




Semi-Annual Progress Report #12

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Contents

- 1. Accomplishments 2
 - A. Research Accomplishments 2
 - i. Research dissemination 7
 - ii. Plans for next reporting period..... 10
 - B. Educational Accomplishments..... 10
 - Student Programs 12
 - i. Workforce development..... 12
 - ii. Education and Workforce Development goals for next reporting period 13
 - C. Outreach Accomplishments..... 13
 - i. Outreach plans for the next reporting period 15
- 2. Participants & Collaborating Organizations 15
 - A. Financial support..... 15
 - B. Other support 16
 - Additional Support 16
 - C. Collaborations 17
- 3. Outputs 17
 - A. Websites 17
 - B. New methodologies, technologies, or techniques 18
 - C. Other products..... 18
- 4. Outcomes..... 19
- 5. Impacts 19
- 6. Changes/Problems..... 20
- 7. Special Reporting Requirements 20
- 8. Appendix A..... 21

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.

Accomplishments under these goals

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

Administrative accomplishments

During the reporting period, **Marlon Boarnet (USC)** met with the **METRANS executive committee** to update them on recent activities and to discuss upcoming events such as the International Association of Maritime Economists (IAME) conference, hosted by METRANS, which will take place in Long Beach, CA, Sept. 5-8, 2023. METRANS convened the PSR executive committee several times during the reporting period. The PSR executive committee gathered at the Transportation Research Board Annual Meeting in Washington, D.C. in January 2023, and at the USC campus on March 17 during the PSR Annual Congress. Several members of the METRANS and PSR executive committees formed the PSR Congress Program Committee, which was responsible for the grouping and selection of all abstract submissions presented at the PSR Annual Congress (described later in this report.) The PSR program committee was composed of the following members: Marlon Boarnet, Edward Smaglik, Missy Blair, Petros Ioannou, Tom O'Brien, Roxana Javid.

Distinguished professor of urban planning and PSR researcher, **Anastasia Loukaitou-Sideris (UCLA)**, was appointed interim dean of the UCLA Luskin School of Public Affairs. Former METRANS director **Genevieve Giuliano** was named a USC distinguished professor during this review period. **Tom O'Brien (CSULB)** was elected the First Vice President of the Harbor Association of Industry & Commerce (HAIC) in January 2023 and appointed a member of the National Academy of Sciences' Committee on Best Practices for the Efficient Supply of Chassis for Transporting Intermodal Containers in January of 2023. **Marlon Boarnet (USC)** is a current member of the Transportation Research Board standing committee on Economic Development and Land Use.

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 covered in our previous SAPR.

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 with the purpose to promote broader participation across the states and territories.

The total research project and white paper count for PSR is 158. We have funded 6 regional pool fund projects at UC Santa Barbara and 4 at UC Riverside, the remainder of the projects are based at PSR-member institutions. PSR partners have now completed a total of 110 research projects and white papers. Due to METRANS staff turnover in late 2022, several projects with completed *draft* final reports were delayed for final publication and therefore not included in SAPR 11. These projects have now produced final reports and have been published on all appropriate depositories. Table 1 below includes all delayed projects in addition to projects with end dates corresponding to the reporting period.

Table 1: Projects Completed during current reporting period.

Note on Funding Sources: DOT= DOT funded

CT-PSR= Caltrans funds (for California partners)

SB1= CA state funding available to UCI, UCD, and UCLA through CA Senate Bill 1

CZI= Chan Zuckerberg Initiative

Partner	Project No.	PI	Title	Funding Source
UCLA	UCLA-17-05 TO-024	Ertugrul Taciroglu	Bridge R—a Regional Seismic Hazard Assessment Tool for Transportation Networks & its Application to Freight Loss Assessment	CT-PSR
UCI	UCI-18-15	Jean-Daniel Saphores	What Explains Recent Trends in Southern California Bus Ridership?	SB1
UCI	UCI-18-17	R. Jayakrishnan	Efficient Mobility Portfolio schemes for Integrated, Intermodal, and Incentivized Shared Transportation	SB1
USC	MT-19-17	Ketan Savla	Traffic Flow Models Based on Queuing Theory for Analysis and Performance Evaluation	DOT
USC	PSR-20-SP97	Marlon Boarnet	Measuring the Evolution of California’s Central Valley: Demographics, Supercommuting, and Fiscal Stress	CZI
USC	PSR-20-02	Cyrus Shahabi	Freight Volume Modeling on Major Highway Links	DOT
USC	PSR-20-07	Maged Dessouky	Making HOT lanes benefit every traveler---design, pricing, and analysis	DOT
USC	PSR-20-09	Petros Ioannou	Highway Safety and Traffic Flow Analysis of Mixed traffic with Connected and Non-Connected Vehicles	DOT
USC	PSR-20-17	Ketan Savla	Data-driven Feedback Control of Urban Traffic Systems with Performance Guarantees	DOT
UCI	PSR-20-31 TO 040	R. Jayakrishnan	A Smart Mobility Platform with Fair Congestion Pricing and Efficiently Distributed Incentives to Equitably Reduce VMT	CT-PSR
UCD	PSR-20-40 TO 039	Susan Handy	The Implications of Freeway Siting in California: An Equity, Geospatial, and Case Study Approach	CT-PSR

