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2. Accomplishments

What are the major goals of the program?

The Pacific Southwest Region University Transportation Center (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 California State University, Long Beach (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 (Pima). 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.

What was accomplished under these goals?

During this reporting period we scheduled an Executive Committee meeting, began planning for our second PSR Congress, held several signature events, launched Year 2 research projects at 5 of the 8 partner universities, and scheduled the Year 2a RFP (a follow-up RFP to allocate remaining funds from years 1 and 2).

A. Administrative Accomplishments

- We scheduled a PSR Executive Committee meeting for October 26, 2018. Previous meetings were held in July 2017, January 2018, and March 2018.
- METRANS created a new position to handle education and outreach programs and events: Associate Director, Education and Professional Development. The position reports directly to METRANS Director Genevieve Giuliano.
- The UC Davis Institute of Transportation Studies (ITS-Davis) hired a UTC Assistant Program Manager. This position will provide assistance with ITS-Davis's PSR administrative and educational activities.

- ITS-Davis held a data management workshop on September 20, 2018, for project PIs to provide guidance with complying with the USDOT Public Access Plan.
- NAU hired a student webmaster to develop a website to showcase UTC events and accomplishments (<https://nau.edu/aztrans/psr-region-9/>)

B. Research Accomplishments

The role of a regional 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.

i. Research Themes and topics

Theme 1: Technology for Improved Mobility

This theme explores technology solutions for improving mobility for both passengers and freight. It is organized around three topic areas:

- **Technology and mobility (Topic 1-1):** Emerging technologies and their potential for improving passenger and freight mobility.
- **Smart infrastructure and vehicles (Topic 1-2):** Technology for connected and autonomous vehicles (CAVs).
- **Public policy and implementation (Topic 1-3):** The role of government in technology implementation and regulation.

Theme 2: Improving Mobility for Disadvantaged Populations

Research in Theme 2 addresses mobility and accessibility problems of disadvantaged populations. It includes two topic areas:

- **Novel modes for improved mobility and accessibility (Topic 2-1):** The potential of novel modes, new models of public transport, and new models of private vehicle access to address mobility problems.
- **Land use, accessibility, mobility (Topic 2-2):** Impacts of limited accessibility and mobility both in urban and rural areas; role of land use policies in reducing access barriers for underrepresented groups.

Theme 3: Improving Resilience and Protecting the Environment

Research in Theme 3 addresses all aspects of environmental protection. It includes three topic areas:

- **Analyzing alternative resilience strategies (Topic 3-1):** Frameworks to analyze resilience strategies at different geographic scales; resilience and unexpected events
- **Smart technologies (Topic 3-2):** Smart technologies for system monitoring and maintenance
- **Reducing environmental impacts (Topic 3-3):** Reducing environmental impacts while meeting the mobility needs of society, fostering healthy communities, and supporting economic growth.

Theme 4: Managing Mobility in High-Growth Cities and Regions

This theme addresses the transportation problems of regions and metro areas experiencing rapid population and employment growth, and are expected to continue to grow.

- **Managing passenger demand (Topic 4-1):** Meeting human needs while lessening travel required; role of planning and urban design; urban rural, and intercity travel.

- **Managing freight demand and its impacts (Topic 4-2):** Managing freight, both last mile and regional; impacts of e-commerce and other changes on local and regional mobility.

ii. Research Selection

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.

Year 1 RFP

The Year 1 RFP was distributed on a rolling schedule by USC and partners. As noted in PPPR 1, USC created a template that is customized to each university. The Year 1 RFP included only USDOT funds. A total of 11 research projects from Year 1 are active: 5 from USC (including 1 pooled-fund project at UC Riverside and 1 pooled-fund project at UC Santa Barbara), 4 from UCD (including 1 white paper and 1 seed grant), and 2 from UH. One CSULB project was approved, but awaits match funding and will be set up as a Year 2 project. One UCD project was delayed due to delays by the overall project lead, the City of Davis. A revised proposal was submitted and approved as a year 2 project. Year 1 projects are listed in PPPR 2.

PI Ertugrul Taciroglu from UCLA is continuing to modify the project “BridgeR- a Regional Seismic Hazard Assessment Tool for Transportation Networks and its Application to freight Loss Assessment.” The stakeholder for this project is the Caltrans Office of Earthquake Engineering, Analysis, and Research. Negotiations are ongoing regarding how the project can be structured to meet the data confidentiality requirements of Caltrans.

Year 2 RFP

The second PSR RFP was issued on March 12, 2018. Projects were selected during spring and summer of 2018. The California universities have the additional objective of scheduling the RFP to include both USDOT and match funds from Caltrans. Additionally, USC and UCD seek to coordinate RFPs for PSR and the National Center for Sustainable Transportation. Table 1 lists Year 2 projects by partner, project number, theme, title, funding source, and status. Project summaries are added to the website when projects become active.

- Eleven proposals were received from USC, CSULB and other pool fund universities. Of these, 7 were selected for funding: 2 from DOT and 5 from Caltrans.
- UCD issued two RFPs, one for USDOT funds in February, and one for Caltrans funding in March. Both included the NCST and PSR. Eleven proposals were submitted for UCD PSR Federal and Caltrans funding. Six proposals were awarded funding: 3 federally-funded projects, including two white papers; and 3 Caltrans-funded projects, including 2 seed grants.
- UCLA issued the Year 2 RFP in February, 7 proposals were submitted and 1 was selected for funding. PI Anastasia Loukaitou-Sideris from UCLA is working on the project “Public Transportation Safety among University Students.” The stakeholder for this project is Josh Shaw, the executive director of the California Transit Association. This project will be examining transit safety related concerns of college students throughout 16 cities in six continents. It is aimed to be finished by September 2019.
- UCI issued the Year 2 RFP in August and received and reviewed 6 proposals.
- UH issued a Year 2 RFP during this reporting period, and selected two proposals.

- NAU did not issue a Year 2 RFP during the reporting period.

Table 1: Year two research projects

Partner	Project No.	Theme	Title	Funding Source	Status
USC	18-02	Technology and Improved Mobility	Cost-Sharing Mechanisms for Ridesharing	Caltrans	New
USC	18-04	Managing Passenger Demand	Measuring Accessibility Changes for Households Moving Away from Rail Transit Areas	Caltrans	New
USC	18-06	Technology and Improved Mobility	Connected Autonomous Vehicles: Safety During Merging and Lane Change and Impact on Traffic Flow	Caltrans	New
USC	18-07	Improving Resilience and Protecting the Environment	Socioeconomic Dimensions of Resilience to Seaport and Highway Transportation Network Disruptions	Caltrans	New
USC	18-08	Technology and Improved Mobility	Measurement and Modeling of Broadband Millimeter-Wave Signal Propagation Between Intelligent Vehicles	USDOT	New
USC	18-10	Technology and Improved Mobility	An Analysis of Accessibility, Social Interaction, and Activity-Travel Fragmentation in California	Caltrans	New
UCSB	18-09	Improving Mobility for Disadvantaged Populations	Deep-Learning Traffic Flow Prediction for Forecasting Performance Measurement of Public Transportation Systems	USDOT	New
UCI	18-13	Technology and Improved Mobility	Green driving on a two-way street	CA SB1	Active
UCI	18-14	Technology and Improved Mobility	Transportation Plans: Their Informational Content and Use Patterns in Southern California	CA SB1	Active
UCI	18-15	Technology and Improved Mobility	What Explains Recent Trends in Southern California Bus Ridership?	CA SB1	Active
UCI	18-16	Improving Resilience and Protecting the Environment	Life Cycle Assessment of Environmental and Economic Impacts of Deploying Alternative Urban Bus Powertrain Technologies in the South Coast Air Basin	CA SB1	Active
UCI	18-17	Technology and Improved Mobility	Efficient Mobility Portfolio schemes for Integrated, Intermodal, and Incentivized Shared Transportation	CA SB1	Active
UCLA	18-31	Technology and Improved Mobility	Public Transportation Safety among University Students	Caltrans	New
UH	18-41	Improving Resilience and Protecting the Environment	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	New
UH	18-42	Improving Resilience and Protecting the Environment	Stormwater Management for Transportation Planners and Engineers	USDOT	New

