



METRANS Transportation Center
www.metrans.org

Request for Proposals for Research Projects 5
METRANS Tier 1 UTC
and
National Center for Sustainable Transportation

RFP Issued: March 17, 2017
Proposals Due: April 19, 2017

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Introduction

The METRANS Transportation Center includes the METRANS University Transportation Center (UTC), the National Center for Sustainable Transportation (NCST), the Pacific Southwest Region 9 University Transportation Center (PSR), MetroFreight, and the Southwest Transportation Workforce Development Center (SWTWC). The METRANS UTC is a United States Department of Transportation (USDOT) Tier 1 University Transportation Center. It is a partnership of the University of Southern California (USC) and California State University, Long Beach (CSULB). METRANS is a partner in NCST, a National UTC led by University of California, Davis. METRANS emphasizes research directed at solving significant metropolitan transportation problems while contributing to knowledge. We expect that METRANS funded research will result in scholarly publications and will serve as seed funding that generates larger grants from other sources.

Funding for this RFP

METRANS is issuing this RFP to allocate the remaining research funding from the METRANS Tier 1 grant and to award projects for new NCST Center funds. Funding available under this RFP is approximately \$700,000 for METRANS Tier 1 Projects and \$650,000 for METRANS NCST Projects. For METRANS Tier 1, we anticipate that projects funded under this RFP will begin in the fall of 2017. *Tier 1 funds expire 9/30/18 and cannot be extended.*

Funding available for METRANS NCST projects is a mix of new and old award funding. The amount available listed above is based on an expected match contribution from Caltrans. *These funds have not yet been committed.* Thus NCST project awards will begin based on funding available, with the first group anticipated to begin in fall 2017. NCST has chosen to take this approach in order to have projects in hand ready to fund, rather than having to issue another RFP within a few months.

The amount awarded under this RFP will be determined by the quality and relevance of proposals received. Given the anticipated competition for these funds, prospective applicants should carefully consider their expertise relative to the thematic areas and topics.

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 for both USC and CSULB. Submission instructions and a METRANS cover page are also provided.

Eligibility

Full-time tenure track and research faculty members eligible to serve as Principal Investigators at USC or CSULB are eligible to serve as Principal Investigators on METRANS Tier 1 UTC grants. Proposals may include multiple investigators. Proposals may also include research faculty and non-tenure track faculty from USC and CSULB as Co-Principal Investigators.

Full-time tenure track and research faculty members eligible to serve as Principal Investigators at USC are eligible to serve as Principal Investigators on NCST grants. At CSULB, those eligible to serve as Principal Investigators in the Colleges of Business Administration, Liberal Arts, and Continuing and Professional Education are eligible to serve as Principal Investigators on NCST grants. Proposals may

include multiple investigators. Proposals may also include research faculty and non-tenure track faculty from USC and the eligible CSULB colleges as Co-Principal Investigators.

Research Program Themes and Topic Areas

1. METRANS Tier 1 UTC

Our research program is organized around two multimodal themes: 1) understanding passenger/freight interactions; and 2) achieving system efficiencies. Prospective applicants are referred to <http://www.metrans.org/research-projects/metrans-utc> for examples of projects that were previously funded.

Theme 1: Understanding Passenger-Freight Interactions

Research in Theme 1 will contribute to our understanding of passenger and freight interactions by examining the basic forces underlying supply and demand, developing more comprehensive data for analysis, and better methods for monitoring the performance of the urban transportation system.

Topic 1-1: Relationships between Spatial Patterns and Transportation

The spatial distribution of population and economic activities drives the pattern of transportation demand and flows within metropolitan areas. Metropolitan spatial patterns are changing. The overall trend is decentralization, yet downtowns are being revitalized, employment centers continue to grow, and in growing cities population density is increasing. On the freight side, warehousing and distribution is decentralizing, in part due to increasing scale economies in these industries, congestion in metropolitan cores, and rising land values. Topic 1-1 examines changing spatial patterns and their implications for freight and passenger flows. Examples of possible topics include transit-oriented development and travel behavior; impacts of inventory practices and replenishment on truck traffic patterns.