Partner	Project No.	PI	Title	Funding Source
UH	PSR-21-72	Qi Chen	Rapid and Accurate Assessment of Road Damage by Integrating Data from Mobile Camera Systems (MCS) and Mobile LiDAR Systems (MLS): Can we get the best of both worlds?	DOT
UH	PSR-21-71	DoSoo Moon	Integrated Hazard Vulnerability Assessment and Mitigation Framework with Mixed Reality for Transportation Infrastructures	DOT
NAU	PSR-21-17	Chun-Hsing Ho	Development of Instrumented Bikes: Toward Smart Cycling Infrastructure and Maintenance	DOT
USC	PSR-21-SP81 TO 043	Dan Wei	Economic Analysis and Review of Commercial Vehicle Road User Charges	CT-PSR
UCSB	PSR-21-19	Konstadinos Goulias	Spatial microanalysis and equity assessment of joint relationships among destination choice, activity duration, and mode choice.	DOT
USC	PSR-21-25	Ketan Savla	Coordinated Demand-side Management and Traffic Control for Tight Areas	DOT
USC	PSR-21-01 TO 046	Genevieve Giuliano	The Potential for Ride-Matching in Disadvantaged Communities	CT-PSR
USC	PSR-21-26 TO 047	Hilda Blanco	Redeveloping Failing Malls: Opportunities for Reducing VMT and GHG Emissions and Increasing the Housing Supply through Urban Villages	CT-PSR
UCD	PSR-21-41 TO 051	Prashanth Venkataram	Cross-Sectional Study of the Effects of Disability on the Mismatch of Desires versus Choices for Transportation Modes and Residential Location	CT-PSR
UCLA	PSR-21-52 TO 048	Anastasia Loukaitou-Sideris	Understanding and Responding to Homelessness in State Transportation Settings [white paper]	CT-PSR
USC	PSR-21-04 TO 053	Jong-Shi Pang	Modeling multi-modal mobility in a coupled morning-evening commute framework that considers deadheading and flexible pooling	CT-PSR
USC	PSR-21-10 TO 058	Marlon Boarnet	Commuting During and after COVID-19: The Impact of COVID-19 on Shared Mobility and Extreme Commuting in the Bay Area - Central Valley	CT-PSR
USC	PSR-21-13 TO 059	Geoff Boeing	Improving the Accuracy of Intersection Counts and Densities for Measuring Urban Street Network Compactness and Resilience	CT-PSR
UCI	PSR-21-35 TO 055	Michael Hyland	Evaluating Mixed Electric Vehicle and Conventional Fueled Vehicle Fleets for Last-mile Package Delivery	CT-PSR
UCD	PSR-21-40 TO 052	Debapriya Chakraborty	Tolling lessons learned for road usage charge	CT-PSR
UCD	PSR-21-44	Sarah McCullough	Mobility Justice: A New Framework for Transportation Researchers and Professionals	DOT
UCD	PSR-21-42	Dillon Fitch	A Review of Cargo Bikes and Light Electric Freight Vehicle (LEFV) System Performance, Impacts, and Infrastructure Requirements	DOT

Partner	Project No.	PI	Title	Funding Source
UCLA	PSR-21-50 TO 050	Jiaqi Ma	Evaluating Policies and Incentives to Reduce Vehicle-Miles-Traveled and Air Pollutant Emissions through the Promotion of Telework and Remote Services Theme: Technology for improved mobility/Improving resilience and protecting the environment	CT-PSR
UCLA	PSR-21-51 TO 054	Sylvia Gonzalez	White Paper: Measuring equity in public transit service: LA Metro and the Post-Decree Era	CT-PSR
LBSU	PSR-21-SP92	Tom O'Brien	Caltrans National Freight Conference	CT-PSR

In accordance with METTRANS’ goal to develop innovative workforce development strategies, **CSULB** has commenced the following research projects:

- **Addressing Transportation Construction Workforce Needs Through, Innovative Policies and Practices (Match Project):** At the beginning of 2023 CITT at CSULB received notice that it was awarded a grant through California’s Senate Bill 1 (SB-1) to conduct research on how to address the growing shortage of highway construction workers in both California and in the United States.
- **Southern California Association of Governments (SCAG) Freight Impact Assessment (Match Project):** CSULB CITT is assisting a team led by Fehr & Peers that is assessing the unique freight impacts within six communities in the SCAG (Southern California) region.
- **San Diego Association of Governments (SANDAG) Freight Implementation Strategy (Match Project):** CSULB CITT is assisting a team led by WSP developing a Sustainable Freight Strategy for the SANDAG (San Diego) region.
- **California Air Resources Board (CARB) Study on Workforce Impacts of Zero Emission Freight Mandates (Match Project):** This study, led by CITT in conjunction with the CSULB Dept. of Economics, studied the impacts of the State’s zero emissions freight mandates on port and regional workforce.

Match funding

PSR has the following match funding priority rankings: new funding, match from other existing research projects, and in-kind match. It is important to note that we have met and exceeded our 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	\$15,584,200.00
Caltrans match funding for PSR	\$4,912,339.00
Other match funding for PSR	\$14,370,796.00
Total match funding, all sources for PSR	\$19,283,135.00

The original start dates for the 10 match-funded projects listed below were delayed while Caltrans finalized the extension of the master contract for their funding. All projects listed below in Table 3 now have a start date of July 1, 2023.

Table 3: New Projects

Partner	Project No.	PI	Title	Funding Source
UCI	PSR 22-24 TO 069	Avipsa Roy	Developing a data fusion framework to map active transportation usage patterns in Orange County	CT-PSR
UCI	PSR 22-23 TO 068	Jean Daniel Saphores	How to enhance student outcomes while strengthening transit? An Analysis of LA Metro’s	CT-PSR
UCLA	PSR 22-22 TO 067	Evelyn Blumenberg	Student Transit Programs and Other Modes-to-School in California	CT-PSR
USC	PSR 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	PSR 22-10 TO 065	Andreas Molisch	Deep-learning-based radio channel prediction for vehicle-to-vehicle communications	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	22-08 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
LBSU	22-02 TO 063	Tyler Reeb	Implementing a Community-Based Mobility Lab: Improving Traffic, Protecting Data Privacy	CT-PSR
LBSU	21-SP94	Tom O’Brien	Succession Planning	CT-PSR

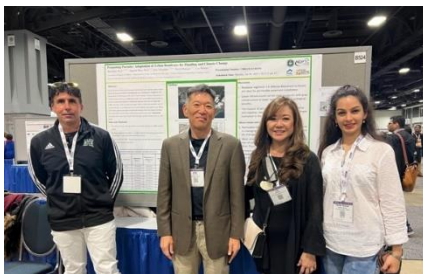
Student opportunities for research

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

- **USC METRANS** sponsored the USC ITE Student Leadership Summit at USC during this reporting period. More information can be found [here](#).
- **USC METRANS** supported 5 USC Ph.D. students to attend TRB in January 2023 with various sources at USC.
- **ITS-Davis** supported student attendance of four UC Davis undergraduate at the **California Transportation Foundation’s 2022 Transportation Education Symposium** in November 2022.
- **ITS-Davis** continued to provide support to the Women’s Transportation Seminar (**WTS**) UC Davis Student Chapter. **UC Davis** had a strong presence at the 2023 PSR Congress at USC campus. Four presentations were made by UC Davis students on PSR projects.
- **UCLA** awarded a total of \$236,609 to 17 MURP and 4 PhD Urban Planning Students.
- As part of **CSULB’s Beach2030** strategic planning program, Tom O’Brien is leading an action team focused on opportunities for the growth of off-campus programs.
- Several scholarships were awarded by the Port of Long Beach (POLB), LA Transportation Club (LATC), and the Intermodal Association of North America (IANA) for participation in **CSULB’s Global Logistics Professional (GLP)** program and IANA student research.
- At **PCC**, a standalone Hazardous Materials class launched in July of 2022 has nearly doubled in student enrollment since the last reporting period.
- Dual enrollment in the Commercial Driver’s License (CDL) theory class for high school students is progressing with implementation put on hold until Spring 2024. 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.
- **NAU** funded five students and two faculty to attend the annual meeting of the Transportation Research Board in Washington D.C., 2 faculty and 12 students to attend the 2022 ITS Arizona Conference, 1 faculty and 6 students to attend the American Traffic Safety Services Association (ATSSA) 2023 Convention and Traffic Expo in Phoenix, AZ, and four students and two faculty to attend the PSR Annual Congress in Los Angeles, CA.