Match Funding

PSR has the following match funding priority rankings: new funding, match from other existing research projects, and in-kind match. We have focused on obtaining new funding. First, the University of California partners were awarded a new source of state funding. SB1, which increased the California fuel tax by 12 cents per gallon, provides annual funding 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. Second, Caltrans has committed to a 50% match for PSR. Previously Caltrans had committed 25% in Year 1 and 50% thereafter. A new Caltrans contract was recently signed, and we will set up approved Caltrans projects in the next reporting period. Third, USC has obtained research funding from local industry and agencies for specific projects. These projects will start in the next reporting period. NAU has continued 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.

Graduate Research Fellowships

Graduate research fellowships are reported in the Education section.

Opportunities for Research

Student support is an important component of research project selection. USC, CSULB, and UCD require that research projects include student support. Of the projects that were in progress during this reporting period, a total of 47 student positions were included: USC, 9 graduate; CSULB, 12 graduate, 2 undergraduate; UCD, 3 graduate, 2 undergraduate; UCLA, 2 graduate; UCI, 11 graduate; UH, 2 graduate; NAU, 1 graduate, 3 undergraduate. Pima did not issue RFPs or complete significant research for Year 2. Pima's primary focus is workforce development.

Student-Led Research Projects

UCLA supported 21 student-led research projects with completed results during this period. The completed projects and reports can be found here: https://docs.google.com/spreadsheets/d/e/2PACX-1vQ2Wlfy2Yh7nDCW3EzZVDkD3O_RrC3tOsqF1Ug7shncrNT5n-WU_fotD1GnRY0jg7-BFpaT8xMSUD4z/pub?gid=0&single=true&output=pdf

iii. Dissemination

Dissemination of our research results takes place via research reports and research briefs, scholarly publications, popular publications, conference presentations, and media. None of the research projects have yet been completed, and no research reports have yet been produced.

Presentations resulting from PSR research during the current reporting period include:

- UCD had a researcher present at Infra Eco Network Europe Conference.
- NAU had one presentation at the ITE Western District Annual meeting, and two presentations at the AHB25 Traffic Signal Systems Committee Summer Meeting.
- CSULB Assistant Professor Dr. Jinwon Kim from the Department of Economics presented at the International Economics Association Meetings (Barcelona, Spain), the Urban Economics Association Meetings (Vancouver, Canada), and the Western Economic Association International Meetings (Vancouver, Canada).

iv. Plans for Next Reporting Period

The next reporting period is October 1, 2018 through March 31, 2019. Our plans for the next reporting period are:

- Begin the remaining Year 2 projects, including USDOT and match projects.
- Execute the new Caltrans task orders for projects at USC, UCD, UCI, and UCLA.
- Collect proposals from the Year 2a RFP and complete the review and selection of new projects at USC, CSULB, UCI, UCLA, with projects beginning in early 2019.
- Release Year 3 RFPs in February 2019.
- Continue solicitation of new match funding for research projects.

C. 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

i. New and Continuing Activities Associated with Degree Programs

Postdoctoral researcher: UCD hired 3 postdoctoral researchers during the reporting period, whose positions are supported by state match funding. UH hired a graduate student assistant (GA), and research project budgets include the hiring of graduate research assistants (GRA) to assist with project research. UH's budget does not include the hiring of a Postdoc, but funding through the RFP may provide partial support for postdocs by project PIs. USC plans to hire a postdoc during the next reporting period.

Graduate research fellowship program: Attracting the best, brightest, and most diverse students to transportation education programs at the graduate level is critical to the future of the discipline, and is a central component of the PSR program. Research fellowships are administered by the individual campuses as part of the student recruitment process, and in each case culminates with a student-led, faculty-supervised transportation research project to be posted on the PSR website.

- NAU awarded a partial AY18-19 fellowship focused on investigating the impacts of Particulate Matter (PM) in megaregions.
- NAU awarded an AY18-19 fellowship focused on investigating the causes and impacts of crashes in the Arizona megaregion, and identifying possible countermeasures to reduce impacts.
- In Fall 2018, UCLA awarded fellowships to 11 incoming and continuing students: 3 PhD Urban Planning, 1 MPP, 7 MURP.
- In Fall 2018, UCI awarded fellowships to 11 graduate students.

USC, CSULB, UCD, and UH support graduate students through research projects and education and outreach activities. The number of students supported was reported in the Research section.

Graduate student exchange program: To take advantage of the substantial disciplinary and geographic variety of the PSR transportation education programs, PSR funds a graduate student exchange program to support their research visits to other member campuses to work with transportation faculty for up to one summer month. No student exchanges took place during the reporting period.

Supporting students to attend conferences and other events

Students at four partner institutions were supported to attend conferences and other events. NAU brought 4 students to the ITE Western District conference. UCLA supported 3 students to attend the National Planning Conference in New Orleans from April 21-24, 2018. UCD supported one student to attend the National Travel Monitoring Exposition and Conference (NaTMEC) in Irvine, CA. USC supported 11 students to attend NaTMEC.

New Degree Programs

NAU is in the process of proposing two additional degree programs that fall within the purview of this center. First, an internal proposal is being developed for a PhD in Civil and Environmental Engineering with a focus in Infrastructure Resilience. A second internal proposal is being developed for an online professional Master of Civil Engineering targeting location-bound individuals seeking a master’s degree in Civil Engineering. While still in the internal proposal stage, support has been indicated from the upper administration, and if approved by the Arizona Board of Regents in Spring 2019, these programs would be live in Fall 2020.

ii. Seminars

The PSR UTC hosts approximately 12 seminars each year, available online for students at all PSR institutions (via webinar or recorded and available through iTunesU). The main purpose of the seminar series is to share cutting edge research throughout the consortium and to the general public.

USC, UCD, UCI, and UCLA hold regular research seminar series. The PSR seminars are incorporated into the series of the partner institutions. The southern California partners share all seminar notifications, and students now travel to neighboring campuses to attend seminars. The seminars serve as a forum for faculty, guest presenters, and advanced graduate students to present their research. They are open to the public, and are often a collaborative effort of PSR and cosponsors such as student, academic, and professional groups.

Tables 2-5 list the seminars presented during the reporting period.