Topic 1-2: Characteristics of Freight and Passenger Demand

This topic examines the role of price, travel time, and reliability in freight and passenger demand. We have a basic understanding of passenger behavior with respect to price and value of time (VOT), but know little about travel time reliability. Our understanding of shipper behavior is more limited. Understanding differences between freight and passenger demand characteristics is important for developing appropriate strategies and incentives for better managing shared systems. Examples of possible topics include shipper responses to travel time unreliability, VOT across industry segments, and effects of travel time unreliability on mode choice. The provision of transport services is changing rapidly; how are travelers responding?

Topic 1-3: Better Data for Analysis of Passenger-Freight Interactions

Numerous studies have identified the lack of data on truck and freight moves as a significant barrier to developing better models of urban freight flows and developing better policies to manage the impacts of freight on metropolitan areas. There is a need for experimentation with mobile devices for more efficient data collection, and with data mining methods to derive truck data from secondary sources. In addition, there is a need to develop methods of estimating critical data elements when actual data are limited or not available. The data collected will help to build a comprehensive freight and passenger data base.

Theme 2: Achieving System Efficiencies

Research in Theme 2 develops efficiency strategies by exploring the potential for efficiencies within and across modes and user classes and identifying policy strategies that facilitate and promote these efficiencies.

Topic 2-1: Integrated Management across Users and Modes

This topic examines the potential for efficiency improvements from better system integration. This topic seeks to identify interdependencies between the various transport subsystems and examine the potential benefits of incorporating them in system management. Issues such as resiliency and sustainability and cyber physical aspects are also of interest. Examples include integrated corridor management, integration of freight and passenger rail scheduling, and scheduling of pickup and deliveries outside of peak passenger demand periods. Many efficiency strategies depend upon various ITS technologies; strategies for effective implementation are also of interest.

Topic 2-2: Policies for More Efficient Urban Transportation

This topic develops and explores strategies that promote more efficient use of transportation resources across multiple modes or user classes. Examples include transit service priority, parking and loading regulations, and pricing policies and their impact on efficiency. We are particularly interested in the institutional conditions under which different policy incentives are feasible, and in new policy mechanisms such as negotiated agreements and self-regulation.

Caltrans Topics

Caltrans has submitted research topics of interest that fall within the Tier 1 UTC thematic areas. These topics are described in Appendix A. Proposers are encouraged to submit research proposals on these topics

2. National Center for Sustainable Transportation

The goal of the NCST is to produce research that directly supports the efforts of policy makers and professionals to improve the sustainability of the transportation system. Proposed projects must fall under one or more of the following research tracks:

- Environmentally Responsible Infrastructure and Operations
- Multi-Modal Travel and Sustainable Land Use
- Institutional Change

The NCST is particularly interested in funding research in the following emphasis areas that cross-cut these three research tracks:

- Sustainable Freight - Examples of projects include but are not limited to strategies for reducing carbon and criteria pollutant emissions and increasing energy efficiency through vehicle technology, system operations, logistics, and land-use planning; and cost-effective strategies for increasing environmental sustainability in the freight sector.
- New Mobility (Including connected, shared, and/or automation of vehicles)– Examples of projects include but are not limited to behavioral implications of new mobility (who will use it and under what conditions); the potential for new mobility to meet the needs of rural areas and

mobility disadvantaged travelers, as well as interregional travel needs; the potential to reduce vehicle use (by increasing load factors in cars, vans, buses, and rail); future funding scenarios that address new technologies and mobility services; and the potential synergies between ride-sharing, automation, and electrification that could lessen environmental impacts and improve access for disadvantaged riders while reducing transportation costs.

- Environmental Review – Examples of projects include more proactive approaches to identifying environmental justice issues and an understanding of what types of data should be collected; and strategies for incorporating environmental analysis and mitigation early in the planning process.

