



Semi-Annual Progress Report #6

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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 (LBSU); 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 (Pima). USC and LBSU are both partners in the METTRANS 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 current total project count for PSR is 69. USC has 28 projects (including 3 regional projects at UCSB and 2 at UCR), LBSU has 3, UCLA has 7, UCD has 14, UCI has 11, UH has 5, and NAU has 1.

PSR completed 9 projects and issued 9 reports during the reporting period (see [Table 1](#)).

Table 1: Projects completed during current reporting period

Partner	Project No.	PI	Title	Funding Source
UCR	17-10	Kanok Boriboonsomsin	Connected Emission Control Technologies for Freight Vehicles	USDOT
LBSU	17-11	James Miles	Evaluation of Autonomous Vehicles and Smart Technologies for Their Impact on Traffic Safety and Traffic Congestion	Caltrans
UCD	17-17	Susan Pike	Davis Amtrak Station Pilot Project Planning: Potential Solutions to the Davis Amtrak Parking and Access Barriers	USDOT
USC	18-02	Maged Dessouky	Cost-Sharing Mechanisms for Ridesharing	Caltrans
USC	18-07	Dan Wei	Socioeconomic Dimensions of Resilience to Seaport and Highway Transportation Network Disruptions	Caltrans
USC	18-10	Cyrus Shahabi	Deep-Learning Traffic Flow Prediction for Forecasting Performance Measurement of Public Transportation Systems	Caltrans
UCLA	18-32	Michael Manville	The Opportunity Cost of Parking Requirements: The Case of Silicon Valley Applied Research Projects	Caltrans
UH	18-41	Qi Chen	Ultra-High-Accuracy Digital Terrain Model Mapping for Assessing Roadway Vulnerability to Sea-level Rise and Flooding: An Integrated Analysis of Mobile and Airborne LiDAR Data	USDOT
UH	18-42	Oceana Francis	Stormwater Drainage Design and Best Management Practices with Applications to Roadways and Climate Change	USDOT

Requests for Proposals (RFPs)

PSR issued a coordinated RFP 4 in early 2020. From this RFP, 35 proposals were received: 18 for USC (including 1 from UCR and 1 from UCSB), 5 from UCD, 4 from UCI, 5 from UCLA, 1 from LBSU, and 2 from NAU. The proposals are currently under review. Proposals will be selected for funding during the next reporting period. In addition to USDOT funding, match funding is available from Caltrans. Project start dates will range from mid-2020 to early 2021.

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 14 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
USC	19-10	Jong-Shi Pang	Modeling e-hailing and car-pooling services in a coupled morning-evening commute framework	Caltrans
USC	19-11	Marlon Boarnet	Ridesharing, Ride-Hailing, and Transit Ridership: A National Study Using the 2017 National Household Travel Survey	Caltrans
NAU	19-12	Chun-Hsing Ho	Development of Cost-Effective Sensing Systems and Analytics (CeSSA) to Monitor Roadway Conditions and Mobility Safety	USDOT
UCSB	19-15	Konstadinos Goulias	Revisiting the impact of teleworking on activity-travel behavior using recent data and sequence-based analytical technique	USDOT
USC	19-20	John Carlsson	The “sidekick” routing paradigm for VMT reduction and improved accessibility	USDOT
UCR	19-26a	Guoyuan Wu	Estimating the Impacts of Automatic Emergency Braking (AEB) Technology on Traffic Energy and Emissions	USDOT
UCI	19-30	Mohammad Al Faruque	Software and Hardware Systems for Autonomous Smart Parking Accommodating both Traditional and Autonomous Vehicles	Caltrans
UCI	19-31	Michael Hyland	Non-myopic pathfinding for shared-ride vehicles: A bi-criterion best-path approach considering travel time and proximity to demand	Caltrans
UCI	19-32	Wenlong Jin	Impacts of connected and autonomous vehicles on the performance of signalized networks: A network fundamental diagram approach	Caltrans
UCD	19-40	Austin Brown	Local Policy for Better Micromobility	Caltrans
UCD	19-42	Sarah McCullough	Assessing the Impact of Equity Work in Active and Sustainable Transportation	Caltrans
UCD	19-43	Miguel Jaller	Cargo Routing and Disadvantaged Communities	USDOT
UCLA	19-60	Madeline Brozen	How People Move: Analyzing the Travel of Vulnerable Populations in Los Angeles	Caltrans
UCLA	19-63	Paul Ong	Mobility, Accessibility and Disadvantaged Neighborhoods	Caltrans

Student opportunities for research

Student support is an important component of research project selection. USC, LBSU, and UCD require that research projects include student support.

USC used PSR funds to support four students to attend TRB: Sue Dexter (PhD candidate in Public Policy), Pouyan Hosseinaliabad (PhD student in Civil Engineering), Madison Swayne (PhD candidate in Urban Planning), and Juanhao Zhao (master's student in Applied Data Science).

UCI awarded 5 graduate student fellowships for the winter and spring quarters of 2020. UCLA awarded fellowships to 26 incoming and continuing students: 5 PhD Urban Planning, 1 PhD Civil Engineering, 1 PhD Social Welfare, 1 MPP, 18 MURP.

In the fall and winter of 2019-20, UCLA has produced graduates who have received PSR funding: 1 PhD Urban Planning, 1 PhD Social Welfare, 1 PhD Civil Engineering. The capstone projects produced from these graduates can be found at <https://www.its.ucla.edu/projects/capstone-projects/>

UCI PSR student fellows' research:

- De'Von Jennings is continuing to conduct research to determine the factors affecting ridership on rail systems in the United State by comparing and analyzing ridership volumes to other similar countries with commuter rail systems. His research is working on creating a direct demand model for ridership estimates in Southern California based upon the 2012 and 2015 on board survey for Metrolink.
- Chenying Qin continues to research how a household unit allocates time for travel to satisfy demand for various activities, focusing on nuclear families reporting on weekdays and considering several measures of travel and activity characteristics including activity duration, travel duration, and travel distance.
- Bumsuh Park is studying a new mobility model that integrates passenger transport (taxi or TNC vehicles) and logistics, with a specific look at meal delivery services. During this research reporting period, he developed a spatial regression framework to reveal the characteristics of the food delivery demand using Grubhub data from New York City during 2016 and 2017.
- Monica Ramirez-Ibarra is working on building a regional microscopic simulation network that will eventually be used to model vehicle autonomy, vehicle connectivity – CACC, V2X (Vehicle to Everything) communications, performance improvements of battery-electric trucks/Zero-Emission Vehicles, and the related environmental effects of infrastructure changes and the deployment of new technology applications.

UCLA PSR student fellows' policy briefs: UCLA produced 8 research briefs as part of its Fellowship program are listed below and are published to eScholarship as well as the UCLA ITS Website.

- Jacob Wasserman; A Time and a Place for Every Rider?: Geographic and Temporal Changes in Bay Area Transit Ridership
- Adam Russell; Improving First/last Mile Conditions Near Highways: An Investigation of Access and Coordination Barriers
- Malia Schilling; Completing our Streets: Lessons for Los Angeles from Peer Agencies Creating Safer, Multimodal Streets

- Forest Barnes; A Scoot, Skip, and a JUMP Away: Learning from Shared Micromobility Systems in San Francisco
- Katelyn Stangl; Parking? Lots! Parking Over the Minimum in the City of Los Angeles
- Tomoko Kanda; Advancing Mobility-as-a-Service: Lessons Learned from Leading-Edge Public Agencies
- Karina Schneider; Wheels for All: Ensuring Equitable Access to Dockless Mobility in Los Angeles
- Ryan Yowell; Class Act: An Assessment of Los Angeles Metro’s U-Pass Program

UCLA PSR student capstone projects:

- Libby Bradley; Changing Infrastructure Strategies: Maximizing the Deployment of Electric Drayage Trucks in Southern California.
- Monique Ho; Land Use in a World of New Transportation Technologies
- Dustin Khuu; Mode Choice and Perceptions of the Built Environment in Watts and Jordan Downs
- Austin Stanion; Congestion Pricing for Climate, Capacity, or Communities?
- Anthony Foneseca; Parking to Place: Barriers and Opportunities for Adaptability in New Parking Structure Construction in Los Angeles
- Doyle Esteban; The Role of Transportation in School Access: A Case Study of the Geffen Academy
- Jesus Peraza; Connecting the Dots...Ridership Changes, Underlying Causes, and Strategies for Pasadena Transit

Student conference support

UCI provided support to 9 students who presented at TRB 2020, and an additional 13 students who attended the conference. UCLA supported 2 students to present and 7 students to attend TRB 2020. UCD continued to provide support to the WTS UC Davis Student Chapter.



