

November 17, 2004

**CALL FOR SUBMISSIONS (CFS)
CFS Number 2056DRI**

**California Department of Transportation, Division of Research and Innovation
2005-2006 Research Problem Statements and Proposal Guidelines**

A CONTRACT MAY OR MAY NOT BE AWARDED FROM THIS CFS.

The Division of Research and Innovation (Division) of the California Department of Transportation (Department) is requesting research proposals from public research institutions: colleges, universities, and government agencies that bring practical and innovative solutions to the Department's research problems. The Division's Call for Submissions (CFS) is based on problem statements derived from customer needs. This CFS focuses on the application of solutions to meet the Department's mission of **improving mobility across California**. This research will specifically address the following Department goals:

- **SAFETY:** achieve the best safety record in the nation
- **RELIABILITY:** reduce traveler delays due to roadwork and incidents
- **PERFORMANCE:** deliver record levels of transportation system improvements
- **FLEXIBILITY:** make transit a more practical travel option
- **PRODUCTIVITY:** improve the efficiency of the transportation system

You are invited to review and respond to this **CFS Number 2056DRI**, entitled, "**California Department of Transportation, Division of Research and Innovation 2005-2006 Research Problem Statements and Proposal Guidelines**". The proposals will be submitted in a two-step process.

- Step 1: We are requesting pre-proposals of 2-4 pages in length. Department staff will evaluate these pre-proposals.
- Step 2: Those respondents who submit successful pre-proposals will be asked to then submit Proposals for their project. Proposals shall be between 10-20 pages in length.

Please see the schedule in the Pre-proposal and Proposal Submission/Evaluation Process section below. In submitting your documents, you must comply with the instructions found herein. Reference the attached CFS for detailed information regarding:

- I. Background
- II. Research Needs
- III. Pre-proposal and Proposal Format and Content
- IV. Questions and Answers
- V. Pre-proposal and Proposal Submission / Evaluation Process
- VI. General Information
- VII. Problem Statements

If you have questions, the contact person for this CFS is:

Tori Kanzler, Division of Research and Innovation
California Department of Transportation
Email: tori.kanzler@dot.ca.gov
Fax Number: (916) 654-9977

Interested parties should submit electronic documents to:

Tori Kanzler at tori.kanzler@dot.ca.gov

Or hardcopy documents to:

California Department of Transportation
Division of Research and Innovation, MS-83
1227 "O" Street
P.O. Box 942873
Sacramento, CA 94273-0001
Attention: Tori Kanzler

This CFS contains the entire terms and conditions relating to the research problem statements, and no other terms, conditions or representations should be considered unless issued in writing as an addendum to this CFS.

<p>Pre-proposals must be received no later than 5:00 PST on December 29, 2004 Proposals must be received no later than 5:00 PST on February 28, 2005</p>
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I. Background

The California Department of Transportation (Department) is the manager of interregional transportation services; more specifically, the Department has the traditional role of owner and operator of the 15,000 mile State Highway System. The Department promotes California's economic vitality and enhances its citizens' quality of life by providing for the movement of people, goods, services and information. The Department is responsible for the delivery of the State's Transportation Improvement Program; planning, designing, building, operating and maintaining California's state highway systems. In addition to a changing mix of transportation modes - such as highways, rail, mass transit, bicycle, pedestrian, and aeronautics, the Department coordinates the solutions to complex issues such as land use, environmental standards, and the formation of partnerships between private industry and local, State and Federal agencies to promote productivity, reliability, safety, flexibility and performance in the State of California. For more information see: www.dot.ca.gov

The Department has developed a new research process guided by the Research and Deployment Steering Committee (RDSC), consisting of Deputy District Directors and District Directors. The RDSC, in turn, created Program Steering Committees (PSCs) and Technical Advisory Panels (TAPs) to assist in developing the research agenda and deploying research products.

The functional Division Chiefs lead the PSCs, and senior staff from those Divisions lead the TAPs. The TAP members can include technical experts from Divisions, Districts and external agencies. The TAPs developed the enclosed problem statements, and will review and rank resulting research proposals. The PSCs and the RDSC will make the final determination on which proposals will become research projects. With this system, the Department hopes to provide more customer participation throughout the research process, and ownership of research products.