Table 2: PSR Research Seminars at UCD

UC Davis		
Date	Title	Speakers
04/20/2018	Innovation and Disruption in Urban Mobility: Do We Need to Rethink Everything?	Dr. Susan Shaheen Department of Civil & Environmental Engineering University of California, Berkeley
05/25/2018	Planning an Integrated Active Travel and Green Infrastructure System for Mental Well-Being in Disadvantaged Communities	Dr. Gary (Hongwei) Dong Department of City and Regional Planning California State University, Fresno

Table 3: PSR Research Seminars at UCI

UC Irvine		
Date	Title	Speakers
4/3/2018	Shared-use Autonomous Vehicle Mobility Services: Operational Control and Transit Impacts	Michael Hyland Northwestern University
4/6/2018	Statistical Inference of Probabilistic Origin-Destination Demand Using Day-to-Day Traffic Data	Zhen (Sean) Qian Assistant Professor Carnegie Mellon University
4/17/2018	Service Design and Operations of Autonomous Car-Sharing Systems (ACSS)	Jee Eun (Jamie) Kang Assistant Professor University at Buffalo, The State University of New York
4/19/2018	Latent Queues and Collective Effects: Revisiting the Activity-Based Approach to Travel Analysis for Smart Cities	Roger Chen Assistant Professor Rochester Institute of Technology
4/26/2018	Modeling the Transportation Systems of Today and Tomorrow: Integrated Framework and Applications	Ömer Verbas Computational Transportation Engineer Argonne National Laboratory
5/1/2018	Adoption of Shared Mobility	Giovanni Circella Senior Research Engineer, Georgia Institute of Technology Director, 3 Revolutions Future Mobility Program, University of California, Davis
5/18/2018	Statistical Inference of a Class of Stochastic Car-Following Models	Jorge Laval Associate Professor Georgia Institute of Technology
6/20/2018	Link as an Aggregate Alternative: A Continuous Recursive Logit Representation of Pedestrian Behavior	Makoto Chikaraishi Hiroshima University, Japan
7/20/2018	Sampling Approach to Spatial Variation for Obtaining a Set of Travel Demands	Junji Urata Kobe University, Japan
7/24/2018	A Third Route Choice Alternative for the Stochastic User Equilibrium Model	Anthony Chen Hong Kong Polytechnic University
8/27/2018	Adaptive Coordinated Traffic Control for Stochastic Demand	Hong K. Lo Hong Kong University of Science and Technology

Table 4: PSR Research Seminars at UCLA

UC Los Angeles		
Date	Title	Speakers
04/03/2018	Creating Vibrant & Healthy Cities for All	Gil Penalosa, MBA, PhD, CSP Founder and Chair, 80 Cities Chair, World Urban Parks President, Gil Penalosa & Associates
04/12/2018	Intercity Passenger Travel & the Prospects for High-Speed Rail	Dr. Martin Wachs Professor Emeritus, UCLA Luskin School of Public Affairs Faculty Fellow, UCLA Institute of Transportation Studies
04/18/2018	Big Data & Urban Government: Effects of the Waze App of Traffic Politics in the Paris Region	Dr. Antoine Courmontis Post-doctoral Research Fellow, Sciences Po's <i>Centre d'études européennes et de politique comparée</i> Scientific Director and Digital Technology Chair, Science Po's Cities
05/01/2018	Investing in bus and rail transit: Ridership and development impacts	Dr. Genevieve Giuliano Professor, USC Sol Price School of Public Policy Director, METRANS Transportation Center
05/10/2018	Re-imagining transit networks: The story of Houston, Texas	Kurt Luhrsen Vice President of Planning, Metropolitan Transit Authority of Harris County, Houston, Texas
05/22/2018	Integrating traditional and innovative transit: Prospects and challenges	Joshua Schank Chief Innovation Officer, LA Metro
05/24/2018	Carshare, bikeshare: Trends, prospects, and the role of public policy	Francie Stefan Mobility Division Manager, City of Santa Monica
05/31/2018	Equity and discrimination in shared mobility	Anne Brown PhD candidate, UCLA Luskin Department of Urban Planning Graduate student researcher, UCLA Institute of Transportation Studies
06/05/2018	Automated vehicles: A shared or ownership future?	Tim Papandreou Founder, City Innovate UCLA Institute of Transportation Studies Advisory Board Former head of transportation partnerships, Waymo

Table 5: PSR Research Seminars at USC

USC		
Date	Title	Speakers
9/26/2018	Intelligent Intersections Reduce Crashes and Support the Safe Introduction of Autonomous Vehicles	Pravin Varaiya Professor, Computer Sciences UC Berkeley
7/23/2018	From Behaviour to Data to Models and Back Again: Where Next for Understanding and Predicting Human Decision-Making?	Stephane Hess Professor, Choice Modelling University of Leeds
6/1/2018	Health Impacts of Urban Transport Planning and Policy	Haneen Khreis Assistant Research Scientist Texas A&M Transportation Institute
5/7/2018	Centralized Processing of Chassis: Modeling, Analysis and Optimization	Timothy VanderBeek Deputy Chief Engineer, ESGN-R program Boeing
4/11/2018	Why is Transit Ridership Falling?	Brian Taylor Professor, Urban Planning UCLA
4/5/2018	Recalibrating the City: Advocacy by Design	Mia Lehrer Landscape Architect Mia Lehrer and Associates

iii. Facilitating Connections between Students and Employers

Our consortium facilitates connections between students and the transportation industry by providing a variety of professional development and employment opportunities. The professional development events held at USC during the reporting period are listed in Table 6.

Table 6: USC Professional Development Series Events

Date	Title	Speaker(s)
04/03/2018	Lunch with Nate Kaplan	Nate Kaplan West Coast State Director GORAIL
09/13/2018	Mentorship for Success	Rebecca Weintraub Director, Communication Management Program University of Southern California

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. We also continue 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.

METRANS Mentor Program

In this program, transportation practitioners (mentors) guide students to make informed career decisions and to develop into well-rounded professionals. Twenty-one students were mentored during the reporting period (16 female, 13 are both female and members of underrepresented groups - Hispanic/Latina and Asian/Pacific Islander). The mentor program now includes students at UCI and UCLA.

Employment opportunities

Pima is currently working with TuSimple, a leader in the emerging autonomous trucking industry, to identify the skills needed to train our students for jobs in autonomous truck driving. The ultimate goal is to develop a new program that will make Pima students more competitive. The Logistics and Truck Driver training programs both worked with their industry advisory committees to ensure the best programming to prepare students for the workforce. The Truck Driver Training advisory committee consists of industry employers, human resources, human trafficking, and student funding sources. We recently added electronic logging devices to the tractors, with the support of advisory committee members. The program is also pursuing the acquisition of an automatic tractor due to industry suggestion. Recruiters from Schneider, Werner, Danny Herman, Swift and Covenant visit Pima Community College's Truck Driver Training program students on a regular basis. This allows students to ask appropriate questions and choose the company that best works for them when entering the workforce.

METRANS Lunch with a Practitioner Series: Designed to facilitate career planning and provide guidance from and connections with practice. These events allow current transportation students to meet and learn from active transportation practitioners. See Table 6 for events that occurred during the current reporting period.

Internships and Employment Assistance: Internships provide professional experience and often lead to jobs. Students in the MPL, MPA, and MPP degrees at USC and in the MSSCM Accelerated program at CSULB complete internships prior to graduating. CITT has established a job and internship post on its website at <https://www.ccpe.csulb.edu/TheManifest/JobPostings.aspx> and works with the CSULB Career Development Center matching students to employment and internships. CITT also includes trade and transportation-related job postings in its email blasts and news updates. UCLA ITS provides an online platform for UCLA students interested in transportation to share job opportunities and internships. Pima College has recruiters that come to most Truck Driver Training Program classes from Schneider, Covenant, Danny Herman Trucking, and Werner. They give presentations to the students about careers in the trucking industry. During the reporting period, student placements included Intel, Port of Long Beach, KOA Corp and CSULB.