ITS-Davis supported student attendance of one UC Davis undergraduate at the California Transportation Foundation's 25th Annual Transportation Education Symposium in November 2019. USC supported attendance of four undergraduate students/

PSR funds were used to provide support the ITS-Davis 3 Revolutions Future Mobility Program's Annual Research Workshop. The workshop, which took place October 8-9, 2019, in Davis, CA, brought together a group of academics, planning agency members, policymakers, practitioners, and private sector representatives to discuss the latest research and findings from the 3 Revolutions Future Mobility Program. Topics of interest included the future of urban, automated, shared mobility, micromobility, and case studies on international efforts.

Administrative accomplishments

LBSU hired Natalie Reyes for a new project manager position in Communications and Reporting to serve as the organizational point person for external communications in promoting and marketing CITT and METRANS events and initiatives. Natalie will also be documenting CITT and METRANS deliverables and metrics for internal reports to satisfy compliance with grants and contracts.

Faculty accomplishments

- Dr. Adam Rose (USC) was appointed the Director of the Center for Risk and Economic Analysis of Terrorism Events, a joint center of the USC Sol Price School of Public Policy and USC Viterbi School of Engineering.
- Professor Genevieve Giuliano (USC), PSR/METRANS Director, received the Domenick Miretti Award on October 15.
- Professor Jean-Daniel Saphores (UCI) has been nominated to TRB ADC80 Alternative Transportation Fuels and Technologies committee.
- Professor Karl Kim (UH) finalized an internal RFP review to conduct research related to impacts and resilience of transportation systems from COVID-19 pandemic.
- Professor Maged Dessouky (USC), METRANS Associate Director of Special Programs, was promoted to Dean's Professor of Industrial and Systems Engineering and Spatial Sciences; and appointed as Department Chair in the Department of Industrial and Systems Engineering.
- Professor Marlon Boarnet (USC) was appointed as President of the Association of Collegiate Schools of Planning (ACSP).

i. Research dissemination

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

USC, UCD, UCI, and UCLA continued their respective research seminars, though some seminars had to be canceled or postponed due to COVID-19.

USC seminars

- Mohammed Mozumdar (LBSU). "Micro Sensors for Next Gen Smart Roads." Oct 9, 2019.
- Fraser Shilling (UCD). "Critical Collisions between Transportation and Ecosystems." Oct 30, 2019.
- Michael Manville (UCLA). "Is Neighborhood Change Leading to Falling Transit Ridership?" Nov 13, 2019.

UC Davis seminars

- Cynthia Chen (University of Washington). “Promises of emerging data for transportation applications.” October 11, 2019.
- Wynand Steyn (University of Pretoria). “Pavements, freight and vehicles – we all need and affect each other.” January 10, 2020.
- Margaret Cederoth (Director of Planning and Sustainability with the California High-Speed Rail). “California High-Speed Rail: Delivering a Transformative Investment.” January 24, 2020.

UC Irvine seminars

- Jim Misener (Senior Director Product Management, Qualcomm). “C-V2X: The Road to a 5G Automotive Future.” October 11, 2019.

UCLA seminars

- Martin Wachs (UCLA). “California High Speed Rail: Origin and Possible Destinations.” October 28, 2019.
- Eric Morris (Clemson). “Where to Put the Port? The Free Harbor Fight and the Development of Los Angeles.” November 1, 2019.
- Veena Dubal (UC Hastings College of Law). “Drive to Precarity: A Political History of Work, Regulation, & Labor Advocacy in San Francisco’s Taxi and Uber Economies.” November 18, 2019.
- Francie Stefan (City of Santa Monica). “Scootershare, Carshare, Bikeshare, and the Role of Public Policy.” November 25, 2019.
- Joshua Schank (LA Metro). “How to Make Money Moving People Around Cities (Hint: Best of Luck!).” November 27, 2019.
- Kara Kockelman (University of Texas). “Anticipating a World of Automated Transport: Opportunities for Vehicle- and Ride-Sharing Systems.” December 3, 2019.



Margaret Cederoth, Director of Planning and Sustainability with the California High-Speed Rail, presenting at UCD.

Emerging Scholars Symposium: USC held its second annual Emerging Scholars Symposium on March 6 with nearly 90 student and faculty participants from USC, UCD, UCI, UCLA, and LBSU. Key speakers included Geraldine Knatz (USC), Michael Manville (UCLA), and Thomas O’Brien (LBSU). The event is an opportunity for emerging scholars to present their work and meet other aspiring and established transportation professionals.

FED Talks (UCLA): In December 2019, UCLA assembled professors and graduate students to discuss and present new research and best practices around public transit, transportation finance, innovative mobility, infrastructure, housing, and much more. The talks were attended by students, faculty, staff, and partners of the institute.

Graduate Colloquium on Innovation in Transportation (UCI) On November 14, 2019, UCI hosted the Third Annual UCI Graduate Colloquium on Innovation in Transportation, during which a forum of invited

speakers from regional transportation agencies engage with graduate students with presentations on current issues in transportation followed by a robust Q&A session.

Irvine Symposium for Emerging Research in Transportation (ISERT): Held January 17–18, this intimate conference allowed researchers to present and receive feedback on new and developing research they are conducting across a broad range of thematic areas that overlap with PSR’s themes.

Transportation Speaker Series: In the fall of 2019, UCLA brought national experts to the UCLA Luskin School to discuss new research and best practices around public transit, transportation finance, innovative mobility, and much more. The videos from these lectures can be found on the UCLA Institute of Transportation Studies Website: www.its.ucla.edu.

In October of 2019, CITT Executive Director Tom O’Brien (LBSU) spoke to the Wilmington (Los Angeles) Chamber of Commerce’s Workforce Development and Beyond Luncheon.

Tyler Reeb (LBSU), CITT Director of Research and Workforce Development, moderated the Educators and Workforce Development Panel at the GetGlobal conference on November 6. The GetGlobal Conference is an event that assembles leaders from major sectors to illuminate key trends that internationally-engaged organizations and companies should be aware of and understand as well as to provide insight on how to address these strategic opportunities or risks.

On January 30, 2020, Mr. Abdollah Ansari, LA Metro’s Managing Executive Officer of the Highway Program, presented updates on current and future projects in Metro’s Highway Program to an international audience through WTS-LA.

NAU researchers participated in the 2019 International Road Safety and Simulation Conference, the Annual Meeting of the Transportation Research Board, the Arizona ITE/IMSA Spring Conference, and the Journal of Transportation Safety and Security.

UH is evaluating better ways to disseminate and share the results from its research and publications. For the research results, the intent is to convert the material and results into certified FEMA training, such that the knowledge gained can be disseminated to those who are trained under the UH FEMA grant.

Dr. Dan Sperling (UCD) contributed to the Fall 2019 issue of *Transfers Magazine*. His article, authored with Steven E. Polzin, “Longer View: Positioning Transit for the 21st Century,” discusses how embracing new mobility technologies and models is essential to improving transit services.

Dr. Sarah McCullough (UCD) facilitated an event in November 2019 (sponsored by the NCST UTC) based in part on her PSR project and report, “Making Bicycling Equitable: Lessons from Sociocultural Research.” The two-day event, “Addressing Cycles of Inequality,” featured a talk on Mobility Justice from Dr. Mimi Sheller (Drexel), and a workshop on day two for invited participants. The workshop considered how frameworks of mobility justice and racial justice offer new pathways toward creating more robust research models for bike equity and sustainable transportation futures. The goals of the event were to 1) develop new collaborative research relationships, 2) develop a shared research agenda that presumes the centrality of equity and justice for sustainable transportation futures, and 3) share insights with the broader community and track their impact.