II. Research Needs

Highlight issues in this CFS are:

- The CFS is organized according to the Division's customers' needs within the Department, including Design/Construction, Environmental, Maintenance, Pavement, Planning/Policy/System Information, Right of Way & Surveys and Transportation Safety & Mobility.
- Respondents should demonstrate how their proposals would benefit the traveling public and contribute to meeting the five Department goals.
- The CFS identifies important problems that need to be solved, but generally does not specify how those problems should be solved. This will allow respondents the flexibility to propose new and innovative solutions.
- Proposals need to be focused toward implementation of their results to improve transportation. In order to facilitate implementation, respondents are encouraged to engage in collaborations with industrial and public agency partners and to consider

how the results of their research can be communicated to those who deploy and operate transportation systems (technology transfer).

- In order to promote synergy among diverse research projects, respondents should consider how their projects could be integrated with other research projects, as well as transportation planning and deployment projects, in specific California regions or corridors.
- Department staff will work with the proposal authors to strengthen the project's implementation effectiveness and to facilitate their integration with other new and ongoing research, planning and deployment projects.
- Multi-disciplinary and multi-campus research teams are encouraged in order to integrate diverse research capabilities.

III. Pre-Proposal and Proposal Format and Content

Two-Step process

The first step of the proposal process will be the pre-proposal. Within 30 days of the pre-proposal submittal deadline, respondents will receive either a request to submit a formal, detailed proposal, or a notice declining interest in the pre-proposal. The respondent may also receive comments from Department personnel for purposes of technical clarification of the proposed effort. The second step of the process will be the proposal.

NOTES:

- **All proposed research projects shall use an assumed start date of October 1, 2005 or later when preparing budget and schedule projections and estimates.**
- **Any funding changes between the pre-proposal and proposal must be justified in the Budget section of the proposal.**
- **The state fiscal year runs from July 1 to June 30.**

Pre-Proposal Format and Content

The pre-proposal will consist of 2-4 pages, and will include a project plan summary, estimated budget/resource plan and research team. Please see format below. Respondents should include the identification number of the problem statement to which you are responding, project title, the name of the entity submitting the proposal and all project partners.

Project Plan Summary

- Brief summary of the problem, and how proposed research would contribute to solving the problem.
- Method of approach to the problem.
- Anticipated deliverables.
- Preliminary schedule and milestones.
- Steps to implementation, including additional research phases (if required) and a preliminary timeline for the final product.

Estimated Budget

Each pre-proposal must include an estimated yearly and total budget including proposed number and type of personnel and man-hours of effort and major equipment proposed for purchase.

Research Team

Describe previous experience and training in relevant areas of research (one-two paragraphs). When relevant, highlight the contribution of research collaborations (across disciplines and campuses or with private sector) to the project. Brief curriculum vitae/resumes of the PI and key personnel may be included as attachments.

Proposal Format and Content

The full proposal should address each of the items requested in the pre-proposal in additional detail, as well as addressing comments and concerns resulting from the pre-proposal screening. The body of the proposal will be limited to twenty (20) pages at the maximum, not including curriculum vitae.

Each proposal, including curriculum vita(e), budget, timeline and cover page, must be in a single file, either in PDF or Word format. (no zipped files) Research proposals should provide a detailed description of the research to be undertaken. The following outline for the body of the proposal should be followed:

Cover Page

The cover page must include the date, problem statement number, proposal title, lead researcher(s) name and affiliation, key supporting researcher(s) name and affiliation, project budget for each fiscal year and a total budget.

Summary

- One paragraph summary of the problem statement, significance of research contribution, and contribution of research to problem statement.
- One or two paragraph summary of the research plan, deliverables, research contribution to solving specific transportation problems, and how the final research product can be implemented to solve California's transportation problems.

Background/Business Case

- Review related/complementary research completed or underway in the problem area. (literature search)
- State project scope, objectives, and motivation, in light of the Department's goals.
- Describe the impact of the proposal on the existing transportation issue/problem/need.
- Identify the anticipated customers/users.
- Explain how this project will improve transportation system safety, efficiency or effectiveness in the short or long term.

