cyrus Shahabi, Luciano Nocera, and Genevieve Giuliano completed a report on fusing sensor data sources to estimate truck volumes and flows on networks. The project included collaborations with Caltrans District 7 and our PSR partner **UCI** Institute of Transportation Studies. The team collected closed circuit TV (CCTV) videos, Weigh-in-Motion (WIM) station data, and Truck Activity Monitoring System (TAMS) data, plus data from an almost twelve-year archive of Los Angeles Metro highway sensor data, the Archived Data Management System (ADMS). Deep learning-based object detection and tracking algorithms were applied to study the feasibility and usefulness of using traffic monitoring videos for truck detection and counting. The results showed that truck detection and counting can be achieved with high detection accuracy and low inference times, allowing them to deploy these methods on video streams. The full final report is [here](#).

During the reporting period, researchers from CITT and the **CSULB** College of Engineering used the traffic analyses platforms Streetlight Insight and Iteris ClearGuide to develop a baseline understanding of the behaviors exhibited by road users at a studied intersection. Based on the traffic analyses carried out with both platforms, researchers identified the behaviors which contribute to congestion at the intersection. Researchers then filmed the intersection during varying hours over the course of two weeks to observe the negative behaviors in person. Researchers found that the traffic patterns suggested by the data analysis platforms were accurate, but that there were additional problems at the intersection that the models failed to capture or convey. The captured footage was then sent to DataFromSky for processing. The processed footage was analyzed by the technology team.



Theresa Gregor at **CSULB** conducted and recorded oral interviews with tribal leadership to document gaps, lessons learned, best practices, and areas for improvement in the relationship and engagement that Tribes in San Diego have with regional county and city partners. The results are being compiled in a report and related StoryMap. A preliminary version of the StoryMap was shared on September 25, 2024 at SANDAG’s Tribal Working Group Meeting and at a TRB workshop in Tribal Transportation Planning in October. We will report on that Tribal Transportation Planning workshop more fully in the next SAPR.

Erdem led efforts on **UNLV's** "Community Partnered Project" which is titled "An Examination of Transportation for Service Employees from Socio-economically Disadvantaged Populations in Las Vegas." Professors Shashi Nambisan (Howard R. Hughes College of Engineering) and Billy Bai (William F. Harrah College of Hospitality) are the co-PIs on this project. The primary objective of this work is to examine key work-related transportation needs and challenges faced by service employees, especially those from socio-economically disadvantaged (SED) populations (lower wage earners), in the Las Vegas metropolitan area.

**UNLV** hosted a transportation seminar series (typically every week). The goal of these seminars is to alert, engage, excite and motivate students to pursue educational and career opportunities in transportation. For this, the seminars aim to alert students to societal needs, challenges, and opportunities in the transportation domain, address current and emerging trends in practice and research, and highlight transportation related programs and initiatives. It is also to impress upon the students that effectively addressing these challenges will need expertise from varied fields. Further, it is to help them recognize that transportation careers are exciting and rewarding (in so many ways). Several of these seminars were in partnership with UNLV student chapters of professional organizations (e.g., Institute of Transportation Engineers, American Railway Engineering and Maintenance-of-Way Association, National Society of Hispanic Engineers, National Society of Black Engineers, Society of Women Engineers). The seminars featured speakers from academe, government, private practice and non-profit organizations. They attracted attendees from many academic disciplines – well beyond engineering. They have also led to students seeking / obtaining internship and research opportunities in transportation.

**UCI** held the first annual Colloquium on the Future of Traffic Safety, on April 12th, 2024. Federico Vaca, Professor and Executive Vice Chair of UCI School of Medicine's Emergency Medicine Department, moderated the colloquium, which featured a welcome from UCI Vice Chancellor for Research Pramod Khargonekar, keynote from California's Secretary of Transportation Toks Omishakin, and presentations from Barbara Rooney, Director of the California Office of Traffic Safety and Chair of the Governor's Highway Safety Association; Kristofer Kusano, Road Vehicle Safety Researcher for Waymo; Daniel McGehee, Associate Professor of Industrial and Systems Engineering and Director of the Driving Safety Research Institute at University of Iowa's Public Policy Center; Johnathon Ehsani, Associate Professor at Johns Hopkins and driver training, testing and licensing expert.

### **Student opportunities for research**

Student support is an important component of research project selection. Highlights of how PSR has supported students:

**PCC** integrated teaching with an adult basic education instructor and standardized testing scores (TABE) had increased for all three students in the cohort from their initial entrance testing scores. One student stayed at the same level but had a higher score within that level, one student went up one reading level and another student went up two reading levels. For the second cohort of 3 students, one student's TABE scores improved. One did not do the post-test and one student did not improve from the pre- and post-tests. Third cohort (3 students) is in process and due to end mid-December 2024.

**PCC** had all six students pass their Commercial Driver’s License state exam to date. The first cohort did all require multiple attempts, which is unusual. One out of three from the second cohort required multiple attempts.

The Transportation Research Immersion Program (TRIP) at the Institute of Transportation Studies – **UCI**, is an eight-week paid summer program for undergraduate students (rising sophomores, juniors, and seniors) and community college students to engage in transportation research. Participants are assigned to a specific transportation research project and contribute meaningfully to that project under the guidance and mentorship of an ITS Faculty Associate. No prior research experience is required. Applications are accepted through May of each year or as space remains. This past summer marks the third year of this program. Eleven undergraduate students were selected for the summer 2024 TRIP program.

**UCB** completed seven projects awarded under the 2023-24 Call for Student Research. They were:

1. Applying Racial, Health, and Mobility Equity to Transit Oriented Development: An East Oakland Case Study
2. Proactively Planning for Safety: Equity Impacts of Reliance on Flawed Collision Data
3. “Don’t Keep Us Out of the Revolution:” Understanding Desires for Accessibility for Autonomous Vehicle Rideshare in California
4. Transit to California’s National Parks: An Assessment of Accessibility and Policy-Level Barriers
5. Expanding Universal Mobility Benefit Programs as a Federal Social Welfare Strategy
6. Incentivizing Cycling for Women from Low-income Communities in the Bay Area: Lessons from the Global South
7. Tapping In: Using Open Loop Payments to Increase Financial Inclusion

At **UNLV**, all Research Experiences for Undergraduate (REU) summer students participated in the **UNLV** Office of Undergraduate Research Summer Research Symposium where they presented their work in a poster session that included other summer research programs (over 30 posters). Yazmin Martinez also presented at the University Transportation Center’s 2024 PSR Annual Congress at UNLV and was selected as the "2023 Student of the Year in the Doctorate Category Center" by the Pacific Southwest Region University Transportation Center (see photo below).



*Ph.D. Student Yazmin Martinez and PI Wolfgang Bein displayed on the electronic billboard outside the new UNLV Advanced Engineering Building of the Howard Hughes College of Engineering*

For this period, **NAU** continued supporting undergraduate and graduate transportation students through paid internships and fellowships, as well as engage in outreach activities. They attended the 2024 ITE/IMSAs Conference in Phoenix, Arizona (two faculty and six students; two presentations), ITS America (one faculty and six students; two student presentations), the ITE International Meeting (one faculty; one presentation), the Summer Meeting of TRB’s Traffic Signal Systems Committee (one faculty), the Arizona Transportation Institute’s inaugural Arizona Transportation Research Summit (five faculty; one presentation), Arizona Roads and Streets (two faculty; one presentation), and the Bridge Engineering Institute (BEI) (one faculty and one student; one presentation).



NAU students and faculty at ITS America in Phoenix, AZ (April 24<sup>th</sup>, 2024)



NAU Students at the Thames Barrier, part of Infrastructure Systems Abroad (May 2024) and NAU Booth at 2024 Arizona Roads and Streets Conference (left to right)

**Additional accomplishments**

**i. Research dissemination**

On April 6, 2024, **PCC** participated in Junior League of Tucson Touch a Truck Event. Touch-A-Truck™ is a family-friendly event designed to allow children to explore, climb, and TOUCH vehicles of all shapes and sizes. The first hour is a quiet hour (no lights, sirens, horns) for children with sensory sensitivities. On August 13, 2024, **PCC, USC, and CSULB** faculty and staff presented three posters at the Future of Transportation UTC Summit in Washington, D.C. Dr. Tom O’Brien (CSULB) and Missy Blair (PCC) presented *Beyond the University: The Role of the UTC in Developing Industry-Driven Educational Pathways* which highlighted the workforce development initiatives for the Pacific Southwest Region UTC. Dr. Ketan Savla’s (USC) poster, *Data-Driven Traffic Signal Control* summarized his research in the field and highlighted the impact of this research including the development of a spinoff company, *Xtelligent Inc.* Dr. Marlon Boarnet (USC) presented *Sustainable and Efficient Goods Movement in Southern California* on behalf of Dr. Maged Dessouky (USC) and Dr. Genevieve Giuliano (USC). Dr. Marlon



*Boarnet presents on work from home at the first US DOT Future of Transportation Summit*

Boarnet also presented *How is Work from Home Changing Transportation?* Click [here](#) for a more detailed summary of each presentation.



On September 28, 2024, **PCC** participated in a local Tire Rack Street Survival teen driving school. The Center provided a full semi to give teens a static demo of how vehicles can be in the blind spots of tractor trailers. The survival school's aim is to reduce deadly car crashes involving teenagers by providing them a controlled setting where they can gain invaluable experience in car control, all with a knowledgeable coach always at their side helping them to understand how important

experience is over guessing when the unexpected happens on the road. Volunteers gladly give of their time and talents to help our most valuable resource, young people, gain experience that will allow them to make educated decisions when driving, rather than guessing what to do and whether they, their passenger or others sharing the road with them, will live or die.

**NAU** presented work funded through this consortium at the following venues:

1. ITE/IMSAs Annual Meeting, April 3<sup>rd</sup>-4<sup>th</sup>, 2024, Phoenix, AZ
2. ITS America, April 24<sup>th</sup>, 2024
3. ITE International Meeting, July 20<sup>th</sup>-24<sup>th</sup>, 2024
4. Arizona Roads and Streets Conference, September 25<sup>th</sup>-27<sup>th</sup>, 2024; Oro Valley, AZ
5. Bridge Engineering Institute (BEI), July 22-25, Las Vegas, NV

**NAU** submitted manuscripts to the following journals / venues:

1. Transportation Research Record
2. 2025 TRB Annual Meeting
3. BEI 2024 Conference Proceedings
4. International Journal of Sustainable Transportation
5. Transportation Research Part A: Policy and Practice
6. Journal of Transport and Land Use (revised manuscript)
7. 2024 International Road Safety and Simulation Conference
8. ITE Journal

### Dissemination highlights

Completed final reports and research briefs are available on the PSR research website at <https://www.mettrans.org/mettrans-research>.