Media coverage

During the current reporting period, a number of PSR faculty associates were covered in the media. Examples include Genevieve Giuliano (USC) in *Popular Science* and NPR, Marlon Boarnet (USC) in *LA Daily News*, Karl Kim (UH) in *Honolulu Star*, Brian Taylor (UCLA) on KCRW and KPCC, Susan Handy (UCD) in *Sacramento Bee*, Antonio Bento (USC) on NPR, Martin Wachs (UCLA) in *LA Times*, Gary Painter (USC) in *Vox*, Adam Rose (USC) in *USA Today*, Geoff Boeing (USC) in *Forbes*, and Michael Manville (UCLA) in *The Economist*, *The Guardian*.

ii. Plans for next reporting period

The next reporting period is April 1, 2020 through September 30, 2020. We plan to award over \$2M in funding from our RFP 4. We have 42 active projects that we will continue to manage. We anticipate completing 23 projects during the next reporting period. We will continue the PSR seminar series at USC, UCD, UCI, and UCLA. Many seminars may be available only as webinars due to COVID-19.

METRANS will hold its biannual Advisory Board meeting on April 3rd, 2020. Additionally, METRANS will hold its next Industry Outlook event this fall. The event features Geraldine Knatz (USC) speaking about the historical forces that shaped the Port of Los Angeles. The event was originally scheduled for March 2020 but was postponed due to the novel coronavirus pandemic.

NAU will continue supporting undergraduate and graduate students through paid internships and fellowships (which result in peer-reviewed presentations and publications), and support for conference travel, as well as engage in outreach activities.

UCI will continue planning for ISERT 2021 as well as the ongoing research seminar series and graduate colloquium. Planning for the regular spring component of the seminar series was disrupted by the COVID-19 crisis. The team is working to adapt to a virtual format.

Planning has begun for next year's UCLA Lake Arrowhead Symposium on the Transportation - Environment - Land Use Connection set to take place October 18–20. The theme will be "California's Climate Crossroads." The event will be attended by over 180 guests including academics, practitioners, and elected officials. UCLA has been meeting with the Lake Arrowhead steering committee since October 2019 to execute this event.

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 Student of the Year Awards

In addition to the PSR Outstanding Student of the Year award, we have created four additional award categories to honor high-performing students that would otherwise not be recognized: Doctoral Student

of the Year, Master's Student of the Year, and two Undergraduate Students of the Year. 2019-2020 winners are:

- Sue Dexter (USC, PhD student): Outstanding Student of the Year
- Danielle Dirksen (USC): Outstanding Undergraduate Student of the Year
- Elham Pourrahmani (UCD): Outstanding Doctoral Student of the Year
- Emmanuel James (NAU): Outstanding Master's Student of the Year
- Nicholas Roy (LBSU): Outstanding Undergraduate Student of the Year

Other student awards

- USC PhD student Zakhary Mallett received a 2019 Eisenhower Fellowship from USDOT
- PSR fellow De'Von Jennings (UCI) was selected as the recipient of a number of scholarships:
 - The ASCE LA YMF Dr. Bill Goodin Outstanding Student Mentor Scholarship
 - Dwight David Eisenhower Transportation Fellowship
 - The HDR Transportation Scholarship for 2020: <https://www.hdrinc.com/2020-hdr-scholarship-program-transportation>
- PSR fellow Farzana Khatun (UCI) received two awards during the reporting period:
 - Women Transportation Seminar (WTS) 2019 graduate scholarship from Orange County (OC) chapter
 - Award for securing the 2nd highest score at the doctoral level abstract in the International Conference on Transport and Health (ICTH) 2019 that was held November 4–8, 2019 in Melbourne, Australia
- UCLA doctoral students, Andrew Schouten and Miriam Pinski, were awarded the Pyke Johnson Award for best paper in planning and environment at the 99th Annual Meeting of the Transportation Research Board in January for their paper "Physical Accessibility and Employment Among Older Adults in California," with professors Evelyn Blumenberg and Martin Wachs.

Jacob Wasserman (UCLA) contributed research related to his 2019 capstone project to the Metropolitan Transportation Commission as part of the research team for "What's behind Recent Transit Ridership Trends in the Bay Area?" The project produced two policy briefs and one report in February.

Undergrad, Joceline Suhaimi (UCLA), is the president of the Institute of Transportation Engineers (ITE) at UCLA and is an active member of the Women's Transportation Seminar and the American Society of Civil Engineers. She led her team to host the ITE Western District Student Leadership Summit in February.

Data Camp: UCLA ITS offered an introductory workshop in data science using Python for transportation researchers in September 2019. UCLA ITS did not use PSR funds to produce this workshop; however, students receiving PSR funds attended and will incorporate new skills into their capstone projects.

NAU fellowships: NAU continued supporting undergraduate and graduate transportation students through paid internships, fellowships, and support for conference travel, as well as engage in outreach activities. During this period, we awarded one fellowship.

Professional development opportunities

PSR partners with WTS Los Angeles (WTS-LA) and WTS Orange County (WTS-OC) to facilitate and sponsor membership and attendance at WTS events and with WTS-LA to promote student participation in the transportation resume book. PSR Associate Director of Education and Professional Development Victoria Deguzman is the WTS-LA chapter University Liaison and a WTS-OC Mentor, and conducts outreach for both chapters to high schools and institutions of higher learning throughout the greater LA region; a graduate-level transportation student at USC serves as the WTS-LA and WTS-OC chapter Student Liaison. USC also continues to offer career services to students interested in a transportation related career, and facilitate connections with students and industry. NAU, Pima, UCI, UCLA, and UH provide numerous professional development opportunities for students and professionals in the transportation field through lectures, conferences, workshops, and internships.

Get the Job: This professional development speaker series was launched at USC during 2018 to meet the demand for specific job-seeking guidance that could not be met by our practitioner lunch series and mentor programs alone. It is designed to provide a small group environment in which students receive advice from active practitioners on securing employment. During the reporting period we held two events for a combined audience of 89 participants.

Internships in Policy, Sustainability & Transportation: USC held a career panel discussion on January 30 for students to learn how employers broke into their careers. The panelists also spoke about what it is like to work in their field and how to effectively network. A number of southern California organizations were represented at the event including: LA Metro, Port of Long Beach, Fehr & Peers, and Caltrans.

METRANS Mentor Program: In this program at USC, transportation practitioners (mentors) guide students to make informed career decisions and to develop into well-rounded professionals. 29 students were mentored during the reporting period (22 are female, 21 are both female and members of underrepresented groups: Hispanic/Latina and Asian/Pacific Islander).

Workforce development

Pima finalized the online content for all 11 logistics classes, developed GIS curriculum (currently under College review), and developed an Autonomous Vehicle certificate program. Pima is currently in the process of converting two truck driver classes to an online format (TDT 116, TDT 118).

Pima's truck driver training had its first female Pascua Yaqui tribe member complete her Class A CDL training. The student was the first Pascua Yaqui CDL completer funded by the Native American Career and Technical Education Program.

Results for PCC's new Autonomous Vehicle Driver and Operations Specialist program were disseminated at the following presentations (data and results related to the Logistics programs are disseminated at industry advisory meetings):

- Women in Trucking (annual conference), panel presentation with Starsky Robotics and TuSimple, Dallas, TX. October 2019.
- National Association of Professional Truck Driving Schools (regional conference), Corpus Christi, TX. October 2019.
- National Council for Workforce Education (annual conference), San Antonio, TX. October 2019.
- National Association of Professional Truck Driving Schools (regional conference), Patterson, CA. December 2019.

- Metropolitan Education Commission Keys to Employment, Tucson, AZ. February 2020.
- League for Innovations, Seattle, WA. March 2020.
- Human Trafficking Presentation/Truck Display completed October 2019 for AJS 204 Investigations class, Tucson, AZ.
- Career Day/Next Steps for Pantano High School, Vail School District, Vail, AZ. November 2019.

PCC continues to offer Autonomous Vehicle Driver and Operations Specialist curriculum, and has 12 students in various stages of program activity. Out of the 12 students, 5 students are currently taking classes, and have completed a total of 37 credits. Six students are awaiting the first online offering of Introduction to Autonomous Vehicles (AUV 101), which is in process for online implementation. (Note: there may be more students enrolling for classes in the program but have not yet declared due to self-enrolling across the different disciplines.) The Logistics program has supported 98 students.

