




Semi-Annual Progress Report #11

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Center Director Name, Title, Contact Information	Marlon Boarnet, Director Sol Price School of Public Policy University of Southern California Lewis Hall, RGL 216 Los Angeles, California 90089-0626 213-740-3956 213-740-0001(fax) boarnet@usc.edu
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1. Accomplishments

Major goals of the program

The Pacific Southwest Region UTC (PSR) addresses the transportation issues of Region 9 through an integrated, multidisciplinary program of research, education, and technology transfer aimed at FAST Act research priority area 1: improving the mobility of people and goods throughout the region. The goal of PSR is to improve passenger and freight transportation throughout Region 9.

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 Long Beach State University (CSULB); 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); and Pima Community College (PCC). USC and CSULB are both partners in the METRANS Transportation Center, the entity that houses the PSR UTC.

The regional UTC must reach beyond the consortium, offering connections to all transport stakeholders within the region. In order to fulfill its goal, the PSR:

- Established a region-wide advisory council of government, academic, and industry leaders to provide guidance on all aspects of the center's activities
- Executes a research program informed by the needs of the region
- Is establishing a web-based clearinghouse for degree and non-degree curricula
- Develops training and workforce development programs transferable across the region
- Holds an annual Region 9 Congress to share research and best practices
- Conducts a comprehensive program of information dissemination, technical assistance, and communications

Accomplishments under these goals

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

Administrative accomplishments

In July 2022, Dr. Marlon Boarnet began his term as the METRANS Director, replacing Dr. Genevieve Giuliano, who had been the Director since 2001. Boarnet has served on the METRANS Executive Committee since 2012 and brings 30 years of leadership in transportation research. He previously served as department chair and vice-dean at the USC Price School and as president of the Association of Collegiate Schools of Planning, the scholarly association of urban planning programs in the U.S. and Canada.

During the reporting period, Dr. Boarnet met with the METRANS executive committee to make plans for the future. The executive committee meetings continue, and most recently met on October 26, 2022.

Other key staff joined the METRANS team:

- Jennifer Hong joined the METRANS team as the Associate Director of Administration. She joins METRANS from the USC Price School of Public Policy as the program administrator for the Master of Urban Planning (MUP) program in the Department of Urban Planning and Spatial

Analysis (DUPSA). She worked closely with the former department chair, Dr. Marlon Boarnet for six years managing the MUP program where she provided student services support with all administrative aspects of their academic progress at USC, including monitoring satisfactory academic progress, and filing for graduation. As a program administrator, Jennifer also managed the Planning Accreditation Board (PAB) reaccreditation process. She is the 2022 recipient of the Margaret Harrington Outstanding Staff Award in recognition of her work to support students and academic programs. Jennifer earned her doctorate in Organizational Change and Leadership at USC Rossier School of Education in 2018.

- Dolores Rodriguez, who began her role as administrator in August 2022, is a recent graduate of the University of Southern California where she double majored in English and Theater Arts. As a student, Dolores worked with a variety of departments including the USC Career Center, University Advancement, and the Price School of Public Policy's Academic Programs Office where she gained valuable organizational skills and a deeper understanding of higher education. During her undergraduate years, Dolores was involved in several interdisciplinary projects that aimed to identify, explore, and propose policy changes for some of Los Angeles' most prevalent socio-economic issues, such as transit inequity. She looks forward to supporting METTRANS' own interdisciplinary mission of education, outreach, and research in order to address the transportation problems of today's diverse metropolitan regions.

In addition, the Center for International Trade and Transportation (CITT) at CSULB transitioned to a new dean, Dr. Chris Swarat, of their home college, the College of Professional and Continuing Education. Center staff contributed to the review process. CITT assisted the **CSULB University Undergraduate Research Opportunity Program (UROP)** with a successful proposal to FHWA to recognize CSULB as an Eisenhower Fellowship Local Competition campus. Tom O'Brien of CSULB contributed to the university's **Beach2030 initiative**, its strategic plan. Beach 2030 | California State University Long Beach (csulb.edu). He currently chairs the Off-campus Growth Strategy Team.

Staff Awards: Whitney Willis, operations manager for the Institute of Transportation Studies (ITS) and the Lewis Center for Regional Policy Studies at UCLA Luskin, was named this year's Rising Star awardee by UCLA's Administrative Management Group in partnership with Campus Human Resources. The 2008 UCLA alumna, who has worked at the UCLA ITS for over six years, was selected from among 14 nominees in the Rising Star category, one of three Excellence Awards bestowed annually to UCLA staff members. Criteria for the award include the potential to make a positive impact, establishing a leadership role, and pursuing both training and development opportunities. Willis' supervisor, Juan Matute, deputy director of ITS, describes her as an out-of-the-box thinker who has streamlined and automated a number of the center's business systems and services. During her time at the School, Willis has established best practices for administration, events and student oversight, while lending support and training to staff from other UCLA Luskin research centers, he said. Willis participated in the UCLA Professional Development Program in academic years 2019-20 and is currently pursuing a masters degree in Public Administration.



A. Research Accomplishments

The goal of our Center is to address regional issues 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 four themes that are derived from the transportation needs assessment conducted during the proposal preparation process: 1) technology for improved mobility, 2) improving mobility for disadvantaged populations, 3) improving resilience and protecting the environment, and 4) managing mobility in high growth cities and regions.

Our research program has three parts: 1) research conducted by PSR faculty; 2) research conducted by researchers inside or outside PSR but within Region 9; and 3) a graduate research fellowship program. We have reserved a small pool fund for a Region 9-wide solicitation. Its purpose is to promote broader participation across the states and territories, in keeping with the purpose of a regional UTC.

The total research project and white paper count for PSR is 146. We have 4 regional projects at UC Santa Barbara and 3 at UC Riverside, the remainder of the projects are based at PSR-member institutions. PSR partners have now completed a total of 88 research projects and white papers.

Due to METRANS staff turnover, several projects with completed *draft* final reports were delayed for final publication. We are currently in the process of moving 16 completed reports into publication. They will appear on the web page and in all appropriate depositories within the next six months.

PSR completed 5 projects and issued 5 reports during the reporting period (see [Table 1](#)).

Table 1: Projects completed during current reporting period

Partner	Project No.	PI	Title	Funding Source
USC	21-12 TO 045	Marlon Boarnet	Institutional Obstacles to New Transportation Technology Adoption [white paper]	CT-PSR
USC	21-22	John Gunnar Carlsson	New continuous approximation models for passenger and freight transportation	DOT
UH	21-70	Chunhee Cho	Bridge Monitoring through a hybrid approach leveraging a modal updating technique and an artificial intelligence (AI) method	DOT
NAU	21-16	Steven Gehrke	Evaluation of Sidewalk Delivery Robot Interactions with Pedestrians and Bicyclists	DOT
UCR	21-20	Guoyuan Wu	Connectivity-Based Cooperative Ramp Merging in Multimodal and Mixed Traffic Environment	DOT

Requests for Proposals (RFPs)

PSR issued a coordinated RFP 6 in early 2022 and received 27 proposals. The proposals were reviewed during the reporting period. Projects were selected for funding during this reporting period.

Match funding

PSR has the following match funding priority rankings: new funding, match from other existing research projects, and in-kind match. The University of California partners continue to have access to state funding through SB1, which increased the California fuel tax by 12 cents per gallon. A portion of SB1 funding is allocated to the UC Institute of Transportation Studies (ITS). UCD, UCLA, and UCI are part of ITS and receive SB1 funds. Some of these funds are used for PSR match. ITS is funded in-part by the state of California, as well as by Caltrans research contracts. There are several statewide research collaborations taking place through ITS. ITS has provided match funding support to initiate the Year 3 Faculty Research Projects and administer the PSR Publication at UCLA. The California partners continue to award funding via Caltrans, who has committed to a 50% match for PSR. USC has obtained additional research funding from local industry and agencies for specific projects. NAU continues to receive in-kind match funding from the Arizona Board of Regents Research Innovation Fund for research aimed at increasing freight safety and mobility along the I-10 corridor. UH requires each research project to provide its own match; the match is mainly in-kind. [Table 2](#) shows match funding sources and amounts.

Table 2: Match funding sources for PSR

Fund source	Amount
USDOT total for PSR	\$15,584,200
Caltrans match funding for PSR	\$3,781,145
Other match funding for PSR	\$14,828,769
Total match funding, all sources for PSR	\$18,609,914

New projects

A total of 23 new projects were started during the reporting period. [Table 3](#) lists the new projects and their funding sources.