Additional accomplishments

i. Research dissemination



Karl Kim from the UHawaii presented at the 2023 TRB conference.

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 20 papers to the 2023 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>.

USC METRANS hosted two PSR funded METRANS Research Seminars during the reporting period. Recordings of the seminars are available via the below links.

- “Cradle-to-grave Life Cycle Assessment of Zero-emissions Heavy-duty Trucks” with Sue Dexter, a Ph.D. candidate in Urban Planning Development at USC.
<https://www.metrans.org/events/cradle-to-grave-life-cycle-assessment-of-zero-emission-heavy-duty-trucks>
- “Lessons learned in my desperate attempt to make it safe to cycle on American roads” with Dr. Kari Watkins, Associate Professor in Civil & Environmental Engineering at UC Davis.
<https://www.metrans.org/events/lessons-learned-in-my-desperate-attempt-to-make-it-safe-to-cycle-on-american-roads>

At UC Davis, the ITS-Davis Friday Seminars were supported by PSR. Recordings of the seminars are available via the below links.

- “Parking Cash Out” 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” with Dr. Carlos Paternina, Assistant Professor, Management Information Systems Department, Diego State University.
<https://its.ucdavis.edu/seminar/october-28-2022/>
- “Planning for Equitable Micromobility” with Dr. Anne Brown, Assistant Professor, School of Planning, Public Policy, and Management, University of Oregon.
<https://its.ucdavis.edu/seminar/january-27-2023/>
- “Spatial analytics approaches for equitable transportation planning” with Dr. Avipsa Roy, Assistant Professor, Department of Urban Planning and Public Policy, UC Irvine.
<https://its.ucdavis.edu/seminar/february-10-2023/>



San

UC Davis researchers also presented on their PSR work at the February 7, 2023, STEPS+ Seminar in Davis. The talk, titled “Transportation and Neighborhood Priorities of Californians With Disabilities: Focus Group Findings,” highlighted findings from the recently completed PSR Caltrans project, “Cross-Sectional Study of the Effects of Disability on the Mismatch of Desires versus Choices for Transportation Modes and Residential Location.”

CSULB held a webinar on November 16, 2022 to convene industry, education, and government partners in the launch of a Talent Pipeline pilot program, as a “proof-of-concept” for this project. This pilot program will prepare engineering students at CSULB for in-demand knowledge, skills, and abilities related to future Intelligent Transportation Systems (ITS) occupations. The Talent Pipeline project was funded through the California State University Transportation Consortium (CSUTC) using SB1 funding.

At **NAU**, research projects funded by PSR were presented at the following venues: ITS Arizona Annual Conference, October 2022; Transportation Research Board Annual Meeting, January 2023; and PSR Annual Congress, March 2023. **NAU** hosted numerous in-person seminars during the reporting period. Some examples below:

- Tom Bleasdale of TOMAR gave a presentation which included a live demonstration of TOMAR's Strobecom II emergency vehicle pre-emption equipment.
- Dr. Brendan Russo gave a presentation about ongoing transportation research projects at NAU funded by the Oregon DOT, the City of Scottsdale, and the City of Phoenix.
- Anne Dunno from Flagstaff Mountain Line gave a presentation about how Mountain Line functions, their integrations with other forms of transit, and the challenges they face.
- Emmanuel James, a traffic engineer at the Washington State Department of Transportation (and NAU alumnus), presented on new and ongoing traffic safety-related projects at WSDOT.



The **University of Hawaii** hosted three webinars on various transportation related topics during the reporting period: presenters Dr. Karl Kim, Farnaz Kaviari, David Marasco, and Juli Chun presented on TRB23 Takeaways and More; Presenters Dr. Suwan Shen, and Lisa Webster presented on Social Vulnerability Indices and Frameworks; Presenters Allison Hardin, AICP and Melissa Blum presented on Nature Based Solutions for Mitigating Hazards. Examination of NDPTC's training course MGT-484.

Media coverage

PSR researchers are regular contributors to various national media outlets. At CSULB, student researcher Kieu Anh V was interviewed by the U.S. Chamber of Commerce as part of the 2022 Next Gen Scholars Spotlight on December 6, 2022.

https://www.linkedin.com/feed/update/urn:li:activity:6957728187267063808?utm_source=linkedin_share&utm_medium=member_desktop_web

PSR researcher Geoff Boeing's (USC) recently published paper, "Local Inequities in the Relative Production of and Exposure to Vehicular Air Pollution in Los Angeles" was featured twice in the L.A. Times in early March. That research was funded by PSR through the research project PSR 20-19, "Race, Class, and the Production of and Exposure to Vehicular Pollution in Los Angeles." On March 7, 2023, the L.A. Times published an article titled, "L.A. residents who drive less are exposed to more air pollution, study finds." In this article, L.A. Times data reporter, Terry Castleman, summarizes much of Boeing's work on the relationship between the production of and exposure to vehicular air pollution within low-income minority groups and wealthy suburban communities in Los Angeles. Two days later, L.A. Times staff writer, Sammy Roth, published an article titled, "How white and affluent drivers are polluting the air breathed by L.A.'s people of color" wherein he contemplates his own complicity in this blaring inequity of vehicular air production and exposure. The story was originally published in Boiling Point, an L.A. Times weekly newsletter about climate change and the environment, particularly across California.

ii. **Plans for next reporting period**

The next reporting period is April 1, 2023 through September 30, 2023. **We anticipate completing at least 10 projects during the next reporting period throughout the consortium.** A few projects have been delayed due to COVID and our Caltrans match funded projects had delayed starts while Caltrans extended their master contract with PSR. For that reason, we have requested and received a no-cost extension to Sept. 30, 2024. We will use that time to complete the PSR FAST Act center research agenda.

