



Semi-Annual Progress Report #8

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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.

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 93. USC has 40 projects, CSULB has 3, UCLA has 8, UCD has 16, UCI has 13, UH has 5, and NAU has 1. Additionally, we have 4 regional projects at UC

Santa Barbara and 3 at UC Riverside. PSR partners have completed a total of 36 research projects and white papers. PSR completed 9 projects and issued 9 reports during this reporting period (see [Table 1](#)).

Table 1: Projects completed and reports published during current reporting period

Partner	Project No.	PI	Title	Funding Source
USC	19-06	Ketan Savla	Implications of Information Structure in Control of Urban Traffic Networks	Caltrans
UCD	18-20	Alan Jenn	White paper: Charging Forward: Deploying Electric Vehicle Infrastructure for Uber and Lyft in California	DOT
USC	18-08	Andreas Molisch	Measurement and Modeling of Broadband Millimeter-Wave Signal Propagation Between Intelligent Vehicles	DOT
UCD	18-21	Michael Zhang	Get More Out of Variable Speed Limit Control: An Integrated Approach to Manage Traffic Corridors with Multiple Bottlenecks	DOT
UCD	18-25	Susan Pike	Davis Amtrak Station Pilot Project Evaluation: Informing Long Term Solutions to the Davis Amtrak Station Access Barriers	Caltrans
USC	18-04	Marlon Boarnet	Residential Moves Into and Away from Los Angeles Rail Transit Neighborhoods: Adding Insight to the Gentrification and Displacement Debate	Caltrans
UCI	18-16	Scott Samuelson	Life Cycle Assessment of Environmental and Economic Impacts of Deploying Alternative Urban Bus Powertrain Technologies in the South Coast Air Basin	SB1
UCD	18-22	Miguel Jaller	Spatio-Temporal Analysis of Freight Patterns in Southern California	Caltrans
USC	19-08	Andrii Parkhomenko	Optimal Density Restrictions in the Los Angeles-Long Beach CSA	Caltrans

Requests for Proposals (RFPs)

PSR issued a coordinated RFP 5 in early 2021 and received 40 proposals. The proposals were sent out for academic and practitioner review during the 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. 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.

New projects

A total of 3 new projects were started during the reporting period. [Table 2](#) lists the new projects and their funding sources.

Table 2: New research projects initiated during current reporting period

Partner	Project No.	PI	Title	Funding Source
UCI	20-31	R. Jayakrishnan	A Smart Mobility Platform with Fair Congestion Pricing and Efficiently Distributed Incentives to Equitably Reduce VMT	Caltrans
UCD/ UCLA	20-40	Susan Handy	The Implications of Freeway Siting in California: An Equity, Geospatial, and Case Study Approach	Caltrans
USC	21-SP80	Genevieve Giuliano	Implementation of Action 6 of the California Sustainable Freight Action Plan (CSFAP) Phase 4: Tracking Economic Competitiveness	Caltrans

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.

UCD awarded one dissertation research grant during the report period to Jai Malik for his work, “Changing Mobility in the United States – the Effect of New Mobility and COVID Pandemic.”

At UH, masters’ student, Farnaz Kaviari, who is funded by PSR, conducted research on the application of agent-based models to simulate the spread of COVID-19 in Waikiki, a major tourist destination. Masters’ students Jaeho Choi and Ph.D student Bernardo Gonzalez conducted research on the application of deep learning machine vision applications to identify patterns in pedestrian traffic for COVID-19 facemask and social distancing compliance in Waikiki. The students have also been working with Mike Vorce of SiteTour 360 to integrate 360 imaging and Google Street View imagery to examine pre- and post-disaster damage assessments along roadway corridors.

NAU continued supporting undergraduate and graduate transportation students through paid internships, fellowships, as well as engage in outreach activities. Because of the lack of conference travel due to Covid, we continued to repurpose some of these dollars to undergraduate research interns.

CSULB began hiring research assistants via the University Research Opportunity Program that funds students for up to 12 hours to participate in campus research as underclassmen undergraduates. CITT supplements these funds so that a student is able to work as a half-time (20 hour) Research Assistant.

Student conference support

UCLA supported three students to present at the annual conference Association of Collegiate Schools of Planning held in October 2020. One student was supported to present at the Transportation Research Board Sustainability and Emerging Transportation Technologies Virtual Forum in November 2020. Two students were provided support to present at the Annual Meeting for the Transportation Research Board and another twelve students were supported to attend in order to provide professional development and networking opportunities to the students.

Additional accomplishments

In January, UCLA welcomed one new transportation faculty member to the UCLA ITS community. Adam Millard-Ball joins the UCLA Urban Planning Department as an associate professor of Urban Planning. His research focuses on measuring global sprawl through street connectivity, transportation and environment, and transportation and climate policy. He will aid UCLA ITS in expanding its data science offerings and will be teaching Urban Data Science at UCLA in the spring.

Administrative accomplishments

METRANS hired a communications firm to conduct an audit and draft a strategic plan to assess the effectiveness of its existing communications efforts and to provide suggestions on how to better utilize its resources to maximize outcomes. The plan was presented to the METRANS Advisory Board on November 6th. From this process, METRANS has rebranded itself as the **METRANS Transportation Consortium** (formerly Center) with a new byline: *Reimagining the future of transportation*.

CSULB developed a fact sheet highlighting important research, education and training, outreach, affiliations, and awards to share with potential partners and broader audiences as a quick way to learn about the various center activities.

i. Research dissemination

Dissemination of our research results takes place via research reports and research briefs, scholarly publications, popular publications, conference presentations, and media.

“The Implications of Freeway Siting in California: An Equity, Geospatial, and Case Study Approach” project led by Anastasia Loukaitou-Sideris (UCLA) has held multiple consultations with Caltrans. They have selected four case study neighborhoods in which freeways were built through areas of color across the state. They have conducted a thorough search of the academic and other literature for relevant accounts, and have begun collecting historical socio-economic data on the case study neighborhoods.

Tridib Banerjee (USC) and his research team presented their preliminary findings for PSR-19-19 “Innovations in Transit? An In-Depth Case Study of the City of Monrovia/Lyft Public-Private Partnership to Increase Transit Ridership in Suburbia” to Bradley Mizuno and Chad Riding from Caltrans and Angela Cho from City of Monrovia on January 20, 2021.

Based on her PSR project, Madeline Brozen (UCLA), published a policy brief titled “[The Need to Prioritize Black Lives in LA’s Traffic Safety Efforts](#)”. The brief was cited in the LADOT 2021 Strategic Plan.

Preliminary results of the project “Developing an Analytical Framework for Optimizing Disaster Relief Preparedness to Coastal Hazards: A Preliminary Investigation of Factors Affecting Supply Chain Resilience in Hawaii,” were presented at the 2020 Pacific Risk Management Ohana Conference held in Honolulu, Hawaii in March 2020. In addition, a journal article is being prepared by Dr. Suwan Shen (UH).

Farnaz Kaviari’s (UH) research has been created into an ESRI StoryMap, and is continuously being updated as changes in COVID-19 travel policy and practice change within the State of Hawaii, and City and County of Honolulu, and as vaccines are rolled out to tourist related employees.

<https://storymaps.arcgis.com/stories/8c240838f21c4cbbb4dd500da21ba2d0>

As with all partners, UCI has collaborated with Caltrans staff on Caltrans-sponsored faculty research projects. In particular, Professor Al Faruque collaborated with Caltrans staff on his project “Software and Hardware Systems for Autonomous Smart Parking Accommodating both Traditional and Autonomous Vehicles,” receiving technical feedback that helped shape the research.

PhD candidate Sarah Grajdura (UCD) presented on her PSR-supported dissertation work, “Equity and Wildfires in California: Evidence from the 2018 Camp Fire and Literature,” at the Third Annual PSR Emerging Scholars Transportation Research Symposium on March 2, 2021.

Dr. Susan Pike’s (UCD) PSR research was featured in a February 25, 2021, METRANS News article, titled “PSR Scholar Evaluates Ridesharing and Ridehail Programs for Alternative Access to the Davis Amtrak Station.” <https://www.metrans.org/news/psr-scholar-evaluates-ridesharing-and-ridehail-programs-for-alternative-access-to-the-davis-amtrak-station->

Dr. Fraser Shilling (UCD) presented on “RADS and Artificial Intelligence” at a November 18, 2020, TRB webinar on Protection Detection—Making Roads Safe for Drivers and Wildlife (<http://www.trb.org/main/blurbs/181314.aspx>). Dr. Shilling’s presentation relates to his PSR research on “Automated Analysis of Wildlife-Vehicle Conflict Hotspots Using Carcass and Collision Data”.

Dr. Miguel Jaller (UCD) was quoted in Caltrans Division of Research, Innovation & System Information’s 2020 issue of DRISI 2020: Caltrans’ Solution Lab, in an article on “Trucks, Trucks, and More Trucks.” The article refers to Dr. Jaller’s PSR research around automation, electrification, and shared mobility in freight. <https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/drisi-caltrans-solution-lab-v33-a11y.pdf>

Dr. Alan Jenn (UCD) presented on his PSR research, “Charging Infrastructure Development for Transportation Network Company Electrification,” at several meetings and workshops with industry, agencies, and academics during the reporting period.

NAU gave multiple presentations during the Arizona Council for Transportation Innovation (ACTI) Virtual Innovation Exchange Series, and prepared a presentation on transportation engineering/traffic safety for the National Association for College Admission Counseling (NACAC) Virtual STEM Fair.

Genevieve Giuliano presented research on managing traffic of major events to local stakeholders including LA Metro, City of Los Angeles, Caltrans, and USC, and at the Los Angeles Business Council 2020 Sustainability Summit.