The primary METRANS focus area for NCST research is sustainable freight. Improvements may be achieved through technology, operational efficiencies, or policy incentives. All modes of surface freight transport are of interest. Possible topics include: 1) system management strategies to facilitate truck movements, 2) consolidation or other load management strategies, 3) more efficient fuels, vehicles, or modes.

Proposals addressing other sustainability topics that fall within the mission of METRANS – solving transportation problems in large metropolitan areas – are also encouraged. Proposals may address passenger or freight transport. Possible topic areas include: 1) spatial patterns and the sustainability of passenger and freight transport, 2) public transit management and productivity, 3) resiliency of urban transportation systems.

Funding for the NCST is from both the US Department of Transportation and by Caltrans (see RFP funding section above). Submission of proposals consistent with *both* the mission of METRANS and the mission of Caltrans and its research needs for the NCST is encouraged.

Caltrans Topics

Caltrans has not yet identified specific topics for NCST. Rather, proposers are referred to several website links for general information on Caltrans priorities. See Appendix B.

White Papers

NCST encourages proposals for white papers that offer a synthesis of the literature on a specific sustainability topic of critical policy interest. The white papers should summarize the state of knowledge and identify research gaps. White papers are aimed at a broad audience of professionals and policy-makers. The white papers are typically funded at \$10,000 - \$12,000.

Selection Criteria for All Proposals

Transportation researchers and practitioners will evaluate proposals. Proposals will be selected on the basis of their evaluations along with programmatic priorities. Proposals will compete both within topics and across topics. METRANS does not guarantee that proposals will be funded in all topic areas, or that any proposal will be funded.

Reviewers will evaluate proposals according to the following selection criteria:

1. Demonstrated relevance to the above research program themes (a requirement)
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 and potential for attracting larger grant funding
7. Prior performance on METRANS or NCST grants (if applicable)

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

Proposers are encouraged to communicate with members of the METRANS 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 www.metrans.org. Commitments of participation (for example data sharing or match funding) from outside of METRANS 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 METRANS projects, for example the USC Viterbi School of Engineering Merit Research Program, or the USC Gateway (formerly McNair) Scholars Programs. Proposers are strongly encouraged but not required by this RFP to explore such opportunities with their schools and universities.

Match Funding

The USDOT University Transportation Center program requires a non-federal match as a condition of the federal funds. Caltrans provides only a portion of the required match. Thus METRANS encourages proposals that include match funding from non-federal sources. Proposals that include at least a 10% hard match (e.g. contribution to direct costs from external source) will receive priority consideration. For additional information, contact METRANS Associate Director Victoria Deguzman at VictoriV@usc.edu.

Project Selection

The METRANS Executive Committee will make final project selections, taking into account reviewer evaluations, programmatic priorities, and prior project performance. For Caltrans funded projects, Caltrans will approve selected projects. Executive Committee members are allowed to submit proposals, but are not allowed to be present during deliberations and voting related to their proposals.

Funding Guidelines and Restrictions

Budgets should be conservative and cost-effective. Funding should be directed at new and original work. In some cases, METRANS will consider continuations of prior METRANS 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 METRANS grants are eligible to apply. However, grants will not be awarded to PIs with outstanding deliverables (draft or final report; research brief) on prior METRANS grants.

Funds should be spent in a manner that provides publishable results, especially in refereed journals. In general, faculty salary (summer or academic year), 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 research assistant 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 CSULB or USC employees be hired on a consulting basis.

METRANS funded proposals will be set up as satellite accounts in the proposers' departments at USC and as extramural accounts from the CSULB Foundation at CSULB. PIs *will not* have individual contracts or grants from the funding agencies (Caltrans and USDOT).