- Why do you consider this research project essential to the improvement of California's transportation system?
- What are the consequences for Caltrans and its customers if the problem/opportunity is not addressed?

Research Outcome

- Describe the outcome of this research in terms of next steps; will the outcome result in a product that is usable by the practitioner? If not, what further research or additional activities would be required to reach that point? Provide a preliminary timeline for the final product. Be as specific as possible. The Department is looking for applied research and results.
- Provide a benefit/cost assessment, which shows the economic benefits that will be derived for the ultimate product that is the subject of the work.

Methodology

- Explain the proposed research methods in sufficient detail to enable evaluation of feasibility, originality and significance of the proposal. If appropriate to the content of the proposal, describe the current technology that is the subject of the proposal. If the research project involves selection of a specific technology solution from among multiple alternative approaches, explain the reasoning behind that selection.
- Describe the alternatives.
- Identify the alternative that best satisfies the objectives.
- Explain why the selected solution was picked over the other alternatives.

Research Plan and Deliverables

Provide a research plan with specific tasks, milestones and deliverables. Deliverables should be described precisely and in depth, and should be clearly related to the methodology. The proposal should indicate how staff would be assigned by task.

Multi-partner proposals should clearly identify which party is responsible for each task. Quarterly progress reports/meetings are required for all projects, regardless of the duration of the project, and every project must have a final report.

Timeline

Provide a detailed list of project tasks and the duration of each task in a Gantt chart format, including significant milestones and deliverables.

Budget

A detailed budget for the proposed work is required. Budget categories must include at minimum: number and type of personnel, equipment, supplies & expenses, travel, and overhead. Furthermore, each equipment item must be specifically identified. All overhead type of expenses must also be detailed and justified; e.g., benefit rates, etc. Please note that in addition to the total proposed budget, a breakdown by category is required for each fiscal year, which runs from July 1 to June 30.

Research Team

Describe previous experience and training in relevant areas of research (one-two paragraphs). When relevant, highlight the contribution of research collaborations (across disciplines and campuses or with private sector) to the project.

Curriculum Vitae

A detailed resume of the lead researcher(s) as well as brief resumes of all other researchers.

At the conclusion of the project, the researcher(s) will deliver a final report and present his/her research results to Caltrans in a workshop forum, including a full explanation of the applied usefulness of the research. This may be done as a single-topic workshop or bundled with other related topics. (Expenses for this workshop shall be included as part of the Budget.)

IV. Questions and Answers

Respondents with questions about the requirements of this CFS must submit those questions in writing to the email address shown below, and by the dates referred to in **Schedule**. Question submittal must include the individual's name, and name of the research institution. Questions will be answered directly, and posted on the Department's DRI website. (See web link below).

Tori Kanzler at: tori.kanzler@dot.ca.gov

After the deadline for question submittal has passed, written responses to questions will be collectively compiled, and posted on the Department's DRI website. A hard copy of written responses will be provided upon request.

<http://www.dot.ca.gov/research/CFS>

V. Pre-Proposal and Proposal Submission/Evaluation Process

Pre-proposal and Proposal Submittal, Modification, Resubmittal, and Withdrawal

Pre-proposals and proposals should be emailed, with the CFS# and Problem Statement# in the subject line, and Project Title and Respondent's Name/Research Institution in the email text. Respondents are to submit proposals to:

Tori Kanzler at: tori.kanzler@dot.ca.gov

Respondents submitting pre-proposals or proposals may modify or withdraw the proposal at any time prior to the submittal deadline. Such modification or withdrawal of a proposal shall be in writing and submitted by the same person submitting the original proposal.

If the modification requested is only an addition to a pre-proposal or proposal, one e-mailed and two (2) hard copies of the modification shall be submitted in a sealed package, boldly marked “Addition To (Problem Statement # and project title)”, and signed, and addressed the same as the original proposal.