Media coverage

During the current reporting period, a number of PSR faculty associates were covered in the media. Examples include Genevieve Giuliano (USC) in *The Washington Post*, *Daily Express*, Yahoo News; Marlon Boarnet (USC) in *Time Magazine*, *Politico*, CalMatters; Gary Painter (USC) in *New York Times*, *Forbes*, MarketPlace, *Los Angeles Times*; Geoff Boeing (USC) in Slate, Next City; Karl Kim (UH) in *Honolulu Star*, Hawaii Public Radio; Brian Taylor (UCLA) in *Los Angeles Times*, *Wired*; Michael Manville (UCLA) in KCRW, *The Santa Clarita Valley Signal*; Susan Handy (UCD) in Streetsblog California; Andrii Parkhomenko (USC) in *Los Angeles Times* and *USC News*.

ii. **Plans for next reporting period**

The next reporting period is April 1, 2021 through September 30, 2021. We plan to award over \$2M in funding from our RFP 5. We have 53 active projects that we will continue to manage. We anticipate completing 15 projects during the next reporting period.

ITS-Davis will virtually host the **2021 PSR Congress** on April 12th and 13th. The PSR Annual Congress gathers transportation stakeholders from throughout the region to share new research results, best practices, and education and training tools produced by PSR. It also serves as a major networking event to build a regional transportation community. Each year the Congress is hosted by one of the consortium schools, in partnership with consortium universities and government and industry partners. Day 1, April 12th, will be open to the public and will feature four panel sessions highlighting research and workforce development activities from the PSR campuses and moderated by PSR Advisory Council members. Day 2, April 13th, will be a closed session for the PSR Advisory Council meeting as well as a PSR Student Roundtable and Career Pathway Panel session for undergraduate, graduate, and PhD candidates from the PSR campuses. The event webpage and program are available at <https://its.ucdavis.edu/news-and-events/conferences/psr-congress/>.

UCLA will continue working on Year 3, 4, and 5 Faculty Research Projects under the RFP program; release Issue 8 of *Transfers Magazine*; host the Annual Arrowhead Symposium “Transit’s Recovery from COVID-19” virtually; complete capstone projects and reports for 9 master students; continue hosting monthly data hack night led by students; complete and publish 5-10 additional research briefs by graduating master and PhD students; award fellowships to incoming masters and doctoral students.

UH has selected three projects for funding in 2021, details will be published in the next SAPR.

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

PSR Emerging Scholars Transportation Research Symposium: PSR held its third Emerging Scholars Transportation Research Symposium (ESTRS) in a virtual format on March 2 and 3, once again presenting outstanding transportation research conducted by students. This annual signature event provides students the opportunity to present their research to a larger audience with diverse backgrounds in transportation and hear from some of the leading researchers and innovators in the field. This event is held free of charge, typically at USC, and is open to the public. This year, ESTRS was organized to be virtual to adapt to COVID-19 restrictions; the online format enabled more scholars and attendees from different locations around the world to join. This year, presenters were doctoral students from USC, UCLA, UH, UCD, and UCI. Students represented diverse disciplines including urban planning, civil and environmental engineering, electrical engineering, industrial and systems engineering, and

transportation science. PSR Director Dr. Genevieve Giuliano noted, “this diversity reflects the nature of transportation— a field that is broad and multi-dimensional.” In addition to the student speakers, attendees hear from keynote speakers Senator (former) Fran Pavley and Dr. Susan Handy (UCD). Senator Pavley was elected the first mayor of Agoura Hills in 1982 and served 14 years in the California Assembly and the State Senate.



Figure 1. Video still showing the agenda for the Emerging Scholars Symposium

UCI hosted the online *Symposium on Leveraging Mobility Innovations to Address Community Needs* on November 18th, 2020, which can be viewed at <https://youtu.be/eO3q82Fzm7E>. An expert panel consisting of SCAG’s Kome Ajise, SANDAG’s Hasan Ikhtrata, and LA Metro’s Joshua Schank discussed the various ways that their particular cities and region are leveraging mobility innovations and how they are addressing community needs, including SANDAG's Five Big Moves that involve five key strategies for mobility, as how the Los Angeles region plans to recover from the impact of the pandemic while being sensitive to equity issues. Approximately 100 individuals attended and included academics, professionals, and students from a statewide, national, and international audience.

USC, UCD, UCI, and UCLA continued their respective research seminars, which have converted to webinars due to Covid.

USC seminars

- “Knowledge Networks for Infrastructure Systems Bridge as Case Studies” with Lucio Soibelman (USC). October 15, 2020. Webinar recording: <https://www.youtube.com/watch?v=3ow6lIKAi6g>
- “Cost-Sharing Mechanisms for Ride-Sharing” with Maged Dessouky (USC). October 22, 2020. Webinar recording: <https://www.youtube.com/watch?v=8j8b2IDAV2I>
- “Street Network Models and Indicators for Every Urban Area in the World” with Geoff Boeing (USC). October 27, 2020. Webinar recording: <https://www.youtube.com/watch?v=kiwjLUnXbTk>

- “Analyzing Impacts of Major Events: A case study of the LA Coliseum” with Genevieve Giuliano, Yougeng Lu (USC). February 18, 2021. Webinar recording: <https://www.youtube.com/watch?v=ILQTmV-Tzgg>
- “Congestion Reduction for Personalized Incentives” with Meisam Razaviyayn, Ali Ghafelebashi (USC). March 11, 2021. Webinar recording: <https://www.youtube.com/watch?v=1sZwCVtxDpY>
- “Understanding Mobility Changes in Response to Covid-19: An LA case study” with Yougeng Lu, Genevieve Giuliano (USC). March 25, 2021. Webinar recording: <https://www.youtube.com/watch?v=pZ5-KcukGAK>

UC Davis seminars

- “Distracted Pedestrians: Myth or Menace?” with Dr. Kelcie Ralph, Assistant Professor of Urban Planning, Bloustein School of Planning and Public Policy, Rutgers University. Watch the seminar recording at <https://its.ucdavis.edu/seminar/oct-16-2020/>
- “There is No “Green Book” for Walking: Transit Risks Patterned by Race and Place” with Dr. Jennifer D. Roberts, Assistant Professor in the Department of Kinesiology, School of Public Health, University of Maryland College Park. Watch the seminar recording at <https://its.ucdavis.edu/seminar/nov-6-2020/>
- “The Role of Affordable Transit Oriented Development on Travel Behavior” with Dr. Jesus Barajas, Assistant Professor in the Department of Environmental Science and Policy, University of California, Davis. Watch the seminar recording at <https://its.ucdavis.edu/seminar/jan-29-2021/>
- “Mobility Justice and the Future of Transportation” with Darnell Grisby, Executive Director, TransForm. Watch the seminar recording at <https://its.ucdavis.edu/seminar/feb-5-2021/>

UC Irvine seminars

- “Advances Toward Mobility-as-a-Service: from Traveler to Operator and Platform Perspectives.” Joseph Chow, New York University. October 23, 2020.
- “Perimeter metering control for two-region urban networks: A deep reinforcement learning approach.” Vikash Gayah, Pennsylvania State University. November 20, 2020.
- “Transportation Network Companies and Data.” Joe Castiglione, Deputy Director for Data, Technology, and Analysis, San Francisco County Transportation Authority. December 4, 2020,
- “Applications of Spatial and Data Science Approaches in Transportation Studies.” S. M. Labib, University of Cambridge. February 26, 2021.
- “Signal Timing in a Multimodal Connected Vehicle Environment.” S. Ilgin Guler, Pennsylvania State University. March 12, 2021

NAU seminars

- Wulf Grote (Valley Metro) discussed the Tempe streetcar project. February 4, 2021.
- Heather Dalmolin (CEO and General Manager of Mountain Line) discussed Flagstaff’s transit system. February 18, 2021.
- Zach Barlow (Ironside Engineering and Development) discussed driver comprehension and visual attention of flashing yellow right turn arrows. March 4, 2021.

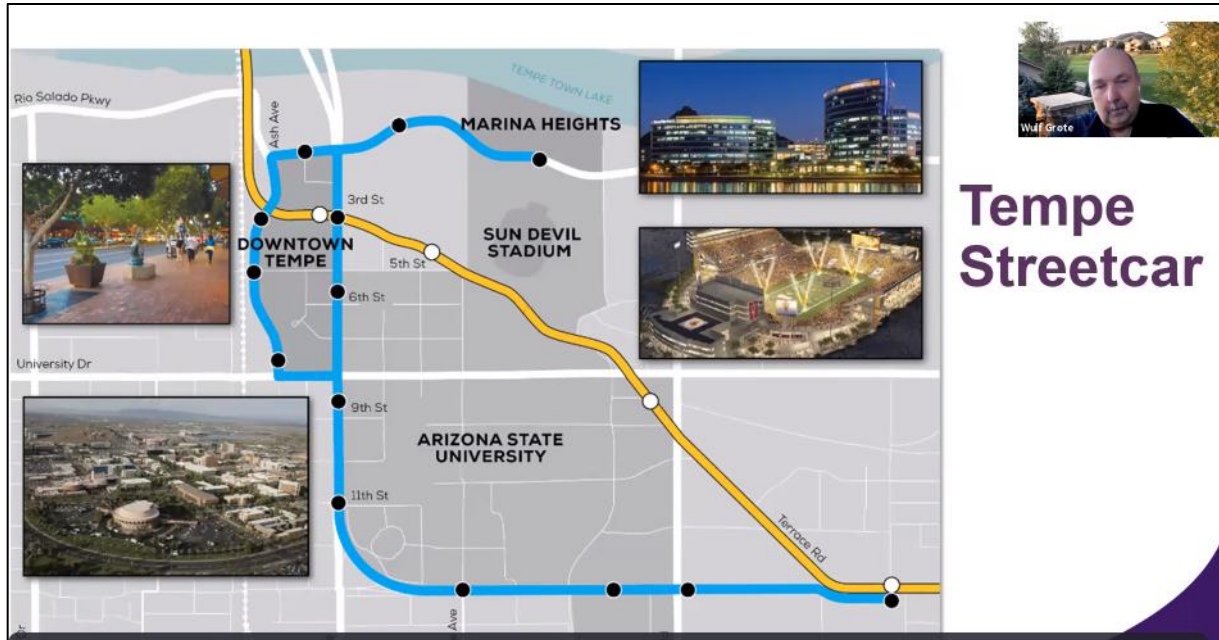


Figure 2. Wulf Grote presents on the Tempe Streetcar project as part of NAU’s seminar series

Student Fellowship Programs: In the fall of 2020, UCLA awarded fellowships to 18 incoming and continuing students to support their studies: 5 PhD Urban Planning, 1 PhD Civil Engineering, 1 MPP, 11 MURP. UCLA also issued fellowships with PSR funding to 9 second year MURP students to support their capstone project. NAU continued supporting undergraduate and graduate transportation students through paid internships, fellowships, and support for conference travel, as well as engage in outreach activities. NAU awarded one new fellowship this spring.