Boarnet (**USC**) provided briefings on METRANS research at the following meetings and events:

1. On May 29, he attended the Caltrans Executive Board meeting and briefed Caltrans leadership on METRANS and PSR activities. The Caltrans executive board includes Director Tony Tavares, directors of the twelve Caltrans district offices, and top executives from Caltrans divisions.
2. On August 27, he briefed the board of the Los Angeles Business Council (LABC) on Advanced Clean Fleets (ACF) research (the ACF requires California's drayage truck fleet to be zero emission by 2035). The LABC is one of the premier business associations in Los Angeles, with a board of leaders from industry and government. Please click [here](#) for the full report.

3. On September 6, he was on a panel presenting the final report of ACF research at the Los Angeles Business Council (LABC) - USC Sustainability Summit. Please click [here](#) for photos and more information about the summit. Please click [here](#) for a USC Price news article.
4. On September 11 Caltrans Division of Research, Innovation, and System Information (DRISI) leadership, METRANS staff, and PSR research faculty convened at the USC campus for a collaborative half-day meeting. Agenda items included a briefing of the PSR research portfolio, prospective collaborations for events such as the 2025 International Urban Freight Conference (hosted by METRANS and PSR) and the Caltrans Innovation Expo, and reviewing ways to streamline administrative processes between PSR and Caltrans. PSR research faculty including Dr. Maged Dessouky (USC), Luciano Nocera (USC), Andreas Molisch (USC), Jacob Wasserman (UCLA), and Susie Pike (UCD) presented their research to Caltrans attendees on topics ranging from travel behavior to transit to highway siting to freight volume modeling. Caltrans attendees included: Dara Wheeler, Division Chief; Leslie Campaz, Staff Services Manager II; April Nistos, Deputy Division Chief- Research; Tyler Monson, Senior Planner- Planning and Policy Research; Benjamin Bressette, Chief- Office of Planning, Policy, and Program Development.
5. On October 10, he briefed Assembly and Senate staff (CA). Some attendees were staff to: Dave Cortese, Chair of the Senate Transportation; Laurie Davies, Vice Chair of the Assembly Transportation Committee; Roger Niello, Vice Chair of the Senate Transportation Committee



*Caltrans research staff visiting USC, September, 2024*

**USC METRANS** hosted four PSR funded METRANS Research Seminars during the reporting period. Recordings of the seminars are available via the links provided.

1. [Lecture with Toks Omishakin, Secretary of Transportation for the State of California](#), Toks Omishakin, California State Transportation Agency (CALSTA), Secretary of Transportation (photo to the right).
2. [Evaluating Alternative Strategies for Traffic Reduction in Los Angeles](#), Antonio Bento, Professor of Pubic Policy and Economics, University of Southern California (USC) (NCST- funded)
3. [A Conversation with Robert Hampshire](#), USDOT Office of Research and Technology (OST-R), Deputy Assistant Secretary for Research and Technology, Chief Science Officer



4. Minding the Gap: Estimating Present and Future Heat Exposure on the London Tube, Rachel Franklin, Newcastle University, Professor of Geographical Analysis

UCI continued its PSR-supported seminar series highlighting PSR work and PSR-related work from external researchers. Seminars this reporting period included:

1. May 23, 2024 - Geographic Intelligence for Bridging Transportation Planning and Environmental Needs (Affonso Nobrega)
2. May 25, 2024 – Los Angeles Student Travel Behavior (David Brownstone)

During the reporting period, two UCD Friday Seminars were supported by PSR. Recordings of the seminars are available via the below links:



1. “Promises and “limitations” of big and small data for human mobility analysis”, with Cynthia Chen, Professor, Department of Civil & Environmental Engineering, University of Washington (Seattle). <https://its.ucdavis.edu/seminar/april-5-2024/>
2. “Resilience Hubs: Human-Centered Analysis of Transportation Considerations”, with Stephen Wong, Assistant Professor, Department of Civil and Environmental Engineering, University of Alberta, and leader of the Resilient and Sustainable Mobility and Evacuation (RESUME) Group. <https://its.ucdavis.edu/seminar/april-19-2024/>

UH hosted the following webinars:

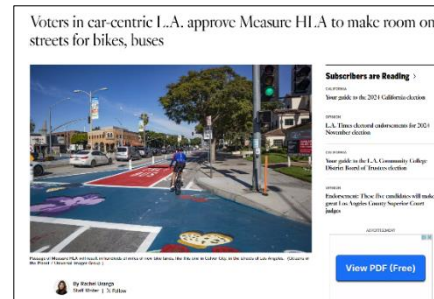
1. April 18, 2024, Geography, Vulnerability, Crises, and Adaptation in Hawai'i, 85 participants
2. May 16, 2024, Integrating Indigenous Knowledge, Socioeconomics, and Nature-based Solutions to Build a Resilient Community - Lahaina as an Example, 90 participants
3. June 20, 2024, Case Study on Damage Assessment Using Remote Sensing Tech for Hurricane Ida, 35 participants
4. July 18, 2024, Assessing Household Emergency Preparedness in Hawai'i, 37 participants
5. August 15, 2024, Equity and Cultural Competency, 53 participants
6. September 19, 2024, The Influence of Plans and Capacity on Coastal Adaptation: Challenges and Opportunities across US Islands, 86 participants

UCB supported Self-eSTEM workforce development event, 10th Annual STEM Exploration Camp, July 15-20, 2024: <https://www.youtube.com/watch?v=pmOoUd8Qpao>

### Media coverage

PSR researchers are regular contributors to various national media outlets. Below are some examples of these media features:

- METTRANS Director Marlon Boarnet quoted in an **L.A. Times article** about the approval of Measure HLA, which will expedite construction of the transit, sidewalk, and bicycle lane elements of Los Angeles’s 2015 mobility plan.
- Dr. Genevieve Giuliano (USC) quoted in an **L.A. Times article** about LAX's People Mover rail link.
- Dr. Gwen Shaffer’s (CSULB) smart city research was highlighted in an **L.A. Times article** about technologies and data privacy.
- Dr. Petros Ioannou's (USC) work on truck parking demand was featured in a **Gwinnet Daily Post article**.
- Dr. Marlon Boarnet was quoted in a **Smart Cities Dive article** about Los Angeles Mayor Karen Bass's vision of a car-free LA for the 2028 Olympic games.
- Dr. Marlon Boarnet was quoted in a **Los Angeles Daily News article** about California’s advanced clean fleets regulations and the uphill battle faced by the SoCal ports in achieving this goal.



ii. Plans for next reporting period

The next reporting period is October 1, 2024 through March 31, 2025.

USC plans for the next period includes:

1. Launch the Transportation Pathways Program with an estimated program launch date in January of 2025, additional details in the following section.
2. Host the 10<sup>th</sup> International Urban Freight Conference, April 9-11. As of the date of this report, almost 100 abstracts have been submitted from across the U.S. and several countries. See the conference web page, [here](#).
3. We plan on releasing year 3 request for proposals
4. Continue with seminar series
5. Hire a Program Coordinator

UCB’s plans for the next reporting period includes:

1. Continue to plan for the PSR Annual Congress for March 2025, which will be held on UCB campus. Established in 2016, the Pacific Southwest Region UTC conducts a multidisciplinary program of research, education, workforce development, and technology transfer aimed at improving the resiliency of transportation systems and the mobility of people and goods throughout the region.
2. Administer the 2024-25 Call for Student Research
3. Host seminar series in Fall 2024 and Spring 2025

UCD expects to do the following in the next reporting period:

1. PSR funds will be used to support ITS-Davis Friday Seminars during the next reporting period.

2. ITS-Davis will support undergraduate students' participation in the 2024 California Transportation Foundation Transportation Education Symposium in Fresno, California, in November.
3. ITS-Davis will also continue to provide travel support to members of the UC Davis ITE Student Chapter.
4. ITS-Davis will continue to provide support to the Women's Transportation Seminar (WTS) UC Davis Student Chapter, the fourteenth WTS student chapter founded nationwide, to help women network and advance their professional careers.

**UCI** anticipates hosting the following activities:

1. In November 2024, UCI will host a Colloquium on freight operations in California.
2. New PSR Caltrans match projects for Borowski, Dean, and Bunch (see above) will begin (specific dates depend on Caltrans contract execution).
3. 2024 GSR fellowship recipients will begin their scholarly work.
4. Seminar series supported by PSR will continue, with the first event scheduled for 10/18/2024, with a presentation by Elizabeth Chrastil, a Neurobiology & Behavior Fellow with UCI's Center for the Neurobiology of Learning & Memory discussing "Human Spatial Navigation: Cognitive Graphs, Route Choice, and Individual Differences".

**UCLA** plans to:

1. Select and support newly funded Faculty Research Projects funded under the PSR-wide RFP program in 2025.
2. Host the 2024 UCLA Lake Arrowhead Symposium which will return to Lake Arrowhead, CA on October 13-15, 2024. The theme of this edition will be "Mega Events, Major Opportunities".
3. Publish Issue 12 of Transfers Magazine in early 2025.

During the next reporting period (**CSULB**) plans to:

1. Convene a hiring committee for a Grants Coordinator.
2. Design a Learning and Development (L&D) "Hydrogen Hub Blueprint" that will be implemented in partnership with career and workforce development leadership at CSU5 (CSU Long Beach, CSU Dominguez Hills, CSU Los Angeles, CSU Northridge, and California State Polytechnic University, Pomona) campuses and leading trade and transportation employers to ensure that L&D and workforce development priorities reinforce related research and development (R&D) and public policy education goals in support of the \$1.2 Billion U.S. Department of Energy-funded ARCHES Hydrogen Hub project.
3. Deliver the final report by October 9 on the Community-Based Mobility Lab

**UH** plans to select internal grants and report on published articles.

**PPC** will continue to explore a Logistics Fast Track program. This would be a short term, noncredit program built with industry input in order to create short pathways resulting in credentials and student entry into the workforce. Outreach events will continue as well as a rewrite of a Logistics course.

**NAU** plan to use funds to continue funding a graduate research fellow, undergraduate research interns, and student and faculty travel for dissemination, outreach, and workforce development. Regarding

travel, they expect to provide support for travel to ITS Arizona, Road Safety and Simulation, the TRB Annual Meeting, and the PSR Annual Congress.