University of Hawaii will undertake two key tasks in the next reporting period:

- Complete existing internal grants and UTC reports for these projects as well as pursue peer-reviewed publications for the following project: Rapid and Accurate Assessment of Road Damage by Integrating Data from Mobile Camera Systems (MCS) and Mobile LiDAR Systems (MLS): Can we get the best of both worlds? (PI – Qi Chen, Ph.D.)
- Work on a proposal titled, “Lessons from hydrogen fueled bus operations” for a new internal grant focused on the evaluation, integration, safety and security of hydrogen fuel transport, fueling operations, and fuel cells for trains in the United States.

UC Davis will commence two Caltrans-funded PSR projects. **ITS-Davis** expects to finalize and publish 2 reports, 1 white paper, and 3 research briefs during the next reporting period. PSR funds will continue to be used to support ITS-Davis Friday Seminars during the next reporting period. Thus far, one seminar has been identified for the Spring 2023 quarter. **UCLA** will continue working on Faculty Research Projects funded under the RFP program as well as work on publishing 10 additional reports and briefs from graduating MURPs and PhDs and on awarding fellowships to incoming masters and continuing doctoral students.

PCC will continue to engage with Arizona Commerce Authority’s Institute for Automated Mobility. **NAU** plans to continue supporting undergraduate and graduate students through the following programs: paid internships and fellowships (which result in peer-reviewed presentations and publications), support for conference travel, and outreach activities. Additionally, **NAU** is finalizing the funding for three fellows for end of this academic year (they will begin soliciting new fellows once start date of the reauthorization is certain) and will send students and faculty to the ITE Mountain District Meeting, the Arizona ITE/IMSAs Spring Conference, and ITS Arizona.

CSULB is looking forward to commencing the Caltrans Succession Planning project. The purpose of this project is to conduct research on previous and current succession planning strategies undertaken by state departments of transportation (DOT)s and other organizations to be used by Caltrans.

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. In line with PSR’s educational goals listed in the previous SAPR, **METRANS** hosted the PSR Annual Congress on March 17 and 18, 2023, on the USC campus. The purpose of the conference is to conduct a multidisciplinary program of research, education, workforce development, and technology transfer aimed at improving the resiliency of transportation systems and the mobility of people and goods throughout the region. The

Congress welcomed the presentation of transportation research and best practices by faculty, researchers, students, and practitioners. Over 50 presentations took place during concurrent sessions. The full program can be found [here](#). All presentation research abstracts are available to view or download [here](#).

The event commenced with a luncheon celebration of former **METRANS** director of 20 years, Genevieve Giuliano. USC alumni, faculty, and industry collaborators all came together to celebrate Dr. Giuliano's esteemed professorship and directorship. CITT executive director, Tom O'Brien, convened a panel with a few of Dr. Giuliano's current and former students including SANDAG's Chief Executive Officer, Hasan Ikhata, and LA Metro's interim Federal and State Policy Executive Officer, Michael Cano. They discussed Dr. Giuliano's profound impact on both their professional and personal lives as well as her many accomplishments.

In collaboration with Caltrans and new this year, PSR convened two hybrid format panels which focused on emerging data needs in California. Participants in the first panel session discussed data aggregation and standardization, particularly within the context of LADOT's (in partnership with LA Metro) new Mobility Wallet pilot program. The second panel session focused on novel ways to collect travel data and the gaps in traditional travel data collection methods: active travel, and freight/ goods movement over the ground transportation system. Both sessions had 15- 20 in person attendees and approximately 40 virtual participants. Recordings of both sessions may be found [here](#) and [here](#).



Pictured above: METRANS Director, Marlon Boarnet, and CSULB's CITT Executive Director, Tom O'Brien, honor former METRANS director Genevieve Giuliano at the 2023 PSR Congress on March 17.

Student Fellowship Program:

In the fall of 2022, **UCLA** awarded a total of \$236,609 to 17 MURP and 4 PhD Urban Planning students, both incoming and continuing, as part of its annual fellowship program that supports faculty-supervised student research for client agencies. Clients include California ARB, LA Metro, SF Bay Area MTC, So Cal Assoc of Govts, and many others. Since 2019, four of these projects have won national awards from the Council of University Transportation Centers.

Student Awards:

Five PSR students from various university transportation centers within PSR's consortium were selected as winners of the 2022 UTC Outstanding Student of the Year competition and PSR Student of the Year competition. **Julene Paul** (UCLA), Ph.D. in Urban Planning and Policy, was selected as **UTC Student of the Year**. **Qinhua Jiang** (UCLA), Ph.D. in Transportation Engineering, was selected as **PSR Doctoral Student of the Year**. **James Reuter** (CSULB), Master's in Philosophy, was selected as **PSR Masters Student of the Year**. **Anthony Eschen** (NAU), B.S. in Civil Engineering, was selected as **PSR Undergraduate Student of**

the Year. Finally, **Calvin Bragg** (CSULB), Global Logistics Specialist student, was selected as **PSR Professional Development Student of the Year**.

UCLA Student Awards: During this reporting period, **Rebecca Swint**, MURP student; **Quinn Haaga**, MURP student; **Keenan Do**, MURP student, PhD student; **Samuel Speroni**, PhD student; **Julene Paul**, PhD student; **Tamika Butler**, PhD student; and **Madeline Wander**, PhD student all received the Dwight David Eisenhower Transportation Fellowship Program award.

Three UCLA urban planning students were awarded national transportation research awards by the Council of University Transportation Centers at a Jan. 7 ceremony.

Miriam Pinski, Ph.D. '22 was awarded the Charley V. Wootan Memorial Award for best doctoral dissertation in the field of transportation policy and planning. See op Ed in SF Chronicle. **Nataly Rios Gutierrez**, MURP '22 received the Neville A. Parker Award for best non-thesis master's project in transportation planning.



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:

Academy of Global Logistics (AGL): CITT launched a new 12th grade CTE capstone class as part of its work for the Port of Long Beach Academy of Global Logistics on February 9, 2023. The capstone allows graduating seniors to work in teams over the course of an entire semester to solve the supply chain problems of a fictitious solar company.

METRANS K-12 Futures in Transportation (FIT) Program: provided 30 participating students from the USC Hybrid High School with various enrichment opportunities. The FIT Program was funded by a generous grant by the USC Good Neighbors Program. Over the course of the program, which ran from early February through early March, students had opportunities to participate in college classes, lectures, and activities at USC.



