CALL FOR SUBMISSIONS (CFS)
CFS Number 2011DRI-(A)

California Department of Transportation
Division of Research and Innovation
2011-2012 Research Proposal Guidelines

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

The Division of Research and Innovation (DRI) of the California Department of Transportation (Department) is requesting research proposals from public research institutions: public colleges, universities, and government agencies that bring solutions to the Department's research problems. Respondents are encouraged to engage in collaborations with industrial and public agency partners, and to enhance the research and to facilitate communication of research results to those who deploy and operate transportation systems (technology transfer).

Private universities or institutions are not eligible participants under this Call For Submissions (CFS) process and direct submittals from these institutions cannot be accepted. Public institutions using subcontracts with private entities are subject to certain conditions and may not be eligible under this CFS process. Respondents who have concerns over their eligibility are encouraged to contact the DRI representative identified below to determine their status prior to spending time and resources on a proposal.

All needs in this CFS are based on an Initial Description of Work (IDOW) derived from a customer need. The 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: Provide the safest transportation system in the nation for users and workers.
- MOBILITY: Maximize transportation system performance and accessibility.
- DELIVERY: Efficiently deliver quality transportation projects and services.
- STEWARDSHIP: Preserve and enhance California's resources and investments.
- SERVICE: Promote quality service through an excellent workforce.

DRI is advertising this CFS with one IDOW (Refer to page 13). Public institutions are invited to review and respond to this CFS Number 2011DRI-(A), titled, **"California Department of Transportation, Division of Research and Innovation, 2011-2012 Research Proposal Guidelines."** Please refer to the link below for access to electronic versions of the CFS document and IDOW. Proposals must be submitted by **November 1, 2011** at **5:00 PM (PST).** Proposals must be a fully developed bid, with a clear scope of work linked to timelines (in weeks, not specific dates), milestones, and deliverables. Each major category in the budget shall be fully supported within the bid.

http://www.dot.ca.gov/research/cfs/index.htm

Please see the schedule in the Proposal Submission/Evaluation Process section of the CFS. In submitting your documents, you must comply with the instructions found herein. Reference the attached CFS Initial Description of Work for detailed information.

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

Yvonne Cooks
Division of Research and Innovation
California Department of Transportation
Email: yvonne.cooks@dot.ca.gov
Fax Number: (916) 657-4721

All questions must be submitted on or before **October 11, 2011** at **5:00 PM (PST).** Questions will be collected and responded to in a single public response made available via a public posting via the following internet site. All participants will be advised of the posting when it is available. All questions will be stripped of any identifying information traceable to the originating participant.

Responding parties shall submit their formal proposals and supporting documents in electronic format to:

Yvonne Cooks at yvonne.cooks@dot.ca.gov

In the event Caltrans elects to issue a contract for this work, the selected proposal(s) and supporting documents shall be made available to Caltrans in a Microsoft WORD (*.DOC) compatible format, in addition to an Adobe PDF compatible format. This will facilitate development and processing of the actual contract documents.

This CFS contains a preliminary representation of terms and conditions relating to the research problem statements included in this CFS. In the event a contract is awarded, the final terms and conditions may vary from this initial representation, depending upon the exact nature of the contractual arrangement between the parties.

Proposals must be received no later than **5:00 PM (PST)** on **November 1, 2011**.

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I. GENERAL 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 (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, access the following link: http://www.dot.ca.gov/

The Department has developed a five stage research and development process guided by the Research and Deployment Steering Committee (RDSC), consisting of Deputies 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. These stages of research and development are:

- **Stage 1:** CONCEPT STAGE
- **Stage 2:** LABORATORY PROTOTYPE STAGE
- **Stage 3:** CONTROLLED FIELD DEMONSTRATION STAGE
- **Stage 4:** FIRST APPLICATION (CONTRACT) FIELD PILOT STAGE
- **Stage 5:** SPECIFICATION & STANDARDS WITH FULL CORPORATE DEPLOYMENT STAGE

The functional Division Chiefs responsible for the areas of research interest lead the PSCs. Together, these Division Chiefs form the Research Deployment Advisory Committee (RDAC) and advise the RDSC on research topics of interest and recommended priorities. Senior staff from the responsible Divisions lead the TAPs. The TAP membership can also include technical experts from other Divisions, Districts and/or external agencies. Project Panels are formed for each project, consisting of the Project Manager (PM), Customer Representative (CR) and other members as selected by the PM in consultation with the CR. The responsible Project Panel and the responsible TAP have developed the enclosed IDOW(s), and the responsible Project Panels will review and select any resulting research proposal(s). The PSCs and the RDSC will make the final determination on which, if any, proposal(s) will become actual research projects. This system provides customer participation throughout the research process and customer ownership of research products.