AZTrans: NAU supports STEM outreach activities which provide exposure to transportation to K-12 students and members of the public. *AZTrans* graduate student Emmanuel James operated a transportation-focused exhibit at a STEM celebration which took place at an Arizona Diamondbacks game in July 2019 (not reported in previous SAPR). *AZTrans* also operated an exhibit at the 2019 NAU Science and Engineering Day (which was part of the Flagstaff Festival of Science) entitled “Behind the Scenes: How Our Roadways are Designed & Operated” on Saturday, September 21, 2019. Participants had the opportunity to examine equipment and software used in real-world traffic engineering applications in order to provide safe and efficient transportation of people and goods.

Data Hack Night: UCLA ITS offered an introductory workshop in data science using python for transportation researchers each month since October 2019. UCLA ITS did not use PSR funds to produce this workshop, but students receiving PSR funds attended and will incorporate new skills into their capstone projects.



Middle school girls attend a STEM event at USC.

Make Way for Gen Z: USC held a STEM workshop for nearly 100 middle school students on the USC campus in October. The workshop provided a hands-on encounter with emerging technology, an immersion in higher education, and lively lessons teaching soft skills critical for the next generation of transportation technology leaders. The workshop was led by professors, college students, and transportation professionals with the goal of motivating the middle school students to become transportation innovators and professionals.

i. **Education 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.

Softskills Webinar: The focus of the Soft Skills Webinar is a shift from the term “soft skills” to “employability skills” in the trucking workforce. This encompasses all skills and knowledge needed to obtain and keep a job within the trucking industry including those that help develop leadership and small business management skills. The team has created a working outline for the project that includes both an annotated bibliography of the research sources for the project as well as a guide for the structure of the webinar itself.

Online Commercial Driver’s License (CDL) Training: LBSU and PCC will develop and deploy a webinar series on best practices for migrating non-credit courses to the online environment. With a focus on CDL training, the series will present ways to eliminate barriers to entry to underserved populations such as women, veterans, tribal communities, and nonnative English speakers. LBSU’s scope of work includes curriculum development, online coordination, outreach and marketing to potential participants in instructional design and trucking, and follow-up evaluations and interviews.

The theory portion of PCC’s Class A Commercial Driver License Training (TDT 118) is being implemented in an online environment. The first offering begins April 13, 2020 with 4 students expected to attend, as of this writing. The class will serve as a pilot for the Arizona Department of Transportation (ADOT) as they explore standards for online training. Program staff have given a demonstration of the platform and curriculum to ADOT key officials. The next steps are to inform ADOT of successes and challenges experienced with the first offering. The Pascua Yaqui tribe is also aware of this new opportunity to do the theory portion online and is hoping to enroll students soon.

Logistics Peer Exchange: CITT (LBSU) is currently scheduling a peer exchange for MPOs throughout the PSR region to share and document best practices in regional freight planning. While originally intended to be focused on the unique needs of Arizona, the pilot will be expanded to include a greater number of MPOs to capture the post-COVID 19 issues experienced in moving goods during the pandemic.

CITT has partnered with the California Energy Commission (CEC) and the Governor’s Office of Business and Economic Development (GO-Biz) to develop a Sustainable Freight Foundations Certificate Pilot Program. The goal of the program is to identify and implement steps to ensure that sufficiently skilled labor is available to meet the needs of an expanding freight-related job market. The program’s curriculum combines learning objectives targeted to middle managers. Objectives such as compliance reporting, efficient and effective program management, foundational knowledge of energy ecosystems, and the use of data and metrics for presenting information will be presented by industry experts.

The Caltrans Freight Academies convene Caltrans employees in four-day workshops that give an overview of the supply chain and the role that they play in goods movement. They will also understand the roles played by various actors and identify possible partners for goods movement activities, armed with examples of successful collaborative planning efforts. The workshops consist of lectures, activities, guest speakers, and site visits. This year's workshops will be held in Bakersfield and San Diego.

Geospatial Technology Education: Roadmaps and Story Maps for Public Outreach

This CITT training program will consist of three distinct components:

1. The development of a research-based white paper on the use of technology in public-sector outreach. This will allow the team to better understand the conditions under which technology facilitates communications as well as the policy and legal considerations (such as ADA requirements) that must be built into the development of curricular materials.
2. The development of course materials for a one-day workshop on geospatial technologies for the public sector. This includes GIS-based story maps, accompanying guides for the student as well as an instructor's manual to be used in Train the Trainer exercises.
3. Course delivery including a Train the Trainer class for public sector representatives from each of the PSR regions, a pilot classroom-based workshop offered in California with state DOT and MPO employees as participants, and a virtual workshop for participants across the PSR region.

UCLA will create an independent learning package in lieu of in-person monthly Data Hack Night workshops for current students, staff, and faculty on Python software used for research data analysis; and create an opportunity for remote office hours for students to interact with staff regarding professional development.

C. Outreach Accomplishments

PSR Annual Congress: Our annual congress was set to be hosted by UH and held in Honolulu, HI March 23–24. However, due to the COVID-19 pandemic, we were forced to postpone the event. However, our PSR Advisory Council meeting took place as planned, albeit as a web conference instead of an in-person meeting. Representatives from all PSR consortium members participated along with our Advisory Board members. In addition to research, education and outreach updates, the meeting included two research presentations and tech transfer best practices presentation. PSR Director Genevieve Giuliano led a group discussion on how PSR can better engage with its Advisory Board, and how their organizations can better leverage current and future PSR research.

Smart Freight Week: METRANS (USC/LBSU) and the Center for International Trade and Transportation (LBSU) recently hosted Smart Freight Week at Hotel Maya in Long Beach, California, October 14-18, 2019. The week's events included the CITT Town Hall addressing the future of port operations, a MetroFreight workshop for policy makers and planners from around the world looking at complete street solutions for freight, a reception for Caltrans Mentors reception, and the 8th METRANS International Urban Freight Conference (INUF) along with other receptions, meetings, and tours. These events gathered more than 500 attendees from over 18 different countries and provided forums for researchers, policymakers and practitioners to build a dialogue on the future of the transportation industry. More about Smart Freight Week:

- This year's Town Hall Meeting, "Smart Port of the Future: Economy, Environment, Technology, and Workforce", addressed the future of how we move goods and what this means for our

national and regional competitiveness, the livability of our communities and the opportunities and challenges for the workforce. Technology can contribute to a more efficient and cleaner supply chain, including port and terminal operations; but technology also contributes to a change in the way goods are moved and the skills needed by the waterfront workforce.

- The Caltrans Mentors reception launched the Caltrans Mentors program. Building on CITT’s past support of Caltrans professional development through a series of activities including the Freight Academies, the program will match Caltrans personnel with freight-related practitioners. The purpose of the program is to allow Caltrans employees to engage on a more regular basis with the users of the freight system so that they better understand the impact of statewide planning on the freight and logistics sector.
- INUF hosted scholars and industry specialists who presented research that is increasingly relevant as the rise of e-commerce, transformational technology, and other developments influence urban freight movement.



INUF participants tour the Port of Long Beach.

The METRANS Transportation Center held its semi-annual Advisory Board meeting on November 22, 2019 on the campus of USC in Los Angeles, California. The meeting was well attended by senior leaders from the Center’s industry and agency stakeholders. The meeting allowed METRANS to provide updates on its research, education and outreach activities during the prior six months. Additionally, the meeting allowed for discourse between the Center and its stakeholders, which will inform future Center activities and efforts. METRANS Advisory Board members are listed on our website:

<https://www.metrans.org/advisory-board>

Lake Arrowhead Symposium (UCLA): UCLA’s Lake Arrowhead Symposium on the Transportation–Environment–Land Use Connection was held from October 20 to 22, 2019. The theme was “Routes to

Opportunity: Connecting Equity and Transportation.” The event was attended by over 180 guests including academics, practitioners, and elected officials. UCLA has been meeting with the Lake Arrowhead steering committee since 2018 to execute this event.

ROUTES TO OPPORTUNITY

CONNECTING EQUITY AND TRANSPORTATION

THE 29TH ANNUAL UCLA LAKE ARROWHEAD SYMPOSIUM

OCTOBER 20–22, 2019



Logistics Peer Exchange: LBSU compiled a list of potential participants from their network of municipal and MPO-level planners. Ongoing conference attendance, site visits, and research on best practices in logistics planning and distance-based learning is ongoing and will inform the webinar content.