UCI awarded 5 Dissertation fellowships for PhD students in Civil & Environmental Engineering:

- **Brian Casebolt**, Impacts of Connected & Automated Vehicles on Traveler Behavior
- **De’Von Jennings**, Developing Demand Models for Commuter Rail
- **Bumsub Park**, Minimizing the operation costs of a prepared food delivery service by optimizing the size of the delivery fleet
- **Chenyng Qin**, Consistency for Statewide and Regional Models: The Interregional Trip Gap
- **Joseph Lo**, New student entered fall 2020

Student awards

The PSR Student of the Year Awards will be officially announced at the PSR Congress on April 12th and 13th, a virtual conference hosted by PSR partner UC Davis. The winners are:

- **Youngeng Lu**, doctoral student in Urban Planning and Development at the University of Southern California (USC)
- **Bing Lin Nayang**, graduate student in City/Urban, Community, and Regional Planning at UCLA
- **David Lemcke**, undergraduate student in Civil Engineering at Northern Arizona University
- **Faraz Bhatti**, Global Logistics Specialist student from California State University, Long Beach College of Professional and International Education (CPIE)

A METRANS student team won second place in the Post-Secondary, Transportation Safety category of the [American Road and Transportation Builders Association's \(ARTBA\) 2020 Student Video Contest](#). ARTBA hosts this annual contest to engage K-12 and post-secondary students in the creation of short videos in the categories of General Transportation and Transportation Safety highlighting the crucial nature of transportation in the U.S. as well as to inform those looking to learn more about these disciplines. [The award-winning METRANS video](#) emphasizes the importance of traffic safety initiatives, with emphasis on Vision Zero, a global initiative which aims to eliminate traffic fatalities worldwide. METRANS/USC student **Ben Ephraim** led the creation and produced of the submission. In addition to original transportation video footage, the content features interviews and narrative from both students and alumni of USC. Highlighted in the video are current students **Alex Melaragno** and **Reaghan Murphy**, both of whom work for the Los Angeles Department of Transportation's Vision Zero Division as Student Professional Workers, and **Jose Richard Aviles**, MSW/MPL, who graduated from the Price School in 2019 and serves the Vision Zero Division as a Community Engagement Specialist.



Figure 3. Screenshot from award-winning student video

Select USC student awards:

- **James Huang**, Undergraduate, Industrial Engineering with Urban Sustainable Planning minor, *Railway Association of Southern California Undergraduate Scholarship*
- **Zakhary Mallett**, Ph.D. Candidate, Urban Planning and Development, *Dwight D. Eisenhower Graduate Transportation Fellowship; Railway Association of Southern California Graduate Scholarship*
- **Marena William**, Master of Business Administration, Transportation Electrification, *BYD: WTS Los Angeles Build Your Dreams Graduate Scholarship*
- **Lilly Nie**, Master of Urban Planning, *WTS Los Angeles Myra L. Frank Memorial Scholarship*
- **Jessica Brown**, Undergraduate, Civil Engineering, *WTS Los Angeles Environmental Science Associates Undergraduate Scholarship*
- **Yerandy Pacheco**, Undergraduate, Urban Studies and Planning, *WTS Los Angeles Jacobs Undergraduate Scholarship*
- **Allison Fischer**, Undergraduate, Industrial and Systems Engineering, *WTS Los Angeles Ava Doner Memorial Scholarship*
- **Elise Adreon**, Undergraduate, Industrial and Systems Engineering, *WTS Los Angeles Ava Doner Memorial Scholarship*
- **Haley Rundle**, Master of Urban Planning, *WTS Sacramento Helene M. Overly Memorial Scholarship*
- **Joan Lee**, Undergraduate, Urban Studies and Planning, *Spectrum Scholar; WTS Orange County Undergraduate Scholarship*

Select UCD student awards:

- **Xinwei Li** *WTS Sacramento Maggie Walsh Leadership Legacy Scholarship*

- **Maryam Ostovar** *Honorary Recipient WTS Sacramento Maggie Walsh Leadership Legacy Scholarship*
- **Sonia Anthoine** *WTS Sacramento Sharon D. Banks Memorial Undergraduate Scholarship*

Ten UCLA students received a fellowship under the **Dwight David Eisenhower Transportation Fellowship Program** this year:

- **Eric Dasmalchi**, MURP student
- **Yu Hong Hwang**, MURP student
- **Hannah King**, doctoral student in Urban Planning
- **Edgar Mejia**, MURP student
- **Julene Paul**, doctoral student in Urban Planning
- **Miriam Pinski**, doctoral student in Urban Planning
- **Lena Rogow**, MURP student
- **Samuel Speroni**, doctoral student in Urban Planning
- **Alexandra Weber**, MURP student
- **Timothy Wickland**, doctoral student in Urban Planning

Samuel Speroni MURP '20, has been awarded the Neville A. Parker Award by the Transportation Research Board for best capstone project for his research on ride-hailing as school transportation for vulnerable student populations. **Jan Yonan**, UCLA MURP student and PSR Fellowship recipient, received a 2020 scholarship by the Railway Association of Southern California. **Fariba Siddiq**, PhD Urban Planning Student and PSR researcher was awarded the prestigious Lee Schipper Scholarship Award for her International Study on Women and Ride-Hailing in Los Angeles and Dhaka. UCI PSR-supported student, **Riju Lavanya**, successfully defended his dissertation, and is currently employed as a postdoctoral researcher at ITS-Irvine.

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: **FED Talks** (UCLA), assembles professors and graduate students to discuss and present new research and best practices around transportation-related issues; **Data Hack Night** (UCLA), these web meetings provide students an opportunity to work with others on their data projects to seek help and alternative approaches to accomplish data acquisition, cleaning, analysis, and visualization; **Soft Skills Webinar** (CSULB), incorporates “soft” or foundational skills into its training programs, including webinars, has evolved into a strategic partnership with the renowned Toastmasters International; **Get the Job** (USC), a speaker series designed to provide a small-group environment for students to receive advice from active practitioners on securing employment. **METRANS Mentor Program** (USC), transportation practitioner mentors guide students to make informed career decisions and to develop as well-rounded professionals; **WTS Partnerships** (USC, UCI, UCD, UCLA), sponsor membership and event attendance to promote student participation in the transportation resume book.

iii. Workforce development

PCC had its first student in the Autonomous Vehicle Driver and Operations Specialist certificate program graduate in Fall 2020. **Rick Pena** resides in Tucson, Arizona and is currently in the application process with TuSimple. Rick’s story can be found on the Pima Community College’s [website homepage](#).

PCC's Center for Transportation Training (CTT) had 19 students enrolled in the online theory class (TDT 118) during the reporting period. While this enrollment level is lower than typical due to COVID restrictions, the online implementation continues to result in 100% Class A commercial permit student success rate. Additionally, PCC had three students from regional tribes enrolled and/or participating in commercial driver license training.

PCC created Joint Service Transcript analysis to determine and apply transferability of military skills and knowledge to Prior Learning Assessments (PLA). This provides an opportunity for veterans to gain college credit by passing the PLA exams for select Logistics and Supply Chain Management courses without completing the course. Students are able to easily access classes eligible for PLA through PCC's [Veteran's Articulation Guide](#).



Figure 4. Rick Peña poses with an autonomous truck

The Logistics Discipline Coordinator and an instructional designer collaborated to modularize select Logistic courses into short skills-based non-credit courses. This will allow an individual or company employees to familiarize themselves with only certain segments of the course which are most applicable to their needs.

Ian Roark and his PCC colleagues have appeared in numerous panels to disseminate their PSR-funded workforce development knowledge, including:

- “Driving Partnerships Between Higher Education and Corporations.” Ian Roark (PCC) and Robert Brown (TuSimple). October 1, 2020: Arizona State University Global Silicon Valley Summit.
- “Breaking Through Gridlock via Cooperation and Coordination.” Ben Blink (Governor Ducey’s office), Robert Brown (TuSimple), Missy Blair (PCC), and Jackie Beckwith (AUVSI), moderator. October 6, 2020: Association for Unmanned Vehicle Systems International (AUVSI). Virtual.
- “Cultivating Readiness for the Transportation Workforce of Tomorrow.” Lisa Kay Schwyer (Carnegie Mellon University), Robert Koch (Community College of Allegheny County), Robert Brown (TuSimple), and Missy Blair (PCC). October 7, 2020: The National Council for Workforce Education (NWCE). Virtual.
- “Workforce Development and Partnerships”. Ian Roark (PCC). December 4, 2020: Tucson Young Professionals.
- “Creating a Program for Jobs that Don’t Exist Yet.” First in a Series of Cross Discipline Conversations. Jay Lau (TuSimple), Jim Craig and Missy Blair (PCC), moderated by Devin Marble (Pima Community College). January 22, 2021. Recording: https://www.youtube.com/watch?v=7LC8cMcmn_4
- “Business and Industry Partnerships.” Ian Roark (PCC). March 17, 2021. Southern Arizona Leadership Council.

CSULB has been providing geospatial curriculum development support that can be incorporated into PCC's coursework, which includes the CDL, supply chain, and tribal training programs. Research Director Tyler Reeb and Research Coordinator Ben Olson have been working with multiple departments at PCC to identify ways to integrate GIS training.

CSULB held its **Caltrans Freight Academy** on December 1-3, 8, and 10 of 2020. The Academy consisted of presentations from goods movement professionals and subject matter experts, daily activities to supplement the instruction, and a final group presentation on regional freight issues using a web-based geospatial presentation platform. There were 88 participants that were divided into two groups with different study areas of focus: San Diego and Bakersfield. Each had a separate geographic focus and freight-related challenge: (San Diego Neo-bulk freight movement; Bakersfield agricultural freight).

PSR offers many additional 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; **IANA – Teaching Intermodalism Post-Covid-19**: (CSULB), provides support for student scholarships in Global Logistics Professional and Marine Terminal Operations Professional programs.

i. 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 be available only as webinars due to Covid.