Get the Job: A new professional development speaker series launched at USC during the reporting period, created to meet the demand for specific job-seeking guidance which 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.

iv. Educational Enrichment

PSR offers many opportunities for students to engage directly with professional organizations. PSR students provide support to transportation-related student and professional groups at several of the partner universities and in the community to assist them with strategic planning, event planning and execution, membership recruitment and retention, awards, scholarships, and operations. These groups include:

- Women's Transportation Seminar (WTS; USC, CSULB, UCLA, UCD); Women in Transportation in Los Angeles (UCLA); Women in Trucking (Pima)
- Student Chapters of the Institute for Transportation Engineers (ITE; USC, NAU), American Planning Association (APA; USC), National Society of Black Engineers (NSBE; USC), Society of Women Engineers (SWE; USC, CSULB, and NAU), Asian Pacific Islander Caucus (APIC; USC and CSULB)
- Eno Foundation and Transportation Research Board (UCLA)
- National Association of Publicly Funded Truck Driver Training Schools (Pima)
- Several school or university-specific programs, for example:
 - USC Price Women Leading Policy, Planning, and Development (WLPPD)
 - CSULB Society for the Advancement of Management (SAM) and Graduate Business Association
 - UCLA Luskin Community Scholars Program

In addition to professional organizations, PSR partners offer other programs to enhance educational opportunities at partner institutions, including:

- Pima and the lead faculty for the Logistics program provided OSHA 10 training to 27 participants.
- Pima instructors successfully attended Commercial Driver License (CDL) examiner certification training in July 2018. This Arizona Department of Transportation training is a 5-day training that results in attendees becoming an authorized Third Party tester for CDL Class A, B, and C. The previously had only two full time instructors as examiners. Instructors cannot examine the students they train, so having another examiner on the team has allowed them to expand the examination hours and meet the demands of testing for both students and community members seeking testing only.
- In August, Pima Truck Driver Training instructors successfully attended OSHA 511 and OSHA 501 to become OSHA-certified instructors. This training/certification offers assistance to the Logistics faculty lead in developing OSHA courses for both the LGM and TDT programs. The online OSHA classes will help increase the availability of OSHA credentials to PCC students, regardless of their discipline.

v. Products

PSR provides opportunities for students to experience transportation outside the classroom, such as field trips, resource and guest speaker referrals, and opportunities for publication of their written work and accomplishments.

Field Trips and Site Visits: These are a regular component of our enrichment programming. During the reporting period, USC hosted a field trip to the Port of Los Angeles for 26 affiliates to tour the USS Iowa, an active US Navy battleship.

METRANS on the Move: This is a weekly e-newsletter written and produced by students under the guidance of the Associate Director of Education and Professional Development, Victoria Deguzman. Over 2,000 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. Forty-three issues were published during the reporting period. Students at USC, UCLA, UC Davis, UC Irvine, and CSULB participated as authors of feature stories.

Student ITE Chapter Support: NAU continues to use PSR funds to assist the student chapter of ITE. During this reporting period, PSR funding provided food at chapter meetings and travel support for four students to attend the ITE Western District Annual Meeting in Keystone, CO.

NC3 National Letter of Intent Signing Day February (Pima): Signing day is a national event that took place in February 2018. The event celebrates students' commitment to earning a degree or certificate in CTE. Transportation technology students signed letters of commitment and receive hats for Pima College.

vi. Non-Degree Programs

PSR has an extensive non-degree and workforce development program. In order to manage and coordinate efforts across the partners, PSR established a Workforce Development Committee. The committee is chaired by Thomas O'Brien (CSULB), and members include Victoria Deguzman (USC), Karl Kim (UH), Tyler Reeb (CSULB), and Ian Roark (Pima). Members of the team are tasked with reviewing workforce development strategies to increase reach across the region and to begin the development of pilot programs involving tribal partners. The WDC will also coordinate on the development of a workforce-related component for our PSR Congress in Spring 2019.

Training Courses

PSR offers and develops a broad array of training courses and programs aimed at various skill and experience levels.

Courses for Professionals

Metropolitan Transportation Management Certificate (MTMC): Curriculum development was coordinated with LA Metro and designed to cover multi-modal transportation planning fundamentals, with a focus on passenger-freight conflicts. The class was conducted in four sessions during the spring of 2018. The success of this pilot program has motivated the METRANS team to further develop its curriculum and share it as an educational tool for planning and transportation professionals around the country.

Caltrans Freight Academy: CSULB offers a four-day freight academy designed for planners and engineers as part of a regular series of Caltrans-specific classes. During the reporting period, one workshop on intermodal transport was held in Ontario CA; and a second workshop on agricultural supply chains was held in April 2018 in Sacramento.

Incorporating transportation resilience into FEMA certified training: The UH National Disaster Preparedness Training Center (NDPTC) will incorporate PSR transportation resilience research into both face-to-face and online training courses for transportation professionals and other responders. UH also plans to incorporate applicable research outcomes into FEMA certified training. The outcomes of the 2018 funded research project focused on “Stormwater Management for Transportation Planners and Engineers” will be transformed into learning objectives and course material to be submitted to FEMA for certification, which will then be made available nationwide as a training course for transportation engineers and planners, and emergency management personnel. UH NDPTC is currently working to complete the certification of the management-level FEMA training course on Evacuation Planning. The course, once FEMA certified, could provide emergency management and first responders the knowledge to better plan for evacuations. The course could also be delivered to transportation agencies as part of their professional development program. UH NDPTC is working to identify other transportation-related training that could be certified by FEMA, but also serve as a way to prepare transportation agency staff for emergencies and make systems more resilient to future disasters.

Community College Courses

Transition of AAS in Logistics and Supply Chain Management to online: Pima continued to fund faculty to transition its Associate of Applied Science (AAS) degree in Logistics and Supply Chain Management (with a focus on Arizona and California cross-border trade logistics) into a 100% online format to extend the program’s reach and enrollment. Pima began the process of developing all of its Logistics and Supply Chain Management classes to an online format in spring 2017. To date, six logistics courses have been transitioned to the online format: LGM 101 Principles of Logistics and Supply Chain Management, LGM102 Inventory Control, LGM 104 Computerized Logistics, LGM 106 Transportation and Traffic Management, LGM 108 International Logistics, LGM 109 Readiness Skills for Logistics Careers, LGM 290 Logistics and Supply Chain Internship, and LGM 296 Independent Study in Logistics and Supply Chain Management. LGM 106 and LGM 296 were open for enrollment in Spring 2018; other currently available classes are listed online. LGM 103 Contracts and Freight Claims, an online class, is under development at the time of reporting.

Best practices in online commercial driver’s license (CDL) training: Pima is using PSR funding to transition sections of its in-class CDL program into an online format, the development of which is scheduled to begin in early 2019. Pima’s Truck Driver Training Program manager completed the online “Teach” training. A staff instructional employee is currently attending the Teach training (Fall 2018). These trainings will prepare them as subject matter experts to provide instructional designers the content and support they require to develop online courses.