The **UNLV** team will continue to work on the two ongoing projects: An Examination of Transportation for Service Employees from Socio-economically Disadvantaged Populations in Las Vegas, and the development of algorithms and computational tools to model policy and operational approaches related to roadway traffic operations. For the first project, Erdem will continue collaborating with the Culinary Workers Union Local 226 to translate/distribute the assessment instrument and collect the data. The team will also revisit their efforts to collect data directly from the hotel operators on the Strip corridor.

## B. Educational Accomplishments

### Student Programs

#### i. Workforce development

PSR offers many ongoing workforce development programs that have been written about in-depth in past SAPRs. These programs include: **Commercial Driver License (CDL) Training** (PCC), an innovative Truck Driver Training Program that reaches out to a rural/tribal audience to provide the training and certifications necessary to start a career; **Southern California Workforce Development Needs Assessment for Supply Chain and Transportation Industries** (CSULB), identifies existing and future workforce skills gaps for middle-skill occupations in southern California's supply chain and transportation chain industries; **Academy of Global Logistics (AGL)** (CSULB), this collaborative partnership combines academic curriculum with industry-led training to support academic and career development for high school students; **AZTrans** (NAU), supports STEM outreach activities that provide exposure to transportation to K-12 students and members of the public. Those are continuing with the BIL PSR UTC.

In collaboration with the College of Professional and Continuing Education (CPaCE), **CSULB** hosted the 2024 Port of Long Beach Academy Teacher Externship. The objective of the Externship is to provide high school educators with both foundational knowledge as well as knowledge on current trends in logistics that can be applied in the classroom. The team also identified additional resources educators may use in the classroom that reflect their individual needs as a teacher of a specific discipline. The Externship took place over three days: August 20 and 21 and Sep. 18, 2024.

**CSULB** assists tribal communities in California with workforce development and partnerships in highway construction. CITT's work has resulted in training courses and resources that include the Highway Construction Apprenticeship Development Guide for the FHWA Roads to Your Future Playbook.

#### ii. Education and Workforce Development goals for next reporting period

During the next reporting period, PSR partners will continue to administer degree and non-degree training programs to a broad array of students. We will continue the PSR seminar series at USC, UCD, UCI, and UCLA. Seminars will continue to be offered in a hybrid format.

USC METRANS is working on developing the Transportation Pathways program and will launch the program during the next reporting period. This new program will provide students, counselors, educators, and community leaders with information and resources on education pathways available at PSR institutions in order to draw diverse students into transportation careers. The program's primary component will be the Transportation Pathways website which will include information and resources on transportation-related degree and non-degree programs available across the PSR consortium. Additional resources such as financial aid and admissions information from each institution will also be provided for students.



*Mock up of the Transportation Pathways Web Site Home Page, to launch in the next reporting period.*

In the next reporting period, **CSULB** will work on the following objectives for the Port of Long Beach's (POLB) Academy of Global Logistics (AGL):

- Develop students' foundational knowledge of logistics and understanding of the value of global trade and transportation in our community
- Prepare students for entry level career opportunities for in-demand, high opportunity career paths in international trade and transportation
- Document students' knowledge and understanding of industry concepts acquired in this pathway and build on that knowledge each year as they progress towards graduation
- Provide students with information to pursue a wide range of training and higher education opportunities including certificates, certifications, and degrees offered at a community college or four-year university upon graduation from high school
- Engage teachers in activities and with industry partners to develop knowledge needed to create relevant course curriculum that is based on real world content, provides contextualized learning experiences for students, and contributes to the ongoing development of rich and dynamic integrated, grade-level projects for an international trade and logistics career pathway
- Build a community of educators and industry partners vested in student success

### C. Outreach Accomplishments

PSR conducts many outreach efforts that have been described in past SAPRs. Ongoing outreach activities include: **CSULB CITT Center Updates**, bimonthly e-blasts to industry/academia consisting of brief articles covering relevant Center activities with a focus on the freight sector and workforce development; **Logistics Peer Exchange** (CSULB), a peer exchange on best practices in regional freight planning and coordination; **Mobility Matters** (CSULB), a CITT podcast series dedicated to addressing mission-critical issues facing the professionals who design, develop, operate, and maintain mobility systems.

**METRANS News:** During this past reporting period, USC METRANS and CSULB continued the newsletter issues with newsletters in April, May, June, August, and September 2024. Each monthly newsletter

includes an example of transformative research, summarizing a recently completed PSR research project. METRANS News also summarizes education and outreach and includes coverage of NCST and other METRANS projects and activities. It is distributed to 2201 scholars, students, staff at Caltrans, USDOT, UTCs and faculty throughout the U.S., to federal, state, and local public and private agencies, and to industry. The average opening rate was 38.48%, compared to 38.23% during the previous reporting period. This is generally consistent with Constant Contact’s overall average of 35%. The range for a good open rate is 15-25%, and the newsletter’s open rate slightly exceeds this range. The monthly newsletters are archived [here](#).

To promote the International Urban Freight Conference (INUF), **USC** and **CSULB** staff have sent various eblasts to all program committee members, track chairs, METRANS principle investigators, and the CITT Policy and Steering Committee. The INUF conference is the premier conference dedicated to all aspects of urban freight transportation, and a signature PSR activity. See [here](#). Copies of the flyer have also been distributed via the METRANS network and CITT LinkedIn page. The program chairs have promoted the event extensively through their own personal networks and have sent flyers and call for abstracts to contacts at state and federal DOTs. USC and CSULB continues to promote the event though weekly eblasts and other reminder emails. The organizing committee has also managed to arrange for a special issue of *Transportation Research Interdisciplinary Perspectives*, for which participants can submit full-length papers if interested. METRANS has received a steady flow of abstract submissions through these various dissemination efforts and continues to source abstracts until November 11<sup>th</sup>, and may choose to extend the abstract submission deadline until Spring 2025. Currently we have received close to 100 abstracts.



**Transfers Magazine:** During this period, Transfers Magazine recruited and began editing articles for the 12th issue magazine, currently slated to release in early 2025. The articles under consideration come from authors representing UCLA, UC Berkeley, NAU, and UC Irvine. The Transfers team recruited new student editors to reengage on our social media channel and Circulator blog content to maintain the promotion of PSR

campuses and research throughout the year. The goal of the magazine is to translate the research of faculty, staff, and students at the PSR campuses into highly accessible content for an audience of elected officials, transportation planners, members of the media, and the general public.

**FED Talks**

Since October 2020, UCLA has assembled professors and graduate students to discuss and present new research and best practices around public transit, transportation finance, innovative mobility, infrastructure, housing, and much more in a Forum for Education/Engagement and Discussion (FED). Since April 2024 we hosted a FED Talk titled “Several Studies in School Transportation & a Dissertation



Proposal” led by PhD student Sam Speroni. Speroni discussed several different studies that he has conducted that relate to the transportation of children to/from school.

#### UCLA Arrowhead Symposium

UCLA continued planning for the annual UCLA Lake Arrowhead Symposium on the Transportation - Environment - Land Use Connection which will be held October 13-15, 2024. The theme was titled “Mega Events, Major Opportunities” which include in-depth discussions on how planning for large-scale events such as the 2026 World Cup and 2028 Olympics, can help host cities including Los Angeles, to maximize their planning efforts to create lasting benefits for host cities and the people that live in them. The conference was attended by 174 guests. More information can be found on the symposium website at [www.uclaarrowheadsymposium.org](http://www.uclaarrowheadsymposium.org)



#### LEAP to Graduate Success Program

In the spring 2024, UCLA ITS was awarded a 3-year, UC-HBCU grant to launch the **Leveraging Transportation Equity Research as a Pathway (LEAP)** to Graduate Success Program led by Professor Tierra Bills, photo on the left. With the overarching goal of inspiring Black and other underrepresented students to pursue graduate education and research, and transportation industry and practice, *LEAP to*

*Graduate Success* is an 8-week summer program for HBCU undergraduate students, that centers on transportation equity research. The program design is motivated by understandings from academic literature and public practice on the significance of mentorship, group learning, empirical investigation, and connecting work with one’s lived experiences on recruiting and retaining Black students in science, technology, engineering, and mathematics (STEM)-related fields.

#### i. Outreach plans for the next reporting period

The PSR Advisory Council advises specifically on PSR, met in March 2024 at the PSR Annual Congress, and will reconvene in November to link our stakeholders to research projects selected for funding. Members of the PSR Advisory Council include representatives from state DOTs, MPOs, local governments, tribal organizations, transportation service providers, non-profit organizations, and the goods movement industry. See a list of advisory council members [here](#). The METTRANS Advisory Board, which advises METTRANS on all its activities extending beyond PSR, will convene next in November also. The **Transfers Magazine** will be released this summer, <https://transfersmagazine.org/>.

**CSULB** has begun planning the Town Hall, which will be held in Spring 2025. CITT plans to hold the event at the Cabrillo High School auditorium. Holding the Town Hall there signals the CITT commitment to education and community engagement. CITT and partners will develop a documentary. The documentary—working title “Bring the Docks to the University and the University to the Docks”—will draw inspiration from founding members of CITT and document education and workforce development success stories. The documentary will conclude with a candid assessment of current challenges in trade

and transportation and explore ways that community-based education can democratize education, public policy, and land-use planning.

## 2. Participants & Collaborating Organizations

Participants contribute to the work of the PSR through financial or other support, or directly in research, education, or technology transfer. Collaborating organizations participate in Center activities, provide advisement, or support the center.

### 1. Financial support

Over the course of the grant, these are among the entities who provided match funding for PSR research projects:

- California Department of Transportation (Caltrans)
- Los Angeles Business Council (LABC)
- California Air Resources Board
- Peterson Foundation

### 2. Other support

The following organizations provide or have provided in the past (e.g. Fast Act UTC or BIL UTC) indirect or in-kind support to PSR:

- **California:** AECOM (Los Angeles); Alliance for Community Transit; Amtrak Capitol Corridor; California Energy Commission (CEC); California Transit Association; Caltrans Office of Earthquake Engineering, Analysis and Research; City of Anaheim; City of Anaheim; City of Davis; City of Santa Clara; Cool Davis; Council of Supply Chain Management Professionals (CSMCP); Fehr & Peers; Foothill Transit; Gateway City Council of Governments; Governor’s Office of Business and Economic Development (GO-Biz); HDR; International Longshoremens and Warehousemen’s Union (ILWU) Local 13; Investing in Place (Los Angeles); Kiwi Inc.; Long Beach Transit; Long Beach Unified School District; Los Angeles Department of City Planning; Majestic Realty; MetroLink; Nixon Peabody; Orange County Transportation Authority (OCTA); Port of Los Angeles; San Francisco Metropolitan Transportation Commission; San Francisco Municipal Transportation Agency; Santa Clara County Assessor’s Office; Southern California Association of Governments (SCAG); Southern California Edison; Toole Design Group; Tree People/Climate Resolve (Los Angeles); UC Davis Feminist Research Institute; UC Davis Policy Institute for Energy, Environment, and the Economy; UC Davis Road Ecology Center; UC Institute of Transportation Studies (UC-ITS); Watson Land Company; Yusen Terminals LLC
- **Arizona:** Arizona Board of Regents, Chamberlin Group, Pima Association of Governments, Northern Arizona University, Southern Arizona Anti-Trafficking United Response Network (SAATURN)
- **Hawaii:** National Disaster Preparedness Training Center (NDPTC), University of Hawaii
- **Others:** Federal Highway Administration; King County Metro (Seattle, WA); staff from state DOTs in California, Colorado, Maine, Minnesota, Nevada, and Virginia.