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.



At **PCC**, collaboration with the Adult Basic Education and Career Counseling team continues to assist ESL students with the CDL program. The Integrated Basic Education and Skills Training (IBEST) model will be a valuable resource to assist ESL students in earning their CDL credential. This is the first language learner iBEST model for PCC. ABECC's instructional staff observed a CDL behind the wheel class in person in March of 2023 (see pictures of students above).

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.

The team at **PCC** is engaging autonomous vehicle employers for the continuous improvement of their current certificate program. The team at **CSULB** is pivoting their responsibility of the Caltrans Tribal Technical Assistance Program (TTAP) grant given the dissolution of the National Indian Justice Center (NIJC). CSULB will develop and coordinate a Peer Exchange for the Western Region NLTAPA.

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 this past reporting period, USC METRANS and CSULB continued our newsletters, with newsletters in October and November, 2022 and January, 2023. The monthly newsletters are an example of transformative research. The newsletters cover research briefs, events and more, for example, Professor Carlsson's research which was covered in the January newsletter. METRANS News also summarizes METRANS research, education, and outreach, including coverage of NCST- and PSR-funded projects and activities. It is distributed to 2201 scholars, students, staff at Caltrans, USDOT, UTCs and faculty throughout the U.S., to federal, state, and local public and private agencies, and to industry. The average open rate for all the newsletters for this reporting period was

27%, which is generally consistent with Constant Contact’s overall average of 35%. The range for a good open rate is 15-25%, and the newsletter’s open rate slightly exceeds this range. The monthly newsletters are archived [here](#).

The focus of information dissemination for both **METRANS** and **CITT** emphasizes **LinkedIn** over other forms of social media. Engagement rates grew by 30% during March 2023. With the launch of the CA LTAP Center at CITT, efforts took place to launch a LTAP social media presence. CA LTAP has established a regular email newsletter and social media posting schedule and launched a LTAP website in the fall of 2022.

Mobility Matters Podcast (CSLUB): *Mobility Matters* is a podcast series dedicated to addressing mission-critical issues facing the professionals who design, develop, operate, and maintain mobility systems. Currently scheduled podcasts during the next reporting period will feature the work of the late Southern California urban scholar Mike Davis.

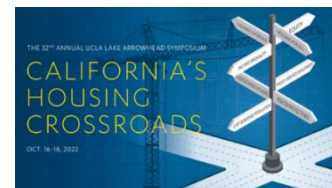
NAU completed a community outreach event in February 2023 at the Flagstaff Community Library as part of their Science Café series. The description of this event is provided to the right. Finally, AZTrans faculty have volunteered to provide in-school presentations to local K-12 students every academic year.

At **PCC**, Chancellor Lee Lambert, President David Dore, Vice Chancellor Dr. Ian Roark, Dean Amanda Abens and Missy Blair (PCC) attended a ribbon cutting ceremony for a new facility at TuSimple’s Tucson location to represent the collaboration between PCC and TuSimple. Arizona Governor Doug Ducey was present at the ribbon cutting ceremony.

Transfers Magazine: *Transfers Magazine* published its 10th issue in January 2023, consisting of three articles and an opinion piece from UC Davis and UCLA scholars. The website www.transfersmagazine.org, which also features regularly updated blogs with transportation-related news, research and events, had more than 20,000 page views during this six-month period, which is a slight decrease to the previous six-month period. Editing is currently underway for the next issue set to release in June/July 2023. We’ve also begun recruiting articles for the December 2023 issue.



UCLA Lake Arrowhead Transportation - Land Use - Environment Symposium: UCLA hosted the annual UCLA Lake Arrowhead Symposium on the Transportation - Environment - Land Use Connection which took place October 16-18, 2022. For the first time in three years, the 2022 UCLA Arrowhead Symposium reconvened at its eponymous home at the [UCLA Lake Arrowhead Lodge and Conference Center](#) in Lake Arrowhead, California and was attended by 189 guests.



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.



InterActions LA: From Housing Crossroads to Transportation Connections

UCLA began planning the annual InterActions LA Conference alongside the UCLA Lewis Center for Regional Policy Studies. Back in person at The California Endowment, InterActions will take place on April 28, 2023 and will include approximately 120 guests including those from academia, nonprofits, public agencies, and government.

PCC CTT hosted a regional meeting for the National Association of Publicly Funded Truck Driving Schools (NAPFTDS) on January 25-27, 2023. On January 26th, Missy Blair and Jay Lau, adjunct faculty for the autonomous vehicle driver and operations specialist certificate, presented on, “Autonomous Trucking Conversation: where we’ve been, where we are, and where we are going...” This also resulted in an invitation for Mr. Lau to present at NAPFTDS annual conference on March 28th, 2023 on the same topic/presentation title.

i. Outreach plans for the next reporting period

METRANS will hold its next **Advisory Board meeting** on November 3, 2023, tentatively. The *Transfers Magazine* was released in January 2023, <https://transfersmagazine.org/>.

PCC will continue to engage in speaking and outreach opportunities to disseminate results of various programming. **UCLA** will begin planning the UCLA Lake Arrowhead Symposium which will return to Lake Arrowhead, CA on October 15-17, 2023. Over at **CSULB**, **CITT** will be revising the classes for the Global Logistics Professional (GLP) program and updating the capstone project to reflect rapidly changing industry trends. The new course structure will launch with the July 2023 cohort. **NAU AZTrans** faculty have volunteered to provide in-school presentations to local K-12 students every academic year.

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

Over the course of the grant, these are among the entities who provided 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 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.

PCC has undertaken outreach with their Business Development partners and continue to train residents at the Gospel Rescue Mission. They have had one successful graduate thus far and two more pending for April and May 2023.

NAU has established a new task order to provide guidance to the City of Phoenix on implementation of LPIs (Leading Pedestrian Intervals) and other signalized intersection pedestrian treatments across the city. NAU has also continued efforts to establish an IGA with the City of Scottsdale since they have completed their first project funded by them in 2022.

CSULB collaborated with the Long Beach Unified School District and Juan Rodriguez Cabrillo High School during the reporting period. Additionally, CSULB worked with the National Local Technical Assistance Program Association (NLTAPA) on collaborative technical transfer and local assistance in addition to event coordination.

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 **19 peer-reviewed** journal publications and **23 presentations**. For a list of the publications, conference papers, and presentations, see [Appendix A](#). See [Table 1](#) for a list of the 30 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>
- PCC's Center for Transportation Training has a facebook, instagram and twitter page (@pcctruckdriver for all).