Workshops

Pima College hosted a meeting of the National Association of Publicly Funded Truck Driver Schools November 2-3, 2017 with 19 attendees from TX, NM, CA and AZ. Attendees discussed current trends in truck driver training and emerging technologies relevant to the surface transportation industries who hire their graduates. The gathering in Tucson was an opportunity for Pima College to highlight the creative ways in which truck driver training is delivered to the College’s students.

vii. Workforce Development

PSR is developing a comprehensive workforce development program through the efforts of CSULB and Pima College.

K-12 outreach

K-12 outreach is taking place at USC, CSULB, NAU, and Pima College.

CSULB has partnered with Esri to develop a story map accompanied with a narrative video that introduces K-12 students to the supply chain. The video will be presented to students at the Academy of Global Logistics. We are currently working with the Esri's education team to build a comprehensive story map that depicts key topical aspects of global and domestic supply chains.

METRANS STEM program participation: Associate Director of Education and Professional Development Victoria Deguzman leads the K-12 outreach efforts for METRANS at USC. No K-12 events were held during the reporting period. However, METRANS will provide event support and sponsorship for two Society of Women Engineers (SWE)-led, half-day STEM programs for elementary school girls at USC, and a day-long transportation engineering program for high school girls lead by WTS-OC at a local public school to be held during the next reporting period.

CSULB support of Cabrillo High School Academy of Global Logistics: CSULB continues to support the Port of Long Beach Academy of Global Logistics at Cabrillo HS through its annual Teacher Externship and by coordinating engagement with the industry. The AGL is a four-year small learning community which combines an academic curriculum with industry-relevant training and information to support academic and career development. The Academy introduces high school students to career opportunities in global trade and logistics and shows them how to prepare for those careers. During the reporting period, CSULB worked on curriculum development.

AZTrans Exhibit at the 2018 NAU Science and Engineering Day: AZTrans operated an exhibit at the 2018 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 29th, 2018. The transportation-focused exhibit had equipment set up to show how traffic signal systems detect vehicles and efficiently move traffic through intersections. There was also a display showing how traffic simulation software is used to analyze signal timing before it is implemented in the field as well as an example of a real-time camera setup used for traffic data collection. Finally, there was a traffic-related game for children ages K-8 to play where they could create their own traffic signal timing plans. 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. Nearly 100 students and members of the public interacted with the exhibit which was staffed by NAU PSR9 faculty Brendan Russo, PSR Graduate Fellow Cristopher Aguilar, and PSR Undergraduate Intern Emmanuel James. A similar exhibit was set up at the 2018 Arizona Council for Transportation Innovation "Arizona Innovation Day" staffed by NAU PSR Faculty Edward Smaglik and PSR Graduate Fellow Cristopher Aguilar.



K-8 Students interacting with the AZTrans Exhibit at the 2018 NAU Science and Engineering Day.

Pima truck driver training outreach: Pima’s Truck Driver Training program brought the full truck and trailer combination to a few schools this reporting period to educate students on the trucking industry. Schools visited were Dunham Elementary School (Tucson), Patagonia High School (Patagonia), and Pierson Vocational High School (Nogales). The students were able to sit inside the tractor as well as ask questions regarding the industry. The program also attended several career/job fairs throughout the reporting period, in and outside of Pima County.

The truck branding was also completed during this reporting period, allowing Pima to better promote the industry. With branding in place, Pima is better able to represent the industry at outreach events where only the tractor space can be accommodated. The trailers have been upgraded to a half-wrap from lettering only. Pima has received positive feedback from the community regarding the increased noticeability. A statement acknowledging the grant funding was placed on each side of the each trailer.



Trucks from Pima’s Truck Driver Training program at an outreach event.

viii. Dissemination

Dissemination of education activities takes place through the degree and non-degree programs offered by the partner universities, the various student programs and events, METRANS on the Move, and social media. As noted above, PSR has engaged with under-represented youth, including at the tribal nations in Arizona.

ix. Plans for Next Reporting Period

Plans for the next reporting period include continuing all existing programs, and starting the following new activities:

- Award 2019-20 graduate fellowships at UCLA, NAU, and UCI.
- Launch a fellowship capstone program to support high quality capstone projects for continuing students at UCLA.
- Award 1-2 dissertation fellowships at UCD.
- Continue the PSR seminar series at USC, UCD, UCLA, and UCI.
- Continue student engagement and enrichment programs.
- Begin development of online CDL training courses at Pima College in Spring 2019.
- Begin development of online transportation soft skills curricular materials at CSULB.
- Develop outline for and schedule a Virtual Peer Exchange focused on State DOT and regional planning organizations undertaking freight planning exercises, including FAST Act compliant plans (CSULB and Pima).
- Develop a PSR workforce development program focused in GIS Tribal Training.
- Pima College’s seminar in 2018 will be a noncredit OSHA 10 course offered to students in the logistics and truck driver programs at the College, and participants from the Pascua Yaqui Native American Tribe. This seminar will provide successful graduates with an OSHA 10 credential, recognized by industry employers throughout the U.S.

- Boy Scout Truck Transportation Merit Badges, hosted by Pima Community College's Truck Driver Training program, are scheduled for March and October 2019.
- Attend at least two outreach events with the tractor and/or trailer on the T'Ohono Oodham nation.
- Begin development of an autonomous vehicle driver certificate program in collaboration with TuSimple and the UTC research component.
- UCD will provide funding support for the 24th Annual California Transportation Foundation Transportation Education Symposium, as well as travel support for student attendees. USC will send Dr. Shahed Rowshan to serve as a mentor at the Symposium to share what he has learned about succeeding in the transportation field with the next generation of transportation leaders.

D. Technology Transfer Accomplishments

The goal of our technology transfer program is to enhance the transition of research to practice. We accomplish this goal through conferences and events, publications, and social media. We accomplished the following: 1) hold the I-NUF conference; 2) hold the NaTMEC conference; 3) plan the PSR Annual Congress for Spring 2019; 4) launch Transfers magazine; 5) produce branding materials.

Our goals for the next reporting period are to: 1) hold the 2019 PSR Congress; 2) continue planning the 2019 I-NUF Conference; 3) complete website reconstruction and launch permanent website.

i. New Events

Region 9 Annual Congress: We held the first Region 9 Annual Congress on March 29, 2018 at CSULB hosted by USC, CSULB, UCI, and UCLA. It gathered the PSR Advisory Council and Executive Committee, as well as transportation stakeholders, students, faculty and staff from throughout the region together to share new research results, best practices, and education and training tools produced by the PSR. This annual event serves as a major networking event to build a Region 9 transportation community. It also serves as the annual in-person meeting of the PSR Advisory Council. We are currently planning our second PSR Congress to be held in March 2019 in Tucson, Arizona co-hosted by Pima and NAU. Students and faculty from all 8 PSR members will attend.

NaTMEC Biennial Conference (USC): PSR was asked to host the biennial North American Travel Monitoring Exposition and Conference held June 10-13, 2018. Steve Ritchie (UCI) was planning committee co-chair and Victoria Deguzman, METTRANS Associate Director of Education and Professional Development, was leading the logistics planning for the conference. The conference took place at Hotel Irvine, in Irvine, CA and included 115 presentations and poster sessions with participation from across the country.