### Additional Support

PSR has a tremendous network of partners. Thomas O'Brien (CSULB) completed his tenure as president of **Council of University Transportation Centers (CUTC)** and Genevieve Giuliano (USC) is a past president and past executive committee member, and Susan Handy (UCD) and Marlon Boarnet (USC) are members of the CUTC board; USC is the lead for the **U.S. Department of Transportation's University Partnership Program for the US-ASEAN Smart Cities Program**, partnering with the University of Indonesia, University of Technology Malaysia, Institute of Technology Cambodia, and Chulalongkorn University (Thailand); **Institute of Transportation Studies (ITS)** (UCD, UCI, UCLA), provides match funding and other resources; **MetroFreight Center of Excellence** (USC, CSULB), METRANS is the home of the Volvo Research and Education Foundation (VREF) Center of Excellence on urban freight and offers many opportunities for international collaboration and partnerships; **National Center for Sustainable Transportation (NCST UTC)** (UCD, USC), strengthens and expands our work in sustainable freight transport; **Southwest Transportation Workforce Center** (CSULB), provides significant infrastructure and professional capacity in support of workforce development programs for PSR; **The Center for International Trade and Transportation** (CSULB), uses its media and social media channels to announce events and other opportunities to a network of students and industry and government partners; **TuSimple** (PCC), offers program support and priority hiring to graduates; **UCLA Lewis Center for Regional Policy Studies**, provides workspace and matching funds researchers and staff at UCLA ITS; **Velodyne Lidar** (UCI), provided a donation of two LiDAR units that are supporting current graduate student fellowship and faculty research projects. The following **METRANS Associates** provide additional financial support: LA Metro, Majestic Realty, Port of Long Beach, Southern California Association of Governments, WSP USA, Western States Petroleum Association, Los Angeles World Airports, San Diego Council of Governments.

### 3. Collaborations

PSR has an extensive network of collaborations with academic, public and private organizations. Many of these have been described in past SAPRs. Ongoing collaborations include: **Arizona Technology Park** (PCC), seeks to bring economic developers and academic researchers together to attract autonomous vehicle manufactures to southern Arizona; **Florida Atlantic University** (UH), engages in collaborative research on the use of visualizations to improve the understanding of sea level rise Impacts to transportation in FL and HI; **Maricopa Association of Governments** (NAU), continues to work on pilot evaluation projects with the **University of Arizona**; **Oregon State University** (NAU), partners on two research projects funded by the **Oregon Department of Transportation**; **University of Antwerp** (CSULB), developing an executive workshop that address pharmacological supply chains including the rollout of vaccines in the City of Long Beach.

USC partners with:

1. The Los Angeles Business Council (funding) and several industry partners (knowledge supporting, partners include the Harbor Trucking Association and trucking firms) on research into California's Advanced Clean Fleets zero-emission truck regulation.
2. The World Bank Global Transportation Group
3. The California Air Resources Board
4. The Southeast Los Angeles Collaborative
5. METRANS Associates Program and wider knowledge and technology transfer interactions, a range of entities including: The Gateway Cities Council of Governments, the City of Los Angeles,

L.A. Metro, the Southern California Association of Governments, the San Diego Association of Governments, the Ports of Long Beach, Los Angeles, Hueneme, and San Diego, Los Angeles World Airports, and several other public, private, and non-profit entities.

**UCI** partnered with Brownstone’s Caltrans match funded project, titled “Modeling the impacts of California electric vehicle policies with emphasis on the used vehicle market”.

**UNLV** is partnered with the following organizations:

1. National Science Foundation in Washington D.C.
2. Regional Transportation Commission of Southern Nevada in Las Vegas, Nevada
3. Culinary Workers Union Local 226 in Las Vegas, Nevada
4. William Werner, Associate Dean of Faculty, College of Hospitality, UNLV, Las Vegas NV – expert in hotel industry labor relations.

**CSULB** is partnered with the following organizations:

1. California State Transportation Agency (CalSTA)
2. International Association of Maritime Economists (IAME)
3. California Air Resources Board (CARB)
4. Governor’s Office for Business (GO-Biz)
5. Tribal Strategic Workforce Development Initiative (WDI)

**NAU** is partnered with the following organizations:

1. MAG (Maricopa Association of Governments): They have an ongoing partnership with MAG that is ongoing, and they expect to wrap up an emerging technology grant this coming spring.
2. Phoenix: They wrapped up a task order to provide guidance to the city on implementation of LPIs (Leading Pedestrian Intervals) and other signalized intersection pedestrian treatments across the city.
3. They will continue to work on a task order to assist the City with configuration and evaluation of an Advanced Traffic Management System.
4. Arizona Transportation Institute (AzTI), which connects experts from NAU, the University of Arizona, and Arizona State University to solve problems identified by ADOT.

At **UH**, they are collaborating with:

1. Lisa Staes, Director, Center for Urban Transportation Research
2. Hilary Nixon, Deputy Executive Director, Mineta Transportation Institute, San Jose Institute –
3. MD Islam, Director, Southern Colorado Institute of Transportation Technology (SCITT)
4. Arman Sargolzaei, Director of the Resilient Autonomous Networked Control Systems Research Lab, Assistant Professor, Mechanical Engineering, University of South Florida.

At **UCLA**, they are collaborating with some organizations below:

1. Siskiyou County Local Transportation Commission at Los Angeles on the project, “Siskiyou County LTC: Transit Revitalization Recommendations (Mia Lewis)”

2. Office of Council member Bob Blumenfiled on the project, “Los Angeles' ADU Ordinance & Its Impact on Neighborhoods in the Greater Western San Fernando Valley (Miles Cressy)”
3. Southern California Association of Governments on the project, “Transitioning Transportation Pilot Projects into Long-term Programs (Josephine Dine)”
4. Los Angeles Department of Transportation (LADOT) on the project, “Enhancing Mobility and Access for Carless/Car-Deficient Household in Los Angeles (Alyssa Suzukawa)”
5. California Air Resources Board on the project, “Tolling for Tomorrow: Road Pricing as a Climate Strategy in California (Alexandria Florin)”

**UCB** is collaborating with Self-eSTEM in Oakland, California to host a workforce development summer camp.

**UCD** is currently collaborating with:

1. California Department of Transportation
2. California Air Resources Board
3. Miocar

#### 4. Outputs

PSR outputs include publications, reports, papers, presentations, media, and others. Our target for peer-reviewed publications is 5 per year; our target for presentations is 10. During this reporting period, we have produced **41 peer-reviewed** journal publications and **62 presentations**.

##### A. Websites

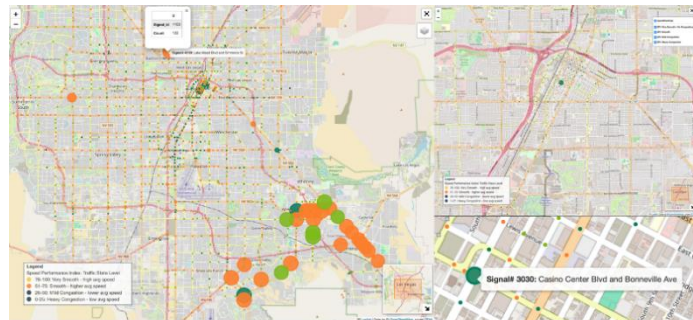
The [PSR website](#) is the central, authoritative source of information regarding our center. Our consortium members also maintain additional sites that contain information relevant to PSR's research and activities. Some of these sites are:

- CITT (CSULB): <https://www.cpie.csulb.edu/center-for-international-trade-and-transportation>
- CITT Articles: <https://ww2.cpie.csulb.edu/news/citt-news/citt-in-the-news>
- eScholarship (UCD, UCI, UCLA): <https://escholarship.org/>
- ITS-Davis: <https://its.ucdavis.edu/>
- METRANS: <https://www.metrans.org/>
- NAU PSR UTC: <https://in.nau.edu/aztrans/psr-region-9/>
- NAU's Cyclist Routing Algorithm for Network Connectivity (<https://rc.nau.edu/cranc>)
- PCC's Center for Transportation Training has a facebook, instagram and twitter page: [@pcctruckdriver for all](#)
- Transfers Magazine (PSR flagship publication): <http://www.transfersmagazine.org/>
- UC Berkeley Digital Repository of ITS Berkeley research reports: <https://escholarship.org/uc/its>
- UC Berkeley news: <https://its.berkeley.edu/>
- UC Davis Feminist Research Institute: <https://fri.ucdavis.edu/>
- UC Davis Policy Institute for Energy, Environment, and the Economy: <https://policyinstitute.ucdavis.edu/>

- UC Davis eScholarship: <https://escholarship.org/uc/itsdavis>
- UCI ISERT conference: [www.its.uci.edu/isert2020](http://www.its.uci.edu/isert2020)
- UCI seminar series: [www.its.uci.edu/seminars](http://www.its.uci.edu/seminars)
- UCLA ITS YouTube channel: <https://www.youtube.com/c/UCLAInstituteofTransportationStudies/>
- UCLA ITS: <http://www.its.ucla.edu>
- UCLA Lake Arrowhead Symposium: <http://www.uclaarrowheadsymposium.org>
- UCLA Transfers Magazine: <http://www.transfersmagazine.org>
- Open access to UCLA Institute of Transportation Studies reports, capstone projects, and policy briefs: [https://escholarship.org/uc/ucla\\_its](https://escholarship.org/uc/ucla_its)
- UH website (includes posts on PSR research): <https://ndptc.hawaii.edu>
- UH Twitter: <https://twitter.com/disasterctr>
- UH Facebook: <https://www.facebook.com/disasterctr>
- UH LinkedIn: <https://www.linkedin.com/company/18472899/admin/feed/posts/>
- UNLV website: <https://smartcities.sites.unlv.edu/>

### B. New methodologies, technologies, or techniques

At **UNLV**, the Traffic Signal Congestion Visualization Tool (TSCV), has been created and is being refined in the Fall of 2024 (screenshot on the right). We focused on gathering and pre-processing the latest 2024 primary data sources (RTC FAST Signal Performance Metrics) and secondary sources like incident alerts (RTC FAST Freeway Traffic Alert). The pre-processing of data sources was done using a Python programming script.



