



**Request for Proposals for UCI Research Projects
USDOT
Pacific Southwest Region
University Transportation Center**

RFP Issued: June 12, 2018

Proposals Due: August 10, 2018
Anticipated project start date: January 1, 2019

Maximum project duration: up to 12 months



ITS·IRVINE
INSTITUTE of TRANSPORTATION STUDIES

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Introduction

The USDOT Pacific Southwest Region University Transportation Center (PSR) is the Regional UTC for US Region 9 (California, Arizona, Nevada, Hawaii, and the Pacific Islands). PSR is led by the PSR Transportation Center, University of Southern California and includes the following partners: California State University, Long Beach, Northern Arizona University, Pima Community College, University of California, Davis, University of California, Irvine (UCI), University of California, Los Angeles, and University of Hawaii. PSR funded research is expected to result in scholarly publications and contribute to generating larger grants from other sources.

Funding for this RFP

This is the second UCI PSR RFP, and is for Year 2 research funding. Total faculty research funding available under this RFP is expected to be up to approximately \$225,000, predominantly from Caltrans, the primary anticipated source of matching funds for this period. Caltrans funds are available only for PSR partner universities in California. *These funds have not yet been formally committed for potential UCI projects by Caltrans, nor have any other matching funds.* Thus project awards will depend on both the availability of funding and project selections by Caltrans. It is thus likely that GSR appointments on successful projects could have an earliest start date of January 1, 2019.

Given the anticipated competition for these funds, prospective applicants should carefully consider their expertise relative to the thematic areas and topics, and ability to obtain command Caltrans support as described below in the section Selection Criteria for all Proposals.

The remainder of this RFP describes eligibility requirements, research topics, selection criteria, funding guidelines and restrictions, project requirements, and proposal instructions as well as budget instructions and sample budget sheets. Submission instructions and a cover page are also provided.

Eligibility

Full-time ITS-Irvine Faculty Associates who are tenure track faculty, or researchers eligible to serve as Principal Investigators at UCI, are eligible to serve as Principal Investigators on PSR UTC grants. Proposals may include multiple investigators. Proposals may also include research faculty and non-tenure track faculty from the PSR partner universities as Co-Principal Investigators.

Research Program Themes and Topic Areas

Our research program is organized around four themes: Technology for improved mobility, Improving mobility for disadvantaged populations, Improving resilience and protecting the environment, and Managing mobility in high growth cities and regions.

In addition, given the expected sources of funds supporting this RFP, preference will be given to proposals addressing one or more of the themes below, while also maintaining a primary focus on informing transportation policy, planning, operations and management in California. In particular,

proposal authors should carefully note the strategic goals of Caltrans listed in Appendix A when deciding whether and how to respond to this RFP.

Theme 1: Technology for improved mobility

We are on the threshold of a largely unforeseen technological and social transformation in connectivity, automation, and the sharing economy that promises to revolutionize travel in our Region and beyond. This theme explores technology solutions for improving mobility for both passengers and freight. Our Theme 1 research program is organized around three topic areas.

Topic 1-1: Technology and mobility: This topic examines emerging technologies and their potential for improving passenger and freight mobility. Innovation is rapid across both passenger and freight modes. Examples include smart parking, dynamic routing, delivery consolidations, and integrated transit fare systems, in addition to the well-known transportation network companies (TNCs). This topic examines the potential of these innovations to solve the transport problems of Region 9.

Topic 1-2: Smart infrastructure and vehicles: Technology for connected and autonomous vehicles (CAVs) is advancing rapidly. This topic examines AVs and CAVs. Examples of research include: 1) development of models and algorithms for managing shared CAVs; 2) impacts on travel behavior; 3) impacts on traffic flow and management in mixed fleets; and 4) truck platoons. This topic also examines the potential long term impacts of AVs and CAVs on travel behavior, location choices of households and firms, and metropolitan spatial structure.