Table 3: New research projects initiated during current reporting period

Partner	Project No.	PI	Title	Funding Source
UCLA	22-22 TO 067	Evelyn Blumenberg	Student Transit Programs and Other Modes-to-School in California	CT-PSR
USC	22-15 TO 066	Jong-Shi Pang	A general traffic equilibrium framework with ridesourcing services that considers flow-dependent waiting time and public transit	CT-PSR
USC	22-10 TO 065	Andreas Molisch	Deep-learning-based radio channel prediction for vehicle-to-vehicle communications	CT-PSR
UCI	22-23 TO 068	Jean Daniel Saphores	How to enhance student outcomes while strengthening transit? An Analysis of LA Metro’s	CT-PSR
UCI	22-24 TO 069	Avipsa Roy	Developing a data fusion framework to map active transportation usage patterns in Orange County	CT-PSR

UCD	22-46 TO 070	Miguel Jaller	Development of Public Dynamic Spatio-Temporal Monitoring and Analysis Tool of Supply Chain Vulnerability, Resilience, and Sustainability	CT-PSR
UCD	22-47 TO 071	Prashanth Venkataram	Studying the Effects of Disability on Choices and Desires for Travel and Neighborhood Location	CT-PSR
USC	22-01	Detlof von Winterfeldt	Reducing Greenhouse Gas Emissions from Student Commuting	DOT
USC	22-12	Petros Ioannou	Systematic and Provably Safe Control Design Methodology for Autonomous Vehicles	DOT
USC	22-19	John Gunnar Carlsson	Continuous approximation models with temporal constraints and objectives	DOT
USC	22-18	Ketan Savla	Dynamic Incentive Design for Transportation Systems with Unknown Value of Time	DOT
USC	22-08 TO 064	Marlon Boarnet	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	21-SP80 TO-042	Genevieve Giuliano	Implementation of Action 6 of the California Sustainable Freight Action Plan (CSFAP) Phase 4: Tracking Economic Competitiveness	CT-PSR
CSULB	-	Tyler Reeb	National Academies Tribal Transportation Workforce Peer Exchange	DOT
UCD	21-45	Susan Handy	Post-COVID Transportation Scenarios: Evaluating the Impact of Policies	CARB
UCD	22-48	Miguel Jaller	Development of Sketch-Planning Tool for Sustainable and Resilient Urban Goods Movements	DOT
UCD	22-49	Fraser Shilling	Predicting Wildlife Use of Existing Highway Bridges and Culverts	DOT
NAU	22-05	Steven Gehrke	Evaluation of Transportation Safety and Security Barriers in Bicyclist Accessibility	DOT
NAU	22-09	Edward Smaglik	Prioritizing Bicyclist Safety and Mobility: Which Guidance Do I Use?	DOT
LBSU	22-02 TO 063	Tyler Reeb	Implementing a Community-Based Mobility Lab: Improving Traffic, Protecting Data Privacy	CT-PSR
LBSU	21-SP 94	Tom O'Brien	Succession Planning	CT-PSR

UCSB	22-06	Konstadinos Goulias	Commercial Fleet Demand for Electric Vehicles in California: Current Fleet, Purchase Intentions, and Optimal Structure of Incentives	DOT
UCR	22-17	Peng Hao	Evaluating the Impacts of Clean Miles Standard on Transportation System	DOT

Student opportunities for research

Student support is an important component of research project selection. USC, CSULB, and UCD require that research projects include student support. NAU continues supporting undergraduate and graduate students through paid internships, fellowships, as well as engage in outreach activities.

As reported in the Performance Indicators report, PSR funding supports over 170 students during the academic year. Our students are engaged in numerous research activities, and many go on to successful careers in the transportation field.

Highlights of how PSR has supported students:

- PSR-supported UCI fellows, Monica Ramirez-Ibarra, who successfully defended her dissertation entitled “Electrification, Connectivity, & Active Demand Management: Addressing the traffic, health, and EJ impacts of drayage trucks in Southern California” for her PhD in Civil and Environmental Engineering, and Farzana Khatun, successfully defended her dissertation entitled “PUBLIC TRANSPORTATION AT A CROSSROADS Transportation Network Companies, COVID-19, and Transit Ridership” for her PhD in Transportation Science
- **UCLA published 17 student research reports** with open access, examples include:
 - Elizabeth Owen, “Try Transit! Lessons Learned from Metrolink Riders to Incentivize a Post-Pandemic Mode Shift to Commuter Rail”
 - Kimberly Venegas, “Take the High (Volume) Road: Analyzing the Safety and Speed Effect of High Traffic Volume Road Diets”
 - Shinah Park, “Equity and Mileage-Based User Fees: An Analysis of the Equity Implications of Mileage-Based User Fees Compared to the Gas Tax in the SCAG Region”
 - Ryota Abe, Matthew Forbes, Emily Marshall, Marium Navid, Karleigh Spard, “Zero Emission Delivery Zones - An analysis on US Implementation”
 - Michael Byrd, Richard Diaz, Steven King, Ha Luong, Atsushi Seto, “Designing a Carsharing Pilot Program for Los Angeles”
- CSULB brought on two new **Intermodal Association of North America (IANA) program scholars**, Maria Casares and Patrick Schiwiek. The students participate in supply chain research and CSULB’s Global Logistics Professional (GLP) courses as part of the program.

Additional accomplishments

Dissemination of recent research policy briefs at the **UCLA Lake Arrowhead Transportation-Land Use-Environment Symposium** (October 16-18, 2022) increased the awareness of UCLA and PSR research among its public and private stakeholders.

Detlof Von Winterfeldt (USC) became the **Executive Director** for the **USC Center for Sustainability Solutions**. As ED, Von Winterfeldt supported USC’s Office of Sustainability in its Carbon Task Force and commuting surveys. Ketan Savla (USC) became **Associate Editor** for **IEEE Transactions on Control of**

Network Systems and IEEE Control Systems Letters, Guest Editor for a special issue in the IEEE Transactions on Intelligent Transportation Systems.

Marlon Boarnet (USC) concluded his service as **Association of Collegiate Schools of Planning** president in October of 2021 and is now serving as immediate past president. During his term as ACSP president, Boarnet led ACSP through moving two conferences online during COVID, increasing the attendance beyond what had been the norm pre-COVID. Boarnet led the ACSP Governing Board in developing and approving an anti-racism agenda which shifted almost a quarter of the association's fungible budget to activities that include expanded fellowships for students from under-represented groups, a survey of the association's member to assess barriers to equity and advancement, and a task force on anti-racism.

Important Note, Honoring the Legacy of Martin

Wachs: Professor Martin Wachs served as a senior editor of Transfers Magazine until his unexpected passing in April 2021. For better than a half-century, Professor Martin Wachs was a leading educator, researcher, and influencer of transportation policy and planning at UCLA, UC Berkeley, and the RAND Corporation. On May 13, 2022, we brought together some of his many former students, colleagues, and friends to reflect on his influence and legacy as a teacher and mentor, as a planning and transportation scholar, as well as his dedication to influencing policy and practice for the better.



The Legacy of Martin Wachs

Friday, May 13 • UCLA Campus



i. Research dissemination

Dissemination of our research results takes place via research reports and research briefs, scholarly publications, popular publications, conference presentations, and media. Numerous PSR researchers present at conferences and seminars throughout the region, nationally, and internationally. Projects that are funded by Caltrans require the PI to present findings to a panel of practitioners, and particularly to Caltrans personnel. Additionally, PSR researchers and students are very active with TRB. Collectively, we presented over 60 papers to the 2022 meeting of TRB.

Dissemination highlights

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

- Sarah McCullough's (UCD) research was featured in a May 10, 2022, METRANS News article, "UC Davis Researchers present Transportation Equity Research," which highlighted the presentation that Dr. McCullough and Sequoia Erasmus gave at the March 2022 METRANS Speaker Series seminar sponsored by the National Center for Sustainable Transportation. The article can be accessed at <https://www.metrans.org/news/uc-davis-researchers-present-transportation-equity-research>.
- Prashanth Venkataram's (UCD) PSR research on understanding the ways that people with disabilities may be poorly served by existing transportation options was highlighted in several

formats aimed at making research accessible to general audiences. Dr. Venkataram was featured on the Arrested Mobility podcast in April and on the Disability Rap podcast in May. In August, Dr. Venkataram and Mollie D'Agostino penned a StreetsBlog Cal article on "The Controversy Over How to Regulate Wheelchair Service by Uber and Lyft in California." (Refer to Outputs for more information.)

- Petros Iannou (USC) presented his research and findings at a hybrid METRANS seminar on April 12, 2022, entitled "Balancing of Truck Parking Demand by a Centralized Incentives/Pricing System"
- On April 3, 2022, PCC brought a semi-tractor to the 162nd Air National Guard Family Day to engage with the Air Guard community about the various programs available. Attendees are also able to learn more about the life of a CDL driver by getting into the tractor (see image below).
- On April 25, 2022, Dean Amanda Abens (PCC) presented in a "Building Autonomous Vehicles Workforce" panel at the Association for Uncrewed Vehicle Systems International (AUVSI) annual conference.
- On May 2, 2022, Dr. Ian Roark, Jay Lau, and Missy Blair presented "**Preparing the Workforce of the Future: Autonomous Vehicle Driver and Operations Specialist**" at the American Association of Community Colleges' annual conference.



One of PCC's tractors at the April 3, 2022 Family Day for the 162nd Air National Guard.

- In addition, UCI hosted nine seminars during the reporting period. These are generally available as recorded presentations on ITS-Irvine's youtube channel:
https://www.youtube.com/channel/UCbkO-jFcfwRS9hPbqb_LdFg/videos

Media coverage

PSR researchers are regular contributors to various national media outlets. A few examples from the reporting period follow:

- On September 30, 2022, Missy Blair (PCC) was on the Dave Nemo Education Station segment to discuss academia in transportation and what PCC is doing to train the workforce of the future. The segment is available to Sirius XM subscribers on channel 146. A PCC link is also pending at the time of this report.
- The UTC Project led by Chun-Hsing Ho (NAU) has been featured in the following professional platforms:
 - Featured in a Civil Engineering Magazine July/August 2022, American Society of Civil Engineers: <https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/issues/magazine-issue/article/2022/07/smart-bike-system-to-improve-cycling-infrastructure>
 - Featured in a Cronkite News (Smart Bike Technology):
https://cronkitenews.azpbs.org/2022/05/13/naus-smart-bike-technology-can-detect-damaged-pathways/?fbclid=IwAR0cQXfwX5rFGa4tg3sj5Ma9vteavU0-X-kFvF1UJFxxHu2udv1mlq_K4hc#.YoHp98sDSas.facebook
 - Featured in a Cronkite TV (Youtube) (Smart Bike Technology):
https://www.youtube.com/watch?v=qRtK_PfwPgU&t=11s
- Prashanth Venkataram (UCD) was featured on two podcasts:
 - "Sidewalk Riding II: Micromobility & Persons with Disabilities." Arrested Mobility Podcast, Episode 3, 29 April 2022. <https://arrestedmobility.com/episode-3-sidewalk-riding-ii-micromobility-persons-with-disabilities/>
 - "The Future of Transportation for People With Disabilities." Disability Rap Podcast, Episode 23, conducted by FREED Independent Living Center. 3 May 2022. <https://share.transistor.fm/s/9af24134>

ii. Plans for next reporting period

The next reporting period is October 1, 2022 through March 31, 2023. **We anticipate completing 35 projects during the next reporting period.**

USC METRANS will host a research seminar on November 9 on the life-cycle impacts of zero emission fuels in trucks (from Dr. Sue Dexter). The METRANS seminar series will reconvene in Spring 2023. The METRANS team is also planning an event in honor of Dr. Genevieve Giuiliano's retirement as Director of METRANS, to take place in early 2023 (timing tbd). USC will commence planning for the International Association of Maritime Economics conference which they will locally sponsor in September 2023. We anticipate a PSR Annual Congress in March 2023.