The script ensures the data is in the proper format and has all the expected columns/features. We prepared a geospatial map prototype using a Python library called Folium which provides an interactive leaflet map (an open-source JavaScript library for mobile-friendly interactive maps). Folium has built-in tiles laid out in a grid from OpenStreetMap and Mapbox. The prototype map in HTML format provides an interactive way to visualize the datasets overlaid on a geospatial map.

### C. Other products

Nothing to report.

## 5. Outcomes

PSR's goal is to effectively and efficiently move research to practice so that new knowledge can be shared, acted upon, and contribute to a more efficient, sustainable, and equitable transportation system. We achieve our goal through technology transfer activities: events, communications, training, and client-based research. We define outcomes as any changes made to the transportation system, or its regulatory, legislative, or policy framework, resulting from research and development outputs.

**UCB** hosted a workforce development Self-eSTEM event for 55 7-17 year old young women from under-represented minorities in STEM. The six-day STEM Exploration Camp was themed Futuristic City Planning and Transportation Solutions for Tomorrow’s World. The event included a project-based activity planning a futuristic city block and creating an autonomous vehicle. Participants embarked on a groundbreaking journey, addressing the challenges of our “new normal” during the 2020 Pandemic Crisis.

The 2024 summer TRIP program at **UCI** exposed 11 new undergraduates to transportation topics and research. Prior history with this program has shown these projects often lead to TRB presentations as well and conversion of undergraduate students to transportation graduate students and professionals.

As a part of the Community-Based Mobility Lab project, **CSULB** CITT and project partners collected 30 hours of footage from the chosen intersection of study at Pacific Coast Highway and Santa Fe Avenue in West Long Beach. researchers utilized DataFromSky, an Intelligent Transportation Systems company, to convert raw data into a format which an Artificial Neural Network would then use to train the model simulator.

The major outcome of the summer 2024 **UNLV** Research Experiences for Undergraduates (REU) program was increased awareness and understanding of transportation issues for the undergraduate participants. The students were trained in research and have additional motivation for graduate school.

In Jaller’s (**UCD**) PSR project, “Dynamic Monitoring of Supply Chain Resilience” he and his team developed a novel methodology for real-time text analysis of news data to forecast supply chain disruptions, a comprehensive tool for forecasting the effects of global disruptions on logistics. Subsequently, Jaller was recently awarded a new project from the California Department of Transportation to implement that methodology to identify the effects of disruptions on critical freight corridors and freight facilities, and to design resilient routes.

**UCLA’s** fellowship program will support 30 graduate professionals in the transportation field with hands-on experience in transportation research which bridges the gap between academic learning and practice. They also hosted the fall 2024 UCLA Lake Arrowhead Symposium, which included over 175 attendees, including scholars, practitioners, and public sector leaders.

**PCC** had a few of the commercial driver license (CDL) graduates. Photos are below.



*Pictured above: Curtis F., Doreen M. and Jess C. (left to right).*

## Student Awards



Monisha Reginald, UCLA MURP '24, received the UCLA *ITS Grand Prize* for her Capstone Project, "Progress, Priorities, and Obstacles to Providing Adequate Shade and Lighting at Bus Stops". As Los Angeles plans to build more shelters, Reginald aims to highlight the barriers to improving bus shelters. Her overall findings lead to the conclusion that bus stops in Los Angeles require more adequate street lights near the bus shelters. A link to her report and policy brief can be found [HERE](#).

Carolyn Pugh, UCLA MURP '24t, received the UCLA ITS *Excellence in a Transportation Equity & Justice Capstone Prize*, for her Capstone Project, "Rochester's Inner Loop Freeway-to-Boulevard Project". Through this project, Pugh takes a look at the freeway removal and redesign projects that have a negative impact on Black and Brown communities. Pugh completed a comprehensive case study analysis of one such freeway removal project in Rochester, New York. A link to her report and policy brief can be found [HERE](#).



### **Scholarly Awards:**

Nothing to report.

## **6. Impacts**

PSR defines an impact as that which influences the transportation system, or society in general, such as reduced fatalities, decreased capital or operating costs, community impacts, or environmental benefits. The journey of generating outputs and impacts is uncertain and happens over time. PSR's research products are made [available to the public](#).

During this reporting period, **USC** researchers had influenced the transportation system and society:

1. Boarnet presented at the Future of Transportation UTC Summit at US DOT, August, 2024.
2. Boarnet briefed Caltrans leadership, staff to the California Assembly and Senate Transportation Committees, the board of the Los Angeles Business Council (LABC), and attendees at the LABC-USC Sustainability Summit on results of research and resulting policy recommendations related to California's zero emission heavy-duty trucking regulations.
3. Shahabi used methods to sense trucks in video and algorithms to integrate truck observations for flow estimation. He also educated Caltrans personnel regarding the capabilities of existing sensors for truck sensing.
4. Molish used New Machine Learning tools to channel prediction. Methodology of deep meta learning can be generalized to other scientific areas.

Additionally, USC METRANS was a bronze patron for the 7<sup>th</sup> International Conference on Women and Gender in Transportation convened by the Transportation Research Board. The conference theme



was *Progress and Possibilities: Bridging Perspectives* and the event highlighted how far recognition of gendered issues in transport have come, while also noting the important work ahead to bridge inequities.



The technology transfer component of **UNLV's** grant activities includes five presentations at the PSR UTC 2024 Congress. The audiences at these presentations include individuals from academia, government, and industry.

**UNLV's** transportation seminar series attracted attendees / students from many academic disciplines – well beyond engineering. They have also led to students seeking / obtaining internship and research opportunities in transportation.

With the PSR financial support received from **UCD**, the UC Davis Institute of Transportation Engineers (ITE) Student Chapter was able to fund members' travel to the 2024 ITS Western District Student Leadership Summit and the 2024 Intermountain Southwest Student Symposium (ISWS). For the Student Leadership Summit, four members of the UC Davis ITE student chapter board were able to travel to Cal Poly San Luis Obispo for a 3-day conference featuring transportation professionals and leadership from other Western District student chapters. The event featured three rounds of technical presentations, several panels and workshop sessions, a career fair with resume review and mock interview opportunities, and time to network with industry professionals and fellow students. The members shared that they left the conference inspired and full of ideas on how to improve the UC Davis Chapter. For the Student Symposium, 18 members of the chapter traveled to Logan, Utah, to participate in a transportation engineering competition. Photos on the next page.



UC Davis ITE Student Chapter members at the 2024 ISWS Symposium in Logan, Utah

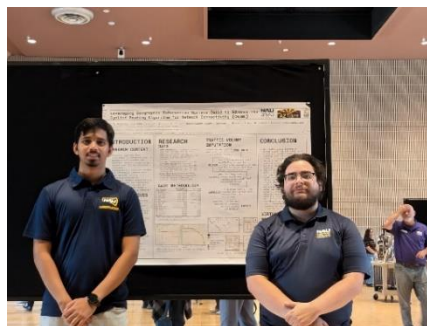
Gehrke (**NAU**) continues to update the Cyclist Routing Algorithm for Network Connectivity (CRANC) decision support tool (<https://rc.nau.edu/cranc>). At present, he is participating in the National Science Foundation's Innovation Corps (I-Corps) program for the Desert and Pacific Region Hub (Fall 2024, Cohort 7) to better understand the business environment that would use decision support tools for bicycle planning.

**AZTrans Exhibit at the 2024 Flagstaff STEM Celebration**

The Arizona Laboratory for Applied Transportation Research (AZTrans) operated an exhibit at the 2024 Flagstaff STEM Celebration entitled “Behind the Scenes: How Our Roadways are Designed & Operated” on Saturday, April 27th, 2024, at Ft. Tuthill County Park. The transportation-focused exhibit had equipment set up to show how traffic signal systems detect vehicles and efficiently move traffic through intersections. Photo on the right: NAU students Ava Elia, Anthony Eschen, and Omkar Chorge (L to R) with the AZTrans Exhibit at the 2024 Flagstaff STEM Celebration



On September 25<sup>th</sup>, 2024, AzTrans graduate students Anthony Eschen and Omkar Chorge presented a poster at the 2024 Flagstaff Festival of Science STEM Poster Session. The poster was entitled “Leveraging Geographic Information Systems (GIS) to Advance the Cyclist Routing Algorithm for Network Connectivity (CRANC)”. A Photo of the event is provided below.



*NAU graduate students Omkar Chorge (left) and Anthony Eschen (right) present at the 2024 Flagstaff Festival of Science STEM Poster Session*

**7. Changes/Problems**

**Changes in approach and reasons for change**

Nothing to report.

**Problems and delays encountered during the reporting period**

Erdem’s (UNLV) project schedule is behind schedule by about 6+ months due to unanticipated challenges related to developing and administering the survey.

For the efforts led by Morris (UNLV), due to late start recruiting students the REU had to limit the summer 2024 cohort to local Las Vegas area residents.

UCI encountered the following problems and delays:

1. Roy’s project, "Developing a data fusion framework to map active transportation usage patterns in Orange County" has been completed with a project report finished for submission but was terminated due to her no-cost extension being denied.
2. Saphores’s project, “How to enhance student outcomes while strengthening transit? An Analysis of LA Metro’s GoPass Fareless pilot program” was terminated because his no-cost extension was

denied. It is uncertain if he will submit a final report because most of the money that was taken away was to write the final report.

**Change of primary performance site location**

Nothing to report.

**8. Special Reporting Requirements**

Nothing to report.

## 9. Appendix A

This appendix includes lists (non-exhaustive) of PSR researchers' publications and presentations from the current reporting period.