METRANS on the Move: This is a weekly e-newsletter written and produced by USC students with staff guidance. Over 3,000 subscribers receive this weekly publication containing transportation news, and notice of transportation events and opportunities, such as conferences, seminars, webinars, scholarships, internships, and job listings. Twenty-six issues were published during the reporting period. Students and alums from USC, UCLA, UC Davis and UC Irvine participated as authors of feature stories.

Speaker Series (UCLA): In the spring of 2019, UCLA brought national experts to the UCLA Luskin School to discuss new research and best practices around public transit, transportation finance, innovative mobility, and much more. The videos from these lectures can be found on the UCLA Institute of Transportation Studies Website: www.its.ucla.edu.

Transfers Magazine: The fourth issue of Transfers Magazine was launched in November 2019, consisting of four articles and an opinion column representing writers from three PSR campuses (UCLA, UC Davis and UC Irvine). The website www.transfersmagazine.org, which also features regularly updated blogs with transportation-related news, research and events, had more than 24,000 page views during this six-month period, which is twice the amount received a year ago. In January, Michael Manville, associate professor of urban planning at UCLA Luskin School of Public Affairs, became the new editor-in-chief of Transfers Magazine. A Q&A blog post with Manville was the most widely read and engaging post on social media for the magazine’s handle. Editing is currently underway for the next issue set to release in May 2020. 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.



i. Outreach plans for the next reporting period

METRANS will hold its next Advisory Board meeting on April 3. The meeting will be held virtually due to restrictions brought on by COVID-19.

Logistics Peer Exchange: LBSU will leverage experience in logistics programs for in-person and online audiences at regional and statewide planning organizations to host two virtual peer exchanges on

freight and logistics as part of local and regional plans. LBSU will facilitate the discussion by preparing content specific to the regional audience (e.g. cross-border trade logistics in Arizona and California) and will incorporate existing distance-based teaching tools and offer access to industry practitioners who will serve as virtual mentors.

UCLA will release Issue 5 of *Transfers Magazine*, host the Annual Interactions LA 2020 virtual event on uplifting women's safety in transportation in partnership with the UCLA Lewis Center for Regional Policy Studies, and host the Annual Downtown Los Angeles Forum virtual event on practical implementation strategies for incorporating recommendations discussed at the 2019 UCLA Lake Arrowhead Symposium on "Routes to Opportunities: Connecting Equity and Transportation."

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
- 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, California Department of Transportation (Caltrans)
- Volvo Research and Education Foundation (VREF)

CITT at LBSU 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 with CITT 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. Total contributions amount to \$583,231.

The Intermodal Association of North America (IANA), has designated CITT as one of only nine programs in the country to be part of its scholarship program and the only one focused on professional development offerings. The IANA scholarship money is made available on a competitive basis to students on the LBSU campus pursuing degree programs who would also benefit from the logistics industry exposure offered by CITT's Global Logistics Specialist and Marine Terminal Operations Professional programs. A portion of the money also allows both undergraduate and graduate students on campus to gain research experience on applied research projects being undertaken by CITT, including those that are part of the PSR research program. During the reporting period, IANA-funded research on port disruptions by undergraduate student Nicholas Roy, was recognized as the best economics research project as part of the LBSU Student Research Awards. Nicholas will represent CSU in the 23 CSU campus wide competition in the spring of 2020.

B. Other support

The following organizations provide indirect or in-kind support to PSR:

- **California:** AECOM (Los Angeles); 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; Governor’s Office of Business and Economic Development (GO-Biz); HDR; International Longshoremen and Warehousemen’s Union (ILWU) Local 13; Kiwi Inc.; Long Beach Transit; 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; 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, 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

Arizona Technology Park: Pima partners with the University of Arizona Technology Park in a Smart Vehicle Innovation Team (SVIT), which seeks to bring economic developers and academic researchers together to attract autonomous vehicle manufactures to southern Arizona.

Center for Urban Transportation Research, University of South Florida: UH is in discussion with the CUTR to jointly develop FEMA and FTA certified training sessions/courses targeting DOT and transit agency personnel, local governments, etc. UH is also working towards establishing a “point of delivery” (POD) at CUTR to deliver newly certified evacuation planning and strategies courses.

Council of University Transportation Centers (CUTC): Thomas O’Brien (LBSU) was recently elected president of CUTC. Center Director Genevieve Giuliano (USC) is a past president and past executive committee member.

Institute of Transportation Studies (ITS): ITS is the University of California transportation research institute. It has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA. ITS is funded in-part by the state of California, as well as by Caltrans research contracts. ITS provides PSR match funding.

Long Beach Unified School District: LBUSD partners with CITT on the Academy of Global Logistics (AGL), which serves as a testing ground for many of the tools, programs and workforce initiatives developed through PSR.

Maricopa Association of Governments: NAU serves as an independent evaluator of pilot smart technology deployments in the MAG region. Projects include an adaptive-like technology and a novel method of improving preemption for emergency vehicles.

MetroFreight Center of Excellence: METRANS is the home of the Volvo Research and Education Foundation (VREF) Center of Excellence on urban freight. It is an international consortium that includes the University Transportation Research Center (Region 2 UTC), Institute of Science and Technology for Transport (IFSTTAR), and the Korean Transport Institute (KOTI). MetroFreight has greatly expanded our international linkages, and offers many opportunities for collaboration and partnerships.

National Center for Sustainable Transportation: The NCST UTC was established in 2013 and renewed 2016. Led by University of California, Davis, consortium partners include METRANS (USC and LBSU); University of California, Riverside; Georgia Institute of Technology; and the University of Vermont. METRANS' role is sustainable freight transport, which links well with MetroFreight.

Southwest Transportation Workforce Center: SWTWC and its partners provide significant infrastructure and professional capacity in support of workforce development programs for PSR. SWTWC is led by LBSU, with USC, Texas A&M Transportation Institute (TTI), ICF International, and the National Occupational Competency Testing Institute as partners.

The Center for International Trade and Transportation: CITT (LBSU) acts as a media sponsor, using its media and social media channels to announce events and other opportunities to a network of students and industry and government partners.

TuSimple: Autonomous trucking company TuSimple works closely with PCC's transportation programs and was one of the key partners in developing and promoting the new Autonomous Vehicle Driver and Operations Specialist certificate program. TuSimple offers priority hiring to the program graduates.

UCLA Lewis Center for Regional Policy Studies: Deputy Director, Madeline Brozen is a researcher on the project, "Public Transportation Among University Students." The Lewis Center also provides workspace and matching funds researchers and staff at the UCLA Institute of Transportation Studies.

Velodyne Lidar: The company has provided a donation of two LiDAR units that are supporting current graduate student fellowship and faculty research projects at UCI.

C. Collaborations

CITT (LBSU) acts as a sponsor for events offered by these and other organizations as a way to provide access to industry professionals for Long Beach students. During the reporting period, CITT (co)sponsored the following:

- Council of University Transportation Centers (CUTC)
- Harbor Association of Industry and Commerce (HAIC)
- Los Angeles Area Chamber of Commerce

This allowed students to attend events where they were able to learn about the transportation, logistics and supply chain industry and meet industry professionals. CITT also acts as a media sponsor, using its media and social media channels to announce events and other opportunities to a network of students and industry and government partners.

CITT also partners with the Port of Long Beach and Long Beach Unified School District on the Cabrillo HS Academy of Global Logistics (AGL), which serves as a testing ground for many of the tools, programs and workforce initiatives developed through PSR.

NAU continues to collaborate with Iowa State University, offering a study abroad course in Summer 2020 in Italy, entitled Infrastructure Systems Abroad. This will be the 4th time NAU offers this opportunity. While NAU was successful in attracting enough students to make the program a go, it was cancelled because of COVID-19.

UH is exploring potential collaboration with Louisiana State University, Department of Civil and Environmental Engineering, Gulf Coast Center for Evacuation and Transportation Resiliency, Maritime Transportation Research and Education Center (MarTREC) on matters related to evacuation and traffic impacts when examining disaster impacts to regions.

UCD collaborates with the UC Davis Policy Institute for Energy, Environment, and the Economy.