Topic 1-3: Public policy and implementation: This topic explores the role of government in technology implementation and regulation. Research is needed on the role of government in this changing environment. A second issue is cooperation. A future of vehicles managed at the system level requires cooperation of public and private entities involved, yet there are many barriers to such cooperation. Finally, there are questions about the viability of CAVs.

Theme 2: Improving mobility for disadvantaged populations

This theme addresses mobility and accessibility problems of disadvantaged populations.

Topic 2-1: Novel modes for improved mobility and accessibility: This topic explores the potential of novel modes, new models of public transport, and new models of private vehicle access to address mobility problems. Research may include challenges to implementation and strategies to overcome them.

Topic 2-2: Land use, accessibility, mobility: Addressing the needs of the disadvantaged includes studying relationships between land use and transport with respect to minority and disadvantaged populations. This topic examines the impacts of limited accessibility and mobility both in urban and rural areas. It also explores the role of land use policies in reducing access barriers for underrepresented groups.

Theme 3: Improving resilience and protecting the environment

Resilience, or the ability to absorb shocks, recover quickly, and adapt to changing social, economic, and environmental conditions is essential to ensuring well-functioning and sustainable communities. Sustainability also requires reducing environmental problems. This theme addresses all aspects of environmental protection.

Topic 3-1: Analyzing alternative resilience strategies: More effective resilience strategies can reduce the damages of natural disasters, accidents, or terrorist events. There is a need for research on frameworks to analyze resilience strategies at different geographic scales. Effectiveness of resilience strategies is often analyzed via economic impact models. In the case of transportation, these models could be linked with transportation network models to quantify the cost-effectiveness of different strategies. Methods to examine distributional impacts of disruptions and resilience across socioeconomic groups is also needed.

Topic 3-2: Smart technologies: Smart technologies can improve system monitoring. Smart sensing systems, including those powered through solar or power harvesting, can provide the necessary information to monitor the health of systems so that proactive repair and replacement can be dealt with through normal crew duties.

Topic 3-3: Reducing environmental impacts: The challenge for Region 9 is to reduce environmental impacts while meeting the mobility needs of society, fostering healthy communities, and supporting economic growth. Research is needed to address this challenge along three fronts: 1) *Infrastructure and operations:* lifecycle use of materials and practices in roadway construction, maintenance, and operation; assessment of environmental implications of Intelligent Transportation System (ITS) strategies; 2) *Travel demand:* effectiveness of strategies for shifting driving to transit, walking, and bicycling; implications of automated cars for land development patterns; role of new mobility services in daily household travel; and 3) *Vehicle and fuel technologies:* assessment of new-generation fuel and vehicle technologies, including battery, plug-in hybrid, roadway-powered, and fuel cell electric vehicles, with respect to lifecycle emissions, private and social costs, consumer behavior, and regulatory and market policies.

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 are expecting to continue to grow.

Topic 4-1: Managing passenger demand: This topic explores meeting human needs while lessening travel required. The emphasis is on “accessibility” rather than “mobility.” Well-being is enhanced when people are able to acquire goods and services, employment and education, but not necessarily by increasing travel volume. There is increasing emphasis on combining land use planning with transportation capital investments to achieve efficient movement patterns.

Topic 4-2: Managing freight demand and its impacts: This topic addresses the challenges of managing freight, both last mile and regional. For example, the rise of e-commerce has brought about changes to

global and local supply chains and greatly increased urban freight deliveries. The revitalization of our urban cores adds another increase in demand that translates into additional trips made by trucks and delivery vans. Research is needed to examine the impacts of e-commerce and other changes on local and regional mobility, economic activity, and employment patterns, such as passenger-freight conflicts, dynamics of shifts and their local impacts, and effective strategies for managing trade-related traffic, including better balancing demand across time intervals, routes, and modes.