B. New methodologies, technologies, or techniques

Cyrus Shahabi's (USC) project, "Freight Volume Modeling on Major Highway Links" resulted in the creation of computer vision algorithms to count specific trucks by class. This research will be useful to policymakers and transportation planners to achieve effective freight management, as well as to improve the well-being of citizens.

Cyrus Shahabi and Seon Ho Kim's (USC) project titled, "Evaluating Accessibility of Los Angeles Metropolitan Area Using Data-Driven Time-Dependent Reachability Analysis" resulted in the synthetic vehicle trajectory dataset and reachability map construction—will be helpful in evaluating accessibility of city blocks for transport systems over a large area, essential for policymakers for effective city planning as well as to improve the well-being of citizens.

C. Other products

Andreas Molisch (USC) created a method for channel sounding: Spinning directional antenna in centimeter and millimeter wave bands; US Patent application US202163137320P. The patented sounder design aspect of the project provides a novel method of extracting double-directional channel models at mm-wave frequencies and can be extended to even higher frequencies.

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.

As mentioned previously, **Geoff Boeing's (USC)** research on the relationship between the production of and exposure to vehicular air pollution within low-income minority groups and wealthy suburban communities in Los Angeles was featured twice in the L.A. Times during the reporting period. This media coverage greatly broadens the impact of Boeing's work as agency officials and the public work to understand the role of transportation infrastructure as it relates to structural barriers.

UC Davis has findings from the near-complete project, "Tolling Lessons Learned for Road Usage Charge," will inform California's plans to introduce a Road User Charge (RUC) Program. The insights obtained from the analysis provides invaluable lessons learned in terms of the functioning of the tolling systems. This is a major takeaway for RUC in terms of designing a program that has clear objectives of revenue generation for funding infrastructures, while allowing enough flexibility to handle regional differences.

NAU project with the City of Scottsdale resulted in the first Crash Modification Factors (CMFs) for the left-in left-out median treatment. The CMFs developed from this project were recently (during a previous reporting period) published on the FHWA CMF Clearinghouse (https://www.cmfclearinghouse.org/study_detail.cfm?stid=643). ADOT is currently using the results to implement left-in left-out treatments throughout the state.

Andrii Parkhomenko's (USC) project, "Spatial Implications of Telecommuting in the United States", documented several stylized facts about telecommuting before the pandemic. The main contribution is to provide a quantitative framework that allows studying effects of spatial policies that account for the ability of workers to work both on-site and from home.

Genevieve Giuliano's (USC) project, "The Potential for Ride-Matching in Disadvantaged Communities," analyzed the role that communicate cooperative ride-matching could play in increasing access in Southeast Los Angeles. METTRANS has discussed follow up pilot or demonstration programs with the South Coast Air Quality Management District, elected officials, and community members.

Scholarly Awards:



Donald Shoup (UCLA), distinguished research professor of urban planning, will be honored as the 2023 Seaside Prize recipient at an annual prize weekend in Seaside, Florida, in February for his ground-breaking work on parking policy. The Seaside Prize recognizes individuals who have changed the way we live through design and thought innovation.

5. Impacts

PSR defines an impact as that which influences the transportation system, or society in general, such as reduced fatalities, decreased capital or operating costs, community impacts, or environmental benefits.

The journey of generating outputs and impacts is uncertain and happens over time. Our contributions are judged by the PSR Advisory Council and measured as significant or not significant. PSR's research products are made [available to the public](#).

The **USC** project "Making HOT lanes benefit every traveler---design, pricing, and analysis" research led to new design suggestions for HOT lanes and published on TRB conference proceedings. The **USC** project, "Evaluating Accessibility of Los Angeles Metropolitan Area Using Data-Driven Time-Dependent Reachability Analysis", devised 1) imputation methods to handle temporally missing values for different lengths of imputing gaps, and 2) interpolation methods to estimate the traffic conditions near locations where sensor data is not available.

The PSR project led by **UC Davis** PI Alan Jenn, "Charging Infrastructure Development for Transportation Network Company Electrification" informed efforts by the California Energy Commission to meet the infrastructure requirements spelled out in AB 2127. Results from the project are combined with efforts by NREL in their AB 2127 staff report (<https://efiling.energy.ca.gov/getdocument.aspx?tn=236237>).

The **UCLA** project "Measuring Equity in Public Transit Service: LA Metro and the Post-Decree Era" revisited the landmark consent decree of 1996 that limited fare increases, expanded bus services in Los Angeles, and negotiated other community benefits. Over the past 30 years, the consent decree has been used to challenge LA Metro policies and win improvements to the Metro's transit system for low-income riders.

Impacts from **PCC** include: increased public awareness of autonomous trucking; collaborations formed to move forward with bringing younger learners into the industry through dual enrollment efforts; collaborations formed to broaden network of autonomous vehicle employers through; and continued progress toward a language learner contextualized learning model for CDL applicants, decreasing barriers to transportation-related jobs.

6. Changes/Problems

Changes in approach and reasons for change

Nothing to report.

Problems and delays encountered during the reporting period

Continued delay in the extension of the PSR Caltrans parent agreement caused subsequent delays in getting new ITS-Davis PSR Caltrans task orders executed. Start dates for these projects were delayed from January 1, 2023, to July 1, 2023. These task orders provide cost-share from the state DOT for UC Davis's PSR federal grant. UCLA is waiting on a notice to proceed for Caltrans-funded project Student Transit Programs and Other Modes-to-School in California. This is expected in June 2023.

Change of primary performance site location

Nothing to report.

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.