3. Outputs

PSR outputs include publications, reports, papers, presentations, media, and others. Our target for peer-reviewed publications is 5 per year. During this reporting period, we have exceeded our target. For a list of the 18 publications, 33 conference papers, and 14 research presentations, see [Appendix A](#). See [Table 1](#) for a list of the 9 final reports that were completed 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:

- eScholarship (UCD, UCI, UCLA): <https://escholarship.org/>
- ITS-Davis: <https://its.ucdavis.edu/>
- NAU PSR UTC site: <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/UCYgWr1zI9uFlip1nwmcKhOQUCLA>
- 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>

METRANS website: The METRANS website (www.metrans.org) is a central portal for information on METRANS and CITT's programs including PSR as well as the MetroFreight Volvo Center, the National Center for Sustainable Transportation, and the Southwest Transportation Workforce Center. A website

redesign has been under development with Volatile Studios during the reporting period and was launched in October of 2019.

E. New methodologies, technologies or techniques

Although not specifically funded by UTC funds at the moment, UH has been examining with its partners the development and use of 360 imaging (similar to Google Street View) and AI/machine learning applications for disaster damage assessment and transportation infrastructure management. Further research may be funded by PSR UTC.

F. Other products

PSR/METRANS News: METRANS News is published three times a year and summarizes METRANS research, education, and outreach, including coverage of PSR projects and activities. The publication highlights METRANS researchers, conferences and events, recent publications, interviews with key individuals involved in METRANS, and other newsworthy activities and events. It is distributed to university transportation centers and faculty throughout the U.S., to federal, state, and local public agencies, and to the transportation industry. A portion of METRANS News is specifically dedicated to featuring PSR updates, and this portion is also disseminated on its own as a separate PSR newsletter.

METRANS E-blasts: CITT at LBSU also produces two monthly e-blasts, one for CITT-specific news and one for METRANS, which include PSR updates. Each e-blast usually contains three brief articles covering CITT- or METRANS-related awards, presentations, events, and project descriptions as they appear. The e-blasts essentially function as a more frequent and localized version of METRANS News. They are distributed as e-mails to CITT and METRANS members, partners, and subscribers.

Trade Talks: Dr. Thomas O'Brien of LBSU hosts a quarterly television series called Trade Talks produced by LBSU's Advanced Media Production services and distributed through a regional cable network including all 23 campuses of the California State University system. The episodes are also available on YouTube. The October 2019 episode featured Peter V. Hall, Professor at Simon Fraser University. The February 2020 episode featured Dr. Tyler Reeb, Director of Research and Workforce Development at CITT. Trade Talk episodes have been included as teaching tools in educational programs such as massive open online courses (MOOC). All episodes can be viewed here:

<https://www.youtube.com/playlist?list=PL1POu-XNKt4k1RZv9NG3HROnbKYBQgpjb>

METRANS YouTube: METRANS (USC/LBSU) has a YouTube channel, where we post videos of seminars and other recorded events. Many of the videos feature PSR-funded researchers and research. Videos are available here: <https://www.youtube.com/playlist?list=PLFF4D4389AC445594>

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.

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. PSR partners held several events 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.

- METTRANS' Smart Freight Week (October 15–18, 2019) included over 500 participants from 18 different countries and provided forums for researchers, policymakers and practitioners to build a dialogue on the future of the transportation industry.
 - International Urban Freight Conference (INUF) attracted 250 practitioners, policymakers, and academics.
 - The Town Hall meeting assembled the major stakeholders of the Ports of Long Beach and Los Angeles and attracted 240 attendees.
 - Our international policy and planning workshop on last mile deliveries sponsored by the Volvo Research and Education Foundations had 45 participants.
 - CITT's professional development program for Caltrans, the state DOT, sent 30 participants to the weeks' events.
- METTRANS utilizes its semi-annual Advisory Board meetings to help disseminate PSR research. Board members include 23 senior leaders from major regional public and private transportation organizations.
- UCLA Lake Arrowhead Symposium (Oct 14-16, 2018): 181 public and elected officials.
- UCLA Downtown Los Angeles Forum (Mar 1, 2019): 100 public and elected officials.

UCD's GreenLight webinar (Feb 13, 2019) with Dr. Fraser Shilling, "Automated Analysis of Wildlife-Vehicle Conflict Hotspots Using Carcass and Collision Data," was attended by stakeholders from four different countries affiliated with the USDOT, state DOTs, other national and state agencies, non-profit organizations, local and tribal governmental organizations, academia, and the private/industry sector.

Presentations from the METTRANS INUF conference were featured in a "Talking Freight" Webinar hosted by the FHWA on November 20, 2019. There were 102 attendees at the webinar.

USC professors Genevieve Giuliano and Antonio Bento participated in the University of Southern and Stanford University Symposium on Climate Change Policy and Transportation on November 20, 2019. The event was held at USC. Panelists included former California Governor Arnold Schwarzenegger and Senator Kevin de León.

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](#).

Dr. Alan Jenn's (UCD) project, "Charging Infrastructure Development for Transportation Network Company Electrification," has helped to inform the shaping of Senate Bill 1014, the California Clean Miles Standard and Incentive Program, and has provided guidance to the California Air Resources Board for implementation of the same regulation.

A UCD project which resulted in the white paper, “California Climate Change Target Setting: A Workshop Report and Recommendations to the State of California Based on the Third California Climate Policy Modeling Dialogue and Workshop,” (<https://escholarship.org/uc/item/2699b5zh>) has contributed to the research team’s design of a new study developing scenarios of a carbon-neutral transportation system for California by 2045.

The UCD white paper, “Making Bicycling Equitable: Lessons from Sociocultural Research,” (<https://escholarship.org/uc/item/37s8b56q>) has had extended reach, with over 1,000 web hits, 375 downloads, and 38 instances of online attention since publication.

Dissemination of recent research policy briefs has increased the awareness of PSR research amongst its public and private stakeholders. Notably, research completed at UCLA has made substantial contributions to understanding the nature of declining public transit ridership in California, and has increased awareness of sexual harassment on public transit among public transportation agencies.

UH research assists with both increasing the understanding and awareness of transportation issues, which allowed for the creation of FEMA certified training courses to train first responders, transportation managers, public utilities and others that deal with impacts from disasters to transportation systems and the resilience of such infrastructure.

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.

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.

From a pedagogical standpoint, one paper presented by NAU at TRB during this period was titled ‘Impact of Evolving Course Operational Changes on Student Outcomes in Transportation Engineering,’ and was developed through an analysis of student course evaluations and assessments, to gain an understanding of how changes made over time in a course’s delivery impact student outcomes.

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 sections above.

The National Disaster Preparedness Training Center (NDPTC) at UH trains approximately 5,000 first responders and other state and local governmental agency personnel annually across the United States and its territories. UH's PSR-funded research produces outcomes that can be converted into certified FEMA training and provides valuable information for practitioners on maintaining the safety and security of the transportation infrastructure in the United States.

CITT's efforts for AGL include the development of integrated project learning topics for teachers and coordination for all industry engagement. The program serves an outlet for research done by CITT under other grants such as PSR. Furthermore, an instructional video created by CITT introducing the supply chain with a focus on Southern California is used as part of AGL, available at the following link:

<https://youtu.be/7U2fqkCB3pc>.

During the reporting period, AGL and the Port of Long Beach received the Clean Air Education Outreach Award through the South Coast Air Quality Management District <https://www.ajot.com/news/air-district-honors-ports-innovative-education-program>.

NAU continues to conduct K-12 STEM outreach activities aimed at educating students about the field of transportation engineering with the goal of fostering interest in this field as a career. Specific outreach activities during this reporting period include:

- In February 2020, a local high school STEM group visited the NAU traffic lab and were given a presentation and demonstrations related to the field of transportation engineering.
- In November 2019, a class of approximately 30 third-grade students who visited the NAU traffic lab were given a presentation (along with an activity) focused on the field of transportation engineering.

The Impact of PCC's programing is primarily through relationship building with industry partners and the development of new programs that allow enrolled students to qualify for advanced jobs that pay sustainable wages. The development of industry aligned programs increases access to new educational and career opportunities and increases equity in the College's offerings. Autonomous Vehicle Driver and Operations Specialist and Logistics programs both provide students with access to industry driven curriculum that prepares them for careers in fields that pay well and provide access to continuous learning opportunities. Logistics is completely online, which has increased access to the program and allows students to take classes during times that work best for them.

As a result of PCC's relationship building and workforce development efforts, TuSimple has donated an automatic truck to the Center for Transportation Training (CTT), the lead for the Autonomous Vehicle Driver and Operations Specialist certificate program. In addition to adding another unit to our fleet to serve a backlog of students, per feedback received from our advisory committee industry members, the automatic truck will allow CTT to reach underserved populations who may not otherwise train due to physical limitations with manual shifting.