Evaluation Process

The pre-proposal selection will be made by the Department's Technical Advisory Panels (TAPs). Pre-proposals will be screened against the basic evaluation criteria below. Authors of successful pre-proposals will be asked to submit a full proposal.

The proposal evaluations will be completed by the Department's Technical Advisory Panels (TAPs) and Program Steering Committees (PSCs). Final selection will be made by the Department's Research and Deployment Steering Committee. Proposals will be screened against the evaluation criteria below.

Pre-proposal Evaluation Criteria

- Responds well to problem statement?
- Meets Department goals and objectives?
- Cost is reasonable?
- Is likely to succeed? (deployability)

Proposal Evaluation Criteria

- Responds well to problem statement and meets Department goals and objectives?
- Comprehensive Literature Search completed?
- Utility of research outcome: When will the ultimate product(s) that is the subject of the research be available, and is it likely to be deployed? What benefit (economic or other) will the project provide?
- Research objective: Are the stated objective, scope and motivation clear, valid, and logical?
- Methodology: Are the plans, methods, techniques and procedures feasible, clear, valid, adequately referenced, and state-of-the-art?
- Qualifications: Are the qualifications, capabilities, and experience of the proposed lead researcher and other key personnel sufficient to achieve the proposed objectives? If applicable, is proposed facility adequate for proposed work?
- Budget: Does the budget reflect the actual needs of the proposed work? Have the requests for personnel, equipment, supplies, etc. been fully justified?

Acceptance and Rejection of Submissions

The Division retains the right to disregard a minor deviation from the requirements and may, at its sole discretion, request supplemental information or clarification of that information submitted.

Negotiations with Selected Respondent

Once a full proposal is submitted, the Division may elect to negotiate with the selected respondent, leading to a written Agreement with the Division about implementing the proposal. Any agreement as a result of this CFS will be subject to all necessary State, Federal and Agency approvals. If an agreement cannot be reached, negotiations will cease and no contractual agreement written or implied will exist. The Division will not reimburse submitting organizations for any costs incurred in the preparation or submission of pre-proposals or proposals, or in the negotiation process.

This CFS shall not commit the Division to negotiate and execute any Agreement. The Division reserves the right to accept proposals that, in the sole judgment of the Division, are in the best interest of the State and regions. The Division reserves the right to reject any or all proposals or to modify or cancel, in part or in its entirety, this CFS.

VI. General Information

Confidentiality

Proposal submittals are confidential. Selection committee members shall discuss the evaluation proceedings and content of proposals only with Division staff and with members of the selection committees. Proposals that are not selected will not be reprinted or used for purposes not pertaining to this CFS process. Information on proposals that are selected will not be released until a contract is in place.

Amendments to the Requested Proposal

The Division reserves the right to amend this CFS by addendum prior to the final date of proposal submission.

Schedule

The schedule related to this CFS is as follows:

EVENT	DATE
CFS available to prospective Respondents	November 15, 2004
Pre-proposal Written Question Submittal Deadline	December 6, 2004
Responses to Questions	December 10, 2004
Final Date for Pre-proposal Submission	December 29, 2004
Completion of Pre-proposal Evaluations*	January 28, 2005
Proposal Written Question Submittal Deadline	February 22, 2005
Responses to Questions	February 25, 2005
Final Date for Proposal Submission	February 28, 2005
Proposal selection	May, 2005

* By this date all respondents will be notified if their proposal has been selected for development into a proposal.

VII. Research Problem Statements

This section outlines the Division's research needs within the following categories: Design & Construction, Environmental, Maintenance, Pavement, Planning/Policy/System Information, Right of Way & Surveys and Transportation Safety & Mobility.