Funding Guidelines:

1. Research project awards have a maximum of \$100,000 per year
2. The typical project duration is one year
3. NCST white paper proposals are targeted at \$10,000 - \$12,000. White paper budgets in excess of this amount require justification of any additional costs
4. **Note that conservative and cost-effective budgets are strongly encouraged.** METRANS reserves the right to reduce the budgets of submitted proposals. Projects should be budgeted to begin on August 15, 2017 and end by August 14, 2018

Research Initiation Awards

Research initiation awards from both METRANS Tier 1 and NCST are available to tenure track Assistant Professors, with preference for faculty who have not been previously funded for research in transportation. These awards are limited to \$35,000 for one year. These awards will receive priority consideration over regular awards. Research initiation proposals are subject to the same selection criteria and peer review process as regular proposals.

Project Requirements:

All research projects have the following requirements (guidelines and templates may be found at <http://www.metrans.org/research.htm>)

1. Semi-annual progress reports conforming to METRANS/NCST guidelines
2. A Draft Final Report, conforming to METRANS/NCST 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, document the research project, and be complete, original, well organized and accurate
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 METRANS and NCST websites, and are submitted to METRANS 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 Draft 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. The biographical sketch is to be submitted with the Draft Final Report
7. At least one presentation of the funded project's research at a thematic conference organized by METRANS, and located in the Los Angeles region
8. Timely reporting of all information requested for the METRANS Annual Report
9. Copies of all papers submitted to journals or conferences that are based on the project's research. Copies should be provided to the METRANS Administrator
10. Acknowledge METRANS support in all work that results from METRANS funding, including peer-reviewed publications and conference presentations
11. **NCST projects require conformance to new data management requirements imposed by DOT.**

White paper projects have the following requirements:

1. Semi-annual progress reports conforming to METRANS guidelines if the project exceeds 6-months duration
2. A Draft White Paper submitted 30 days prior to the completion date of the project. The Draft White Paper is subject to peer review
3. A Final White Paper that responds to the review comments must be delivered within 30 days after the review of the Draft white paper has been received by the author. The white papers are distributed by NCST and METRANS, and are submitted to METRANS and NCST sponsors and to various publications databases
4. A brief Biographical Sketch for each of the project's investigators to be submitted with the Draft white paper. A template for the biographical sketch will be provided with the notification of award. The biographical sketch is to be submitted with the Draft Final Report
5. Timely reporting of all information requested for the METRANS Annual Report

Projects funded by Caltrans have additional reporting and budget requirements. Authors 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 C. Each proposal must include the following sections:

1. Cover page (use the form provided in Appendix C)
2. Data Management Plan commitment (NCST only; the 2016 FAST Act requires a data management plan for all UTC research; we are awaiting approval of the NCST Data Management Plan; please simply include a placeholder in the proposal)
3. Project objective and project abstract (see research page at www.metrans.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 Deliverable (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 USC proposals, use the form provided in Appendix B. For CSULB proposals, include with your proposal the budget that is used for the clearance process. Assume a start date of 8/15/17.
12. Prior Project Accomplishments (1-page maximum. List publications, students who have received support from prior METRANS/NCST funding, and other grants received as a result of METRANS/NCST funding. Provide information on any policies, technologies, or products implemented as a result of the research)
13. Letters of 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.*
14. Short bios for all investigators and a list of recent (past 5 years or less) publications and funded research projects (2-page maximum)

White Paper Proposal Instructions

White paper proposals must include the following:

1. Cover page (use the form provided in Appendix C)
2. 1- to 2-page description of the proposed topic
3. 1-page bio that includes recent relevant publications
4. Budget. Budget and other forms are included in Appendix C

Proposals should demonstrate their responsiveness to METRANS 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 justification
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 USC: Please use your School guidelines in preparing your budget. For the Price School, see http://www.usc.edu/schools/price/intranet/research_admin.html for proposal and budget instructions. Contact Elizabeth Gatchalian (egatchal@usc.edu) for budget assistance. For VSOE, contact your department grants administrators. Note, tuition cost share is limited to PhD students. Please show the cost share in your budget. Tuition charges are not subject to overhead. The indirect cost rate is 50%, and the difference from the audited rate is to be shown as a cost share.