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

The COVID-19 pandemic has caused disruptions for many PSR activities. Fortunately, most activities can proceed as planned, with some activities being changed 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. If travel delays continue past the current calendar year, some travel budgets may need to be re-directed to other activities.

METRANS created a research continuity plan, which has been transmitted to OST-R. Each PSR partner has developed an individual plan to keep PSR activities maintained to the extent possible.

Problems and delays encountered during the reporting period

Although the COVID-19 pandemic has caused delays, most research projects are able to stay on track for timely completion. An ongoing assessment will determine which projects need to request no-cost extensions.

International students who have returned home, and some who have been admitted for Fall, may have trouble getting visas. This would have a negative impact on our educational programs.

Change of primary performance site location

All PSR UTC partner campuses have closed to all but essential personnel. Accordingly, most faculty and staff have been working remotely as of mid-March. We will continue to work remotely until the restrictions are lifted.

One program that is heavily affected is the Truck Driver training program at PCC, which has moved as much instruction as possible online; however, there are hands-on driving components that cannot be transitioned. PCC plans to offer the hands-on portion as soon as campus opens up again.

7. Special Reporting Requirements

In addition to the regular reporting requirements, PSR partners collected reports from researchers to assess the impacts and potential delays caused by COVID-19.

8. Appendix A

A. Publications

Peer-reviewed publications

1. An, S., D. Nam, and R. Jayakrishnan (UCI). 2019. "Impacts of integrating shared autonomous vehicles into a Peer-to-Peer ridesharing system." *Procedia Computer Science Volume 151*, 2019, Pages 511-518.
2. Gehrke, S.R. & L. Wang. (NAU) (2020). Operationalizing the neighborhood effects of the built environment on travel behavior. *Journal of Transport Geography 82*: 1-12. doi.org/10.1016/j.jtrangeo.2019.102561.
3. Giuliano G., S. Kang, and Q. Yuan (2019) "Agglomeration economies and evolving urban form," *The Annals of Regional Science*, DOI 10.1007/s00168-019-00957-4 (online first)
4. Ho, C.H., Snyder, M., and Zhang, D. (NAU) (2020). Application of Vehicle-Based Sensing Technology in Monitoring Vibration Response of Pavement Conditions. Accepted for publication in the *Journal of Transportation Engineering, Part B: Pavements*, ASCE, in press.
5. Jaller M., C. Otero-Palencia, and A. Pahwa (UCD). "Automation, electrification, and shared mobility in urban freight: opportunities and challenges." *Transportation Research Procedia*. TRPRO13235, PII S2352146520303586
6. Jamme, H. T., Rodriguez, J., Bahl, D., & Banerjee, T. (USC) (2019). A Twenty-Five-Year Biography of the TOD Concept: From Design to Policy, Planning, and Implementation. *Journal of Planning Education and Research*, 39(4), 409-428.
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8. Jin, WL (UCI). "Stable day-to-day dynamics for departure time choice." *Transportation Science* Vol 54:1, 2020. <https://doi.org/10.1287/trsc.2019.0919>
9. Jung, J., A Tok, SG Ritchie (UCI). "Determining optimal sensor locations under uncertainty for a truck activity monitoring system on California freeways." *Journal of Intelligent Transportation Systems*, 1-14, 2019. <https://www.tandfonline.com/doi/abs/10.1080/15472450.2019.1579094>
10. Khatun, F. & J-D Saphores (UCI). "DON'T HOP in the Bus GUS – an Analysis of Recent Trends in Octa (Orange County Transit Authority) Bus Ridership." *Journal of Transport & Health* 14:100784, 2019.
11. Mohebbi, A., Yu, F., Cai, S., Akbariyeh, S., & Smaglik, E. J. (NAU) (2020). "Spatial Study of Particulate Matter Distribution, based on Climatic Indicators during Major Dust Storms in the State of Arizona." *Frontiers of Earth Science*, <https://doi.org/10.1007/s11707-020-0814-4>. (in press)
12. Russo, B., Kothuri, S., Smaglik, E., Aguilar, C., James, E., Levenson, N., and Koonce, P. (NAU) "Exploring the Impacts of Intersection and Traffic Characteristics on the Frequency and Severity of Bicycle-Vehicle Conflicts." Accepted for publication, *Advances in Transportation Studies*, 2020.
13. Russo, B.J., and E.J. Smaglik. (NAU) "Analysis of Factors Affecting Injury Severity for Riders or Occupants of All-Terrain Vehicles and Golf Carts Involved in Police-Reported Crashes", *Accident Analysis and Prevention*, Vol. 133, 2019.
14. Russo, B.J., James, E., Erdmann, T., and E. Smaglik. (NAU) "Pedestrian and Bicyclist Behavior at Highway-Rail Grade Crossings: An Observational Study of Factors Associated with Violations,

Distraction, and Crossing Speeds During Train Crossing Events”, *Journal Transportation Safety and Security*, 2020.

15. Wishart, J., Como, S., Elli, M., Russo, B., Weast, J., Altekar, N., and E. James. (NAU) “Development of Safety Performance Assessment Metrics for ADS-Equipped Vehicles”, SAE Technical Paper, 2020.
16. Zoechmann, E., M. Hofer, M. Lerch, S. Pratschner, L. Bernado, R. Blumenstein, S. Caban, S. Sangodoyin, H. Groll, T. Zemen, A. Prokesch, M. Rupp, A. F. Molisch, and C. F. Mecklenbrauker, (USC) “Position-Specific Statistics of 60 GHz Vehicular Channels During Overtaking”, *IEEE Access*, 7, 14216-14232 (2019).

Other publications

17. Jin, W.L., A. Morales Fresquet (UCI). *Evaluating the Impacts of Start-Up and Clearance Behaviors in a Signalized Network: A Network Fundamental Diagram Approach*. UC ITS Report UC-ITS-2018-12. <https://escholarship.org/uc/item/36v9c2ct>
18. Pike, S., & Kothawala, A. (UCD). 2019. Informing a Pilot: Preparing the Pre-launch Survey for the Davis Amtrak Station Access Program. *UC Davis: Institute of Transportation Studies*. <http://dx.doi.org/10.7922/G2JW8C4M> Published by institute.

B. Conference papers

1. Aguilar, C. (G), James, E. (G), Russo, B., and Smaglik, E. (NAU) “Examination of Factors Affecting Injury Severity in Crashes Occurring on Interstate Freeways by Vehicle Type: Analysis of the Arizona Megaregion.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
2. Ahmad, Haleh Ale, Hani Mahmassani, Michael Hyland (UCI). “Simulation Framework for Autonomous On-Demand Urban Air Mobility.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
3. Ahuja, R., G. Ghinita, N. Krishna and C. Shahabi (USC). “Protecting Against Inference Attacks on Co-location Data.” In the 28th International Conference on Computer Communications and Networks (ICCCN 2019), Valencia, Spain. July 2019 (not previously reported).
4. Anastasiou, Chrysovalantis, Jianfa Lin, Chaoyang He, Yao-Yi Chiang, Cyrus Shahabi (USC). “ADMSv2: A Modern Architecture for Transportation Data Management and Analysis, Proceedings of the 2nd ACM SIGSPATIAL International Workshop on Advances on Resilient and Intelligent Cities.” 2019.
5. Anastasiou, Chrysovalantis, Jianfa Lin, Chaoyang He, Yao-Yi Chiang, Cyrus Shahabi (USC). “ADMSv2: A Modern Architecture for Transportation Data Management and Analysis.” In 2nd ACM SIGSPATIAL International Workshop on Advances on Resilient and Intelligent Cities (ARIC’19), Chicago, IL, USA. November 2019.
6. Chakraborty, Debapriya, David Bunch, David Brownstone, Bingzheng Xu, Gil Tal (UCI). “Plug-in Electric Vehicle Diffusion in California: Role of Exposure to New Technology at Home and Work.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
7. Dandl, Florian, Michael Hyland, Klaus Bogenberger, Hani Mahmassani (UCI). “Dual-Horizon Forecasts and Repositioning Strategies for Operating Shared Autonomous Mobility Fleets.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
8. Gehrke, S.R. (NAU) “Uber service area expansion in three major American cities.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.