Selection Criteria for All Proposals

Proposals will first be evaluated by the ITS Director for relevance to the PSR UTC research program themes above. Selected proposals will then be forwarded to the Caltrans Division of Research, Innovation and Systems Information, which will be responsible for evaluation and selection of proposals for funding. Proposals are expected to be selected on the basis of their evaluations along with programmatic priorities. Proposals will compete both within topics and across topics. PSR does not guarantee that proposals will be funded in all topic areas, or that any proposal will be funded.

It is expected that Caltrans reviewers will evaluate proposals according to the following selection criteria:

1. Demonstrated relevance to the above research program themes (a requirement) and to Caltrans strategic goals
2. Quality and research significance
3. Student involvement
4. Reasonableness of budget and cost-effectiveness
5. Qualifications to perform work and likelihood of successful completion
6. Match funding, if any, and potential for attracting larger grant funding
7. Prior performance on grants (as applicable)

Proposals that involve collaboration between partner universities, interdisciplinary proposals that cross school boundaries as well as participation from outside organizations are encouraged.

Proposers are encouraged to communicate with members of the PSR Executive Committee or other outside organizations in the development of research proposals. A list of Executive Committee members can be found in the directory page of PSR at <https://www.mettrans.org/psr-utc-key-personnel>.

Given that Caltrans is the expected source of funds supporting this RFP, proposals do NOT have to provide confirmation that a California local, regional or state agency has expressed interest in the proposed work, as has been the case with previous PSR UTC and SB1 RFPs.

Commitments of participation (for example data sharing or match funding) from outside of PSR will be

a consideration in making awards. *Any project that involves data collection, access to facilities, or cooperation of a private or public entity **must** include a letter of participation from the entity in the proposal.*

Proposers are encouraged to include undergraduate students in the research project if appropriate. There are potential funding opportunities through various university programs that could support students working on PSR projects. Proposers are strongly encouraged but not required by this RFP to explore such opportunities with their schools and the campus.

Funding Guidelines and Restrictions

Budgets should be conservative and cost-effective. Funding should be directed at new and original work. In some cases, PSR will consider continuations of prior PSR projects that have achieved significant results and have a high potential for deployment, scholarly products or large grants. PIs may submit multiple proposals, though it is unlikely that any PI will be awarded more than one grant. PIs with current PSR grants are eligible to apply. However, grants will not be awarded to PIs with outstanding deliverables (draft or final report; research brief; data management plan compliance) on prior PSR grants.

Funds should be spent in a manner that provides publishable results, especially in refereed journals. In general, faculty summer salary, student support, and tuition/fee reimbursement are allowed expenses. Proposers are encouraged to budget travel to one domestic conference to present project results. However, Caltrans will not fund travel to TRB conferences. Funding for students is expected in all projects, including GSR salary and any additional costs for student presentations at conferences. Overhead and fringe benefits should also be included in the budget. A limited amount of travel for data collection purposes, materials, and supplies may be included, provided that they are a direct expense related to completing the work. International travel is not permitted.

Proposers are discouraged from budgeting for computers, equipment, support staff, outside consultants, or any salary that goes beyond normal academic or summer compensation. These may only be included if specific justification is provided as to why the work cannot be completed without the expense. In no case shall PSR partner university employees be hired on a consulting basis.

UCI PSR funded proposals will have accounts administered by ITS-Irvine. At the partner universities, accounts will be set up within the subcontract per each partner's policies.

Funding Guidelines:

1. Research project awards have a maximum of approximately \$80,000 per year (including indirect costs of 30%)
2. The typical project duration is one year

3. **Note that conservative and cost-effective budgets are strongly encouraged.** PSR reserves the right to reduce the budgets of submitted proposals. Projects should be budgeted to begin on January 1st, 2019 and end by December 31, 2019

Project Requirements:

All research projects have the following requirements (a link to online guidelines and templates will be provided soon); note that Caltrans may have additional requirements:

1. Semi-annual progress reports conforming to PSR guidelines
2. A Draft Final Report, conforming to PSR guidelines, which must be delivered 30 days prior to the completion date of the project. The Draft Final Report is subject to peer review. The Draft Final Report should include an executive summary, data management plan compliance explanation, and documentation of the research project. It should be complete, original, well organized and accurate; and comply with report content and format guidelines (posted to the PSR website)
3. A Final Report that complies with the review comments and requirements must be delivered within 30 days after the review of the Draft Report. Draft Final and Final Reports are distributed via the PSR websites, and are submitted to PSR sponsors and to various publications databases
4. A separate statement listing publications, presentations and inventions resulting from research; names of students supported along with their degree status; and a summary of project results. This statement is to be submitted with the Draft Final Report
5. A 2- to 4-page Research Brief suitable for a general audience that summarizes the main findings of the research and its contribution to practice or policy. This brief is to be submitted with the Final Report
6. A brief Biographical Sketch for each of the project's investigators to be submitted with the Draft Final Report. A template for the biographical sketch will be provided with the notification of award. At least one presentation of the funded project's research at a thematic conference or seminar organized by PSR
7. Timely reporting of all information requested for the PSR Annual Report
8. Copies of all papers submitted to journals or conferences that are based on the project's research. Copies should be provided to the PSR Administrator
9. Acknowledgement of PSR support in all work that results from PSR funding, including peer-reviewed publications and conference presentations
10. **Conformance to new data management requirements imposed by DOT.** These requirements will be provided as soon as possible (see 2. below)

11. **PI ORCID number.** PIs are directed to obtain and provide this number to the center administrator within 30-days of notification of project selection. Numbers can be obtained at <https://orcid.org/register>

Projects funded by Caltrans will have additional reporting and budget requirements. Principal Investigators of proposals selected for Caltrans funding will be informed of these requirements.

Proposal Instructions

Research Proposal Instructions

Research proposals should be succinct and clearly written for a mixed technical and non-technical audience. Proposals are limited to no more than 8 pages in sections 3 – 7. Budget and other forms are included in Appendix B. Each proposal must include the following sections:

1. Cover page (use the form provided in Appendix B)
2. Data Management Plan commitment (the 2016 FAST Act requires a data management plan for all UTC research; we are awaiting approval of the PSR Data Management Plan; please simply include a placeholder in the proposal)
3. Project objective and project abstract (see research page at www.PSR.org for examples; no more than one page)
4. Background and motivation for the topic to be addressed (problem to be addressed, what has been done previously, why it is important, and relevance to selected research areas)
5. Methodology (the methodology by which project objectives will be accomplished)
6. Tasks, Schedule and Deliverables (steps that will be followed in executing the methodology, and when they will be completed)
7. Description of the expected research product and contribution to practice (e.g. peer-reviewed publication)
8. Qualifications (the research team's relevant skills and experience that will help ensure success)
9. Budget justification (strong justification should be provided for unusual expenses, e.g., equipment). The extent of student involvement should be clearly stated
10. Reference List (no limit)
11. Budget (1 page.) For UCI proposals, use the form provided in Appendix B. For partner universities, use the budget that is used for the clearance process.
12. Letters of support, participation, or match funding commitment (attached, any number and

length) *Letters of participation are required for any project that involves data collection from private or public entities, access to private or public facilities, or cooperation of private or public entities.*

13. Short bios for all investigators and a list of recent (past 5 years or less) publications and funded research projects (2-page maximum)

Proposals should demonstrate their responsiveness to PSR UTC selection criteria, according to the following guidelines:

Selection Criteria	Most Relevant Section(s)
Relevance to research theme areas	Background/Objective
Quality and research significance	Methodology/Tasks
Student involvement	Budget justifications
Reasonableness of budget and cost-effectiveness	Budget justification
Qualifications	Qualifications
Match funding & potential for other grant funding	Budget justification, Methodology/Tasks
Prior performance	Prior project accomplishments

Budget Instructions

For UCI: Please use UCI Office of Research guidelines in preparing your budget, see <http://www.research.uci.edu/sponsored-projects/contracts-grants-admin/proposal-prep/budget-general-info.html>. Contact ITS CAO Cam Tran <camt@uci.edu> for budget assistance. Tuition charges are not subject to F&A charges. The F&A cost rate is 30%.