In addition to completing the online development of TDT 116 Class B theory and two GIS online courses, PCC will continue to engage with **TuSimple** to continuously improve the **Autonomous Vehicle Driver and Operations Specialist** program, specifically with exploring integrating cybersecurity into the program. Furthermore, PCC has been selected as one of six community colleges to form the **Community College Growth Engine Fund**. Through this initiative, micropathways, prior learning assessment, training in 21st century skills and a noncredit marketplace (**Unmudl**) will be avenues to mitigate the growing skills gap. Five of the Logistics classes (as noted in the achievements for this period) and the Introduction to Autonomous Vehicles class will be instrumental components in this initiative.

CSULB continues to develop its **Roadmaps and Story Maps for Public Outreach** program, which is in the drafting and editing phase. They will also produce a follow-up **State of the Mobility Workforce Report** that includes most recent Bureau of Labor Statistics and U.S. Census Bureau data.

C. Outreach Accomplishments

METRANS held its semi-annual Advisory Board meeting on November 6, 2020 via video conference. The meeting was well attended by senior leaders from the Center's industry and agency stakeholders

including the new Caltrans District 7 Director Tony Tavares. The meeting allowed METTRANS to provide updates on its research, education and outreach activities. PSR research and workforce development activities were presented to the board. Additionally, the meeting allowed for discourse between the Center and its stakeholders, which will inform future Center activities and efforts. [METTRANS Advisory Board](#) members are listed on its website.

METRANS held its annual **Industry Outlook** on October 1, 2020. This event addressed the challenges of Covid in the transportation industry. The conversation addressed opportunities for consolidations, service reductions, and labor cost reductions across industry segments and the longer-term implications of these shifts. The event panelists were Michael Christensen (Los Angeles World Airports), Mario Cordero (Port of Long Beach), and Phillip Washington (LA Metro). The event was moderated by METTRANS and PSR Director Genevieve Giuliano.

Due to Covid, the annual **UCLA Lake Arrowhead Symposium on the Transportation - Environment - Land Use Connection** was converted to an online series with 10 sessions hosted over the course of two weeks during the month of October 2020. The theme was changed from “California’s Climate Crossroads” to “Not Back to Normal: Mapping a Just Transportation Recovery from COVID-19.” The event was attended by over 500 guests including academics, practitioners, and elected officials. Planning for the 2021 event is currently underway. UCLA has also opted to host the 2021 event remotely with a potential one-day in-person component should public health conditions improve by October 2021. This year’s theme will be *Transit’s Recovery from COVID-19*.

The Center for International Trade and Transportation (CITT/CSULB) held its annual **Town Hall meeting** on Tuesday October 6, 2020, with the theme *A COVID-19 Supply Chain Report Card: Balancing Perception and Reality*. Since its inception in 1999, the CITT Town Hall has delivered a dialogue-driven opportunity for transportation and supply chain stakeholders to discuss pertinent transportation and trade-related issues. This year’s panelists included **Leslie Blakey**, President of Coalition for America’s Gateways and Trade Corridors and Advisory Committee Member to the Department of Commerce on Supply Chain Effectiveness; **Carla Fernandez**, Supervisory Consumer Safety Officer of the U.S. Food and Drug Administration; **Donna Lemm**, Executive Vice President of National Sales of IMC Companies; **LCDR Kazu Okumura**, Imports Specialist of the FDA; and **Bobby Olvera Jr.**, International Vice President (Mainland) of the International Longshore and Warehouse Union (ILWU).

CSULB held a webinar on October 27, 2020, in which presenters Tom O’Brien and Tyler Reeb discussed the findings from the Southwest Transportation Workforce Center’s the **State of the Mobility Workforce Report**. O’Brien and Reeb highlighted labor market trends that are shaping the transportation workforce of the Southwest United States and introduced four strategic priorities that address the industry’s need for qualified workers who are able to meet the demands of a growing transportation economy.

The **VREF Urban Freight Workshop** builds upon a 2019 workshop held in Long Beach, CA that introduced a toolkit of urban freight solutions to local planners and policymakers. This new virtual workshop extends the range of options and includes participants from beyond North America and Europe. The content is currently being developed, and stakeholder meetings have commenced to explore activities and actions for attendees to participate in. Due to pandemic travel restrictions, it is anticipated that the international audience will participate virtually.

Long Beach Business Journal and CSULB’s *Beach Bulletin* published e-newsletters on December 1st, 2020 with “Economy During Pandemic” discussed by Seiji Steimetz of the CSULB Economics Department.

Tom O'Brien (CSULB) taught a virtual session, *Southern California Logistics: Surviving Covid, Preparing for the Future*, via CSULB's College of Professional and International Education in January and March 2021. This course aimed to answer questions regarding lessons learned during the COVID-19 pandemic and how Southern California logistics service providers are preparing for the post-pandemic future. The presentation was also delivered to NEOMA Business School, a French business and management graduate school.

The flagship PSR publication, *Transfers Magazine*, published its 6th issue in fall 2020, consisting of five articles and one opinion piece. The authors represented three PSR campuses: USC, UCLA and U. of Hawaii. The website www.transfersmagazine.org, which also features regularly updated blogs with transportation-related news, research and events, had more than 22,400 page views during this six-month period, which is 12% more than 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. Editing is currently underway for the next issue set to release in May 2021, with articles under consideration from even more PSR partners. They have also begun recruiting articles for the fall 2021 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.



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 News/PSR News**, a monthly newsletter summarizing METRANS and PSR activities, and is distributed to academia, federal/state/local public agencies, and industry; **METRANS on the Move** (USC), this is a weekly e-newsletter written and produced by USC students with staff guidance.

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

METRANS will hold its next Advisory Board meeting on April 2nd. The board meeting convenes senior leaders from regional transportation organizations in southern California. The meeting will be held virtually due to restrictions brought on by Covid.

METRANS will continue planning for its premier biennial International Urban Freight (INUF) Conference to be held in person in Long Beach, CA in October. The CITT International Trade and Transportation Town Hall will be held the day before. Contingency plans are in place in case Covid restrictions prevent an in-person event.

Within the next reporting period, CSULB will continue focusing its efforts on increased social media engagement. The team will concentrate its efforts on achieving similar follower growth rates on Twitter and Instagram as well as continuing its growth trend on LinkedIn. Pending a communications audit for METRANS channels, the Project Manager in Communications will reassess objectives and activities in digital communications. CSULB will continue to recruit research assistants as necessary for ongoing PSR

research and programs. Specifically, they will seek a Multimedia Assistant to increase the team's capabilities in multimedia production.

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 projects:

- Bosch LCC, California 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)

CSULB works with several external transportation-related trade and industry associations. Three of these (Los Angeles Transportation Club, Harbor Transportation Club, Harbor Association of Industry and Commerce) have established endowments that are used to provide scholarships for educational opportunities in professional development programs. These are important resources for non-traditional students pursuing non-credit programs who are often not eligible for other kinds of financial support.

B. Other support

During the reporting period, PCC received a now-retired autonomous truck from **TuSimple**. In addition to allowing PCC to have an automatic transmission to be more inclusive of student training needs, the donated truck was TuSimple's very first autonomous truck. PCC is honored to have a true piece of history in their fleet thanks to the collaboration and partnership with TuSimple.

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 Unitrans; 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, Nevada, Maine, Minnesota, Colorado, 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; **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.

C. Collaborations

Initial discussions have occurred between PCC and **Next Generation in Trucking**, an organization that facilitates the process to encourage high schoolers to join the trucking industry. Future collaborations are scheduled to take place with Next Generation and PCC's dual enrollment liaison.

Collaboration meetings were held between CSULB/METRANS and PCC's GIS and CAD departments to supplement the GIS online class implementation. The team is also exploring how to integrate CSULB/METRANS graduate projects into the CAD 177 GIS class implementation.

UH has initiated the following collaborations:

- Dr. Van Romero, Vice President for Research, New Mexico Tech – Work on proposal for DHS Center of Excellence for Engineering Secure Environments from Targeted Attacks focused on securing transportation infrastructure
- Dr. Lisa Staes, Director, Center for Urban Transportation Research – Establishment of the C-STTAR (Center for Surface Transportation Testing and Academic Research) to support the

private company ENSCO who is the recipient of the contract to manage the Transportation Technology Center a US DOT Federal Railroad Administration (FRA) center.

- Dr. John Renne and Dr. Brian Wolshon, work on visualizing impact of SLR to transportation under UTC Maritime Transportation Research and Education Center's ([MarTREC](#)) Engaging the Business and Tourism Industry in Visualizing Sea Level Rise Impacts to Transportation Infrastructure in Waikiki, Hawaii. [Visualizing SLR in Waikiki, Honolulu - YouTube](#)

NAU recently started a project funded by the **City of Scottsdale**, AZ focused on the safety impacts of left-in left-out median treatments. NAU plans to continue to establish this partnership with Scottsdale with plans to pursue an IGA.

Internally, NAU has multiple collaborative efforts. They are continuing a collaboration with Steven Gehrke in the Department of Geography, Planning, and Recreation. During this period, they collaborated on a proposal submitted in response to the PSR RFP, and have committed to funding an undergraduate intern this summer. Dr. Chun-Hsing Ho has been collaborating with Dr. Marco Gerosa from the School of Informatics, Computing, and Cyber Security and Dr. Bertrand Cambou from the Department of Applied Physics and Materials Science. This collaboration involves work on pavement research. Externally, NAU has also begun collaborating on pedestrian safety-focused research with Dr. Deborah Salon and Dr. Rebecca Sanders from **Arizona State University**. Furthermore, NAU is collaborating with multiple entities on two research projects funded by the Arizona IAM. Collaborators include:

- NAU (Dr. Brendan Russo and Dr. Abolfazl Razi from the NAU School of Informatics, Computing, and Cyber Security)
- University of Arizona (Dr. Larry Head and Dr. Jason Pacheco)
- Arizona State University (Dr. Yan Chen and Dr. Yezhou Yang)
- Intel (Jack Weast, Greg Leeming, Scott Kovesdy, and Maria Elli)
- Exponent, Inc. (Dr. Jeffrey Wishart)
- State Farm (Alex Cardona)

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 Institute of Automated Mobility (IAM)** (NAU), provides technical guidance and coordination aimed at fostering the implementation of automated mobility across Arizona; **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.