### Publications

#### Peer-reviewed journal publications

1. Boarnet, M. G., Shao, Q., & Pilgram, C. A. (2024). Monetary cost, time cost, and mode choice: Transit and ridehailing in California. *Transportation Research Part D: Transport and Environment*, 130, 104149.
2. Boeing, G., Lu, Y., & Pilgram, C. (2023). Local inequities in the relative production of and exposure to vehicular air pollution in Los Angeles. *Urban Studies*, 60 (12), 2351–2368. doi:10.1177/00420980221145403
3. Boeing, G., Y. Lu, C. Pilgram, and P. Mannino. "Local Inequities in the Relative Production of and Exposure to Vehicular Air Pollution in Los Angeles."
4. Boeing, G., Y. Lu, C. Pilgram, and P. Mannino. (2023). "Local Inequities in the Relative Production of and Exposure to Vehicular Air Pollution in Los Angeles." *Transportation Research Board Annual Meeting*. Washington, DC. Jan 9–13. 2021.
5. Boeing, G., Y. Lu, C. Pilgram, and P. Mannino. (2023). "Race, Class, and the Production of and Exposure to Vehicular Pollution in Los Angeles." *Association for Public Policy Analysis & Management Fall Conference*. Austin, Texas. Mar 27–29. 2022.
6. Boeing, G., Y. Lu, C. Pilgram, and P. Mannino. (2023). "Race, Class, and the Production of and Exposure to Vehicular Pollution in Los Angeles." *Association of Collegiate Schools of Planning Annual Conference*. Miami, Florida. Oct 21–23.
7. Boeing, G., Y. Lu, C. Pilgram, and P. Mannino. (2023). "Race, Class, and the Production of and Exposure to Vehicular Pollution in Los Angeles." *US Department of Transportation, Pacific Southwest Region UTC. Technical report*. <https://rosap.ntl.bts.gov/view/dot/67432>.
8. Borello Vargas, J., Spencer, B., and Jones, T. (2024, January 2). Understanding Accessibility as Lived Experience: The Case of Walking and Cycling in Porto Alegre, Brazil. *Area Development and Policy*. <https://doi.org/10.1080/23792949.2023.2290155>.
9. Broader, J. (2024). Tapping In: Leveraging Open-Loop Fare Payments to Increase Financial Inclusion (UCB-ITS-PSR-2024-07). <https://escholarship.org/uc/item/88v9c0wm>
10. Chen, A. (2024). A Safe System Approach to Pedestrian High Injury Network Development in Oakland, California (UCB-ITS-PSR-2024-02). <https://escholarship.org/uc/item/2pn189p3>
11. Chu, L., Alghafis, A., & Molisch, A. F. (2023, October 11). Exploiting semantic localization in highly dynamic wireless networks using deep homoscedastic domain adaptation. *IEEE Trans.*
12. Chu, L., Burghal, D., Neuman, M., & F. Molisch, A. (2024, September 16). Context-Conditioned Spatio-Temporal Predictive Learning for Reliable V2V Channel Prediction Part of this work was supported by the California Transportation Department and by the National Science Foundation. *IEEE ICC Workshop – APATN*.
13. Cingolani, A. (2024, May). Laws In Tension: Affirmatively Furthering Fair Housing and Transit Access for Low-income Households (MUP planning report). San José State University, San José, CA. [https://www.sjsu.edu/urbanplanning/docs/honors-reports/2023\\_2024%20Cingolani.pdf](https://www.sjsu.edu/urbanplanning/docs/honors-reports/2023_2024%20Cingolani.pdf).
14. Douglas, G. (2024, April 16). Rethinking Placemaking in Urban Planning Through the Lens of Trauma. In C. Courage and A. McKeown (Eds.), *Trauma Informed Placemaking* (1st ed.). London: Routledge. <https://doi.org/10.4324/9781003371533-28>.

15. Dymond, B.Z., Kandgule, V. (G). 2024. "Characterizing Bridge and Culvert Deterioration in Arizona Using National Bridge Inventory Data." Proc. Bridge Engineering Institute (BEI), Jul. 22-25, Las Vegas, NV.
16. Flynn, Justin A., Venkataram, Prashanth S., and Circella, Giovanni. (2022). Review of Transportation and Neighborhood Priorities of Californians with Disabilities: Focus Group Findings. In Transportation Resources Board.
17. Flynn, Justin A., Venkataram, Prashanth S., and Circella, Giovanni. (2023). Exclusion from Activities and Transportation Modes by Disability and Income: Results from a Survey in California. In Transportation Resources Board.
18. Gupta, M. (2024). Power To Pedal: A Gendered Analysis of the Barriers and Joys of Cycling in Oakland (UCB-ITS-PSR-2024-06). <https://escholarship.org/uc/item/0jw0n66r>
19. Heuser, K. L. (2024). "Don't Keep Us Out of the Revolution!": Accessibility and Autonomous Rideshare in California (UCB-ITS-PSR-2024-03). <https://escholarship.org/uc/item/3pp8k71h>
20. Ji, J. Y., Chakraborty, D., & Jenn, A. (2024). The present and future of road Financing: Leveraging knowledge from the tolling industry to implement road-usage charge programs in the u.s. *Transportation Research Interdisciplinary Perspectives*, 27, 101240. <https://doi.org/10.1016/j.trip.2024.101240>
21. Ji, J., D. Chakraborty, & A. Jenn. (2024). The present and future of road Financing: Leveraging knowledge from the tolling industry to implement road-usage charge programs in the U.S. *Transportation Research Interdisciplinary Perspectives*, Volume 27, <https://doi.org/10.1016/j.trip.2024.101240>.
22. Kim, K., Yamashita, E., Houghton, B., Boothman-Shepard, N., Bui, L. (2024) Modeling Roadway Impacts and Recovery from Volcanic Ashfall from the 2021 St. Vincent Eruption. *Journal of Emergency Management*. 22(3), 249-260.
23. Lee, A. E. (2023, January 1). The policy and politics of highway expansions. <https://www.proquest.com/docview/2867034214>.
24. Li, W., Zhong, H., & Boarnet, M. G. (2024). Effects of new transit lines on commuting: Evidence from restricted-use Census Bureau microdata. *Applied Geography*, 164.
25. Millard-Ball, A., Silverstein, B., Kapshikar, P., Stevenson, S., and Barrington-Leigh, C. (2022, October 31). Dividing Highways: Barrier Effects and Environmental Justice in California (UC-ITS-2022-16). UCLA Institute of Transportation Studies. <https://doi.org/10.17610/T65W2B>.
26. Millard-Ball, A., Silverstein, B., Kapshikar, P., Stevenson, S., and Barrington-Leigh, C. (2024, May 7). Dividing Highways: Barrier Effects and Environmental Justice in California. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X241247330>.
27. Nguyen, A. (2023). Barriers to Mobility, Barriers to Unity: Freeway construction and racialized dispossession in San José, CA. <https://www.proquest.com/docview/2899175768>.
28. O'Malley, G., Wishart, J., Zhao, J., and B. Russo, "A Scenario-Based Test Selection and Scoring Methodology for Inclusion in a Safety Case Framework for Automated Vehicles", SAE Technical Paper, 2024.
29. Raha, F., Eschen, A., Gehrke, SR., Smaglik, E., and Russo, BJ. "Analysis of Factors Associated with the Frequency and Severity of Turning Vehicle-Bicycle Crashes at Signalized Intersections." Accepted for presentation at the 2024 International Road Safety and Simulation Conference, 2024.
30. Reeb, T., Chris Swarat, and Barbara Taylor, "Talent Pipelines for the Fourth Industrial Revolution: How California PaCE Units Can Bridge Critical KSA Gaps," UC Berkeley: Center for Studies in Higher Education, Research and Occasional Papers Series, no. Special Issue: Opportunities and

- Challenges for California Higher Education (June 7, 2024), <https://escholarship.org/uc/item/5hh3904k.R>
31. Romero, S. (2024). Universal Basic Mobility Pilots in Oakland and Los Angeles: Striking a Balance Between Accessibility and Sustainability (UCB-ITS-PSR-2024-05). <https://escholarship.org/uc/item/4b73k640>
  32. Serrano, M. (2023, September 6). Metro Gold Line Foothill Extension Access: Successes and Challenges for Residents and Transit Riders of Pomona (MPA thesis). California State Polytechnic University, Pomona, Pomona, CA. <http://hdl.handle.net/20.500.12680/h702qd91t>.
  33. Soucy, A. B. (2024). East Oakland Mobility Justice: A Case Study of the International Boulevard Bus Rapid Transit Project Safety and Displacement (UCB-ITS-PSR-2024-01). <https://escholarship.org/uc/item/4zm0z35z>
  34. Tom O'Brien, Ben Olson, and Devin Martinez Flores, "Addressing Transportation Construction Workforce Needs Through Innovative Policies and Practices" (San José State University: Mineta Transportation Institute, September 2024), <https://transweb.sjsu.edu/sites/default/files/2332-0%E2%80%99Brien-Employee-Compensation-Highway-Transportation.pdf>.
  35. Ullmann, L., and Douglas, G. (2024, February). Beneath I-280: Excavating a Neighborhood Lost to San José Freeways (Report 23-41). Mineta Transportation Institute, San José State University. <https://doi.org/10.31979/mti.2023.2304>.
  36. Venkataram, P., Flynn, J., Rahman Bhuiya, Md. M., Barajas, J., and Handy, S. (2023). Availability and usability of transportation for people with disabilities depending on what the user is expected to do. In *Transportation Research Interdisciplinary Perspectives*.
  37. Venkataram, P., Flynn, J., Rahman Bhuiya, Md. M., Barajas, J., and Handy, S. (2023). Framing availability and usability of transportation for people with disabilities. In *Transportation Research Interdisciplinary Perspectives*. [https://authors.elsevier.com/sd/article/S2590-1982\(23\)00208-7](https://authors.elsevier.com/sd/article/S2590-1982(23)00208-7)
  38. Venkataram, Prashanth S., Flynn, J. A., Bhuiya, M. M. R., Barajas, J. M., & Handy, S. (2023). Availability and usability of transportation for people with disabilities depending on what the user is expected to do. *Transportation Research Interdisciplinary Perspectives*, 23, 100960.
  39. Wang, B. S., Rodnyansky, S., Boarnet, M. G., & Comandon, A. (2024). Measuring the impact of COVID-19 policies on local commute traffic: Evidence from mobile data in Northern California. *Travel Behaviour and Society* vol. 34, 2024.
  40. Zaino, R., Ahmed, V., Alhammadi, A. M., & Alghoush, M. (2024). Electric Vehicle Adoption: A comprehensive systematic review of technological, environmental, organizational and policy impacts. *World Electric Vehicle Journal*, 15(8), 375. <https://doi.org/10.3390/wevj15080375>
  41. Zhuang, W. (2024). Transit to California's National Parks: An Assessment of Visitation and Sociodemographic Barriers (UCB-ITS-PSR-2024-04). <https://escholarship.org/uc/item/4vv0h2sp>

## Other publications

### Conference papers

42. Boakye, Kwaku and Shashi Nambisan. (2023, January). The Risk of Seatbelt Non-use among Unlicensed and Licensed Drivers. (TRBAM- 23-02087), 102nd Annual Meeting, Transportation Research Board of the National Academies, Washington, D.C.
43. Boakye, Kwaku and Shashi Nambisan. The Risk of Seatbelt Non-use among Unlicensed and Licensed Drivers. (TRBAM- 23-02087), 102nd Annual Meeting, Transportation Research Board of the National Academies, Washington, D.C., January 2023.