Summer Meeting of TRB Committee AHB25, Traffic Signal Systems (NAU): NAU held the summer meeting of Traffic Signal Systems Committee of TRB at the High Country Conference Center July 22-24, 2018 in Flagstaff, AZ. Edward Smaglik of NAU handled all of the logistics for this event, which had 48 professionals in attendance representing academia, practice, and governmental entities.

ii. Continuation of Signature Events

International Urban Freight Conference (I-NUF; USC and CSULB): I-NUF 2019 will be held October 16-18, 2019 at Hotel Maya in Long Beach, California. Planning for this event will continue in the next reporting period.

Annual Town Hall Meeting (USC/CSULB): The meeting was held on March 29th, 2018 (though this is slightly outside of the reporting period, it was not included in the last PPPR) at the Gerald R. Daniel Recital Hall on CSULB campus to discuss how Clean Air Action Plan will once again reshape the goods movement landscape at the Ports of Los Angeles and Long Beach. The Town Hall Meeting was attended by over 200 people from industry, academia and government.

LA Forum on Transportation, Land Use, and the Environment (UCLA): The Downtown Los Angeles Forum took place on May 18, 2018. The event focused on Transit Oriented Development (TOD) and the effects of affordable housing on TOD. The event was attended by 129 guests, including academics and practitioners from the public and private sectors.

Lake Arrowhead Symposium (UCLA): UCLA will be hosting the Lake Arrowhead Symposium on the private invasion of public transit from October 14 to 16, 2018. The theme will be “From Public Transit to Public Mobility.” The event will be attended by over 160 guests including academics, practitioners, and elected officials. UCLA has been meeting with the Lake Arrowhead steering committee since April 2018 to execute this event.

National Summit on Transportation and Environmental Sustainability (UCD): UC Davis organizes the biennial Asilomar Conference, the leading international conference on transportation, energy, and environmental sustainability. The next summit will take place July 9-12, 2019.

iii. Other activities

Working and Living in a Port City Series (CSULB): Introducing local decision makers and community residents to the port, its position in the global supply chain, and careers available in international trade and transportation, this three-part series is offered twice a year and is taught by industry professionals and a career advisor. It is supported by industry sponsorships and offered free of charge. CITT plans to hold a seminar series in fall 2018.

Research Seminar (CSULB): PSR organized a Spring Research Seminar at CSULB in May 2018 on the topic “Centralized Processing of Chassis: Modeling, Analysis and Optimization” which was presented by Timothy VanderBeek a PhD candidate in Applied Mathematics and Industrial Engineering.

Spring Speaker Series (UCLA): The series 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. It took place during Professor Brian Taylor’s Transportation Policy and Planning graduate course, but all events were open to the public. Recordings of most of the speakers on our YouTube channel. UCLA will continue this series for fall 2018.

iv. Media and Communications

PSR’s media and communications offerings include digital and print publications, websites, social media, podcasts, and videos.

Publications

PSR News: The PSR e-newsletter has been launched as a part of *METRANS News*. As the activities of the center ramp up, the e-newsletter will be established as a publication linked to *METRANS News*. *METRANS News* has a national circulation of about 3,000, most via email link. Bi-weekly news blasts are issued throughout the year to provide current information on METRANS and PSR activities.



Transfers Magazine: The PSR Executive Committee decided to replace *ACCESS Magazine* with a new, high quality biannual digital magazine in the style of *ACCESS*, but with a more modern appearance: *TRANSFERS Magazine*. 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. UCLA ITS staff have taken the lead in this endeavor. UCLA ITS hired a communications manager to serve as the magazine's managing editor, with editorial support from two student assistants, ITS associate director and editor-in-chief Madeline Brozen, and Professors Donald Shoup and Martin Wachs, who will advise the publication and solicit article contributions from PSR scholars. The first issue was released in May 2018 and the second is scheduled for November 2018, each with four articles and an opinion column representing writers from nearly all the PSR campuses. In addition to the twice-yearly issues, the Transfers website (<https://transfersmagazine.org>) features a supplemental, regularly updated blog with news, research, and events from around the PSR network. Additionally, the directors of the affiliated PSR research centers have formed an editorial board to provide guidance to the editorial team and held the first annual meeting via conference call in July 2018 to assess the magazine. TRANSFERS is the flagship publication of PSR.

Research Briefs: UCLA produced one research brief as part of its Fellowship program. The research brief summarized the project "Fast, Furious, & Fatal: An Assessment of Speed Setting Methodology in California" by Ribeka Toda, Urban Planning Masters Graduate Student.

Website

PSR website: The PSR website is complete and currently housed at <https://www.metrans.org/psr-utc>. The PSR website is managed as part of the METRANS website. Incorporating PSR, along with several other changes within METRANS, required a restructuring of the entire website. We decided to take this opportunity to update the entire website to take advantage of new dynamic and interactive capabilities. The restructuring of the website is currently in progress. The RFQ for the new website was issued in Winter 2018, and the developer has been selected. We anticipate that the new website will be deployed by December 2018.

Partner websites: PSR partners include PSR activities on their own websites. Information regarding UCLA ITS's participation in PSR has been shared on the websites for UCLA ITS, UCLA Luskin School of Public Affairs, and the UCLA main page. ITS-Davis added a "Partner Centers" webpage to its website to highlight ITS-Davis's affiliation with PSR and other centers not led by UC Davis. Planning continued for UCI's PSR-UTC website in conjunction with a broader redesign of the ITS-Irvine website, which is slated

for completion by December 2018. Pima has listed the UTC grant on the College's website: <https://www.pima.edu/administrative-services/grants/grants-list.html>. NAU has put together a website to display the work they do at the center: <https://nau.edu/aztrans>

Media

PSR activities and events have been incorporated into the METRANS social media outlets (Facebook (<https://www.facebook.com/metranscenter/>) and Twitter (https://twitter.com/metrans_center?lang=en)), and into the weekly student e-news. This reporting period we had 657 Twitter followers and 25 tweets. We had 413 Facebook "Likes" and 12,045 Facebook visits, as measured by "reach" (the number of people that have encountered a post or the page itself).

METRANS and UCLA seminars are available on YouTube. In addition we have several series that are available online:

- **ContainerCasts** are webcasts focused on topics of interest to the international trade community. No ContainerCasts were produced and posted during the reporting period; past ContainerCasts can be accessed at <https://www.ccpe.csulb.edu/TheManifest/ContainerCast.aspx?PID=13>.
- **TransCasts** are podcasts featuring interviews with METRANS researchers and other distinguished transportation experts. METRANS 20th anniversary TransCasts with Randy Iwasaki, Executive Director of the Contra Costa County Transportation Authority, is posted on METRANS website. All episodes are available at <https://www.metrans.org/transcasts>.
- **Trade and Transportation Perspective and Trade Talks:** METRANS Associate Director O'Brien hosts a quarterly television series called Trade Talks produced by CSULB's Advanced Media Production services and distributed through a regional cable network. The episodes are also available via YouTube. Two episodes were produced during this reporting period: the April 2018 episode featured Genevieve Giuliano, Director of METRANS and the Ferraro Chair in Effective Government at the Sol Price School of Public Policy at USC; the August 2018 episode featured Terry Bills, Global Transportation Industry Manager at ESRI. These and all past episodes can be viewed here: <https://www.youtube.com/watch?v=D0ouTGwCt0o>.

v. Dissemination

Dissemination is achieved through the events, media, and communication channels described above.

vi. Plans for Next Reporting Period

Plans for the coming report period include:

- METRANS will hold its annual Industry Outlook event on November 7, 2018. Jon Coleman, Director at City Solutions, Ford Smart Mobility is the featured speaker
- Continue preparations for I-NUF 2019.
- Host the UCLA Lake Arrowhead Symposium "From Public Transit to Private Mobility" on October 14-16, 2018.
- UCLA will host an Innovative Mobility Speaker Series from November 1 to December 30, 2018. Host the Steering Committee to plan the Downtown Los Angeles Forum 2019.
- Release Issue 2 of TRANSFERS Magazine.
- Add additional mentee/mentor pairings in the UCLA Mentor Program.
- Complete website reconstruction.
- UCI will deploy its PSR-UTC website.