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 12 peer-reviewed journal publications and 22 presentations. For a list of the

publications, conference papers, and presentations, see [Appendix A](#). See [Table 1](#) for a list of the 9 project final reports that were published during the reporting period.

D. 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/channel/UCYgWr1zI9uFlip1nwmckhOQ/featured>
- UCLA ITS: <http://www.its.ucla.edu>
- UCLA Lake Arrowhead Symposium: <http://www.uclaarrowheadsymposium.org>
- UH website (includes posts on PSR research): <https://ndptc.hawaii.edu>

CSULB invited previous IANA scholarship recipients [Diana Sanchez](#), [Jeremy Stumpp](#), and [Nicholas Roy](#) to submit video clips of their research experience under the IANA program. Each of the recipients shared a clip in which they provide a short description of their research topic and the benefits of participating in the IANA research program. These clips are now visible on the CITT at CSULB's Instagram page.

E. New methodologies, technologies or techniques

As a result of the project titled, *BridgeR—a Regional Seismic Hazard Assessment Tool for Transportation Networks & its Application to Freight Loss Assessment* led by Ertugrul Tacirogul (UCLA), novel computer-vision methods were devised into the BridgeR tool, which extract geometric properties of ordinary bridges from a combination of satellite and street-view images. The website www.ShakeReady.org contains the U.S. national bridge Inventory as a result of the BridgeR project.

Antonio Bento (USC) under his PSR/Caltrans-funded project, "Using big data to estimate the environmental benefits of congestion pricing in the Los Angeles metropolitan area," applied the Los Angeles subset of the Aclima and Google air quality data with Performance Measurement System (PeMS) data to [estimate the environmental benefits of congestion pricing](#).

USC researchers have developed a data-driven, deep learning approach that integrates the prediction and long-term forecasting of traffic flow for bus arrival time estimation for the entire Los Angeles County (project ID: PSR-18-SP50). They also incorporate the developed approach in a bus arrival time

estimation dashboard. The dashboard demonstrates the overall approach and shows that incorporating traffic flow predictions and long-term forecasting can help to estimate bus arrival times accurately, even for long bus routes. The researchers have deployed the developed technologies on the USC IMSC cloud and can be accessed on the IMSC ADMS website (<https://adms.usc.edu/app>).

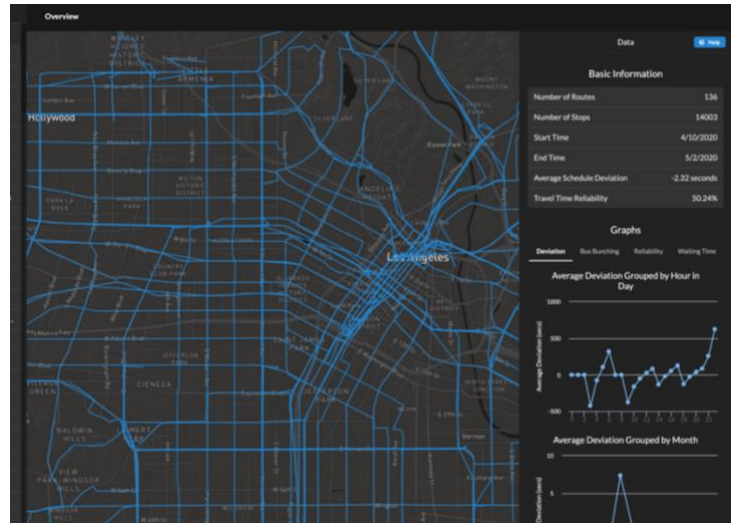


Figure 5. Dashboard view of METRANS transit app

Jaeho Choi and Bernardo Gonzalez’s (UH) are working on machine vision research that includes face mask detection, social distancing, and damage assessment. They have created a [portal that shows](#) pre (Google Street View Imagery) and post-disaster (Imagery captured with 360 imaging camera) of Lake Charles, LA after Hurricane Laura.

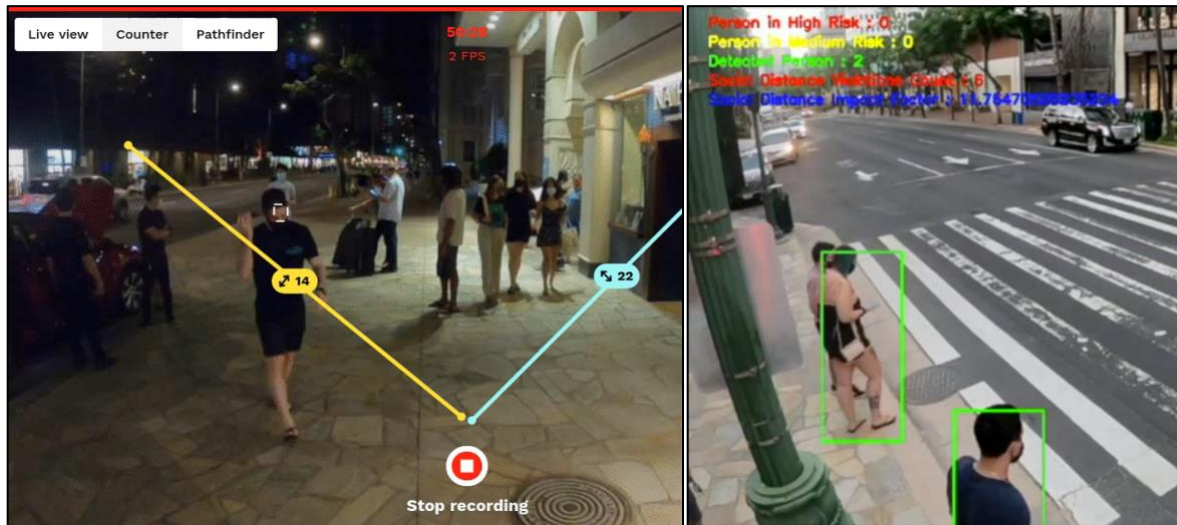


Figure 6. Mask and social distancing detection software

Dr. Goulias’ (UCSB) research for, “A Before-After Intervention Experiment and Survey for the Crenshaw/LAX Metro Line,” will lead to the development of new technology in the form of a free, open-source smartphone application. This application will allow for future researchers to do travel diaries in their data collection in a low-cost way.

Professor Al Faruque (UCI) developed a solution for parking congestion integrated with autonomous vehicles. The project addresses the issue by providing a full-stack solution including sensors to monitor occupancy, Fog systems to perform local data pre-processing, and SDR radios to communicate with autonomous vehicles. The primary research challenge was integrating autonomous vehicles into existing smart parking platform options. This entails not only securing DSRC connections between smart parking

systems and autonomous vehicles, but also ensuring that the system provides sufficient information for successful parking services in real time. This work was funded through a Caltrans PSR grant and has received significant attention from the sponsor.

F. Other products

Deanna Matsumoto and Tom O'Brien (CSULB) virtually presented Mindful Mobility Tech Talk Series: Sustainable Freight Foundation Certificate for middle managers.

- Part 1: Overview, Freight Systems & Management, Legal Issues for Sustainable Freight Operations on 4th of February 2021, moderated by Diana Sanchez and Deanna Matsumoto.
- Part 2: Energy, Infrastructure, and Sustainability; Data and Metrics for Freight on 11th February 2021. Moderated by Tom O'Brien and Deanna Matsumoto
- Part 3: Introduction to Regulatory Compliance on 25th February 2021. Moderated by Tom O'Brien and Deanna Matsumoto

Dr. Thomas O'Brien of CSULB hosts a quarterly television series called *Trade Talks* that is distributed through a regional cable network including all 23 campuses of the California State University system. The episodes are also [available on YouTube](#). Trade Talk episodes have been included as teaching tools in educational programs such as massive open online courses (MOOC). *METRANS* (USC/CSULB) has a [YouTube channel](#), where videos of seminars and other recorded events are posted. Many of the videos feature PSR-funded researchers and research.

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.

"BridgeR—a Regional Seismic Hazard Assessment Tool for Transportation Networks & its Application to Freight Loss Assessment" led by Ertugrul Taciroglu (UCLA): the US National Bridge Inventory is absorbed and is offered to the broader public through a searchable database that is visualized using Google Maps through the website <http://www.shakeready.org/>. An additional highly detailed model inventory of approximately 800 bridges in California are generated using BridgeR. A large portion of these bridges are in Southern California. Key Outcomes: Bridge-specific fragility functions are developed for 100 bridges in the immediate surroundings of Ports of Los Angeles and Long Beach as a case study. Using these fragility curves, the physical damage resulting from a magnitude 7.3 scenario earthquake on the Palos Verdes connected fault is predicted. Subsequently, the effects of bridge infrastructure damage to the transportation patterns in the Los Angeles metropolitan area are investigated in terms of various resilience metrics. For example, estimated damage was coupled with a highly granular regional travel demand model developed by the Southern California Association of Governments for the Los Angeles Metropolitan Area. This combination produced granular estimates of increased travel times in the region. As expected, the impact of the port traffic was mostly observed in the City of Los Angeles. The repercussions of the disruptions around the port to other counties were also successfully captured.

As a result of the project, "[Public Transportation Safety among University Students](#)", Professor Loukaitou-Sideris engaged Los Angeles City Councilmember Buscaino's staff. The councilmember drafted a motion that finds the problem of street harassment against people of color, women, LGBTQ+, people with disabilities, seniors and adolescents to be a matter of public concern and that the city administration should report back to council actions that the city can take to mitigate and respond to street harassment. The motion has garnered support from Los Angeles Walks, a prominent community organizing nonprofit organization in Los Angeles.

The PSR-funded project for Dr. Oceana Francis (UH), *Stormwater Drainage Design and Best Management Practices with Applications to Roadways and Climate Change*, is being integrated into a FEMA certified training course on Nature Based Solutions and Stormwater Protection. Once certified, the course will be offered nationwide at no cost to the participant, providing continuing education units.