Publications

Peer-reviewed journal publications

1. Anastasiou, C., Kim, S. H., & Shahabi, C. *Generation of Synthetic Urban Vehicle Trajectories*. IEEE International Conference on Big Data (BigData 2022), Dec. 2022.
2. Anastasiou, C., Kim, S. H., & Shahabi, C. *Generation of Synthetic Urban Vehicle Trajectories*. IEEE International Conference on Big Data (BigData 2022), Dec. 2022.
3. Anastasiou, C., Zhao, J., Kim, S. H. & Shahabi, C. *Data-driven traffic index from sparse and incomplete data*. IEEE Transactions on Intelligent Transportation Systems, 2022.
4. Boarnet, M., Mallette, Z., and Clemens, P. (2021, March 1). Dockless Scooter Travel: A Land Use Model with Implications for California (Report No. PSR-19-02). Pacific Southwest Region University Transportation Center. <https://www.mettrans.org/news/uscs-marlon-boarnet-presents-land-use-modelling-for-dockless-scooter-travel-patterns>
5. Boeing, G., Lu, Y., & Pilgram, C. 2023. Local Inequities in the Relative Production of and Exposure to Vehicular Air Pollution in Los Angeles. *Urban Studies*, published online ahead of print. doi:10.1177/00420980221145403
6. Chen, P., Ioannou, P., and Dessouky, M. (2021). Mixed Freight Dynamic Routing Using a Co-Simulation Optimization Approach. *IEEE Transactions on Intelligent Transportation Systems*, 23(8), 12833-12845. doi: 10.1109/TITS.2021.3117931.
7. Chen, P., Ioannou, P., and Dessouky, M. (2022). Distributed Co-Simulation Optimization Approach for Freight Dynamic Routing [under review]. *IEEE Transactions on Intelligent Transportation Systems*
8. Delventhal, M. J., & Parkhomenko, A. (2022). Spatial Implications of Telecommuting. Working Paper.
9. Gao, H., Gu, W., Zhang, H.M., & Dessouky, M.M.M. (2023). Morning Commute Problem with Congestion-free HOT Lanes. Conference Proceedings of the 2023 TRB National Meeting, Washington D.C.
10. Giuliano, G., M. Boarnet, A. O'Reilly, W. Zhou, J. Collins (2023) The Potential for Ride-matching in Disadvantaged Communities. Report PSR-21-01. Los Angeles: Pacific Southwest Region University Transportation Center
11. Giuliano, G., M. Boarnet, M. Jaller, W. Franco, R. Binder, S. Dexter, J. Fang, D. Moctezuma, A. Pahwa, M. Randazzo, B. Wang (2022) Improving Environmental Justice and Mobility in Southeast Los Angeles, Final Report PSR-18-SP91. Los Angeles: Pacific Southwest Region University Transportation Center.
12. Hofer, M., Loeschenbrand, M.D., Blumenstein, J., Groll, H., Zelenbaba, S., Rainer, B., Bernado, L., Vychodil, J., Mikulasek, T., Zochmann, E., Sangodoyin, S., Hammoud, H., Schrenk, B., Langwieser, R., Pratschner, S., Prokes, A., Molisch, A.F., Mecklenbraeuer, C.F., & Zemen, T. (2021). Wireless Vehicular Multiband Measurements in Centimeterwave and Millimeterwave Bands. *IEEE PIMRC 21*, 836-841

13. Hu, S., Dessouky, M.M., Uhan, N., & Vayanos P. (2021). Cost-Sharing Mechanism Design for Ride-Sharing. *Transportation Research, Part B: Methodological*, 150, 410-434
14. Jafari, S. and Savla, K. (2022). A Decentralized Feedback Approach for Flow Control in Highway Traffic Networks. *Automatica*, 146.
15. Jamme, Hue-Tam, Rodriguez, Janet, Bahl, Deepak and Banerjee, Tridib. (2019). A twenty-five-year biography of the TOD concept: From design to policy, planning, and implementation. *Journal of Planning Education and Research*. 39(4): 409-428.
16. Jenn, A. (2023) Charging forward: deploying EV infrastructure for Uber and Lyft in California. *Transportation*. <https://doi.org/10.1007/s11116-023-10381-5>
17. Pooladsanj, M., Savla, K., & Ioannou, P. A. (2022). Vehicle Following On A Ring Road Under Safety Constraints: Role of Connectivity and Coordination. *IEEE Transactions on Intelligent Vehicles*, 8 (1), 628-638. 10.1109/TIV.2022.3149972
18. Pooladsanj, M., Savla, K., & Ioannou, P.A. (2023). Ramp Metering to Maximize Freeway Throughput under Vehicle Safety Constraints. *Transportation Research Part C: Emerging Technologies*, under review.
19. Zhu Y. and Savla, K. *Information Design in Non-atomic Routing Games with Partial Participation: Computation & Properties*. *IEEE Transactions on Control of Network Systems*, 2022.

Other publications

Conference papers

20. Boarnet, M., Rodnyansky, S., Austin, B., Commandon, A, & Wang, B. (2021, September 11). Measuring the Evolution of California's Central Valley: Demographics, Supercommuting, and Fiscal Stress. American Planning Association California Conference, Riverside, California, United States. <https://sites.usc.edu/ca-regional-impact/>.

Presentations

21. Banerjee, T. & Jamme, H. (2021, June 9-10). Visions for Transit Communities in Regeneration of Territories: Can they Include Low Income Residents? SMART CITY CASABLANCA SYMPOSIUM 2021, Casablanca, Morocco.
22. Boarnet, M. (2023, January 8-12). Commuting During and after COVID-19: The Impact of COVID-19 on Shared Mobility and Extreme Commuting in the Bay Area - Central Valley," Marlon Boarnet, Bonnie Wang, Seva Rodnyansky, and Andre Comandon, Transportation Research Board 2023 annual, Washington, D.C., United States.
23. Boarnet, M., Mallette, Z., and Clemens, P. (2022, February 17-20). Dockless Scooter Travel: A Land Use Model with Implications for California. In Marlon Boarnet, Zakhary Mallette, and Clemens Pilgram (Principal Investigator and Student Researchers), Western Regional Science Association Annual Conference, 2022, Big Island, Hawaii, United States.
24. Chan, T. C. M. (2023, March 17-18). Road Pricing in Los Angeles County: Understanding Stakeholder Views and Vision for Transportation Sustainability. 2023 PSR Congress, University of Southern California, Los Angeles, CA.
25. Chakraborty, D. (2022, November 7-8). Emission Implications of Transitioning to Road User Charges. University of California, Davis, Institute of Transportation Studies, The Future Mobility, Automation, and Transit Research Workshop, Davis, CA.