- UC Davis's Dr. Fraser Shilling organized and will moderate a TRB webinar on "Wildlife-Vehicle Collision Mitigation: Data to Decisions" on October 24, 2018.
<https://webinar.mytrb.org/Webinars/Details/1231>

3. Products

PSR products include publications, websites, technologies, inventions, webcasts, podcasts, and seminars.

A. Publications

During the reporting period, PSR research resulted in five papers that have been accepted for conference presentations.

CSULB Assistant Professor Dr. Mohammad Mozumdar from the Department of Electrical Engineering along with his peers published a conference paper that was accepted in *2018 IEEE Green Energy and Smart Systems Conference (IGESSC)* titled as "Vibration Based Energy Scavenging System for Battery Powered Sensor Networks", Authors: Salim Masumdar, Mohammad Mozumdar, Fei Wang.

CSULB Assistant Professor Dr. Chandra from the Department of Civil Engineering and Construction Engineering Management has submitted two journal articles for publication which are undergoing review.

NAU PSR Summer Intern Emmanuel James was co-author on a paper entitled "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". This work examined factors associated with violations and distraction at highway-rail grade crossings and discussed strategies to improve safety/mobility at these crossings. The paper has been accepted for presentation at *the 2019 Transportation Research Board Annual Meeting*. This work was funded with PSR funds (summer intern funding). NAU PSR9 Faculty Brendan Russo and Edward Smaglik were co-authors on this paper.

Emmanuel James (NAU) was also lead author on a paper entitled "Analysis of Factors Affecting Injury Severity in Traffic Crashes on Arizona Tribal Lands". This work examined factors leading to severe injury outcomes for disadvantaged tribal populations and discussed potential countermeasures to improve safety for these populations. The paper has been accepted for presentation at the *2019 Transportation Research Board Annual Meeting* and is under review for publication in the *Transportation Research Record*. This work was funded with PSR funds (summer intern funding). NAU PSR Faculty Brendan Russo was co-author on this paper. This work also resulted in Christopher being awarded the "2018 Best Student Paper Award" by the Intelligent Transportation Society of Arizona.

NAU PSR Graduate Fellow Cristopher Aguilar was lead author on a paper entitled "Analysis of Factors Affecting the Frequency of Crashes on Interstate Freeways by Vehicle Type and Severity Incorporating Weather Prediction Models." This study utilized weather prediction models to analyze the impacts of precipitation on interstate safety (and mobility in terms of the non-recurring delay that crashes cause). The paper has been accepted for presentation at the *2019 Transportation Research Board Annual Meeting*. Part of this work was funded with PSR funds (graduate fellowship funding). NAU PSR Faculty Brendan Russo was co-author on this paper.

NAU PSR Graduate Fellow Cristopher Aguilar and NAU PSR Intern Emmanuel James were co-authors on a paper entitled “Exploring the Impacts of Traffic Characteristics on Bicycle-Vehicle Conflicts.” This work utilized field-collected data to analyze the impacts of vehicle and bicycle volumes, as well as certain site characteristics, on the frequency of vehicle-bicycle conflicts in urban areas. The paper has been accepted for presentation at the *2019 Transportation Research Board Annual Meeting*. Part of this work was funded with PSR9 funds (PSR summer intern funding). NAU PSR Faculty Brendan Russo and Edward Smaglik were co-authors on this paper.

B. Websites

The PSR website URL is <https://www.mettrans.org/psr-utc>. The website is described in the “Media” section.

C. Technologies

Nothing to report during this period.

D. Inventions

Nothing to report during this period.

E. Other Products

Webcasts and podcasts of seminars and events; professional training courses and programs.

UC Davis’s Dr. Fraser Shilling participated in the organizing group for a workshop related to his PSR research at the 2018 Infra Eco Network Europe Conference in Eindhoven, The Netherlands. The workshop was titled, “Global wildlife-vehicle conflict reporting systems”, and the organizing committee included representatives from the Endangered Wildlife Trust in South Africa, the Transportation Research Centre in the Czech Republic, Natuurpunt in Belgium, the University of Natural Resources and Life Sciences in Austria, Cardiff University in the UK, and Red Deer College in Canada.

4. Participants and Collaborating Organizations

A. Participants

Participants contribute to the work of the Center 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. Table 7 lists the PSR partners, provides a brief description, and describes the main contributions of each partner.

The following California organizations provide match funding to PSR:

- State of California, California Department of Transportation, Los Angeles County Metropolitan Planning Authority, South Coast Air Quality Management District, Port of Long Beach, Southern California Association of Governments, Los Angeles World Airports.

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

- California: MetroLink, Foothill Transit, Ceres/Yusen Terminals, Port of Los Angeles, Majestic Realty, Volvo Research and Education Foundation, Los Angeles Transportation Club (LATC),

Harbor Transportation Club (HTC), Harbor Association for Industry and Commerce (HAIC), Council of Supply Chain Management Professionals (CSMCP), Long Beach Transit, City of Anaheim, Orange County Transportation Authority (OCTA), California Energy Commission (CEC), Governor’s Office of Business and Economic Development (GO-Biz).

- Arizona: Arizona Board of Regents, Pima Association of Governments, Southern Arizona Anti-Trafficking United Response Network (SAATURN), Northern Arizona University.
- Hawaii: University of Hawaii.

Table 7: PSR Partners

Institution (Diversity)	Description	Contribution to the Consortium
USC (AANAPISI)	USC is the largest private research university in the US, with over 47,000 students. Ranked 22nd among national universities by U.S. News & World Report; public policy school is ranked 2nd, and engineering is ranked 10th nationally; \$5.1 billion endowment.	Leading faculty; top ranked graduate programs in transportation, including public policy, systems engineering; proven track record of consortium leadership
CSULB (HSI, AANAPISI)	Public regional university, ranked 5th among western regional universities according to U.S. News & World Report; 37,000 students.	Undergrad and masters level programs, workforce development, tech transfer
UCD (HSI eligible)	Public research university; ranks 10th among US public universities by U.S. News and World Report; ranked 7th in ecology/environmental research among global universities; ranks 12th in graduate civil engineering; and ranked 1st in the nation for launching women into STEM professions; 38,370 students.	Leading faculty, interdisciplinary MS and PhD, policy outreach; energy and environment; lead institution of the National Center on Sustainable Transportation
UCI (AANAPISI)	Public research university; ranks 9th among US public universities by U.S. News and World Report; ranked 1st in the U.S. and 7th in the world among universities less than 50 years old (Times Higher Ed, 2015); 31,551 students.	Leading faculty, strong graduate programs, ITS research facilities, interdisciplinary PhD, strong connected and automated vehicles research program
UCLA	One of the world’s leading universities, public or private; ranked 15th globally for scholarly reputation by Times Higher Education 2018, ranked #1 public university in the US by U.S. News and World Report 2019. Ranked 6th among US public universities in Nobel Prize winners.	Leading faculty; large, highly ranked graduate transportation programs (MPP, MURP, & PhD) in Public Affairs, as well as in engineering
UH (AANAPISI, NHSI)	University of Hawai’i at Mānoa is the flagship campus of the University of Hawai’i System. Consistently ranked a “best value” among U.S. colleges and universities. Classified by the Carnegie Foundation as a “very high research activity” university.	Leading transportation and infrastructure resilience faculty; planning program with specialization in transportation and infrastructure planning, includes courses in disaster management planning
NAU (HSI, AIANSI)	Public University; ranked in the top 25% of programs with a Masters as the ultimate degree by U.S. News & World Report.	Leading faculty; undergrad and master's transportation program; transportation and environmental workforce development and outreach
Pima (HSI, AIANSI)	Public community college, 47,500 students on 6 campuses; one of the largest multi-campus community colleges in the US.	College transition; technical training; workforce development