9. Gehrke, S.R., & Reardon, T.G. "Direct demand modeling approach to forecast cycling activity on a proposed bike facility." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
10. Ghaffar, Arash, Suman Mitra, Michael Hyland (UCI). "Modeling Ridesourcing Trip Generation: Chicago Case Study." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
11. Giuliano, G., S. Kang, and Q. Yuan (2019) "Shopping, freight deliveries, and urban form", presented at TRB 2020 Annual Meeting
12. Groll, H., E. Zoemann, S. Pratschner, M. Lerch, D. Schuetzenhofer, M. Hofer, J. Blumenstein, S. Sangodoyin, T. Zemen, A. Prokes, A. F. Molisch, S. Caban, (USC) "Sparsity in the Delay-Doppler Domain for Measured 60 GHz Vehicle-to-Infrastructure Communication Channels", 2019 IEEE International Conference on Communications Workshops.
13. Hermawan, Karina, Amelia Regan (UCI). "Pooling Transportation Network Company (TNC) Rides to the Airport to Reduce Curbside Congestion." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
14. Ho, C.H., Chen, G (U), Fang, P (U), Zhang, A. (U), and Zhang, J (U). (NAU) Instrumented Bike: Sensing and Sharing, accepted for presentation at the 2020 Wavelength Conference in Nottingham, UK, March 2020. The trip was cancelled due to COVID-19.
15. Jaller, Miguel (UCD). "Understanding Faster and Faster Deliveries: Traditional Facility Location Problems and New Delivery Technologies and Services." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
16. Keith, D.R., Kumari, S., Gehrke, S.R., & Reardon, T.G. (NAU) "Real-world patterns of hybrid and electric vehicle driving in the United States." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
17. Kim, K., Chowdhury, R., Pant, P., and Yamashita, E. (UH) "Integration of ENSO Hazards Risk Assessment into Transportation Systems Planning." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
18. Kim, K., Ghimire, J., Pant, P., and Yamashita, E. (UH) "Bikeshare and Safety: Risk Assessment and Management." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
19. King, Hannah and Brian Taylor (UCLA). "Centuries of Ballot-box Transportation Planning in Los Angeles." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
20. Li, Yiqiao (UCI). "Enhancing Truck Activity Monitoring through the Integration of Bluetooth and Inductive loop Signature Data." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
21. Martinez, Irene, Michael Hyland, Wenlong Jin (UCI). "Improving Urban Multi-Modal Transport System through Congestion Pricing and Bus Fleet Sizing: Bi-Modal Network Fundamental Diagram Modeling Approach." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
22. Meguro, W. and Kim, K. (UH) "Green Infrastructure and Living Shorelines: Adaptation of Transportation Systems." 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
23. Paul, Julene, Brian Taylor, and Evelyn Blumenberg (UCLA). "Won't You Be My [Transit-friendly] Neighbor[hoo]d? Analyzing High-propensity Users in Transit-friendly Neighborhoods in Greater

- Los Angeles and the Bay Area”. 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
24. Pengyuan Sun, Dingdong Yang, Wenlong Jin (UCI). “Eco-driving Algorithm with a Moving Bottleneck on a Single Lane.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 25. Russo, B., (NAU) “Bike-Vehicle Conflicts and Microsimulation”, Presented at the 2020 Arizona ITE-IMSAs Annual Spring Conference, Phoenix, AZ, February 2020.
 26. Russo, B., (NAU) “Exploring the Impacts of Intersection and Traffic Characteristics on the Frequency and Severity of Bicycle-Vehicle Conflicts”, Presented at the 2019 International Road Safety and Simulation Conference, Iowa City, IA, October 2019.
 27. Russo, B., Lemcke D. (U), James, E. (G), Smaglik, E., Wang, Y. (G), and Monsere, C. (NAU) “An Exploratory Parameter Sensitivity Analysis of Bicycle-Vehicle Conflicts Using the Surrogate Safety Assessment Model.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 28. Schouten, Andrew (UCLA). “Residential Relocations and Vehicle Ownership among Low-income Households.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 29. Shen, S. and Kim, K. (UH) “Assessment of Transportation System Vulnerabilities to Tidal Flooding in Honolulu, Hawaii.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 30. Shilling, Fraser. "Facilitated Discussion of Experts with Audience Participation." Workshop 1054: Developing National Standards for Animal–Vehicle Collision Data Collection Systems: Brief Review and Working Discussion. 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 31. Smaglik, E., Lemcke, D. (U), James, E. (G), Russo, B., and Tingerthal, J. (NAU) “Impact of Evolving Course Operational Changes on Student Outcomes in Transportation Engineering.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.
 32. Sperling, Dan, and Steven E. Polzin. "Longer View: Positioning Transit for the 21st Century." *Transfers Magazine*, Fall 2019. <https://transfersmagazine.org/positioning-transit-for-the-21st-century/>
 33. Suman Mitra, Mingqi Yao, Stephen Ritchie (UCI). “Gender and Mobility Through the Course of Life Gender Differences in Travel Patterns of the Elderly in the United States.” 99th Annual Transportation Research Board Meeting, Washington, DC. 12-16 January 2020.

C. Presentations

1. Bento, Antonio (USC) “Estimating the Costs and Benefits of Fuel-Economy Standards.” University of Southern California and Stanford University Symposium on Climate Change Policy and Transportation. Los Angeles, CA, November 20, 2019.
2. Cetiner, B. (UCLA) “Image-based Modeling of Bridges and Its Applications to Evaluating Resiliency of Transportation Networks.” UCLA Civil and Environmental Engineering Seminar Series. March 2020.
3. Giuliano, G. (USC) “Transportation in City 2.0,” The City 2.0: Smart people, places, planning, The Regional Science Institute, Boston, November 2019

4. Giuliano, G, (USC) "Heavy duty trucks: The challenge of getting to zero," University of Southern California and Stanford University Symposium on Climate Change Policy and Transportation. Los Angeles, CA, November 20, 2019.
5. Ioannou, P. (USC). "Longitudinal Adjustments for Safe Lane Changes in Connected Environments" at USC's Electric Engineering Research Festival. November 2019.
6. Jakovich, Scott (LBSU). "Disciplinary challenges facing the transportation workforce and a guide on developing targeted career pathway solutions." Washington, DC. TRB 2020.
7. McCullough, Sarah R; Lugo, Adonia; Stokkum, Rebecca van (UCD). "Making Bicycling Equitable: Lessons from Sociocultural Research." UC Davis Feminist Research Institute and Institute for Transportation Studies Transportation Equity & Mobility Justice Working Group and Discussion Series. Davis, CA. 16 October 2019.
8. Miles, J. & Hollearn, M. (LBSU) "Do People Mentally Represent Automated Tasks? Evidence from Task-Switching Costs Following Takeovers." In Proceedings of the Human Factors and Ergonomics Society Annual Meeting. Sage CA: Los Angeles, CA: SAGE Publications, a peer-reviewed proceedings paper presented on October 29, 2019.
9. Mun, Min (USC). "Archived Data Management System" METRANS Advisory Board meeting. University of Southern California, November 22, 2019.
10. Savla, Ketan (USC). Presented preliminary results related to tasks 2A and 2B at the IEEE Conference on Decision and Control in Nice, France. December 2019.
11. Wei, Dan (USC). "Evaluating the Role of Resilience in Recovering from Disasters: A Multi-Regional Analysis of a Seaport Disruption," presented at the 8th METRANS International Urban Freight Conference, Long Beach CA, October 16-18, 2019.
12. Wei, Dan (USC). "Evaluating the Role of Resilience in Reducing Economic Losses from Disasters: A Multiregional Analysis of a Seaport Disruption," presented at the North American Regional Science Council Annual Conference, Pittsburg CA, November 15, 2019.
13. Yang, Y. (G), and Ho, C.H. (NAU) Application of Light Weight Deflectometer in Field Measurements of Unpaved Roads, presented at 10th Annual Workshop of the International Association of Chinese Infrastructure Professionals, January 12, 2020 in Washington D.C.
14. Zhang, D (G), and Ho, C.H. (NAU) Using Fast Fourier Transform and Time Series Analysis to Maintain the Transportation Infrastructure, presented at 10th Annual Workshop of the International Association of Chinese Infrastructure Professionals, January 12, 2020 in Washington D.C.