For partner universities: Please see your university/school/department guidelines for extramural funding budget proposals.

Submission Instructions

Proposals must be submitted via email to ITS Assistant Director for Research Coordination, Craig Rindt at crindt+psr2018@uci.edu **on or before 5:00pm on August 10, 2018.**

NOTE to PIs: If more than one proposal is to be submitted, they must be submitted separately using the submission form. Proposals received later than the deadline will be rejected. **It is the responsibility of the PI to deliver the proposal by the deadline and to confirm receipt.**

Please note that all proposals must include a budget; proposals submitted without budgets will be determined to be incomplete and rejected.

PSR will reject proposals that: (1) are received after the deadline, (2) do not conform to eligibility requirements, (3) are incomplete, or (4) do not conform to thematic requirements.

Further Information

For further information, UCI PSR Associate Director Prof. Stephen Ritchie can be reached at (949) 824-4214 or srtichie@uci.edu. In addition, check <https://www.metrotrans.org/psr-utc> for center organization and links to outside agencies. For further information regarding program rules and procedures contact ITS Assistant Director for Research Coordination, Craig Rindt at (949) 824-1074 or crindt@uci.edu.

Appendices

Appendix A Caltrans Strategic Goals

Appendix B Budget Information and Forms

Appendix A

Caltrans Strategic Goals

CALTRANS GENERAL STRATEGIC GOALS

Caltrans funds research to provide solutions and knowledge that improve California's transportation system. Caltrans Division of Research, Innovation and System Information (DRISI) manages a comprehensive program to research, develop, test, and evaluate transportation innovations sought by its customers. These innovations in methods, materials, and technologies enable Caltrans to promote safety, enhance mobility and sustainability, improve the management of public facilities and services, and protect public investment in transportation infrastructure.

Caltrans articulates a long-term vision for California's transportation system and implements statewide transportation policy through partnerships with State, regional, and local agencies. The division of transportation planning provides quality planning products, services, and Information to support and guide transportation investment decisions.

Planning is conducted at the community, region, and statewide level, and includes:

- Economic Analysis
- Freight Planning
- Rail Planning
- System Planning
- Air Quality Planning

Appendix B

Budget Information and Forms

UCI Budget Form

Category	Monthly Salary	x	% of Time on Program	x	Number of Months	=	Budget (\$)
Faculty Salary	_____	x	_____	x	_____	=	_____
Faculty Salary1	_____	x	_____	x	_____	=	_____
Student Support	_____	x	_____	x	_____	=	_____
Type of Student	_____						
Student Support*	_____	x	_____	x	_____	=	_____
Type of Student	_____						
Fringe Benefits	Rate	_____			Total		_____
Tuition	Units	_____	Rate	_____	Total		_____
Conference Travel							_____
Conference Name/Date	_____						
Other Travel							_____
Materials and Supplies							_____
Equipment (list)	_____						_____

Other Direct Expenses (itemize)	_____						_____
Tuition cost share	Units	_____	Rate	_____	Total		_____
Overhead (30%)							_____
TOTAL FUNDS REQUESTED							_____

*Use additional faculty and student lines only if more than one professor or student.

PSR Cover Page

Title _____

Theme _____

Topic Area _____

Caltrans Topic (if applicable) _____

Principal Investigator _____

Mailing Address _____

E-mail _____

Phone _____

Fax _____

Co-Principal Investigator _____

Are you submitting this proposal elsewhere, or are you currently receiving funding in the same area of research? Yes _____ No _____

If yes, please describe circumstances and funding source

Does this proposal comply with the PSR Data Management Plan? Yes _____ No _____