For CSULB: Budget guidelines for CSULB faculty are contained in Appendix C. Proposals submitted by CSULB faculty must be approved via the University's internal clearance process prior to submission. Early budget consultation with Office of Research and Sponsored Programs is essential. Once the budget is finalized, internal clearance will be initiated by the Office of Research and Sponsored Programs (ORSP).

CSULB faculty should begin the process by submitting a Notice of Intent at <http://www.csulb.edu/divisions/aa/research/our/information/forms/intent/>. If you have any questions, please contact ORSP Pre-Award Specialists David Smith (562 985-5330, David.Smith@csulb.edu) or Nora Momoli (562 985-1567, Nora.Momoli@csulb.edu).

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

Submission Instructions

Email a pdf copy (max 10 MB) of each proposal to METRANS Associate Director Victoria Deguzman at VictoriV@usc.edu on or before 5:00 pm on April 19, 2017. Please title your PDF file as last name, first initial, university, and a number if more than one is being submitted. For example, a first or single submission would be SmithJ_CSULB. A second submission would be SmithJ_CSULB2.

NOTE to PIs: Please do not submit more than one proposal per email. If more than one proposal is to be submitted, please send each in separate emails, noting the number of the subsequent proposal in the subject line of each email (for example, Second Proposal, Third Proposal, etc.). 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.**

One copy of the proposal will be retained in the Associate Director's office, and must contain all information on the budget form. A second budget form may omit information that can be used to determine faculty salaries (e.g., months of effort). This budget will be included when the proposal is sent for review. If you submit a proposal with salary information omitted, be sure to provide one electronic copy of EACH budget. For CSULB proposals, include with your proposal the budget that is used for the clearance process. Please note that all proposals must include a budget; proposals submitted without budgets will be determined to be incomplete and rejected.

METRANS 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 regarding research topics, METRANS Director Genevieve Giuliano can be reached at (213) 740-3956 or giuliano@usc.edu. For further information regarding program rules and procedures contact METRANS Associate Director, Vicki Deguzman at (213) 821-1025 or VictoriV@usc.edu. In addition, check www.metrans.org for information on current projects, center organization, and links to outside agencies.

Appendices

Appendix A

**Caltrans Suggested Research Topics
METRANS Tier 1 UTC Research**

Appendix B

**Caltrans Suggested Research Topics
METRANS NCST Research**

Appendix C

Budget Information and Forms

Appendix A

Caltrans Suggested Research Topics, METRANS Tier 1 UTC

CALTRANS DIVISION OF TRANSPORTATION PLANNING FREIGHT PLANNING BRANCH RESEARCH TOPICS

- **Creation of a Caltrans Freight Data Hub/Website:** As part of this study a Caltrans Freight Data Center to gather and provide relevant statistical input would also be created. Including Commodity Flow, truck volume, TEU import and export volume information, Rail Carload Traffic volume, Air Cargo Volume, GIS, and other relevant freight Data. Much of this information is available, but in many different locations, and not in a single repository. This effort would seek to consolidate all freight data in a single location, which would be available to all Caltrans and other staff engaged in freight planning, and other related efforts. This is also consistent with MAP-21 Guidance under Section 11, Data and Analytical Resources for State Freight Planning.
- **Addressing Truck Parking Shortages in CA** – There is a general lack of truck parking space in CA. The goal of this research would be to quantify the truck parking problem in CA. Research questions under investigation include: Where are the parking shortages? What kind of parking is needed? How many spaces are needed? The outcome of this study would be to develop strategies to address the current shortage of parking.
- **Freight Mobility Patterns of Key CA Industries** – The purpose of this research is to develop a basic understanding of industry location patterns within California. Goods movement demand is driven by the location of freight suppliers (manufacturing, agriculture, trade) and demanders (retailers, exporters, consumers). Industry location therefore is an important factor in predicting goods movement on the highway and rail systems. Where are the state’s top 15 – 20 industries located? Where are the state’s major industry clusters? Where are new firms locating, and why? What are the state’s emerging industries, and where are they locating?
- **California’s Voluntary and Regulatory Greening Efforts for the Freight Transportation System** - California has been among several states which have been proactive about reducing Greenhouse Gas emissions from freight transportation. However, this shifts the baseline for future efforts, and has the potential of increasing the incremental cost of cleaning the system as opposed to other states who must meet the same future federal emissions standards without having accomplished similar efforts. The purpose of this research will be to document the environmental efforts made by both the private and public sectors on the State’s multimodal freight network within the last twenty years. The research will investigate both the voluntary and regulatory efforts including infrastructure improvements, innovative technologies, strategies and practices that have contributed to reducing air pollution from freight transportation. Benefits from this research