II. RESEARCH NEEDS

Highlighted issues in this specific CFS are:

- This CFS is organized according to the Division's customer needs within the **Modal** category only.
- Respondents should clearly demonstrate how their specific proposal(s) would benefit the traveling public and contribute to meeting the five Department goals shown on the first page of this document.
- The Department's research needs in this area are described in the IDOW outline included within this document.
- This CFS identifies important problem(s) that need to be solved. Since this project is a continuing research project past Stage 1 of development, this CFS may give specific guidance on how problems should be addressed and solved.
- Proposals need to be focused on how the implementation of their results can be used to improve transportation.
- In order to promote synergy among diverse research projects, respondents should consider how their efforts and findings might potentially be integrated with other research projects, as well as transportation planning and deployment projects, in specific California regions or corridors.
- Where appropriate, Department staff will work with the proposal authors of selected proposals to strengthen the project's implementation effectiveness and to facilitate its 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. PROPOSAL FORMAT AND CONTENT

The research proposal should provide a detailed description of the research to be undertaken. The body of the proposal shall be limited to **twenty-five (25) pages maximum**, not including curriculum vitae or supporting appendices. Each proposal, including curriculum vitae, budget, timeline, appendices and cover page, must be in a single file, in either a Microsoft Word 2003 (*.doc) compatible format or an Adobe PDF compatible format. No zipped files will be accepted. The proposal shall contain the following information and be presented in the following order:

1. Cover
2. Executive Summary
3. Table of Contents
4. Research Plan
   A. Introduction
   B. Problem
   C. Background/Business Case
   D. Research Approach
   E. Anticipated Research Results and Benefits of Research
   F. Deployment Plan

5. Research Team
   A. Qualifications
   B. Accomplishments
   C. Other commitments
6. Equipment and Facilities
7. Work Schedule (showing all deliverable milestones)
8. Itemized Budget (based on task deliverables and fiscal year)
9. Partnerships/Subcontracts
10. Appendices
11. Vitae

1. Cover Page

The cover page must include the date, Initial Description of Work identifier, title; proposal title; lead researcher's name, affiliation telephone number, email address and address; key supporting researcher(s) name(s) and affiliation(s); name(s) and address(es) of any organization(s) with which a joint venture is proposed, if such is the case; the name and title of the person formally submitting the proposal; the name(s) and title(s) of the proposal author(s); the project duration; and the project budget for each specific fiscal year where research if performed and a total budget summary across all fiscal years (See **Figure 1)**.

2. Executive Summary

The Executive Summary should be a concise, easily understandable presentation of the proposal in two pages or less. Each item from #4 through #10 above should have a separate heading and a brief description.

3. Table of Contents - Reference Page

4. Research Plan

The research plan shall be subdivided into the following sections:

(a) *Introduction* - The introduction to the research plan should provide a concise overview of the respondent's approach to conducting the research. It should describe the manner in which the expertise and experience of the proposed team will be used in the research, and the application of special data, facilities, contacts, or equipment should be presented. The introduction should highlight the linkages of the proposed team's capabilities to the project tasks and the manner by which the proposed plan will satisfy the objectives.

(b) *Problem* - Provide a brief technical description of the problem and why a solution is needed.

(c) *Background/Business Case* - Provide a brief discussion of the background and business case supporting the proposed research effort. Topics for discussion may include the following:

- Review related/complementary research completed or underway in the problem area. (Literature search)
- State proposed research scope, objectives, and motivation; specifically addressing the Department's goals.
- Describe the impact of the proposal on the existing transportation issue/problem/need.
- Identify the anticipated customers/users.
- Explain why and how this research project is important to the improvement of California's transportation system.
- State the consequences for the Department and its customers if the problem/opportunity is not addressed.
- Provide a brief benefit/cost statement, indicating the anticipated benefits that will be derived from the ultimate product that is the subject of the work to be performed in the proposal.

(d) *Research Approach* - This section shall be used to describe the proposed methodology of the research and how the objectives will be achieved through a logical, innovative, and rational scientific plan. The plan shall describe each phase or task of the research to be undertaken. 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, policy or process that is the subject of the proposal. If the research project involves selection of a specific 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.

(e) *Anticipated Research Results and Benefits of Research* - The research plan for each proposal shall contain specific statements describing the anticipated research results. The results are expected to be presented in terms of the language and working tools of the practitioner or administrator so as to be immediately applicable to practice. Consequently, there must be specific statements of the manner in which the desired results would be reported (e.g., mathematical models, design techniques, field or laboratory test procedures or recommendations for changes in Department policy, practices, procedures, or standard highway specifications).

(f) *Deployment Plan* - DRI projects are intended to produce results that will be applied in practice. Therefore, proposals and the project final report must contain a deployment plan for moving the results of the research into practice. Refer to the "The Department's Five Stages of Research Deployment" for guidance when developing deployment plans (See **Figure 2)**. Under Item 4(f), each proposal must include a preliminary deployment plan that describes any future activities necessary

to actually apply the product of the research in the proposal. It is expected that the deployment plan may evolve during the project; however, proposals must describe, as a minimum, the following: **(a)** the "product" expected from the research, **(b)** the audience or "market" for this product, **(c)** a realistic assessment of impediments to successful deployment, **(d)** the institutions and individuals who might take leadership in applying the research product, **(e)** the activities necessary for successful deployment, and **(f)** the criteria for judging the progress and consequences of deployment, and **(g)** a projected schedule for major tasks.