44. Boeing, G., Ha, J. (2023, October 19-21). "Simulating Street Network Resilience and Robustness around the World." Association of Collegiate Schools of Planning Annual Conference. Chicago, Illinois. Oct 19–21, 2023.
45. Boriboonsomsin, K. and Hao, P. (2021). Evaluating System-Level Impacts of Innovative Truck Routing Strategies. Pacific Southwest Region UTC Research Brief, 2 pp.
46. Boriboonsomsin, K., Hao, P., Liao, Y., and Luo, J. (2021). Evaluating System-Level Impacts of Innovative Truck Routing Strategies. Report No. PSR-20-20, Pacific Southwest Region University Transportation Center, August, 39 pp.
47. Boriboonsomsin, K., Liao, K., Wu, G., Zhao, X.,. (2022). Connectivity-Based Cooperative Ramp Merging in Multimodal and Mixed Traffic Environment. PS Region, MT Center METRANS Transportation Center (Calif.).
48. Goulias, K. G., & Shi, H. (2023). Commercial Fleet Vehicle Additions and Replacements and the Potential Market Penetration for Electric Vehicles. *Transportation Research Procedia*, 70, 69-76.
49. Liao, Y., Luo, J., Hao, P., Barth, M., and Boriboonsomsin, K. (2022). "Evaluating transportation system-level impacts of innovative truck routing strategy for mitigating the impacts of truck emissions on communities." Proceedings of the 101st Annual Meeting of the Transportation Research Board.
50. Loukaitou-Sideris, A. (2023, June 21). Exposing Freeway Inequalities: The Case of Pasadena. Presented at the UCLA Institute of Transportation Studies Advisory Board meeting.
51. Loukaitou-Sideris, A., Handy, S., Ong, P., Barajas, J., Wasserman, J., Pech, C., Garcia Sanchez, J., Ramirez, A., Jain, A., Proussaloglou, E., Nguyen, A., Turner, K., Fitzgibbon, A., Kaepelin, F., Ramirez, F., and Arenas, M. (2023, March 3). The Implications of Freeway Siting in California: Four Case Studies on the Effects of Freeways on Neighborhoods of Color (PSR-20-40; J. Wasserman, Ed.). Pacific Southwest Region University Transportation Center. <https://escholarship.org/uc/item/7mj2b24q>.
52. Loukaitou-Sideris, A., Handy, S., Ong, P., Wasserman, J., Barajas, J., and Pech, C. (2023, March 3). Four Case Studies on the Effects of Freeway Siting on Neighborhoods of Color. Pacific Southwest Region University Transportation Center. <https://escholarship.org/uc/item/0jm2d235>.
53. Loukaitou-Sideris, A., Wasserman, J., Ding, H., and Nelischer, C. (2023, January 31). Homelessness in State Transportation Environments. UCLA Institute of Transportation Studies. <https://doi.org/10.17610/T6J603>.
54. Loukaitou-Sideris, A., Wasserman, J., Ding, H., and Nelischer, C. (2023, January 31). Homelessness on the Road: Reviewing Challenges of and Responses to Homelessness in State Transportation Environments (UC-ITS-2022-17; PSR-21-52). UCLA Institute of Transportation Studies. <https://doi.org/10.17610/T6DC77>.
55. Penmetsa, Praveena, Sakina Dhondia; Stephen Poptic, Matthew Hudnall, Allen Parrish, and Shashi Nambisan. (2023). Impacts on Traffic Citations by Advanced Driver Assistance Systems, Proceedings of the American Society of Civil Engineers, International Conference on Transportation and Development 2023: Transportation Safety and Emerging Technologies. (pp 328-339).
56. Penmetsa, Praveena, Sakina Dhondia; Stephen Poptic, Matthew Hudnall, Allen Parrish, and Shashi Nambisan. (2023). Impacts on Traffic Citations by Advanced Driver Assistance Systems, Proceedings of the American Society of Civil Engineers, International Conference on Transportation and Development 2023: Transportation Safety and Emerging Technologies. 2023. (pp 328-339).

57. Ramirez, A., Proussaloglou, E., Loukaitou-Sideris, A., and Wasserman, J. (2024, August 16). Exposing Freeway Inequalities in the Suburbs: The Cases of Pasadena and Pacoima. *Journal of Planning History*. <https://doi.org/10.1177/15385132241265974>.
58. Reeb, T. (2024, August 29) Presentation of California Tribal Transportation Issues, "2024 National Transportation in Indian Country Conference". Durante, Oklahoma.
59. S. Nambisan, J. Byzyka, K. A. Islam and S. Chindepalli, "A Study of Electric Vehicles Ecosystem in Nevada," 2024 Forum for Innovative Sustainable Transportation Systems (FISTS), Riverside, CA, USA, 2024, pp. 1-6, doi:10.1109/FISTS60717.2024.10485587.
60. S. Nambisan, J. Byzyka, K. A. Islam and S. Chindepalli. (2024). "A Study of Electric Vehicles Ecosystem in Nevada," 2024 Forum for Innovative Sustainable Transportation Systems (FISTS), Riverside, CA, USA, 2024, pp. 1-6, doi:10.1109/FISTS60717.2024.10485587.
61. Su, R., & Goulias, K. (2023). Untangling the relationships among residential environment, destination choice, and daily walk accessibility. *Journal of Transport Geography*, 109, 103595.
62. Wasserman, J., Loukaitou-Sideris, A., Ding, H., and Nelischer, C. (2023, September 1). The Road, Home: Challenges of and Responses to Homelessness in State Transportation Environments. *Transportation Research Interdisciplinary Perspectives*, 21C. <https://doi.org/10.1016/j.trip.2023.100890>.
63. Zhao, X., Liao, X., Boriboonsomsin, K., & Barth, M. (2023, September 24). Improving truck merging at ramps in a mixed traffic environment: a multi-human-in-the-loop (MHUIL) approach. *IEEE Conference Publication | IEEE Xplore*. <https://ieeexplore.ieee.org/document/10422261>.

### Presentations

64. Brown, A. (2024, April 19). "Planning for Equitable Micromobility."
65. Byzyka, J., Gunindi, Z., Nambisan, S. (2024, March 11-12) . A Study of Electric Vehicles Ecosystem and Energy Demand Forecasts in Nevada. Pacific Southwest Region University Transportation Center 2024 Congress, Las Vegas, NV.
66. Byzyka, J., Gunindi, Z., Nambisan, S. (2024, March 14-15). A Preliminary Analysis of the Electric Vehicles Charging Infrastructure and Future Energy Demand in Nevada. The 1st Colorado River Basin Symposium on Sustainable Energy, Environment, and Urban Development (CRB-SEED), Las Vegas, NV.
67. Dymond, B.Z., Kandgule, V. (2024). "Characterizing Bridge and Culvert Deterioration in Arizona Using National Bridge Inventory Data." Bridge Engineering Institute (BEI), Jul. 22-25, Las Vegas, NV.
68. Gupta, M. (2024) "Power to Pedal: A Study of Women's Barriers to Cycling in Oakland" presented at TRB's 7th International Conference on Women and Gender in Transportation, September 9, 2024.
69. Hyland, M., Yang, D. (2024, August 7). Presentation at Bridging Transportation Researchers., titled: Electric Vehicles in Urban Delivery Fleets: How far can they go? Virtual Conference <https://bridgingtransport.org/conference-program-2024>.
70. Islam, K., Nambisan, S. (2023, November 1-2). A Comparative Evaluation of Urban and Rural Road Safety in Nevada. 32nd Annual Nevada Fall Transportation Conference 2023. Organized by the Nevada Chapters / Sections of ASCE, ITE, and ITS America. Tuscan Hotel and Casino, Las Vegas, NV.
71. Islam, K., Nambisan, S. (2024, April 7-9). A Comparative Evaluation of Urban and Rural Road Safety in Nevada, 2024 Lifesaver Conference on Roadway Safety, Denver, CO.

72. Islam, K., Nambisan, S. (2024, August 10-13) Beyond Numbers: Navigating Road Safety Analyses with Integrated Datasets, 2024 Traffic Records Forum, ATSIP, San Diego, CA.
73. Islam, K., Nambisan, S. (2024, July 16-17) Nevada's Road Safety: Comparing Urban and Rural Areas, Nevada Rural Road Safety Summit, Organized by the Nevada Department of Transportation, Elko, NV.
74. Islam, K., Nambisan, S. (2024, March 11-12). Driving Forward: Data-based Strategies for Better Road Safety Equity. Pacific Southwest Region University Transportation Center 2024 Congress, Las Vegas, NV. March 11-12, 2024.
75. Islam, K., Nambisan, S. (2024, October 28-31). Analyzing Rural-Urban Road Safety in Nevada for Informed Strategic Planning, 2024 Road Safety and Simulation International Conference, Lexington, KY.
76. Jain, A., J. C. Garcia Sanchez, S. Handy, and J. Barajas. "Implications of Freeway Siting in California - Sacramento Case Study." Presentation to the California Department of Transportation, online. 3 June 2024.
77. Jaller, M., & A. Pahwa. (2024). Sketch Planning Tool for Sustainable and Resilient Urban Goods Distribution: User Manual. Pacific Southwest Region University Transportation Center, Research Report. <https://doi.org/10.25554/eqpc-5569>
78. Jaller, M., & A. Pahwa. (2024). Sketch Planning Tool for Sustainable and Resilient Urban Goods Distribution. Pacific Southwest Region University Transportation Center, Research Brief. <https://metrans.org/assets/research/psr-22-48%20jaller%20brief.pdf>
79. Kim, K. (2024, July 14 – 17). Leave No One Behind: Using Disaster Lessons for More Inclusive Response. Natural Hazard Workshop 2024, July 14 – 17, 2024, Broomfield, CO.
80. Kim, K. (2024, June 3). Changing of Local Landscapes: Long-term Recovery from Natural Disasters. National Academies of Sciences. Washington DC.
81. Kim, K. (2024, May 14-16). Venice, Hawai'i, Samoa, and Azores: Climate, Islands, and Adaptation. National Adaptation Forum. Minneapolis, MN.
82. Kim, K. (2024, September 18-20). Lessons from the Maui Fire Disaster for Transportation Resilience. European Transport Conference 2024. Antwerp, Belgium.
83. Kim, K. Social Ecological Consequences of Future Wildfire in the West. National Academies of Sciences, June 13, 2024, Irvine, CA
84. Kim, K., Cooper, J., Tran, C., Liu, D., Yamashita, E. Planning for Resilience Hubs: Learning from the 2023 Lahaina Fire Disaster (Accepted for Presentation)
85. Kim, K., Kitchener, A., Kaviari, F., Tran, C., Marasco, D., (2024, April 20). Geography, Vulnerability, Crises, and Adaptation in Hawai'i. Association of American Geographers Meeting. Honolulu, HI.
86. Kim, K., Sakamoto, D. (2024, June 8). Lahaina Wildfire Lessons: What Planners & Architects Need to Know. AIA25. Washington DC.
87. Kim, K., Song, J., Yoon, D.K. The Development and Progress of Hydrogen Transport in Korea
88. Kim, K., Spirandelli, D., Rother, D., Yamashita, E., Toner, M. Tracking Wildfire Risk to California Railroads: Integrating Environmental Data and Railway Operations (Accepted for Presentation)
89. Kim, K., Yamashita, E., Hamaguchi, M. Leave No One Behind: Lessons from the Lahaina Fire Disaster
90. Malikopoulos, A. (2024, May 3). "Separation of Learning and Control in Emerging Mobility Systems,".
91. Marasco, D., Kim, K., Yamashita, E. Investigating Social Vulnerabilities and Non-Use of Seat Belts in Hawai'i