include: best practices to be nationally shared, recognition of the private sector's voluntary efforts within this time period, fulfillment of the research needs of the CA Freight Advisory Committee, and a reference document for federal efforts in the near future to reduce criteria emissions from all surface and waterborne freight transportation.

- **Public Sector Freight Data Analysis** – One of the long-standing challenges for public sector freight planners is the acquisition of freight-related data from private sector sources. In concert with this data acquisition problem is the skill level and expertise planners must have to comprehensively evaluate freight mobility data that is, and will continue to be, increasingly available to them. Some of the key questions for this research to answer include the following: Are planners evaluating the appropriate data sets for their goods movement analysis and resulting narratives? How helpful is it in directing public sector planning, policy and investment decisions? Are planners accurately assessing the trends within the data? Is additional training, specifically focusing on goods movement data interpretation, needed? This research will not only report on the current state of the data but also on the current state of freight planners' ability to interpret such data.
- **Technology Options and Pathways for Heavy Duty Vehicles** – What are the ITS (Intelligent Transportation Systems) infrastructure needs for developing connected corridors? This includes signal priority, eco-routing, etc. Which of these needs can benefit freight in trade corridors and how so?
- **Economic Impacts of California's Freight Network** – What is freight's economic benefit to California and to the nation? While many ports already regularly estimate their own economic impact, this is often done in an "apples-to-oranges" manner and only by some of the ports. This research would focus on creating an economic profile for the state, one in which findings can be validated and used to seek federal funding. It would also identify key gaps in the network that should be addressed to improve the freight system. This would constitute new economic profiles for each port (labor dispute, # of jobs produced, etc.) and would dovetail into Caltrans' next Freight Mobility Plan.

CALTRANS DIVISION OF RAIL AND MASS TRANSPORTATION RAIL PLANNING BRANCH – RESEARCH TOPICS

- **Guidelines for GHG Impacts of Rail Projects:** This project will conduct a literature review of studies that evaluate the impacts on GHG of intercity passenger rail service initiation or expansion and discrete improvement projects. Any studies that compare the GHG impacts of different modes of travel should also be cited. The review should include studies on discrete intercity rail capital projects, such as track, signal, station, or equipment projects. Also studies that look at operational improvements to rail systems, such as automated ticketing systems, real time information systems, improved transit/auto access to rail stations, etc should be cited. Once the literature review is completed, the study should make preliminary evaluations/recommendations of the methodologies suggested in the studies to assess GHG impacts of intercity passenger rail projects. Given that it is likely that the most comprehensive work in this area has been done on electrified high-speed rail, the study should assess if any of that work could be adapted for use on diesel powered intercity rail. Caltrans has provided some background materials. These materials are available upon request to the METRANS Administrator. **NOTE:** *This project may be funded under the METRANS NCST research.*
- **Methods for Assessing Project Benefits and Costs Across Modes** – This research would identify and evaluate methodologies for comparing project proposals from different modes. This multi-mode analysis could have many applications. Specifically, Caltrans is interested in using a multi-mode analysis to develop priorities for project proposals under the Interregional Transportation Improvement Program (ITIP). Possible methods could include cost/benefit analysis, cost-effectiveness analysis, multi-criteria methods, etc. Evaluation would consider advantages and disadvantages, including considerations such as appropriateness, applicability across potential types of projects, data requirements, and feasibility of implementation.
- **Rail Operating and Capacity Model Assessment** – This project would conduct a survey of existing passenger rail operations/scheduling modeling tools and capacity modeling tools (both simulation models and static planning models). The survey would identify existing models, provide a description of the models, their purpose, their relative strengths and weaknesses – including data intensiveness, cost to run and expertise necessary to run, their ownership and whether Caltrans could access the models for use (ie can licenses be purchased, are they hosted by a public agency, are they proprietary, etc). Examples of models that Caltrans is aware of include:
 - Rail capacity simulation: RTC, Rail Ops (Aecom), RailEval (DecisionTec), RailSys, RailPlan, Open Track and Vision
 - Rail operations: Viriato (SMA), VoyagerPlan, and OmniTimes