CSULB will hire two new positions in the next reporting period. The first is a coordinator for the LTAP project and the second is a new finance coordinator for the center. CITT will revise two high school courses as part of its work for the Port of Long Beach Academy of Global Logistics at Cabrillo HS: the

Logistics class and the Supply Chain Management classes. The revisions will be made to align with the recently completed CTE capstone course, also developed by CITT. CSULB will also start planning for the National LTAP Association (NLTAPA) Western Region Conference which will be hosted on campus in the spring. CSULB will start undertaking planning and outreach and identifying sponsorships for their flagship events, the International Urban Freight Conference and Annual Town Hall, to be held in the fall of 2023.

NAU plans to continue supporting undergraduate and graduate students through paid internships and fellowships (which result in peer-reviewed presentations and publications), support for conference travel, as well as engage in outreach activities. Specifically, we are funding three fellows for this and part of next academic year, and will send students and faculty to the TRB Annual Meeting, the Arizona ITE/IMSAs Spring Conference, and ITS Arizona. From a dissemination standpoint, we will continue to submit work to various conferences and publications. Regarding outreach, AZTrans faculty have volunteered to provide in-school presentations to local K-12 students over the 2022-2023 academic year, and we currently have eight requests for presentations ranging from grades 3 to 12. Additionally, we will host visiting students and present at local STEM festivals as these activities begin again as COVID-19 related restrictions are lifted.

UCD expects to complete four research projects and one white paper project, including one project in partnership with USC and another project in collaboration with UC Irvine. Final deliverables will be produced soon thereafter. ITS-Davis expects to finalize and publish 3 reports and 3 research briefs during the next reporting period. Two of the reports are collaborative with other PSR partners: one of the projects/reports is led by USC, and another is led by UCLA.

UCD has identified two seminars to be held for the Fall 2022 quarter (see below). These seminars will be available in-person for ITS-Davis graduate students to attend, as well as webcasted live as a webinar for external viewers. Winter 2023 seminars will be identified in December.

- “Parking Cash Out” on October 21, 2022, with Dr. Don Shoup, Distinguished Research Professor, Department of Urban Planning, UCLA. <https://its.ucdavis.edu/seminar/october-21-2022/>
- “Smart Information Systems for Sustainable Decision Support in Ports” on October 28, 2022, with Dr. Carlos Paternina, Assistant Professor, Management Information Systems Department, San Diego State University. <https://its.ucdavis.edu/seminar/october-28-2022>

UCLA will continue working on Faculty Research Projects funded under the RFP program. During the next reporting period, Issue 11 of Transfers Magazine will be released. The UCLA Lake Arrowhead Symposium which will return to Lake Arrowhead, CA on October 16-18, 2022. The theme will be “California’s Housing Crossroads”. UCLA also plans to publish 3-5 additional Student Briefs from completed student capstone projects and award fellowships to incoming masters and continuing doctoral students who will join UCLA in the fall of 2022, as well as capstone fellowships to 2nd year masters students to support their faculty-advised research projects.

UCI will hold its Sixth Annual Graduate Colloquium on Innovations in Transportation on October 13th as an online meeting with the theme “Emerging Technologies and Automation: Aviation, and Connected and Autonomous Vehicles”. Speakers will include Melissa McCaffrey (Director of Policy and Government Affairs, Overair All Electric Aerial Mobility), Dr. Alexandre M. Bayen (Associate Provost for Moffett Field Program Development, University of California, Berkeley), Dr. Jacqueline Huynh (Assistant

Professor, Mechanical and Aerospace Engineering, University of California, Irvine), and Lori Pepper (Deputy Secretary, Innovative Mobility Solutions, California State Transportation Agency (CalSTA)).

B. Educational Accomplishments

PSR's education goal is to foster education and training to produce the next generation of academic scholars, professionals, and skilled workers. PSR seeks to:

- Attract large numbers of the best students from non-traditional transportation fields – especially those from underrepresented groups – into transportation careers through personal and targeted recruitment from high-schools, community colleges, and universities
- Expand and enhance the multidisciplinary aspects of our transportation education programs, and student exchanges among campuses
- Conduct a comprehensive workforce development program

Student Fellowship Program: The fellowship program produced 23 Graduates in June 2022: 21 MURP, 1 MPP, and 1 PhD Urban Planning and supported 30 MURP, 1 MPP, and 4 PhD Urban Planning Students. This fellowship program supports faculty-supervised student research for client agencies. In conjunction with the Faculty Request for Proposals program, the fellowship program has supported numerous projects in recent years – 15 in 2019, 13 in 2020, 16 in 2021, and 22 in 2022. Clients include Metrolink, LA Metro, LADOT, FASTLinkDTLA, So Cal Assoc of Govts, California Integrated Travel Program, Saban Community Clinic, and many others. Since 2019 two of these projects have won national awards from the Council of University Transportation Centers.

Student Awards: In the spring of 2022, UCLA awarded the ITS Capstone Prize Award to 4 students. The award included a total of \$15,000 to students with capstone projects with exemplary research and potential significant impact. We are confident that their research will provide the critical evaluation that their clients need, and will shape how practitioners approach these issues in the future:

- Nataly Rios Guterriez (MURP '22) "Assessing Transportation Challenges in Access To Healthcare"
- Kimberly Venegas (MURP '22) "Analyzing The Safety and Speed Effects of High Traffic Volume Road Diets"
- Aziz Fellague Ariouat (MURP '22) "Expanding Grocery Access for Community Members at the Century Villages at Cabrillo"
- Erik Felix (MURP '22) "Saved by the... Bus? Analyzing Safety Outcomes on Streets with Bus Lanes"

Grand prize capstone awards went to Kimberly Venegas, MURP '22, who received the ITS Capstone Prize for her project, Take The High (Volume) Road: Analyzing The Safety and Speed Effects of High Traffic Volume Road Diets, and Nataly Rios Gutierrez, MURP '22, who received the Excellence in a Transportation Equity & Justice Capstone Prize for her project titled Transportation Challenges to Healthcare: Evaluating the Transportation Needs of Patients at Saban Community Clinic. Both awards included a prize of \$5,000.

Kimberly Venegas “Take the High (Volume) Road”: So-called “road diets” convert urban streets with two lanes of through-traffic in each direction into streets with center left-turn lanes, one lane of through-traffic and, often, a bicycle lane as well. Intuition suggests that losing two through-traffic lanes would increase congestion. But because cars don’t get stuck behind left-turning vehicles, traffic tends to flow more smoothly, and crashes, injuries, and deaths are reduced — a lot. Venegas found that corridors with road diets had 44% fewer collisions. Furthermore, collisions that resulted in fatal and severe injuries were 200% and 27% lower, respectively. She also found that the safety pay-offs far outweighed the impacts on speed. While observed travel times were indeed longer on road diet corridors, the difference averaged to just 11 seconds per mile. UCLA ITS director and PSR Researcher Brian Taylor, who served as Venegas’s faculty advisor, said her findings were impressive. “She has shaken conventional wisdom about road diets, and in doing so has created many more opportunities to reduce crashes, injuries, and deaths on city streets,” Taylor said. [Learn More](#) about Kimberly’s project.



Nataly Rios Gutierrez “Transportation Challenges to Healthcare”: Delaying or forgoing health care can lead to serious consequences. Each year, millions of people nationwide miss their medical appointments due to inadequate transportation options. For her project, Rios Gutierrez examined the transportation challenges faced by patients of the Saban Community Clinic, which provides health care to predominantly uninsured and underinsured Latino patients at its various Los Angeles sites. Her research included spatial analysis of patient residential locations, patient surveys, and an evaluation of the clinic’s ride-hailing program meant to mitigate some of the transportation barriers.

Rios Gutierrez found that patients who use public transportation, ride-hail, or are driven by someone else are more likely to experience transportation challenges. Unreliable service and lack of money to pay for public transportation, ride-hail, car maintenance, or gas contributed to missed or late appointments. Madeline Brozen, deputy director of the Lewis Center for Regional Policy Studies and PSR Researcher who served as Rios Gutierrez’s advisor, said her capstone project stands apart because of the depth of data collection and analysis and how it frames the consequences of the lack of transportation in people’s lives. [Learn more](#) about Nataly’s project.

Two UCLA Urban Planning recent graduates were honored with awards from the American Planning Association. Jayne Vidhecharoen, MURP ‘21, received APA LA’s award of excellence for her capstone project titled “Equity Lenses: Targeting Equitable Community Investment Across Southern California.” Vidhecharoen conducted a comprehensive review of SCAG’s planning and funding programs through an equity lens to take on the thorny question: how can SCAG allocate its various streams of funding to best address inequities? She also produced an ArcGIS app prototype and scorecard system with unified equity indicators. Vidhecharoen also won the APA Sustainable Communities Division student award of excellence.

Asiya Patel, MURP ‘21, Asiya Patel, MURP ‘21 received APA LA’s award of merit for her master’s capstone project, “It’s Not Just a Sign: Traffic Calming Gives Bump to Safety—A Cost Benefit Analysis of

Traffic Calming in the City of Los Angeles.” Patel looked into the effectiveness of low-cost traffic safety interventions, including speed humps, bike lanes, partial closures and stop signs. Patel also won the APA California academic award of merit.