Genevieve Giuliano (USC) and the ADMS research team presented to senior reps at LA Memorial Coliseum, USC Parking, LADOT, and LA Metro on December 10, 2020. The two-year research project examined the impact of large attendance sporting events on traffic congestion and presented mitigation techniques to senior officials with recommendation on best practices. Giuliano and the ADMS team presented to LA Metro officials and others on the ADMS archive system's potential on January 29th, 2021.

The PSR white paper, "[Making Bicycling Equitable: Lessons from Sociocultural Research](#)," has had extended reach, with over 2,300 web hits, 865 downloads, and 39 instances of online attention since publication.

Dr. Alan Jenn, in his PSR project, "[Charging Infrastructure Development for Transportation Network Company Electrification](#)," developed the Widespread Infrastructure for Ride-Hailing EV Deployment (WIRED) model, a mixed integer linear optimization model that seeks to install infrastructure to meet the demand of electric vehicles providing service for ride-hailing companies while simultaneously meeting operational constraints and other cost concerns. From the research, "it is clear that the charging demand and behavior from TNCs is substantially different from charging from the general public. The tremendous demand on public infrastructure indicates that serious attention must be placed on the potentially tremendous charging demand coming from a rapidly growing segment of light-duty transportation. Despite the relatively small volume of electric vehicles operating for Uber and Lyft in California, they are already placing tremendous stress on the public charging infrastructure." Dr. Alan Jenn will expand on this work through funding from the California Energy Commission.

Following her two PSR projects on the Davis Amtrak Station pilot project evaluation, Dr. Susan Pike is continuing to work with the City of Davis to plan the launch of their shared use mobility program for access to the Davis Amtrak station. The outcomes of her PSR studies will help inform the launch of these programs.

The PSR research by Dr. Fraser Shilling, "Automated Analysis of Wildlife-Vehicle Conflict Hotspots Using Carcass and Collision Data," led to development of a web tool that has been used by transportation and/or wildlife staff within 14 states to analyze impacts from and plan projects.

Raytheon employees recently attended PCC's LGM 104, Computerized Logistics, and received a \$7 per hour raise after successful completion of the course.

NAU continues 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. Additionally, NAU continues to work with the City of Phoenix to help address their pedestrian safety problem through development of a map-based tool to better understand where, when, how, and why pedestrian injuries and fatalities occur. This work is particularly important given pedestrian fatalities have increased substantially over the last decade. The researchers found that several land use, roadway, and demographic characteristics are significantly associated with pedestrian crashes; information which can assist practitioners in more efficiently planning countermeasure designs and locations.

Two active NAU projects funded by Oregon DOT will provide 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 will provide new methods for solving these types of problems across the Oregon state system, and will also be scalable to other jurisdictions.

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. While the final tally will be included in the Fall SAPR, we are on track to surpass our target.

Through the reporting period, PSR partners held several events (see previous sections of this report) in which public and elected officials participated. These events increased attendees' understanding of personal and commercial mobility options, the effects of the rise in private mobility on city and regional planning sectors, and awareness of New Mobility options.

All PSR researchers whose work is funded by Caltrans present their research findings to Caltrans personnel upon completion of their projects. For a list of Caltrans-funded projects that were completed during the reporting period, see [Table 2](#).

UCLA's Data Hack Night trained 30 professionals on the Python software and other relevant tools to meet the increased usage of data science for research data analysis.

Dr. Giuliano and Boarnet's (USC) project, "Climate Smart Transportation and Community Consortium," is aimed at informing policy. They are working directly with LA Metro on transit service options, and they will be sharing findings with SELA cities to promote solutions to the identified heavy duty truck safety problems.

Andrii Parkhomenko (USC) presented "Telecommuting after COVID-19: Economic and Other Implications" to the Los Angeles City Health Commission. The presentation is based on his PSR completed project, "How do cities change when we work from home?"

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 judgement than of

quantifiable metrics. Our contributions are judged by the PSR Advisory Council, and measured as significant or not significant.

Impact on the body of scientific knowledge

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

The brief [The Need to Prioritize Black Lives in LA's Traffic Safety Efforts](#) was cited in the LADOT 2021 Strategic Plan.

NAU's work with the Arizona Institute of Automated Mobility has led to a published paper ("Development of Safety Performance Assessment Metrics for ADS-Equipped Vehicles" published in the SAE International Journal of Advances and Current Practices in Mobility), and the novel safety metrics developed in this work (which continue to be expanded upon and refined) may be of interest to the National Highway Traffic Safety Administration (NHTSA) for safety assessment of connected and automated vehicles.

NAU's involvement with the IAM has led to development of safety metrics for assessing connected and automated vehicle (CAV) safety. This work has the potential to impact this field as CAVs become more prevalent in the traffic stream.

In Dr. Ho's (NAU) project, "Development of Cost-Effective Sensing Systems and Analytics (CeSSA) to Monitor Roadway Conditions and Mobility Safety," the results of statistical analysis indicated that a threshold of 1.7g can be used as a reference line to identify pavement conditions. Since there is no standard or conclusion from past research with regard to what a threshold value should be used to identify pavement conditions, this outcome makes a significant contribution to the pavement industry.

Impact on the adoption of new practices

Dr. Alan Jenn's PSR research, "Charging Infrastructure Development for Transportation Network Company Electrification," directly informed the [California Energy Commission's Assembly Bill 2127](#) efforts for deploying charging infrastructure in California.

Dr. Boarnet's (USC) work on "Residential Moves Into and Away from Los Angeles Rail Transit Neighborhoods: Adding Insight to the Gentrification and Displacement Debate" is informing the Hollywood Community Plan. The research was discussed at the Los Angeles City Planning Commission meeting in March 2021.

Dr. Shahabi (USC) and his team created a bus-arrival-time estimation dashboard for Caltrans to easily access and visualize original bus route and trip data and arrival time prediction results from a variety of machine learning algorithms built from their PSR Caltrans-funded project.

Both Al Faruque and Ritchie's (UCI) research are being studied by Caltrans for how the results can be influential in Caltrans planning and operations. Dr. Ritchie's truck classification research has the potential to significantly improve development and validation of freight modeling techniques. The outsized impact of freight operations on both environmental and equity dimensions makes this a critical area of research. Dr. Al Faruque's parking system addresses the critical issue of how to integrate automated and conventional vehicle operations. By providing a mechanism for AVs to participate in a

general system, this research not only solves a specific problem, but provides a blueprint for how such integrations can be achieved in additional domains outside the parking application.

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 had tribal students participate in the online commercial driver license training during this reporting period, including one from Page, Arizona. Attending the online theory portion has saved students from long travel times and associated expenses. These courses allow access to training for remote learners, who would otherwise be unable to gain training.

PCC's Autonomous Vehicle Driver and Operations Specialist program has given students access to various disciplines, allowing students to upskill or reskill in logistics, automated industrial technology, or computer information systems.

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.

6. Changes/Problems

Changes in approach and reasons for change

Covid has caused disruptions for many PSR activities. Fortunately, most activities have proceeded as planned, with a change from in-person to virtual. Digital technologies have enabled research and administrative teams to continue working. Classes, seminars, and training sessions have been moved to online formats. The UCLA Downtown Los Angeles Forum was canceled due to Covid. Covid left NAU with excess funds for travel. They continue to spend those funds on undergraduate and graduate interns.

Problems and delays encountered during the reporting period

Many research projects were delayed by the pandemic and the switch to remote work. Covid-related restrictions have had the most impact on projects that involve laboratory work or any type of field data collection. These projects have been identified and granted no-cost time extensions. Project expenses previously allocated to travel budgets have largely been reallocated to other budget items, especially student support.

Change of primary performance site location

Most PSR UTC partner campuses remain at limited capacity. Accordingly, most faculty and staff have been working remotely as of mid-March 2020. Additionally, most events have been switched from in-person to online only. We will continue to work remotely until the restrictions are lifted.

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. For a list of final reports published during the reporting period, see [Table 1](#).

A. Publications

Peer-reviewed journal publications

1. Aguilar, C., Russo, B.J., Mohebbi, A., and S. Akbariyeh, "Analysis of Factors Affecting the Frequency of Crashes on Interstate Freeways by Vehicle Type Considering Multiple Weather Variables", *Journal of Transportation Safety and Security*, 2021.
2. Brozen, M., Yahata Ekman, A. (2020). *The Need to Prioritize Black Lives in LA's Traffic Safety Efforts*. Brief, University of California, Los Angeles. <https://escholarship.org/uc/item/0dm6x8k4>
3. C. Huang, A. F. Molisch, Y. Geng, R. He, B. Ai, Z. Zhong, "Trajectory-Joint Clustering Algorithm for Time-Varying Channel Modeling", *IEEE Trans. Vehicular Techn.*, 69, 1041-1045 (2020).
4. Cetiner B (2020). *Image-Based Modeling of Bridges and Its Applications to Evaluating Resiliency of Transportation Networks*. Ph.D. Dissertation, University of California, Los Angeles <https://escholarship.org/uc/item/7vd6b40v>
5. Gabbe, C., Manville, M., & Osman, T. (2021). The opportunity cost of parking requirements: Would Silicon Valley be richer if its parking requirements were lower? *Journal of Transport and Land Use*, 14(1), 277-301. <https://doi.org/10.5198/jtlu.2021.1758>
6. Ho, C.H., Gao, J., Snyder, M., and Qiu, P. Development and Application of Instrumented Bicycle and Its Sensing Technology in Condition Assessments for Bike Trails. Accepted for publication in the *Journal of Infrastructure Systems*, ASCE
7. Kim, K., Ghimire, J., Pant, P., and Yamashita, E. 2021. Bikeshare and Safety: Risk Assessment and Management. *Transportation Research Interdisciplinary Perspectives*. <https://doi.org/10.1016/j.trip.2020.100276>
8. Koc E, Cetiner B, Rose A, Soibelman L, Taciroglu E, Wei D (2020). CRAFT: Comprehensive Resilience Assessment Framework for Transportation Systems in Urban Areas. *Advanced Engineering Informatics*, 46, 101159.
9. Pourrahmani, Elham, and Miguel Jaller. (2021). Crowdshipping in Last Mile Deliveries: Operational Challenges and Research Opportunities. *Socio-Economic Planning Sciences*, 101063, ISSN 0038-0121, <https://doi.org/10.1016/j.seps.2021.101063>
10. S.R. Gehrke, & T.G. Reardon. (2021). Direct demand modelling approach to forecast cycling activity for a proposed bike facility. *Transportation Planning and Technology*. 10.1080/03081060.2020.1849959.
11. S.R. Gehrke, B. Sadeghinassr, Q. Wang, & T.G. Reardon. (2021). Patterns and predictors of dockless bikeshare trip generation and duration in Boston's suburbs. *Case Studies on Transport Policy*. 10.1016/j.cstp.2021.03.012.
12. Su, R., McBride, E.C., Goulias, K.G. (2021). Unveiling daily activity pattern differences between telecommuters and commuters using human mobility motifs and sequence analysis. *Transportation Research Part A: Policy and Practice*, 147, 106-132. doi:10.1016/j.tra.2021.03.002