B. Collaborating Organizations

The PSR partners have extensive relationships with other universities, public agencies, and private industry. Almost all PSR consortium members are currently part of a UTC or other major research consortium; all have experience in collaborative partnerships, and all participate in ongoing joint activities.

In this reporting period, NAU and the City of Phoenix entered into an IGA that allows the City of Phoenix to hire NAU personnel directly to conduct research and engineering activities. NAU is in the process of finalizing negotiations with the City for our inaugural project through this IGA. NAU is pursuing a similar arrangement with the City of Flagstaff and the Flagstaff Metropolitan Planning Organization.

C. Advisory Organizations

Table 8: Members of the PSR Advisory Council

Name	Affiliation	Representation
Allison Yoh	Director of Transportation Planning, Port of Long Beach	Transportation stakeholder organization
Alvin Au (Alts: Kiana Otsuka, Randolph Sykes)	Executive Director, Oahu MPO	MPO (Metropolitan Planning Organization) area over one million
Amanda Eaken	Director of Transportation and Climate, NRDC	Transportation stakeholder organization
Brian Hoeft	Executive Director, Regional Transportation Commission of Southern Nevada	MPO area over one million
Coco Briseno	Chief Deputy Director, Caltrans	State DOT (Director of Traffic)
Dave Stumpo	Executive Director, Southern California Regional Transit Consortium (SCRRTC)	Transportation stakeholder organization
Dave Wessel	Executive Director, Flagstaff MPO	MPO area less than one million
Farhad Moghimi	Executive Director, Pima Association of Governments	MPO area over one million
Hasan Ikhata	Executive Director, Southern California Association of Governments	MPO area over one million
Jade Butay	Director, Hawaii Department of Transportation	State DOT
John Halikowsky	Director, Arizona Department of Transportation	State DOT
Jon Nouchi	Deputy Director, Honolulu Department of Transportation Services	Local transportation agency
Lauren Armstrong	Executive Director, Maui County Metropolitan Organization	MPO area less than one million
Rudy Malfadon	Nevada Department of Transportation	State DOT
Stephanie Ramirez	Associate State Director, American Association of Retired Persons (AARP)	Transportation Stakeholder organization

The **PSR Advisory Council** provides guidance on: 1) the most pressing problems facing the member agencies that can be addressed by university research; 2) themes to be addressed at the PSR annual congress; and 3) workforce and training requirements of the member agencies and their client or constituent government entities. The Advisory Council also plays a role in dissemination of research results and in hosting tech transfer events. We selected members to represent state departments of transportation, MPOs, tribal governments, and private and non-profit sectors. Table 8 lists the current members of the PSR Advisory Council. In addition to the PSR Advisory Council, each partner has its own advisory group (not listed in this report).

D. Relationships with Other Universities

Council of University Transportation Centers (CUTC): The center director (Giuliano) is a past president and executive committee member. Dr. O'Brien (CSULB) was recently named Vice President of CUTC. Dr. O'Brien serves as PSR lead for the CUTC workforce development efforts.

MetroFreight Center of Excellence: METRANS is the home of the Volvo Foundation for Education and Research (VREF) Center of Excellence on urban freight. MetroFreight seeks to improve the sustainability of goods movement in metropolitan areas around the world. 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 National Center for Sustainable Transportation (NCST) UTC was established in 2013 and renewed 2016. Led by University of California, Davis, consortium partners include METRANS (USC and CSULB); University of California, Riverside; Georgia Institute of Technology; and the University of Vermont. METRANS' role is sustainable freight transport, which links well with MetroFreight. The NCST Director, Susan Handy, also serves as the UC Davis PSR Associate Director, and the NCST Program Manager also serves as the UC Davis PSR Program Manager. This overlap helps to facilitate coordination and collaboration among the UTCs.

Southwest Transportation Workforce Center: The Southwest Transportation Workforce Center (SWTWC) seeks to connect and empower the 21st century transportation workforce through research, education, and industry engagement. SWTWC is led by CSULB, with USC, Texas A&M Transportation Institute (TTI), ICF International, and the National Occupational Competency Testing Institute as partners. The mission of SWTWC is to provide a more strategic and efficient approach to transportation workforce development. The partnership of CSULB and Pima began within the SWTWC, and led to Pima joining the PSR consortium. The SWTWC leads an FHWA-funded National Transportation Career Pathways initiative with partners from the other regional workforce centers at the University of Vermont, University of Memphis, University of Wisconsin, and Montana State University.

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. Dr. Ian Roark, and our Dean of Applied Technologies, Mr. Gregory Wilson, serve on the committee.

Arizona High Tech Freight Corridor: NAU is part of a partnership between the three Arizona universities, investigating the use of I-10 as a high tech freight corridor. The partnership includes a portfolio of seven

projects, including safety, efficiency, alternative fuels, and education and outreach, among others. Each project is being conducted by at least two of the three schools, and some involve all three. Outcomes of the partnership include publications, proposals, and dissemination of results through various educational channels (webinars, case studies, and academic modules). This portfolio of projects is funded by the Arizona Board of Regents.

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

UH partnership for transportation resilience: Through its involvement with the Transportation Research Board's Standing Committee on Emergency Evacuation, UH has partnered with Louisiana State University, Florida Atlantic University, and the Gulf Coast Center for Evacuation and Transportation Resiliency (MarTREC UTC, University of Arkansas) to examine opportunities to increase and improve transportation resilience.

5. Impact

What is the impact on the development of the principal discipline(s) of the program?

Scholarships and fellowships have attracted new students to transportation. PSR funding has contributed to the capacity at NAU to propose new degree programs.

What is the impact on other disciplines?

Nothing to report during this period.

What is the impact on the development of 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 section C.vii above.

What is the impact on physical, institutional, and information resources at the university or other partner institutions?

There are increased space and computing requirements.

What is the impact on technology transfer?

Our faculty are editors and on boards of several scholarly journals, and are members of state or local committees and task forces, providing advice on transport policy and practice. The Transfers magazine is an online platform which has allowed us to share research and ideas from all PSR universities through blogs and news stories.

What is the impact on society beyond science and technology?

Nothing to report during this period.

6. Changes/Problems

No changes in the grant have taken place. Our Caltrans match fund projects will start during the next reporting period. There are no problems to report.

7. Special Reporting Requirement

There are no special reporting requirements and nothing to report during this period.