Student Programs

PSR partners conduct a number of student programs designed to increase student engagement and nurture professional development. These programs have been described in-depth in previous reports. Continuing programs include:

- **WTS Partnerships** (USC, UCI, UCD, UCLA), sponsor membership and event attendance to promote student participation (high-school and college), with a planned event to take place on USC campus on December 16, 2022.
- CSULB team led a pilot program in partnership with **Toastmasters International** focused on the development of professional competencies required in trade and transportation occupations. After establishing a Nondisclosure Agreement and memorandum of understanding to co-share curriculum, the Toastmasters and CITT teams collaborated on the facilitation of a three-month-long (October-December 2021) beta testing of the course.
- With the annual support of Port of Long Beach of \$2,000, METRANS collaborates with **USC Hybrid High School to develop an Across the Seas event**. The five hour event focuses on teaching 35 high school students the fascinating journey of International trade. USC Hybrid High School is a college preparatory public charter high school in Downtown Los Angeles serving 9-12th grade. The school is operated by the charter management organization Ednovate. Ednovate's mission is to close the college graduation gap. Attendees from USC Hybrid School will learn about supply chains, the journey of international goods, sustainability matters and international seaports. Across the Seas is managed by the student engagement and communications manager and five student-workers.

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.

AGL CSULB students (50) attended the Intermodal Association of North America (IANA) Expo in September 2022. **CSULB** also developed a capstone project for a 12th grade CTE class as part of the Academy of Global Logistics high school program through Cabrillo High School in Long Beach. The capstone course has been approved by the Long Beach Unified School District, was introduced into the curriculum in August 2022 and may be used for transfer credit to the UC and CSU systems.

On July 1, 2022, PCC implemented a standalone **Hazardous Materials class online for CDL holders** to comply with the Entry Level Driver Training requirements if they are a current CDL holder but need to upgrade with a hazardous materials endorsement. As of this report date, there have been 8 people enrolled in the class with 4 completers (2 nearly complete and 2 in process). Dual enrollment in the CDL theory class for high school students is progressing. It has been approved by the Pima County Community College District Board of Governors and is awaiting high school instructor certification. This pilot program will have high school students taking the online component while in high school and attending the Behind the Wheel portion the summer after they graduate high school. The student could graduate high school with a commercial driver license permit credential.

Collaboration has begun with PCC's Adult Basic Education and Career Counseling to assist ESL students with the CDL program. There have been changes at the state level which permit learners to take their CDL permit test in Spanish while the behind the wheel testing remains mandatory to perform in English. The Integrated Basic Education and Skills Training (IBEST) model will be a valuable resource for us to assist our ESL students in earning their CDL credential.

Enrollment for the **PCC Logistics program** has **increased 54% from the Fall 2021 semester**. The **Truck Driver Training enrollment has increased 69.2% in fiscal year 22 from fiscal year 21**. The Center for Transportation Training has a facebook and twitter page (@pcctruckdriver for both). Student/graduate updates are posted as allowed by the students. Below are some success stories:



Angel P. completed his Class A CDL on April 25, 2022.



Judylynn J. (pictured with her instructor, Dale B.) passed her Class B CDL with passenger endorsement on June 2, 2022. She needed her CDL for transporting residents to appointments, etc.



On May 26, 2022, William was the first to test for his Class B CDL on PCC's new-to-us Class B flatbed. William was employer-sponsored for his training.

Local Technical Assistance Program (LTAP): In October of 2021, CITT became the new administrative home for California's Local Technical Assistance Program (LTAP) Center after being awarded a three-year contract from Caltrans. During the current reporting period, CITT built the new Center infrastructure including coordinating the transition of operations from the previous administrator, developing a new CALTAP website which launched preliminarily in September 2022 along with a new branding strategy, and a communications plans resulting in the release of a new LTAP Newsletter called CAL.FORCE which debuted in May 2022. In June, CITT also rolled out the first California Build a Better Mousetrap campaign, a FHWA-sponsored competition for local agency-driven innovation; and in the summer

undertook a statewide assessment of local agency needs with regard to transportation training. During the next reporting period, we will pilot new classes developed at CSULB and CITT in sustainable construction engineering and GIS for the non-GIS specialist.



Early Careers Program: USC METRANS Transportation Consortium (METRANS) managed and coordinated with Cargomatic on their Early Careers Program implementation. The program ran for 10 weeks during the summer of 2022. Two USC students participated in the program at Cargomatic. Cargomatic was happy with the student output. Both students have continued on for the fall program (see

below).



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.

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; **METRANS on the Move** (USC), this is a weekly e-newsletter written and produced by USC students with staff guidance; **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 the reporting period, METRANS issued its Newsletter, METRANS News, in May 2022, took a break from Newsletter communication in summer, and resumed monthly in October 2022. The average open rate was 29.6%, which is in line with Constant Contact's overall average of 29%. The range for a good open rate is 15-25%, and the newsletter's open rate exceeds this range.

CITT at CSULB issued digital newsletters in May 2022 and June 2022. The average open rate over this reporting period was 26%, which equals Constant Contact's overall average. CITT will continue to implement strategies to improve the open rate such as updating the email lists, adding content highlights in the email subject line, and posting about the newsletter on social media.

METRANS' LinkedIn Page gained 48 followers, and Twitter received 12 new followers over this reporting period. Engagement rates on Facebook remained constant although social media focus has shifted to other channels. Declines in engagement rates on Twitter (20.4%), and LinkedIn (40%) reflect a limited schedule of activities in the summer. METRANS is putting in place a new communications and outreach plan under the new Director and administrative staff.

CITT at CSULB gained 6 new followers on Twitter, 21 new followers on LinkedIn, and 0 new followers on Facebook. Emphasis for information dissemination has shifted to LinkedIn Engagement rates grew by 1.1% on LinkedIn, while they fell by 65% on Twitter. With the launch of the CA LTAP Center at CITT, major efforts took place to launch a LTAP social media presence. CITT is currently working on developing a communications strategy in order to improve and maintain engagement on social media, that strategically highlights CITT news including news on UTC-supported programs and LTAP news. Since the last reporting period, the LTAP Linked In page has gained 62 new followers and had 222 page visits. The same content has been posted on both the LTAP Linked In page and the Facebook page, but engagement on Facebook has been stagnant.

As part of outreach efforts, CITT at CSULB released the second episode of its Mobility Matters podcast in September 2022. Mobility Matters is a series dedicated to addressing mission-critical issues facing the professionals who design, develop, operate, and maintain mobility systems. CITT Director of Research and Workforce Development Tyler Reeb hosts the series and each episode will feature insight from trade and transportation experts from various sectors. The second episode, "Choosing ITS: Smarter Communities and Careers," was released September 20, 2022. And the third episode, "From Invisible to Essential: Covering Freight in the Media" was released September 27, 2022.

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

- "Transit Research in Practice: Making change from inside an agency" with Dr. Laurel Paget-Seekins, 2021 Leadership in Government Fellow with Open Society Foundation.
<https://its.ucdavis.edu/seminar/april-8-2022/>

- “Data for Active Transportation Research and Planning” with Dr. Trisalyn Nelson, Professor, Department of Geography, UC Santa Barbara. <https://its.ucdavis.edu/seminar/may-6-2022/>

Transfers Magazine: published its 9th issue in June 2022, consisting of four articles and one opinion piece, and representing research from UC Davis, UC Irvine, UCLA and its scholars. Featured topics such as “Improving Efficiency and Equity with Geographically Targeted Gasoline Taxes”; Why Older Adults Stop Driving”; and Cashing Out



Employer-Paid Parking”. The website www.transfersmagazine.org, which also features regularly updated blogs with transportation-related news, research and events, had more than 25,000 page views during this six-month period, which is a slight increase to the previous six-month period. Most of our web traffic comes immediately after publishing an issue. The Transfers team has worked to create a social media content calendar to maintain promotion of the issues throughout the full period between issues, and has developed minute-long videos as another means of expanding the magazine’s audience. In June 2022, Transfers Magazine was awarded the Communications Initiative Award of Merit by the APA Los Angeles section. We’ve also begun recruiting articles for the June 2023 issue. 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.

2022 METRANS International Urban Freight Conference (I-NUF): was held in Long Beach, California, on May 25-27, 2022. The biannual event provides a forum for a diversity of urban freight researchers, policymakers, and practitioners to showcase their research, engage in dialogue, and share information across all sectors of the industry. A comprehensive assortment of presentations and special sessions surveyed topics including last mile pickup and delivery, urban modeling and planning, technology, automation, changing consumption and production, spatial organization, and best practices. The first day included an introduction from outgoing METRANS Director Geneveive Giuliano, CSULB’s Associate Vice President and Dean of the College of Professional and Continuing Education (CPaCE) Jeet Joshee and Incoming METRANS Director and Professor/Chair of the USC Department of Urban Planning and Spatial Analysis Marlon Boarnet. Attendees also had the opportunity to participate in an interactive tour at the Santa Monica Zero Emissions Delivery Zone Pilot Program, hosted by the Los Angeles Cleantech Incubator (LACI). The group also made a stop at Total Transportation Services (TTSI), a trucking and logistics company driving sustainable operations. The event’s full agenda can be viewed at this [link](https://www.metrans.org/INUF-2022-Detailed-Agenda). (The link is at <https://www.metrans.org/INUF-2022-Detailed-Agenda>.) Attendance is estimated to be 176.