- #DC-501 Temporary Barrier Usage in Work Zones (C-01)
- #DC-502 Application of Accessibility Principles for Resurfacing, Restoration, and Rehabilitation (RRR) Projects (RD-01)
- #DC-503 Comparison of cost/time/performance of pavement projects using performance specifications versus those using method specifications (C-02)
- #DC-504 Guidance and Specifications for the use of Compost and Mulch for Erosion Control and Stormwater Treatment (LAP-01)
- #DC-505 Increase the Use of Construction By-Products in Transportation Projects (RD-07)
- #DC-506 Evaluation of Wet Weather Accident Causation Criteria (RD-12)
- #DC-507 Evaluation of Oak Mitigation Plantings, successes, failures and recommendations for the future. (LAP-02)
- #DC-508 Development of an Aesthetic / Low-Maintenance Guardrail System (LAP-03)
- #DC-509 Design-Build (RD-03)
- #DC-510 Development of Roundabout Geometrics Design Guidance (RD-09)
- #DC-511 Re-vegetation: Anticipated Plant Community and Re-vegetation Strategy (LAP-05)
- #DC-512 Establishing long-term, sustainable vegetation in conifer and high desert areas. (LAP-07)
- #DC-513 Develop Basically New Kinds of Mobile Safety Barriers (RD-05)
- #DC-515 Vegetative root-soil strength assessment of cut and fill slopes (LAP-08)
- #EV-501 Quiet Pavement Pilot Project Study (EV13)
- #EV-502 Highway Median Barrier Impacts on Wildlife Movement and Mortality – State of the Practice Review and Gaps Analysis (EV4)
- #EV-504 The Effectiveness of Off-Structure Bat Houses Meeting Attraction/Mitigation Regulatory Agency Requirements for State Highway Projects (EV6)
- #EV-505 The effects of construction activities on Valley Elderberry Longhorn Beetle habitat
- #EV-506 Effective Methods of Excluding Nesting Cliff Swallows From Highway Structures (EV5)
- #MA-502 Roadside fire reduction strategies
- #MA-508 Homeland Security - How to keep abreast with the latest technologies and best practices.
- #MA-510 Control of Invasive and Noxious Weeds
- #PA-501 Alternative skid testers for contract acceptance on PCC pavements, bridge decks and surface treatments.
- #PA-502 Investigation of vehicle tires noise on bridge decks (SO21)
- #PA-503 Simplified Test to Estimate Coefficient of Friction on Newly Treated Deck Surfaces (SO67)
- #PA-504 An Evaluation of the Crack, Seal and Overlay Method in California
- #PA-505 Determination of Pavement Surfaces Skid Resistance Values
- #PS-501 Developing Effective and Quantifiable Air Quality Mitigation Measures (AQ-04-01)
- #RW-501 Investigating new and safer technology for performing pavement elevation surveys.

- #RW-502 Develop airborne GPS/INS calibration specifications and procedures for contracted services.
- #RW-503 Develop calibration procedure for airborne LIDAR terrain mapping system.
- #RW-504 Creating standards and specifications for Laser Scanning (ground based Lidar) use on Caltrans projects.
- #RW-505 A lack of guidelines and specifications for the use of GPS RTNs by the Department.
- #RW-506 Develop criteria for using network GPS for airborne GPS photogrammetry.
- #TS-501 Countermeasures to Reduce or Eliminate Headlight Glare and Gawking (2004SAF.1)
- #TS-502 Validate Percent Wet Time Statewide (2004SAF.2)
- #TS-503 Safety of HOV Lane Ingress/ Egress Along Limited Access Buffer Separated Facilities (2004SAF.3)
- #TS-504 Quantifying the Performance of Countermeasures for Collision Concentrations Related to Ramp/Freeway Mainline Intersections (2004SAF.4)
- #TS-505 Development and Testing of an Aesthetic / Low-Maintenance Guardrail System (2004SAF.12)
- #TS-507 Improve communications between TMC and TMS elements in a rural environment through a system that is deployable statewide (2004MOB.10)
- #TS-510 Advanced CMS (2004Mob.12)
- #TS-511 TMC Performance Measurement (2004Mob.4)
- #TS-512 Improve FREQ Macroscopic Freeway Analysis Model (continued) (2004Mob.5)
- #TS-514 Generating Real Time Loop Diagnostics and Travel Times from Existing Field hardware (2004Mob.30)
- #TS-517 Escaping the High Costs of Single Source Advanced Traffic Management System Components (2004Mob.22)
- #TS-518 Radar Detector Evaluation and Calibration System (2004Mob.25)