Appendix B

Caltrans Suggested Research Topics, METRANS NCST Research

One source of funds for this call for proposals is the California Department of Transportation (Caltrans). For selections involving those funds, priority will be given to projects that help to implement and/or inform future activities associated with the following key documents and Executive Orders:

- Caltrans Strategic Management Plan ([link](#))
- California Transportation Plan 2040 ([link](#))
- Caltrans Workplan Standards Guide ([link](#)) - This document provides an overview of the Caltrans project process
- Active Transportation Program ([link](#))
- Executive Order B-32-15 ([link](#)) that supports a transition to a more sustainable freight system
- Executive Order B-30-15 ([link](#)) that sets a 2040 GHG emissions reduction target along with directing state agencies to take additional action on climate mitigation and adaptation efforts. In response to this Executive Order, Caltrans is interested in tools for assessing lifecycle GHG emissions and costs for highway and other projects

Applicants are encouraged to review NCST's current portfolio of research projects ([link](#)) and white papers ([link](#)) to gain a better understanding of the type of projects the NCST funds. Proposed projects may be in any discipline and multidisciplinary topics are encouraged when appropriate.

Appendix C

Budget Information and Forms

USC 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 (50%)	_____						
TOTAL FUNDS REQUESTED	_____						

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

CSULB Budget Instructions

Proposals and the proposal budgets submitted by CSULB faculty must be approved via the CSULB Office of Research and Special Program's (ORSP) internal clearance process prior to submission.

CSULB faculty should begin the process by submitting a Notice of Intent at <http://www.csulb.edu/divisions/aa/research/forms/> and completing all of the applicable documents, including the budget form and applicable details, e.g., fringe rates and F&A.

For CSULB proposals, include with your proposal the budget that is used for the clearance process. Please note that all proposals must include a budget; proposals submitted without budgets will be determined to be incomplete and rejected.

If you have any questions on clearance, please contact ORSP Pre-Award Specialists Mr. David Smith (562 985-5330, David.Smith@csulb.edu) or Ms. Nora Momoli (562 985-1567, Nora.Momoli@csulb.edu).

METRANS Cover Page

Title _____

Tier 1 Theme _____

Tier 1 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

If applicable:

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

METRANS Center Proposal Evaluation Form

(Provided for information only; form will be used by evaluators)

Proposal Title:

Area:

Principal Investigator:

Referee Number:

Evaluation Criteria:

Please rate proposals in each of the categories below, using the following rating scale:

1 = Well below expectations

2 = Below expectations

3 = Meets expectations

4 = Exceeds expectations

5 = Well above expectations

CATEGORY	RATING
Demonstrated relevance to themes of RFP (a requirement)	
Quality and research significance	
Student involvement	
Reasonableness of budget and cost-effectiveness	
Qualifications to perform work/likelihood of completion	
Match funding and potential for attracting grant funding	
Prior performance on METRANS grants (if applicable)	

Referee's Funding Recommendation (Place an X on the line by your choice)

Highly recommended _____

Recommended _____

Not recommended _____

Referee Comments (add additional pages as needed):