UCLA Lake Arrowhead Transportation - Land Use - Environment Symposium: UCLA began planning the annual UCLA Lake Arrowhead Symposium on the Transportation - Environment - Land Use Connection which will take place October 16-18, 2022. This year’s topic is California’s Housing Crossroads which will cover solutions for professionals, elected officials, and advocates working on housing, transportation, and regional economic issues. They will also build an understanding of and capacity to implement these solutions across attendee backgrounds. The program will include a Housing 101 session and a demystification of the California’s Housing terminology and concepts such as RHNA, HEs, AFFH, CEQA, and ADUs. It will also highlight actions that transportation professionals can take to support housing

solutions. Speakers of the series included Jerusalem Demsas (The Atlantic), Councilmember Mike Bonin (City of Los Angeles), Councilmember Nithya Raman (City of Los Angeles), Kome Ajise (SCAG), Tommy Newman (United Way of Greater L.A), Mayor Jed Leano (City of Claremont), Megan Kirkeby (CA Housing and Community Development) among others. For the first time in three years, the 2022 UCLA Arrowhead Symposium reconvenes at its eponymous home at the UCLA Lake Arrowhead Lodge and Conference Center in Lake Arrowhead, California. More information can be found on the symposium website at www.uclaarrowheadsymposium.org

FED Talks: since October 2020, UCLA has continued to assemble 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. The lunchtime talks were attended by students, faculty, staff, and partners of the institute and PSR research over the reporting period. Featured Talks:

- “Partisan Polarization and Support for Public Transit: Evidence from Measure M ” presented by Michael Manville, PSR Transfers Magazine Editor-in-Chief and Associate Professor of Urban Planning
- “Work-Related Business Trips - Pre-COVID trends since 2001” led by Miwa Matsuo, UCLA Visiting Scholar

i. Outreach plans for the next reporting period

METRANS will hold its next **Advisory Board meeting** on November 9, 2022. The next issue of **Transfers Magazine** will be released in December 2022 and editing is already underway. METRANS will continue planning for its premier biennial **International Urban Freight (INUF) Conference** to be held in person in Long Beach, CA in Fall 2023. The **CITT International Trade and Transportation Town Hall** will be held the day before.

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.

A. Financial support

The following organizations provide match funding for PSR research projects:

- Bosch LCC
- California Community Foundation
- California Department of Transportation (Caltrans)
- California Strategic Growth Council
- Chan Zuckerberg Initiative
- Los Angeles County Metropolitan Transportation Authority (LA Metro)
- Los Angeles World Airports (LAWA)
- Port of Long Beach (POLB)

- South Coast Air Quality Management District (SCAQMD)
- Southern California Association of Governments (SCAG)
- State of California
- Volvo Research and Education Foundation (VREF)

B. Other support

The following organizations provide 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 Longshoremen 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 as noted above and in past SAPRs. Additional supporters include: **Council of University Transportation Centers (CUTC)**, Thomas O'Brien (CSULB) completed his tenure as president of CUTC and Center Director Genevieve Giuliano (USC) is a past president and past executive committee member, and Susan Handy (UCD) is a member of the board; **Institute of Transportation Studies (ITS)** (UCD, UCI, UCLA), provides match funding and other resources; **MetroFreight Center of Excellence** (USC, CSULB), METTRANS 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; **Toastmasters International** (CSULB), provides public speaking competency training for undergraduates; **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, Western States Petroleum Association, Metrolink, Southern California Association of Governments, WSP USA< Los Angeles World Airports, San Diego Council of Governments.

C. 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.

CITT at CSULB's Undergraduate Research Opportunity Program (UROP) to host a newly recognized local competition through the **Federal Highway Administration's Dwight D. Eisenhower Transportation Fellowship Program (DDETFP)** that supports CSULB student research and attendance at the Transportation Research Board's Annual Meeting. CSULB is formalizing an agreement with the National Customs Brokers and Freight Forwarders Association (NCBFFA) to offer their certifications through the Global Logistics Professional (GLP) program.

The organizations below are partners through the California LTAP, hosted at CITT:

- American Public Works Association (APWA)
- California Rural Counties Task Force (RCTF)
- National Association of County Engineers (NACE)
- Pacific Gateway Workforce Innovation Network (PGWIN)
- South Bay Cities Council of Governments (SBCCOG)

CSULB will also facilitate the development of a student chapter of the Women's Transportation Seminar (WTS) with the CSULB's University Undergraduate Research Opportunity Program (UROP)

Institute of Transportation Studies (ITS): ITS is the University of California transportation research institute. It has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA. ITS is funded in-part by the state of California, as well as by Caltrans research contracts. There are several statewide research collaborations taking place through ITS. ITS has provided match funding support to administer the PSR Publication *Transfers* at UCLA.

UCLA Lewis Center for Regional Policy Studies: Deputy Director, Madeline Brozen is a researcher on the Year 2 Faculty Research Project, "Public Transportation Among University Students." The Lewis Center

also provides workspace and matching funds researchers and staff at the UCLA Institute of Transportation Studies.

The **Harbor Trucking Association (HTA)** has started the initial development of an endowment MOU for CITT at CSULB which launches with a golf tournament fundraiser in November. The endowment will allow students to take GLP and MTOP classes and to undertake research of interest to the HTA.

In May 2022, **PCC's Center for Transportation Training** met with Pascua Yaqui Tribe WIOA personnel and Sonoran Pueblo Contracting to discuss education and training options for a cohort of construction workers attending a heavy machine operations class. PCC collaborated with the City of Tucson to discuss a partnership program to train their employees in several areas, including CDL. Through attending outreach and working internally with our Business Development partners, we are partnering with Gospel Rescue Mission to train their residents. We currently have one learner due to complete in October 2022. The CDL gives the learner and resident of GRM a second chance at economic and social opportunities.

3. 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 **25 peer-reviewed** journal publications and **38 presentations**. For a list of the publications, conference papers, and presentations, see [Appendix A](#). See [Table 1](#) for a list of the 5 project final reports that were published during the reporting period.

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>
- 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/>
- Transfers Magazine (PSR flagship publication): <http://www.transfersmagazine.org/>
- UC Davis Feminist Research Institute: <https://fri.ucdavis.edu/>
- UC Davis Policy Institute for Energy, Environment, and the Economy: <https://policyinstitute.ucdavis.edu/>
- UCI ISERT conference: www.its.uci.edu/isert2020
- UCI seminar series: 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>

- Open access to UCLA Institute of Transportation Studies reports, capstone projects, and policy briefs: https://escholarship.org/uc/ucla_its
- UH website (includes posts on PSR research): <https://ndptc.hawaii.edu>
- UH Twitter: <https://twitter.com/uhpurl>
- UH Facebook: <https://www.facebook.com/UH.PURL/>
- <https://www.facebook.com/disasterctr>
- <https://twitter.com/disasterctr>

NAU's project with the City of Scottsdale resulted in the first (to our knowledge) Crash Modification Factors (CMFs) for the left-in left-out median treatment. This work was disseminated during the previous reporting period via a paper published in ITE Journal. Additionally the CMFs developed from this project were recently (during the previous reporting period) published on the FHWA CMF Clearinghouse (https://www.cmfclearinghouse.org/study_detail.cfm?stid=643) and are now available to practitioners all over the country who are considering installation of this type of treatment. This work was also presented during this reporting period to ADOT and MAG, and ADOT is currently using the results of this work to implement new left-in left-out treatments throughout the state.

B. New methodologies, technologies, or techniques

The IP generated by PSR research undertaken by Ketan Savla (USC) is **licensed through USC to a startup company co-founded by PI Savla and filed under the following patent:**

- Savla, K., & Hosseini, P. (2022). *Adaptive Traffic Control Systems*. (U.S. Patent No. 11348458)

Petros Ioannou's (USC) project, "Systematic and Provably Safe Control Design Methodology for Autonomous Vehicles" has resulted in a systematic and provably safe control design methodology for the longitudinal control of autonomous vehicles. This methodology makes sure that the vehicles are safe, comfortable and compliant with complex traffic laws under all driving conditions such as adverse weather and complex road geometry.

The work of Professors R. Jayakrishnan and Wenlong Jin (UCI) has produced an **eco-driving algorithm** for intersection control involving mixed traffic flow with autonomous and human-driven vehicles.

C. Other products

The eco-driving algorithm (mentioned above) is being deployed in cooperation with the City of Irvine and with Bluecity Inc.

Ketan Savla (USC) is the co-founder and chief science officer of Xtelligent, Inc., an urban mobility start-up, which sprouted from his PSR supported research project.

4. 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

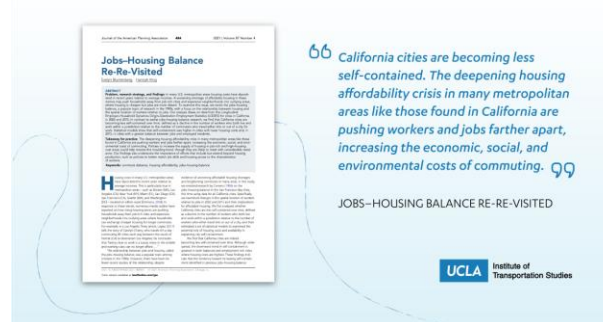
its regulatory, legislative, or policy framework, resulting from research and development outputs. Examples include the full-scale consideration of a new technology technique, or practice, or the passing of a new policy, regulation, rulemaking, or legislation.

NAU is continuing to work with the Maricopa Association of Governments as independent evaluators for Smart Region Pilot deployments, contributing to the body of knowledge through independent assessment of novel smart transportation technologies.

NAU's two active projects funded by the **Oregon Department of Transportation (ODOT)** have provided operational procedures and guidance for identifying vehicle detectors that are not performing properly, and guidance for deployment of countermeasures to reduce bicycle / motor vehicle conflicts at signalized intersections. Both of these provided new methods for solving these types of problems across the Oregon state system, and will also be scalable to other jurisdictions. The bicycle safety focused project was completed during the previous reporting period, and the results will be incorporated into the next update to the ODOT Traffic Manual. For the vehicle detector performance project, the procedures developed in that work are currently being deployed in prototype form by ODOT staff.