Other publications

1. Barajas, Jesus. "Safe for Whom? Transportation Safety in the Context of Planning and Infrastructure Inequities." UCLA Urban Planning and UCLA Institute of Transportation Studies Perloff Lecture Series on Race in Transportation, 25 February 2021. Online. <https://www.its.ucla.edu/tribe-event/safe-for-whom/>
2. Brozen, M., Ekman, A.Y. (UCLA) "The Need to Prioritize Black Lives in LA's Traffic Safety Efforts" Policy Brief; eScholarship.
3. Cetiner, B., Taciroglu, E. (UCLA) "Image-Based Modeling of Bridges and Its Applications to Evaluating Resiliency of Transportation Networks" Doctoral Dissertation.
4. Gao, H., Cheng, S., & Zhang, M. (2020). Get More Out of Variable Speed Limit (VSL) Control: An Integrated Approach to Manage Traffic Corridors with Multiple Bottlenecks. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G2R78CHV> Retrieved from <https://escholarship.org/uc/item/6th037wz>. Research Report. Published by institute. Acknowledges federal support.
5. Giuliano, G. (2020) "Urban logistics: The regional dimension," chapter 3 in M. Browne, S. Behrends, J. Woxenius, G. Giuliano, and J. Holguin-Veras, eds, *Urban Logistics: Management, Policy and Innovation in a Rapidly Changing Environment*. London: Kogan Page Ltd.
6. Houghton, B.F., Cockshell, W.A., Gregg, C.E., Walker, B.H., Kim, K., Tisdale, C.M., and Yamashita, E. 2021. Land, Lava, and Disaster Create a Social Dilemma after the 2018 Eruption of Kilauea Volcano. Nature Communications. 12, 1223. <https://doi.org/10.1038/s41467-021-21455-2>
7. Jaller, M., Harvey, J., Rivera, D., & Kim, C. (2020). Research Brief: Spatio-Temporal Analysis of Freight Patterns in Southern California. UC Davis: Institute of Transportation Studies. Retrieved from <https://escholarship.org/uc/item/2h29004j>. Research Brief. Published by institute.
8. Jaller, M., Rivera, D., Harvey, J., Kim, C., & Lea, J. (2020). Spatio-Temporal Analysis of Freight Patterns in Southern California. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G2MG7MS4> Retrieved from <https://escholarship.org/uc/item/1259f9s1>. Research Report. Published by institute. Acknowledges federal support.
9. Jenn, A. (2021). Charging Forward: Deploying Electric Vehicle Infrastructure for Uber and Lyft in California. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G2X928KG> Retrieved from <https://escholarship.org/uc/item/6vk0h1mj>. Research Report. Published by institute. Acknowledges federal support.
10. Jenn, A. (2021). Research Brief: Charging Forward: Deploying Electric Vehicle Infrastructure for Uber and Lyft in California. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G247484K> Retrieved from <https://escholarship.org/uc/item/1740g5tq>. Research Brief. Published by institute.
11. Jenn, Alan. "Charging Forward: Deploying EV Infrastructure for Uber and Lyft in California." Transportation Research Board's 100th Annual Meeting. Virtual. Poster Session 1316: Alternative Fuel Vehicle Applications. 27 January 2021.
12. Jenn, Alan. "Charging Infrastructure Development for Transportation Network Company Electrification." 3 Revolutions Future Mobility Kick-off meeting. Online. 7 March 2021.
13. Jenn, Alan. "Charging Infrastructure Development for Transportation Network Company Electrification." Uber Infrastructure Workshop. Online. 10 December 2020.
14. Jenn, Alan. "Optimizing Charging Infrastructure Buildout for TNC Electrification." 3 Revolutions Future Mobility Research Workshop. Online. 17-18 November 2020. <https://3rev.ucdavis.edu/events/2020-3rfm-research-workshop>

15. Jenn, Alan. "Optimizing Charging Infrastructure Buildout For TNC Electrification." California Energy Commission AB2127 Workshop. Online. 4 February 2021.
<https://www.energy.ca.gov/event/workshop/2021-02/session-1-lead-commissioner-workshop-assembly-bill-2127-electric-vehicle>
16. Marshall, L. (UCLA) "Neighbors and Neighborhoods: Addressing Older Women's Risk for Social Isolation" Policy Brief; eScholarship.
17. Marshall, L., Levy-Storms, L. (UCLA) "Older Women at Risk for Social Isolation: Intersections of Mobility & Social Well-Being" Doctoral Dissertation.
18. O'Brien, T., Matsumoto, D., Sanchez, D., Warren, E., & Reeb, T. (CSULB). "Workforce Development Needs Assessment for the Transportation and Supply Chain Industry Sector." CSU Long Beach. October 2020.
19. Pike, S. (2020). Davis Amtrak Station Access Program: A Pilot in a Pandemic. UC Davis: Institute of Transportation Studies. Retrieved from <https://escholarship.org/uc/item/4kj8k6h0>. Research Brief. Published by institute.
20. Pike, S. (2020). Davis Amtrak Station Pilot Project Evaluation: Informing Long Term Solutions to the Davis Amtrak Station Access Barriers. UC Davis: Institute of Transportation Studies. <http://dx.doi.org/10.7922/G2RN3643> Retrieved from <https://escholarship.org/uc/item/2s33b8kz>. Research Report. Published by institute. Acknowledges federal support.
21. Rivera-Royero, Daniel, Miguel Jaller, and Changmo Kim. "Spatio-Temporal Analysis of Freight Flows in Southern California." Transportation Research Board's 100th Annual Meeting. Virtual. Workshop 1431: Freight Operations and Logistics. 29 January 2021.
22. Shen, S., Kim, K. 2020. Assessment of Transportation Systems Vulnerabilities to Tidal Flooding in Honolulu, Hawaii. Transportation Research Record: Journal of the Transportation Research Board. 2674, 11. <https://doi.org/10.1177%2F0361198120940680>
23. Shilling, Fraser. "Making Progress on WVC Standards Development (Data collection standards from individual observers to global systems)." Transportation Research Board's 100th Annual Meeting. Virtual. Workshop 1041: Heading our Way? National Standards for Wildlife-Vehicle Collision (WVC) Data Collection. 22 January 2021.
24. Shilling, Fraser. "RADS and Artificial Intelligence." Presentation at Transportation Research Board Webinar, "Protection Detection – Making Roads Safe for Drivers and Wildlife." 18 Nov 2020. <http://www.trb.org/main/blurbs/181314.aspx>
25. Shilling, Fraser. "Wildlife Vehicle Conflict Data Collection and Reporting Standards for State Systems." Transportation Research Board's 100th Annual Meeting. Virtual. Workshop 1363: Hot Topics and Emerging Issues in Environmental Analysis and Ecology. 28 January 2021.
26. Waetjen, David, and Fraser Shilling. "Automated Harvesting and Display of WVC and Crash Data in California." Transportation Research Board's 100th Annual Meeting. Virtual. Workshop 1363: Hot Topics and Emerging Issues in Environmental Analysis and Ecology. 28 January 2021.
27. Zhang, M. (2020). Get More Out of Variable Speed Limit (VSL) Control: An Integrated Approach to Manage Traffic Corridors with Multiple Bottlenecks. UC Davis: Institute of Transportation Studies. Retrieved from <https://escholarship.org/uc/item/6v023484>. Research Brief. Published by institute.

B. Conference papers

1. Gao, J., Ho, C.H., Wiese, I., Zhang, D., and Gerosa, M. The Pavement Condition Assessment and Prediction System based on Machine Learning Technology. In the proceedings of 2021 Annual Meeting of Transportation Research Board in Washington D.C. TRBAM-21-03949
2. Gehrke, S., Huff, M., & Reardon, T. Adoption of Pooled Ride-Hailing Services in the Greater Boston Region. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021
3. Gehrke, S., McCremens, T., & Felix, A. Exploring the Past and Future Impacts of Ride-hailing Services on Bus Riders. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
4. Gehrke, S., Russo, B.J., Sadeghinassr, B., Riffle, K., Smaglik, E., and T. Reardon, "Spatial interactions of shared e-scooter trip generation and vulnerable road user crash frequency", Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
5. Gehrke, S., Sadeghinassr, B., Wang, Q., & Reardon, T. Patterns and Predictors of Dockless Bikeshare Trip Generation and Duration in Boston's Suburbs. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
6. H. Groll, E. Zochmann, M. Hofer, H. Hammoud, S. Sangodoyin, T. Zemen, J. Blumenstein, A. Prokes, A. F. Molisch, and C. F. Mecklenbrauker, "60 GHz V2I Channel Variability for Different Elevation Angle Switching Strategies", EuCAP 2020, (2020).
7. Ho, Chun-Hsing. "Application of Machine Learning Based Technology in Pavement Condition Assessment and Prediction." Presented at the 100th TRB Annual Meeting, 2021.
8. James, E. and B. Russo, "Analysis of Factors Affecting Pedestrian Crash Frequency at the Census Block Group Level Considering Demographic, Land Use, and Roadway Characteristics", Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
9. Khatun, F., JD. Saphores. "Best Frenemies? A Characterization of TNC and Transit Users Based on the 2017 NHTS." Presented at the 100th TRB Annual Meeting, 2021.
10. Koc E, Cetiner B, Lee J, Nutakki A, Soibelman L, Taciroglu E (2019). System-based resilience assessment of networked transportation systems in metropolitan areas: Case of greater Los Angeles, in: Proceedings of the 2019 ASCE International Conference on Computing in Civil Engineering. (Not previously reported)
11. Koc E, Cetiner B, Lee J, Soibelman L, Taciroglu E (2019). System-based vulnerability and resilience assessment in mega-scale transportation systems: Towards data and model-driven methodologies, in: Proceedings of the 26th International Workshop on Intelligent Computing in Engineering, (i3CE 2019, June 17-19, Atlanta CA) pp. 444–450. (Not previously reported)
12. Lemcke, D., Riffle, K., Russo, B.J., and E. Smaglik, "Examining the Use of Microsimulation Modeling to Assess Bicycle-Vehicle Conflicts at Intersections: A Case Study Incorporating Field-Observed Conflict Data", Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
13. Li, Y. K. Allu, Z. Sun, A. Tok, G. Feng, S. Ritchie. "An Ensemble Approach to Truck Body Type Classification using Deep Representation Learning on 3D Point Sets." Presented at the 100th TRB Annual Meeting, 2021.
14. Luan Tran, Min Y. Mun, and Cyrus Shahabi, Real-Time Distance-based Outlier Detection in Data Streams, Proceedings of the 47th International Conference on Very Large Data Bases (VLDB 2020), October, 2020.