92. McCullough, S. (2024, May 1). "Historically underserved communities in transportation planning." TRB Webinar: Power of Partnerships to Improve Transportation Decision-Making, online. [https://www.nationalacademies.org/event/876\\_05-2024\\_trb-webinar-power-of-partnerships-to-improve-transportation-decision-making](https://www.nationalacademies.org/event/876_05-2024_trb-webinar-power-of-partnerships-to-improve-transportation-decision-making).
93. Nambisan, S. (2023, December 17-20). Road Safety Goals: Directions to a Destination? 7th Conference of the Transportation Research Group of India (CTRG-2023), Surat, Gujarat, India. Invited Keynote Speaker.
94. Nambisan, S. (2024, April 7-9). The Role of Policy and Enforcement in Traffic Safety Outcomes, 2024 Lifesaver Conference on Roadway Safety, Denver, CO. (Session Moderator Invited).
95. Nambisan, S. (2024, August 10-13). Session on "Safety Effects and Characteristics of Vehicles & Comparability of Automated Vehicle Crash Databases," 2024 Traffic Records Forum, ATSIIP, San Diego, CA. (Session Moderator Invited).
96. Nambisan, S. (2024, December 18-20). Leveraging Legacy and Emerging Data Sources to Enhance Road User Safety, 15th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC), India. Invited Keynote Speaker.
97. Nambisan, S. (2024, January) Advanced Vehicle Technologies and Occupant Protection, Panel Discussion. Session 2125, 103rd Annual Meeting, Transportation Research Board of the National Academies, Washington, D.C. (Session Moderator Invited).
98. Nambisan, S. (2024, June 16-19). The Challenge of Workforce Development, International Conference on Transportation and Development, American Society of Civil Engineers, Atlanta, GA. (Session Moderator Invited).
99. Nambisan, S. (2024, March 27). An Overview of Accessibility and Mobility Impacts of The Vegas Loop, 3rd Metropolitan Transport Policy International Online Seminar, Seoul, Korea. March 27, 2024. Invited Keynote Speaker.
100. Nambisan, S. (2024, May 13). Vegas Loop: Implications for Mobility in Las Vegas, Kyonggi University, Suwon, Korea.
101. Nambisan, S. (2024, May 14). A Methodology to Assess Infrastructure Availability and Needs for Electric Vehicles, Korea Transport Institute, Sejong City, Korea. (Invited Presentation).
102. Nambisan, S. (2024, May 16). Emerging Urban Mobility Strategies: Examples from Las Vegas, Nevada, USA, Seoul Institute, Seoul, Korea. (Invited Presentation).
103. Nambisan, S. (2024, May 16). Urban Mobility Challenges and Solutions, University of Seoul, Seoul, Korea.
104. Nambisan, S. (2024, October 17-18). Data and Emerging Technology Considerations to Enhance Road User Safety, International Passive Safety Seminar (IPASS -2024), International Centre for Automotive Technology, Manesar, New Delhi, India. Invited Keynote Speaker.
105. Nambisan, S. (2024, September 26). The Future of Transportation. Panel Member, Convene NV 2024: Our Sustainable Future Forum, Organized by ImpactNV, Horseshoe Las Vegas Hotel & Casino, Las Vegas, NV. (Invited Panelist)
106. Nambisan, S., Boakye, K. (2024, January 5). An Analysis of Seat Belt Laws, Seat Belt Use Rates, and Crash Outcomes Across the US. Discussions Advancing Research in Transportation Safety (DARTS) 2024 Meeting, National Highway Traffic Safety Administration, Washington, DC. Invited Keynote Speaker.
107. Nambisan, S., Byzyka, J., Islam, K., Chindepalli, S. (2024, February 26-28). A Study of Electric Vehicles Ecosystem in Nevada. 2024 IEEE Forum on Integrated and Sustainable Transportation Systems, Riverside, CA.

108. Nambisan, S., Byzyka, J., Islam, K., Chindepalli, S., Cranmer, B. (2023, November 1-2). A Preliminary Analysis of the Electric Vehicles Charging Infrastructure in Nevada. 32nd Annual Nevada Fall Transportation Conference 2023. Organized by the Nevada Chapters / Sections of ASCE, ITE, and ITS America. Tuscany Hotel and Casino, Las Vegas, NV.
109. Nambisan, S., Byzyka, J., Chindepalli, S., Islam, K. (2024, June 16-19). Examining Implications of Technological Advancements on Road Safety and Operations International Conference on Transportation and Development, American Society of Civil Engineers, Atlanta, GA.
110. Nambisan, S., Byzyka, J., Erdem, M., Bai, B., Koneti, S. (2024, March 11-12). Transportation Needs and Economic Opportunities of Socio-economically Disadvantaged Populations in Las Vegas Hospitality and Tourism Industry. Pacific Southwest Region University Transportation Center 2024 Congress, Las Vegas, NV.
111. Nambisan, S., Byzyka, J., Islam, K., Chindepalli, S. (2023, November 14-17). An Overview of the Electric Vehicles Charging Ecosystem in Nevada. Global R2T Conference, International Road Federation, Phoenix / Tempe, AZ. Invited Presentation.
112. Nambisan, S., Stream, C., Cunningham, R. (2024, August 10-13). Traffic Citations and Adjudication Data Linkages and Gaps: An Update, 2024 Traffic Records Forum, ATSIP, San Diego, CA.
113. Pan, A., Meiqing L., Fangyu W. (2024, April 26). "Graduating Doctoral Students -Thesis Research Presentations,".
114. Raha, F. (2024, May). "Where to Implement Leading Pedestrian Intervals (LPIs): An Examination of Turning Vehicle-Pedestrian Crashes at Signalized Intersections." Presented at the ITE/IMSAs Annual Meeting in Phoenix, AZ.
115. Reeb, T. (2024 August 29). Presentation of California Tribal Transportation Issues, "2024 National Transportation in Indian Country Conference". Durante, Oklahoma.
116. Rodriguez, D. Roundtable Discussion: From there to here: 50 years of BART and UC Berkeley | Institute of Transportation Studies. (2024, April 12).
117. Shilling, F. (2023, June 5-8). "Spatially Explicit Decision Support to Resolve Wildlife-Vehicle Conflict," and
118. Shilling, F. (2023). Economic Decision Support for Wildlife-Vehicle Conflict Reduction". Final Research Report and Brief for PSR. Presentation at the 2023 International Conference on Ecology and Transportation, Burlington, VT."
119. Shilling, F. (2024). Research Brief: Predicting Wildlife Use of Existing Highway Bridges and Culverts. Pacific Southwest Region University Transportation Center, Research Brief. <https://rosap.nhtl.bts.gov/view/dot/75306>
120. Shilling, F., N. Thoron, & D. Waetjen. (2024). Predicting Wildlife Use of Existing Highway Bridges and Culverts. Pacific Southwest Region University Transportation Center, Research Report. <https://doi.org/10.25554/33br-q089>
121. Smaglik, E. (2024, July). "LPI Implementation Guidelines in Phoenix, Arizona: A Data Driven Approach. Presented at the ITE International Meeting in Philadelphia, PA.
122. Smaglik, E. (2023). A General Equilibrium Model for Transportation Systems with Ride-hailing Services and Customer Waiting,". National Meeting of INFORMS, Phoenix, AZ.
123. Smith, T., C. Herda, M. Hsu, C. Fletcher, R. Gadnis, M. B. Sanchez, & S. R. McCullough. (2024). Mobility Justice: A New Framework. Pacific Southwest Region University Transportation Center, Research Report. <https://doi.org/10.25554/skx3-9v41>

124. Tran, C., Santiago, E.D., Yamashita, E., Kim, K. Greenways for Disaster Recovery and Resilience (Accepted for Presentation)
125. Weinberg, C., Kim, K., Tran, C., Yamashita, E. Traffic Calming and Building Back Better After the Lahaina Fire Disaster

### Research Reports

126. Carlsson, J. (2024). Continuous Approximation Models with Temporal Constraints and Objectives. Pacific Southwest Region University Transportation Center. <https://doi.org/10.25554/QYYS-ZA80>
127. Chen, Q. (2024). Rapid and Accurate Assessment of Road Damage by Integrating Data from Mobile Camera Systems (MCS) and Mobile LiDAR Systems (MLS). Pacific Southwest Region University Transportation Center. <https://doi.org/10.25554/9HXW-3Y87>
128. Giuliano, G., & Wei, D. (2024). Implementation of Action 6 of CSFAP Phase 4 Tracking Economic Competitiveness. Pacific Southwest Region University Transportation Center. <https://doi.org/10.25554/GPWH-6P48>
129. Ioannou, P., & Waqas, M. (2023). Systematic and Provably Safe Design Methodology for Connected and Automated Vehicles. Pacific Southwest Region University Transportation Center. <https://doi.org/10.25554/4n72-ze78>
130. Jaller, M., & Pahwa, A. (2024). Sketch Planning Tool for Sustainable and Resilient Urban Goods Distribution: User Manual. Pacific Southwest Region University Transportation Center. <https://doi.org/10.25554/EQPC-5569>