Chancellor Lee Lambert, Dr. Ian Roark, and Missy Blair (PCC) contributed to a policy paper by Grand Canyon Institute, entitled "Automation in Arizona's Transportation Sector" located at this link: <https://grandcanyoninstitute.org/research/automation-in-arizonas-transportation-sector/>. We have been informed the paper led to the full restoration of STEM funding for community colleges (10.8 million versus 2 million).

Academic Awards: Evelyn Blumenberg, professor of urban planning and director of the UCLA Lewis Center for Regional Policy Studies, and Hannah King, a doctoral student in urban planning, were recognized for their excellent work on the paper, "Jobs–Housing Balance Re-Re-Visited," published May 2021 in the Journal of the **American Planning Association**. Their research resurfaced the once-popular jobs-housing balance framework for the present era, and included 394 cities in California measured at two different points in time (2002 and 2015). They found that, over time, "California cities are becoming less self-contained." In other words, fewer people both live and work in the same cities than in previous years. These changes can be attributed, in part, to the rising cost of housing. Although this research was not PSR-funded, it exemplifies the outstanding capacity and work of PSR-supported faculty and students.



The Los Angeles Department of Transportation's report, "Changing Lanes: A Gender Equity Transportation Study for Los Angeles," received the award of excellence for advancing diversity and social change. The report used community-based research to gain a better understanding of how gender gaps in transportation affect the daily lives of women. UCLA PSR researchers Evelyn Blumenberg, Anastasia Loukaitou-Sideris, and Madeline Brozen with the Lewis Center for Regional Policy Studies provided research analysis and support for the study. This project was not supported by PSR.

Education of public officials, policymakers through attendance

One major goal we have is the education of public officials and policymakers through attendance at PSR events. Our annual target for events is 150 attendees from public agencies and private industry. With almost 3,000 such attendees at PSR events, we have far exceeded our target.

5. Impacts

PSR defines an impact as that which has an effect on 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. Therefore, performance with respect to outcomes and impacts are likely to be more a matter of judgment than of quantifiable metrics. Our contributions are judged by the PSR Advisory Council, and measured as significant or not significant.

All of PSR's research products are made [available to the public](#). These products have an immeasurable impact on the body of scientific knowledge.

NAU's project with the **City of Scottsdale** resulted in the first (to our knowledge) CMFs for the left-in left-out median treatment. The results of this project were published in ITE Journal and on the FHWA CMF Clearinghouse (https://www.cmfclearinghouse.org/study_detail.cfm?stid=643) during the previous reporting period, and these CMFs may be used by agencies around the country who are considering installation of this treatment. This work was also presented during this reporting period to ADOT and MAG, and ADOT is currently using the results of this work to implement new left-in left-out treatments throughout the state.

The results of NAU's ODOT bicyclist safety project will be incorporated into the next update of the ODOT Traffic Manual and the published results will be relevant to other state DOTs and municipalities. The results, which are in the process of dissemination through several journal articles, provide practitioners guidance on when to consider certain bicycle-focused intersection treatments (bike boxes, mixing zones, and bicycle signals). This includes consideration of different vehicle and bicycle volumes, as well as relative comfort and costs between these treatments. The work in our ODOT detector health project using traditional traffic theory in a new way to identify traffic detectors that were not performing properly. While this will help the DOT, we believe that the application of the theory in this new way may open the door for other such applications of this established theory.

The recently-completed NAU UTC project investigating sidewalk autonomous delivery robot (SADR) interactions with active travelers is the first empirical study to the project team's knowledge to identify traffic safety concerns of pedestrians and bicyclists who share pathways with SADRs; offering needed evidence into the challenges of operating these new freight delivery technologies in current and future real-world settings.

Stephen Ritchie's (UCI) work on using **LiDAR technology** for truck classification has resulted in a novel method to subtract irrelevant background from LiDAR pointcloud data. The method introduced mature image processing techniques into pointcloud data processing to detect both static and dynamic backgrounds in freeway scenarios with high level of detail. The method has significantly improved infrastructure-based truck classification, which can provide high-resolution data on on-road truck

activity by commodity to support real-time modeling and the development of new planning models. UCI and Caltrans continue to deploy this technology in various Caltrans districts along with additional sensor technologies to develop a more complete picture of goods movement in California that can support refined policy-making for environmental, equity, and economic benefits.

The work of Professors R. Jayakrishnan and Wenlong Jin (UCI) has produced an eco-driving algorithm for intersection control involving mixed traffic flow with autonomous and human-driven vehicles. The algorithm supports the design of cooperated vehicle behavior with actuated signals with respect to various traffic congestion levels. Autonomous, or information-aided human drivers can apply the algorithmically-determined advisory speed limit to enter the intersections with the minimum headway possible, while an alert for each human-driven vehicle reduces the lost time during the yellow intervals. This research is now being deployed in a DOE-funded field test in the **City of Irvine** and on the UCI campus, with a specific focus on demonstrating the energy savings possible and co-optimizing advanced ZEV drivetrains to take advantage of algorithmic guidance.

Ketan Savla's (USC) PSR project "Coordinated Demand-side Management and Traffic Control for Tight Areas" has made fundamental contributions to control of urban traffic under anticipated autonomous and connectivity paradigms. Results from Petros Ioannou's project "Highway Safety and Traffic Flow Analysis of Mixed traffic with Connected and Non-Connected Vehicles" indicate that autonomous vehicles that follow safety constraints defined for a worst-case brake scenario can have a negative impact on highway traffic flow. However, if the autonomous vehicles are allowed to take short lived small risks, they can achieve a traffic flow like that of human driven vehicles. Connected and autonomous vehicles which cooperate to generate safe lane change gaps lead to improvements both in safety and in traffic flow without having to take any risks.

Impact on transportation workforce development

Training courses and certificate programs have increased the expertise of transportation professionals. PSR carries out an extensive workforce development program as described in previous sections.

PCC has increased public awareness of autonomous trucking. Collaborations have been formed to bring younger learners into the industry through dual enrollment efforts. In addition, PCC has formed collaborations to broaden our network of autonomous vehicle employers through **Association of Uncrewed Vehicles Systems, Arizona Commerce Authority's Institute for Automated Mobility and USDOT PCB**.

PCC's Center for Transportation Center continues to work with the **USDOT Intelligent Transportation Systems (ITS) Professional Capacity Building division and the National Network for the Transportation Workforce** to create an ITS Industry-Education Partnership Showcase document. The showcase has been sent to our industry partner, TuSimple, for editing and approval to publish.

ITS-Davis provides support, via PSR, to the WTS UC Davis Student Chapter, the fourteenth WTS student chapter founded nationwide, to help women network and advance their professional careers.

The unique partnership of **CSULB CITT, the Port of Long Beach** and the **Long Beach Unified School District** has allowed CITT to apply its research and curriculum development expertise to support the creation, launch and assessment of a new 12th grade level CTE course for the Academy of Global

Logistics at Cabrillo HS. The course has been approved for transfer credits to the UC and CSU systems and has established a model for other programs in the Long Beach Unified School District.

The course developed by CSULB CITT for the **Port of Long Beach Academy of Global Logistics** has been approved for transfer credits to the UC and CSU systems. As a result, it directly contributes to career pathway opportunities in transportation for high school students. The Containerization and Intermodal Institute (CII) awarded a total of \$5,500 in scholarships to four CSULB students to participate in the GLP program.

With respect to outreach activities, NAU continued to make available a recorded presentation on transportation engineering for use in the Flagstaff STEM City Nights series and the Career Exploration Series during this reporting period. There were no local in-person outreach events during this reporting period, however we have signed up to provide in-school presentations to local K-12 students over the 2022-2023 academic year, and we currently have eight requests for presentations ranging from grades 3 to 12. Additionally, we will host visiting students and present at local STEM festivals as these activities begin again as Covid-19 related restrictions are lifted.

NAU continues to provide opportunities for research and teaching in transportation and related disciplines through undergraduate and graduate research internships, as well as fellowships. NAU has had a number of in-person seminars events, including:

- 4/11/22: Ellie Volosin (City of Tempe) presented to our NAU ITE Student Chapter. Ellie spoke about her work as a traffic engineer with the City of Tempe, AZ, including analysis of local crash data.
- 9/7/22: Justin Effinger from NoTraffic presented to our NAU ITE student Chapter. Justin spoke about the NoTraffic system and IOT mobility and deployment.
- 9/21/22: David Lemcke, a traffic engineer with the City of Flagstaff presented to our NAU ITE Student Chapter. David discussed his recent experience graduating and starting full time employment, and the type of work city traffic engineers are involved with (pictures below).



6. Changes/Problems

Changes in approach and reasons for change

Covid-19 has left NAU with excess funds for travel, which have been diverted to fund undergraduate and graduate interns.

Problems and delays encountered during the reporting period

CSULB had staffing issues related to turnover and the end of the funding cycle. UH also encountered a shortage of graduate student assistants for an internal research grant, and equipment required repair.

Delays in the extension of the PSR Caltrans parent agreement may in turn cause delays in getting new ITS-Davis PSR Caltrans task orders (and task orders at other California PSR partners) executed in time for January 1, 2023, starts. Delays in the execution of Caltrans Task Order agreements for research projects resulted in one agreement being canceled prior to execution. The PSR project was instead awarded PSR federal funds.

Change of primary performance site location

Most PSR faculty, staff, and students have transitioned back to their work locations on campus on a hybrid schedule.

7. Special Reporting Requirements

Nothing to report.