15. Luan Tran, Min Y. Mun, Matthew Lim, Jonah Yamato, Nathan Huh, and Cyrus Shahabi, DeepTRANS: A Deep Learning System for Public Bus Travel Time Estimation using Traffic Forecasting, Proceedings of the 46th International Conference on Very Large Data Bases (VLDB 2020), Demo paper, Tokyo, Japan, August 31 - September 4, 2020.
16. Martinez Josemaria, I., W. Jin. "Calibration of Time-dependent Trip Distance Distribution with For-hire Vehicle Trips in Chicago." Presented at the 100th TRB Annual Meeting, 2021.
17. Martinez Josemaria, I., W. Jin. "Dynamic Pricing for High Occupancy Toll Lanes along a Freeway Corridor based on Bathtub Model." Presented at the 100th TRB Annual Meeting, 2021.
18. McBride, Elizabeth. "A Before-After Intervention Experiment and Survey for the Crenshaw/LAX Metro Line." Presented at the 100th TRB Annual Meeting, 2021.
19. McNally, Michael. "Analysis of Activity-Travel Patterns and Tour Formation of Transit Users." Presented at the 100th TRB Annual Meeting, 2021.
20. Monteiro, F. V., P. Ioannou. "Safe Lane Change and Merging Gaps in Connected Environments." IFAC's 16th Control in Transportation Systems Symposium, 2021.
21. Nocera, L., G. Constantinou, L. Tran, S.H. Kim, G. Kahn, and C. Shahabi. "Crosstown Foundry: A Scalable Data-driven Journalism Platform for Hyper-local News." Proceedings of the 2021 International Conference on Management of Data (SIGMOD '21), Demo paper, Virtual Event, China, June 20–25.
22. Parkhomenko, A. "Zoning and the density of urban development." presented at the 2020 Meeting of the Urban Economics Association.
23. Prokes, Ales, et al. "Multipath Propagation Analysis for Vehicle-to-Infrastructure Communication at 60 GHz." 2019 IEEE Vehicular Networking Conference (VNC). IEEE, 2019.
24. Rafiq, R. M. McNally. "Heterogeneity in Activity-travel Patterns of Public Transit Users." Presented at the 100th TRB Annual Meeting, 2021.
25. Rafiq, R., M. McNally. "Defining Public Transit Commuters Based on Their Work Tour Choice."
26. Sadeghinassr, B., Akhavan, A., Gehrke, S., Wang, Q., & Reardon, T. Mining Dockless Bikeshare Data for Deeper Transportation Planning Insights: Evidence from the Greater Boston Region. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, DC, 2021.
27. Tok, A. "Characterizing Freight Trucks using Advanced Technology-Based Methods." Presented at the 100th TRB Annual Meeting, 2021.
28. Tran, L., M. Y. Mun, and C. Shahabi. "Real-Time Distance-based Outlier Detection in Data Streams." Proceedings of the 47th International Conference on Very Large Data Bases (VLDB 2020). October 2020.
29. Tran, L., M. Y. Mun, M. Lim, J. Yamato, N. Huh, and C. Shahabi. "DeepTRANS: A Deep Learning System for Public Bus Travel Time Estimation using Traffic Forecasting." Proceedings of the 46th International Conference on Very Large Data Bases (VLDB 2020), Demo paper, Tokyo, Japan, August 31 - September 4, 2020.
30. Xi-Meng Fan, and W.-L. Jin, "Periodicity Detection of Simulated Traffic Data and Calibration of Network Fundamental Diagrams in Signalized Road Networks" Presented at the 100th TRB Annual Meeting, 2021.
31. Xi-Meng Fan, Pengyuan Sun, and W.-L. Jin, "Impact of advisory speed limit on the overall performance of signalized networks: A network fundamental diagram approach" Proceedings of Transportation Research Board Annual Meeting, 99th TRB Annual Meeting, 2020.

32. Zhang, D., Ho, C.H., and Zhang, F. Using Regression Analysis and Distribution Fitting to Analyze Pavement Sensing Patterns for Condition Assessments. In the proceedings of 2021 Annual Meeting of Transportation Research Board in Washington D.C. TRBAM-21-04008

C. Presentations

1. Banerjee, T. (USC). "Innovations in Transit? An In-Depth Case Study of the City of Monrovia/Lyft Public-Private Partnership to Increase Transit Ridership in Suburbia." City of Monrovia. January 20, 2021.
2. Boarnet, M. "Residential Moves Into and Away from Los Angeles Rail Transit Neighborhoods: Adding Insight to the Gentrification and Displacement Debate." Northwestern University. February 2021.
3. Brozen, Madeline; Yahata Ekman, Annaleigh presented collision findings in LA County for the project titled *How people move analyzing travel of vulnerable populations in Los Angeles* at the 2021 PSR Congress.
4. Cetiner B, Koc E, Soibelman L, Taciroglu E, Lee EJ, Nutakki A (2019). *A Granular Simulation of Bridge Closures due to a Southern California Scenario Earthquake and its Effects on the Disruption and Recovery of Freight Traffic to and from Ports of Los Angeles and Long Beach*, Proc. ASCE Int. Conf. on Sustainable Infrastructure, Los Angeles, CA, Nov. 6-9, pp. 575–585. (Not previously reported).
5. Dessouky, M. "Research, Practice, and Future Directions of Dynamic Ridesharing." Seminar at Georgia Tech University, 2021.
6. Hu, S., M. M. Dessouky, N. Uhan, and P. Vayanos. "Cost-Sharing Mechanisms in Ride-Sharing." 2020 National Meetings of INFORMS, National Harbor, MD.
7. Hu, S., M. M. Dessouky, N. Uhan, and P. Vayanos. "Cost-Sharing Mechanisms in Ride-sharing." METRANS Seminar Series. March 2021.
8. Kim, Karl; Leong, Genesis; Yamashita, Eric; Ghimire, Jiwnath. *Impacts of COVID-19 Travel Restrictions on Paratransit Users in Honolulu, Hawaii*. TRB, January 2021.
9. Kim, Karl; Yamashita, Eric; Ghimire, Jiwnath. Factors Associated with Differences in Pandemic Preparedness and Response: Findings from a Nationwide Survey. TRB, January 2021.
10. Kim, Karl; Yamashita, Eric; Ghimire, Jiwnath. Pausing the Pandemic: Understanding and Managing Traveler and Community Spread of COVID-19 in Hawaii. TRB, January 2021.
11. Matsumoto, D. (CSULB). "Covid-19 Impacts on Transportation and Supply Chain Workforce Development in Southern California." Transportation Research Board 2021 Annual Meeting. January 2021.
12. Matsumoto, D. (CSULB). "Southern California Regional Workforce Needs Assessment." LA Metro College/University External Partners' Meeting. February 26, 2021.
13. O'Brien, T. (CSULB) "Intersection of Future of Transportation and Future of Work." South Bay Cities Council of Governments (SBCCOG)'s 21st Annual General Assembly. March 18, 2020.
14. O'Brien, T. (CSULB). "Careers in intermodalism and how students can position themselves for success." IANA 2020 Student Case Competition. October 1, 2020.
15. O'Brien, T. (CSULB). "Freight technology advancements and Workforce Development." Transportation Research Board 2021 Annual Meeting. January 8, 2021.

16. Shahabi, C. "Transportation Data, Applications & Research for Smart Cities." The 20th KOCSEA Technical Symposium 2019, Atlanta, GA, November 16, 17, 2019 (Keynote) [not previously reported].
17. Shahabi, C. "Transportation Data, Applications & Research for Smart Cities." CS Colloquium, Purdue University, West Lafayette, Indiana, October 25, 2019. [not previously reported].
18. Su, Rongxiang. "Unveiling daily activity pattern differences between telecommuters and commuters using human mobility motifs and sequence analysis." 2021 Transportation Research Board Annual Meeting (online). January 27, 2021.
19. Suen, Sze-chuan. "Identifying Priority Testing Locations in Southern California for COVID-19 With Transmission Dynamics and Network Data." Presented at the "USC Research During COVID-19" symposium. August 2020.
20. Taciroglu E (2019-2021). *Big Data—A New Research Frontier in Earthquake Engineering*. Invited presentations at University of Nevada at Reno, Caltech, Northeastern University, Columbia University, Caltrans Seismic Advisory Board.
21. Wei, D., Koc, E., Rose, A., and Soibelman, L. "Socioeconomic Dimensions of Resilience to Seaport and Highway Transportation Network Disruptions," presented at 67th Annual North American Meetings of the Regional Science Association International, November 12, 2020.
22. Yahata Ekman, Annaleigh (Graduate Student Researcher) presented collision findings in LA City for the project titled *How People Move Analyzing Travel of Vulnerable Populations in Los Angeles* led by PI Madeline Brozen at the SCAG Active Transportation/Safety/Go Human working group in March 2021.