26. Circella, G., Handy, S., Barbour, E., and Sun, R. (2023, January 8-12). Post-COVID Scenario Futures: a California Case Study." Transportation Research Board's 102nd Annual Meeting, Lectern Session 3117: We Made It!: Time to Plan for Life After COVID-19. Washington, DC.
27. Dessouky, M. (2023, January 12). Dynamic Pricing and Toll Charging for Ridesharing Platforms in High-Occupancy Toll Lane Systems. National Meeting of INFORMS, Indianapolis, IN, United States.
28. Flynn, J. (2023, March 17-18). Transportation and Neighborhood Priorities of Californians with Disabilities: Focus Group Findings." 2023 PSR Congress, University of Southern California, Los Angeles, CA.
29. Flynn, J. (2023, February 7). Transportation And Neighborhood Priorities Of Californians With Disabilities: Focus Group Findings. University of California, Davis, Institute of Transportation Studies Sustainable Transportation Energy Pathways (STEPS+) Seminar Series, Davis, CA.
30. Flynn, J., G. Circella, & P. Venkataram. (2022, December 7-8). Focus Group on Transportation for Californians with Disabilities. University of California, Davis, Institute of Transportation Studies Sustainable Transportation Energy Pathways (STEPS+) Fall 2022 Research Symposium, Davis, CA. <https://ucdavis.box.com/s/q04x68ie3rklvqggmtyton1v7a3atagd>
31. Flynn, J., G. Circella, & P. Venkataram. (2022, November 7-8). Focus Group on Transportation for Californians with Disabilities." University of California, Davis, Institute of Transportation Studies The Future Mobility, Automation, and Transit Research Workshop, Davis, CA.
32. Flynn, J., G. Circella, & P. Venkataram. (2023, January 8-12). Transportation and Neighborhood Priorities of Californians With Disabilities: Focus Group Findings." Transportation Research Board's 102nd Annual Meeting, Poster Session 3207: Innovation in Accessible Transportation and Mobility. Washington, DC.
33. Giuliano, G. and Y. Lu, Analyzing impacts of major events: A case study of the LA Coliseum, PSR Speaker Series, 2021
34. Giuliano, G. and Y. Lu (2021) "Analyzing traffic impacts of planned major events". Transportation Research Record. <https://doi.org/10.1177/0361198121998710>. Also presented at the 2021 TRB Annual Meeting. Winner of best paper prize, TRB Committee ACP10
35. Giuliano, G., Y. Lu, A. Coombes, S. Soni, Managing impacts of major events: A case study of the LA Coliseum, presented at ACSP conference 2022
36. Gu, W., Pang, J.S., and Zhang, M. (2022). Equilibrium Analysis for Ridesharing and Ride-hailing Platforms in A Coupled Morning-evening Commute Framework. National Meeting of INFORMS 2022, Indianapolis, IN, United States.
37. Jamme, H., Eisenlohr, A., Bahl, D., and Banerjee, T. (2021, October 21-23). Ride-hailing and First/Last Mile Mobility: Enhancing Transit Access for Disadvantaged Populations in a Suburban Community [Pre-Organized Session: New Mobilities, Transportation Equity, and Spatial Justice] Annual ACSP Conference 2021, Virtual, Florida, United States.
38. McCullough, S., & T. Smith. (2023, March 23-27). Toward 'a Wise, and Sacred Movement': Mobility Justice as Movement Work." American Association of Geographers Annual Meeting (AAG 2023), Denver, CO. <https://www.aag.org/wp-content/uploads/2023/03/AAG-2023-PDF-program.pdf>
39. McCullough, S. (2023, January 8-12). Performative vs. Authentic Equity Work: An Assessment of Current Practices in Transportation Planning." Transportation Research Board's 102nd Annual Meeting, Lectern Session 4017: Equity in Past and Present Practice.

40. Nguyen, A. (2023, March 17-18). Barriers to mobility, barriers to unity: Freeway construction and racialized displacement in San Jose, CA. 2023 PSR Congress, University of Southern California, Los Angeles, CA.
41. Shahabi, C., Giuliano, G., & Nocera, L. (2023). Freight Volume Modeling on Major Highway Links. In Cyrus Shahabi, Genevieve Giuliano, and Luciano Nocera, [Novel travel data collection approaches for freight and active travel data] Pacific Southwest Region (PSR) University Transportation Center Annual Congress 2023, Los Angeles, CA, United States.
42. Smith, T., & M. Hsu. (2023, March 17-18). Toward ‘a Wise and Sacred Movement’: Mobility Justice as Movement Work. 2023 PSR Congress, University of Southern California, Los Angeles, CA.
43. Venkataram, P. (2022, November 7-8). Transportation Challenges Facing Adults with Disabilities in California. University of California, Davis, Institute of Transportation Studies The Future Mobility, Automation, and Transit Research Workshop, Davis, CA.

Research Reports

44. Flynn, J. A, Circella, G., & Venkataram, P. S. (2023). Disability, Transportation, Activity Performance, and Neighborhood Features in California: Conducting a Focus Group and Designing a Survey. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G29K48JZ> Retrieved from <https://escholarship.org/uc/item/0340w08s>. Research Report. Published by institute. Acknowledges federal support.
45. Flynn, J. A, Circella, G., & Venkataram, P. S. (2023). People with Disabilities in California Want Density, Improved Streets and Buses to Help Pedestrians, Bus Riders, and Car Drivers. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G2G44NMG> Retrieved from <https://escholarship.org/uc/item/149741f5>. Research Brief. Published by institute.
46. Ioannou, P., & Monteiro, V. (2022). Highway Safety and Traffic Flow Analysis of Mixed traffic with Connected and Non-Connected Vehicles (Report No. PSR-20-09) Pacific Southwest Region UTC. https://www.mettrans.org/assets/research/psr-20-09_final_report.pdf.
47. Loukaitou-Sideris, Anastasia, Susan L. Handy, Paul M. Ong, Jesus M. Barajas, et al. (2023). Four Case Studies on the Effects of Freeway Siting on Neighborhoods of Color. Pacific Southwest Region University Transportation Center, Research Brief. <https://www.mettrans.org/assets/research/four%20case%20studies%20on%20the%20effects%20of%20freeway%20siting%20on%20neighborhoods%20of%20color.pdf>
48. Loukaitou-Sideris, Anastasia, Susan L. Handy, Paul M. Ong, Jesus M. Barajas, et al. (2023). The Implications of Freeway Siting in California: Four Case Studies on the Effects of Freeways on Neighborhoods of Color. Pacific Southwest Region University Transportation Center, Research Report. <https://www.mettrans.org/assets/research/the%20implications%20of%20freeway%20siting%20in%20california.pdf>
49. Pang, Jong-Shi, Michael Zhang, Maged Dessouky, and Wei Gu. (2023). Modeling multi-modal mobility in a coupled morning-evening commute framework that considers deadheading and flexible pooling. Pacific Southwest Region University Transportation Center, Research Report. https://www.mettrans.org/assets/research/psr%2021-04_pang.pdf