8. Appendix A

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

A. Publications

Peer-reviewed journal publications

1. Gehrke, S., Huff, M., Russo, B., & Smaglik, E. (2022) Spatiotemporal patterns of on-demand food delivery services before the COVID-19 pandemic. Submitted to Multimodal Transportation, June 2022.
2. Scott-Deeter, L., Hurwitz, D., Russo, B.J., Smaglik, E., and Kothuri, S. (2022). Assessing the Impact of Three Intersection Treatments on Bicyclist Safety Using a Bicycling Simulator. Submitted to Accident Analysis and Prevention, May.
3. Russo, B.J., Yu, Fan, and Smaglik, E. (2022). Examination of Factors Associated with Fault Status and Injury Severity in Intersection-Related Rear-End Crashes: Application of Binary and Bivariate Ordered Probit Models. Submitted to Safety Science, July.
4. Zhang, D., Ho, C., & Zhang, F. (2022). Distribution Fitting and ANOVA Tests to Analyze Pavement Sensing Patterns for Condition Assessments. Submitted for review for publication in the Journal of Highlights of Vehicles
5. Gehrke, S. R., & Huff, M. P. (2022). Spatial equity implications and neighborhood indicators of ridehailing trip frequency and vehicle miles traveled in the phoenix metro region. Transportation, 1-25.
6. Kim, K., Chun, J., Yamashita, E. (2022). Building Back Better: Transportation Recovery Challenges From the 2018 Kauai Flooding Disaster. Transportation Research Record.
7. Lestari, F., Kim, K., Adiwibowo, A., Octaviani, D. F., Fisher, M., & Yamashita, E. (2022). Improving Service Coverage and Response Times for Three-Wheeled Mobile Fire Units on Pari Island, Indonesia. Transportation Research Record, 03611981221101031.
8. Kim, K., Riley, S., Fischer, E., & Khan, S. (2022). Greening Roadway Infrastructure with Vetiver Grass to Support Transportation Resilience. CivilEng, 3(1), 147-164.
9. Kim, K., Yamashita, E., Ghimire, J., Bye, P. G., & Matherly, D. (2022). Knowledge to Action: Resilience Planning Among State and Local Transportation Agencies in the United States(No. TRBAM-22-02189).
10. Kim, K., Leong, G., Yamashita, E., & Ghimire, J. (2021). Impacts of COVID-19 Travel Restrictions on Paratransit Users in Honolulu, Hawaii (No. TRBAM-21-04331).
11. Shen, S., Chang, R.H., Kim, K., Julian, M. (2022). Challenges to Maintaining Disaster Relief Supply Chains in Island Communities: Disaster Preparedness and Response in Honolulu, Hawaii. Natural Hazards, 1-27.
12. Kim, K. E. (2022). Ten Takeaways from the COVID-19 Pandemic for Transportation Planners. Transportation Research Record, 03611981221090515.
13. Zhu, Y., & Savla, K. (2022). Information Design in Non-atomic Routing Games with Partial Participation: Computation and Properties. IEEE Transactions on Control of Network Systems.
14. Jafari, S., & Savla, K. (2022). A Decentralized Feedback Approach for Flow Control in Highway Traffic Networks, Automatica (in press).

15. Wei, F., Koc, E., Li, N., Soibelman, L., & Wei, D. (2022). Socioeconomic Impacts of Resilience to Seaport and Highway Transportation Network Disruption, *International Journal of Disaster Risk Reduction*, 102946.
16. Wei, D., A. Rose, E. Koc, Z. Chen, & Soibelman, L. (2022). Socioeconomic impacts of resilience to seaport and highway transportation network disruption, *Transportation Research Part D: Transport and Environment*, 106, 103236.
17. Pilgram, C. A., & Boarnet, M. G. (2022). Starting Points Matter: Spatial Variation in Marginal Effects for Negative Binomial Trip Models. *Findings*, 35459.
18. Huang, J., & Boarnet, M. G. (2022). Analyzing the Potential Impact of Docked Bikeshare on Transit First-Last Mile Accessibility in East Los Angeles. *Findings*, 33140.
19. Li, Y., Allu, K. R., Sun, Z., Tok, A. Y., Feng, G., & Ritchie, S. G. (2021). Truck body type classification using a deep representation learning ensemble on 3D point sets. *Transportation Research Part C: Emerging Technologies*, 133, 103461.
20. Bae, Y., Mitra, S. K., Rindt, C. R., & Ritchie, S. G. (2022). Factors influencing alternative fuel adoption decisions in heavy-duty vehicle fleets. *Transportation Research Part D: Transport and Environment*, 102, 103150.
21. Xia, Y., Sun, Z., Tok, A., & Ritchie, S. (2022). A dense background representation method for traffic surveillance based on roadside LiDAR. *Optics and Lasers in Engineering*, 152, 106982.
22. Khatun, F., & Saphores, J. D. M. (2022). Best frenemies? A characterization of TNC and transit users. *Journal of Public Transportation*, 24, 100029.
23. Ahmed, T., & Hyland, M. (2022). Exploring the role of ride-hailing in trip chains. *Transportation*, 1-44.
24. Bahk, Y., Hyland, M. F., & An, S. (2022). Private Autonomous Vehicles and Their Impacts on Near-Activity Location Travel Patterns: Integrated Mode Choice and Parking Assignment Model. *Transportation Research Record*, 03611981221077982.
25. Sun, P., Nam, D., Jayakrishnan, R., & Jin, W. (2022). An eco-driving algorithm based on vehicle to infrastructure (V2I) communications for signalized intersections. *Transportation Research Part C: Emerging Technologies*, 144, 103876.

Other publications

26. Center for International Trade & Transportation. (2022, September). *California Local Technical Assistance Program*. California Local Technical Assistance Program. Retrieved October 23, 2022
27. Grajdura, S. A. (2022). *Mixed Methods Approaches to Wildfire Evacuation: Modeling Behavior, Simulation, and Equity* (Doctoral dissertation, UC Davis).
28. McCullough, S. R., & Erasmus, C. (2022). *Performative vs. Authentic Equity Work: How the California Transportation Sector Can Continue to Do Better* (No. qt3dt084gp). Institute of Transportation Studies, UC Davis.
29. Ruble, E. (2021, November 30). Research suggests mixed-income housing near rail hubs will boost equity and sustainability. *USC Sol Price School of Public Policy*.

B. Conference papers

1. Venkataram, P., & D'Agostino, M.C. "The Controversy Over How to Regulate Wheelchair Service by Uber and Lyft in California." *Streets Blog Cal*. 18 August 2022.

C. Presentations

1. O'Brien, T. (2022, April 1). *Local Impacts on Underserved Communities*. US International Trade Commission (ITC) RoundTable.
2. O'Brien, T., & Decas, K. (2022, April 20). *Trade Talks*.
3. O'Brien, T., Kewalram, B., Vu, A., & Paz, J. (2022, May 25). *Gamification of Urban Freight*. International Urban Freight Conference, Long Beach, CA, United States.
4. Reeb, T., & Shaffer, G., (2022, May 26). *Using Artificial Intelligence to Improve Traffic Flows with Consideration of Data Privacy Principles*. International Urban Freight Conference, Long Beach, CA, United States.
5. O'Brien, T. (2022, June 8). *Sustainability, Energy, and the California Supply Chain*. Southern California Waste Management Forum (SCWMF) Annual Conference, Ontario, CA, United States.
6. O'Brien, T., & Warren, E. (2022, June 22). *Supply Chain Disruption - Part Three: Managing Cargo Movement*. Manufacturers' Council of the Inland Empire, Redlands, CA, United States.
7. Olson, B. (2022, July 9). *GIS Introduction*. Esri User Conference in San Diego, CA, United States.
8. O'Brien, T. (2022, July 25). *Young Transport Academics' Career Development*. World Conference on Transport Research (WCTR).
9. O'Brien, T. (2022, September 6). *Setting your Future Supply Chain Strategy by Economic Modeling*, Pharma Logistics Masterclass, Abu Dhabi, UAE.
10. O'Brien, T. (2022, September 14). International Association of Maritime Economists (IAME) Conference, Busan, South Korea.
11. O'Brien, T. (2022, September 21). *US Inland Waterways' Role in a Global Marketplace*. American Association of State Highway and Transportation Officials (AASHTO) Council on Water Transportation.
12. Russo, B.J., Yu, Fan, and Smaglik, E. (2023). *Examination of Factors Associated with Fault Status and Injury Severity in Intersection-Related Rear-End Crashes: Application of Binary and Bivariate Ordered Probit Models*. TRB Annual Meeting.
13. Raha, F., Russo, B.J., and A. Ryan. (August 2022) *Investigating the Impact of the COVID-19 Pandemic on Traffic Crash Injury Outcomes among Different Demographic Groups*. Submitted for presentation to the 2023 Transportation Research Board (TRB) Annual Meeting. (Not federally supported)
14. Smaglik, E., Eschen, A., Khadka, A. & Russo, B.J. (2023). *An Empirical Analysis of Fisheye Camera Intersection Traffic Detector Performance: Assessing the Potential Impacts of Camera Position and Lighting Conditions*. Submitted for presentation at the 2023 TRB Annual Meeting.
15. Gehrke, S., Phair, C., Russo, B.J., & Smaglik, E. (2023). *Examining Reported Pedestrian and Bicyclist Comfort in Sharing Pathways with Sidewalk Autonomous Delivery Robots*. Submitted for presentation at the 2023 TRB Annual Meeting.
16. Gehrke, S., Phair, C, Russo, B.J, & Smaglik, E. (2023). *Evaluating Sidewalk Autonomous Delivery Robot Interactions with Pedestrians and Bicyclists on Shared-use Transportation Facilities on a University Campus*. Submitted for presentation only at the 2023 TRB Annual Meeting.
17. Russo, B.J., Kothuri, S., Smaglik, E., & Hurwitz, D. (2023). *Analyzing the Impacts of Intersection Treatments and Traffic Characteristics on Bicyclist Safety: Development of Data-Driven Guidance on the Application of Bike Boxes, Mixing Zones, and Bicycle Signals*. Submitted for presentation at the 2023 TRB Annual Meeting.

18. Gehrke, S., Russo, B.J., Huff, M., & Smaglik, E. (2023). *Multiscale Spatial Analysis of Macro-level Determinants of Bicycle Crash Frequencies in the Phoenix Metro Region*. Submitted for presentation at the 2023 TRB Annual Meeting.
19. Ho, C.H., Qiu, P., Zhang, Y., & Zen, K. (2023). *A Generic Deep Learning Based Computing Algorithm in Support of Development of Instrumented Bike* Submitted for presentation at the 2023 TRB Annual Meeting.
20. Martinez, A.E., Phair, C.D., Russo, B.J., & Gehrke, S.R. (2023). *Exploring neighborhood differences in bicycling accessibility to physical and virtual workplaces*. Submitted for presentation at the 2023 TRB Annual Meeting.
21. Russo, B.J., Smith D., & Taylor, S. (2023). *Analyzing the Safety Impacts of Left-In Left-Out Median Opening Treatments at Intersections/Driveways*. Submitted for presentation to the 2023 Transportation Research Board (TRB) Annual Meeting. (Not federally supported)
22. Ho, C.H., Abdelaziz, A., Zhang, D & Zhao, P. (2022, June 28-30). *Mitigating excavation-induced surface settlement and building tilting: a case study*. International Conference on the Bearing Capacity of Roads, Railways and Airfields, Trondheim, Norway.
23. (2022, September 16). *Assessing Traffic Detector Health with a Novel Technique*. Michigan State University Mobility Seminar, East Lansing, MI, United States.
24. Gehrke, S., Russo, B.J., Huff, M., & Smaglik, E. (2022, September) *Current Research at Northern Arizona University*. Tucson, AZ, United States.
25. Russo, B. (2022, June 16). *Analyzing the Safety Impacts of Left-In Left-Out Median Opening Treatments at Intersections/Driveways*. ADOT STSP Intersection Team.
26. Russo, B. (2022, June 26). *Analyzing the Safety Impacts of Left-In Left-Out Median Opening Treatments at Intersections/Driveways*. Maricopa Association of Governments Transportation Safety Committee.
27. Russo, B. (2022, May 19). *Analyzing the Safety Impacts of Left-In Left-Out Median Opening Treatments at Intersections/Driveways*. Arizona ITE/IMSA Annual Meeting.
28. Russo, B. (2022, May 19). *Analyzing the Impacts of Intersection Treatments and Traffic Characteristics on Bicyclist Safety Using Surrogate Safety Measures: Preliminary Results*. Arizona ITE/IMSA Annual Meeting.
29. Russo, B. (2022, May 19). *Examining Factors Affecting Pedestrian Crash Frequency & Severity Considering Demographic, Land Use, & Roadway Characteristics*. Arizona ITE/IMSA Annual Meeting.
30. McCullough, S. (2022, June 15-17). *The Emergence of Mobility Justice and Racial Justice Frameworks in Transportation Advocacy*. 4th International Feminist Geography Conference, Boulder, CO, United States.
31. Pahwa, A. (2022, May 25-27). *Freight eco-routing – carrier’s trade-offs and system-wide impacts*. 9th International Urban Freight Conference, Long Beach, CA, United States.
32. Venkataram, P. (2022, September 12-16). *Transportation Challenges facing Adults with Disabilities in California*. TRANSED: Mobility, Accessibility & Demand Response Transportation Conference, online.
33. Savla, K. (2022, September 20). *Microscopic Traffic Flow Control*. ETH Zurich.
34. Wei, D., Rose, A., Koc, E., Chen, Z., & Soibelman, L. (2022, May 25-27) *Aggregate and Income Distribution Impacts of Resilience to Seaport and Highway Transportation Network Disruption*. 9th International Urban Freight Conference, Long Beach, CA, United States.

35. Wei, D. & Giuliano, G. (2021, October 27). *Economic Impacts of Cargo Handling Equipment Electrification at POLA/POLB*. METRANS Research Seminar, Long Beach, CA, United States.
36. Wei, F., Koc, E., Wei, D., Walmsley, T., Rose, A., & Soibelman, L. (2022, February 9). *Quantitative Assessment of Economic Resilience Tactics and Transportation Network Recovery after Earthquakes*. ASCE Lifelines Conference, Los Angeles, CA, United States.
37. Wei, D., Rose, A., Koc, E., Chen, Z., & Soibelman, L. (2022, May 25-27). *Aggregate and Income Distribution Impacts of Resilience to Seaport and Highway Transportation Network Disruption*. 9th International Urban Freight Conference, Long Beach, CA, United States.
38. Boarnet, M., Mallett, Z., & Pilgram, C.A. (2022, February). *A Land Use Model of Dockless Scooter Travel*. Western Regional Science Association Conference, Scottsdale, AZ, United States.

D. Research Reports

1. Pooladsanj, M., Savla, K., & Ioannou, P. A. (2022). Saturation region of Freeway Networks under Safe Microscopic Ramp Metering. *arXiv preprint arXiv:2207.02360*.
2. Zhu, Y., & Savla, K. (2022). Convergence in a Repeated Non-atomic Routing Game with Partial Signaling. *arXiv preprint arXiv:2207.11415*.
3. Zhu, Y., & Savla, K. (2022). An Experimental Study on Learning Correlated Equilibrium in Routing Games. *arXiv preprint arXiv:2208.00391*.
4. Ioannou, P., & Monteiro, F.V. (2022). Highway Safety and Traffic Flow Analysis of Mixed traffic with Connected and Non-Connected Vehicles. (under review)
5. Owen, E. (2022). Try Transit! Lessons Learned From Metrolink Riders to Incentivize a Post-Pandemic Mode Shift to Commuter Rail.
6. Arseneault, D. (2022). Mobility Hubs: Lessons Learned from Early Adopters.
7. Venegas, K. (2022). Take The High (Volume) Road: Analyzing The Safety and Speed Effects of High Traffic Volume Road Diets.
8. Park, S. (2022). Equity and Mileage-Based User Fees: An Analysis of the Equity Implications of Mileage-Based User Fees Compared to the Gas Tax in the SCAG Region.
9. Graveline, B. (2022). A Tale of Two City Streets: Evaluating the Safety, Congestion, and Cut-Through Effects of Road Diets.
10. Bressette, B. (2022). State Transportation Funding in California: Progressive Targets or Prehistoric Thinking?.
11. Felix, E. (2022). Saved by the... Bus? Analyzing Safety Outcomes on Streets with Bus Lanes.
12. Jacobo, A., Mora Camacho, A., Parnes, D., Cruz, L. D., Tirado Escareño, P., Lu, R., & Long, Z. (2022). Planning Performance Indicators: Access to Opportunity.
13. Rios, N. (2022). Transportation Challenges to Healthcare: Evaluating the Transportation Needs of Patients at Saban Community Clinic.
14. Abe, R., Forbes, M., Marshall, E., Navid, M., & Shepard, K. (2022). Zero Emission Delivery Zones- An Analysis on US Implementation.
15. Jarnagin, A. (2022). Identifying Excess Pavement: A Quantitative Analysis of Streets in the Dallas-Fort Worth Metroplex.

16. Caro, R. (2022). Using Data Science for Equity at SFMTA.
17. Mead-Newton, M., Guirguis, P., Murshed, A., Phan, K., Schwartz, E., & Silverstein, B. (2022). Planning Indicators: Non-Auto Mobility.
18. Fellague Ariouat, A. (2022). Increasing Access to Groceries at the Century Villages at Cabrillo.
19. Byrd, M., Diaz, R., King, S., Luong, H., & Seto, A. (2022). Designing a Carsharing Pilot Program for Los Angeles.

E. Research Briefs

1. Arseneault, D. (2022). Mobility Hubs: Connecting Communities, Expanding Access.
2. Bressette, B. (2022). State Transportation Funding in California: Improving Program Evaluation for Climate Justice.
3. Felix, E. (2022). The Need for Thoughtful Bus Lane Strategies to Enhance Street Safety in Los Angeles.
4. Jarnagin, A. (2022). Prioritizing Underutilized and Dangerous Streets for Pavement Repurposing in the Dallas-Fort Worth Metroplex.
5. Graveline, B. (2022). The Effect of Road Diets on Safety, Congestion and Cut-Through Traffic.
6. Caro, R. (2022). Using Data Science for Equity at SFMTA.
7. Silverstein, B., Mead-Newton, M., Murshed, A., Phan, K., & Schwartz, E. (2022). Identifying Non-Auto Mobility Indicators for Los Angeles Metro.
8. Rios Gutierrez, N. (2022). Improving Transportation Access for Patients Seeking Health Care.
9. Venegas, K. (2022). Evaluating the Safety Impacts of High Traffic Volume Road Diets.
10. Fellague Ariouat, A. (2022). A Transportation Needs Assessment of Grocery Shoppers at the Century Villages at Cabrillo.

F. Inventions or Patent Applications

1. Savla, K., & Hosseini, P. (2022). *Adaptive Traffic Control Systems*. (U.S. Patent No. 11348458).
2. USC. *Automatic Vehicle Following System under Safety, Comfort, Road Geometry Constraints and Sensor Uncertainty*. (Ref. No. 2022-181).

G. Webinars and Podcasts

1. Venkataram, P. (Guest) (2022, April 29). Sidewalk Riding II: Micromobility & Persons with Disabilities (No. 3). *Arrested Mobility Podcast*.
2. Venkataram, P. (Guest) (2022, May 3) The Future of Transportation for People With Disabilities (No. 23). *Disability Rap Podcast*, FREED Independent Living Center.
3. Kong, L., Leonard, G., & Porter, G. (2022, April 21). Stories and Lessons from the Tonga Volcano-Tsunami [Webinar]. University of Hawaii.
4. Decerbo, C., Tate, R., & Williams, G. (2022, May 19). Cybersecurity of Critical Urban Infrastructure [Webinar]. University of Hawaii.
5. Kim, K., & Bui, L. (2022, June 16) Highlights from the 2022 Global Platform for Disaster Risk Reduction [Webinar]. University of Hawaii.