If the nature of a specific proposed research effort is such that it is already recognized or known initially that the results will not be amenable to immediate deployment into practice, the research plan must include realistic recommendations for the additional work necessary to reach the deployment stage.

5. Research Team

When relevant, highlight the contribution of other researcher collaborations (across disciplines and campuses or with private sector) to the project.

(a) *Qualifications of the Research Team* - Proposals must describe how the research team members' academic, industrial, and/or research experiences relate to the project to be undertaken. (Identification and contact information for all researchers should be on the title page, leaving this section specifically for documenting the background and skills each researcher brings to the project. This should NOT be a copy of the Vitae, but a succinct summary of those skills and experiences that contribute to solving the problem being researched.)

(b) *Accomplishments of the Research Team* - Proposals shall contain a summary of the past accomplishments ("track record") of the research team in the same, or closely related, problem area of the project to be undertaken. This summary is to include full particulars concerning all known instances of application to practice of the agency's research results. If no such knowledge exists, it should be so stated. (Again, this should NOT be a copy of the Vitae, but should identify specific accomplishments that will contribute to the success of this project)

(c) *Other Commitments of the Research Team* - Proposals shall contain a listing of current organization and personnel commitments to work on this project and to work other than this proposed project. The description shall be provided in sufficient detail to indicate that the organization and all of the individuals assigned to the proposed project will be able to meet the commitments of the proposal. Staff-hour commitments and percentage of time committed to this project and to other work for each member of the proposed research team shall be specified.

6. Equipment and Facilities

This section shall include a description of the facilities available to undertake the research and an itemization of the equipment on hand that will be used to complete the research. In the event that use of the facilities or equipment is conditional, the

conditions should be described. In the event that certain facilities or equipment are considered necessary to undertake the research but are not on hand, that fact should be presented. The respondent should identify any arrangements that will be made to purchase, borrow or rent necessary equipment. Letters of commitment should be included in the appendices to indicate the availability and commitment of equipment. Rental rates should be included in the budget for equipment to be rented. In the case where it is contemplated that additional equipment will be purchased under project funds, be certain that the budget item "capital equipment" indicates this and a detailed price list is included in the proposal.

7. Work Time Schedule and Deliverables

For planning purposes, any resulting contract(s) will be scheduled to start on or after **January 2, 2012**. The time required to complete the research project shall be clearly specified in the proposal using a months after contract award (MACA) basis. Proposals will not be rejected if the proposed time does not exactly match the time specified in the IDOW included in this CFS; however, any differences must be clearly identified and explained in the proposal. In addition, proposal shall include a Gantt chart type of schedule that shows each phase or task of the work. Schedule shall identify when a phase or task will begin, how long it will continue, and when it should end. The schedule and timetable should clearly delineate the points in time where a project deliverable and/or report are planned. For reports, the timeframes shown in the proposal schedule shall be sufficient to allow for initial development, shall include a single 45-day Caltrans review of any draft documents, shall accommodate incorporation of Caltrans comments and suggestions, and shall also accommodate the final submittal and approval cycle with an additional 45-day approval period of the final document. Any additional internal requirements that a proposer may need to accommodate that could affect the schedule of the research, shall clearly be delineated within the schedule and stated as a contingency. This may include items such as a University or Corporate Board approval needed prior to any human testing, etc.

At the conclusion of the project, the researcher(s) shall deliver a final report and shall also **present** the research results to the Department in a workshop forum, including a full explanation of the perceived applied usefulness of the research and follow-on steps. This may be done as a single-topic workshop or bundled with other related topics benefiting from a meeting style presentation. (Expenses, including travel, for this workshop shall be included as part of the budget and the workshop shall be shown on the schedule.)

8. Itemized Budget

The estimated cost for the project should be based on the proposed performance period. Lump sum estimates are not acceptable; budgets shall be detailed and itemized.

The budget table must include hourly breakdowns for every principal member of the research team, including consultants and subcontractors. Actual hours should be shown rather than months or dollars. In addition, it is preferred that only one table be

submitted rather than separate tables. The table should be located immediately behind the *Itemized Budget.*

Budget categories must include, at a minimum:

a) The number and type of personnel, their associated labor rates and benefit rates;
b) Equipment, (each major equipment item over $5,000 must be specifically identified);
c) Supplies and Miscellaneous Expenses;
d) Travel; and
e) Direct Overhead.

All overhead expenses must be detailed and justified (e.g., benefit, subcontract, material, labor, 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. (Note: Contract start date should be planned to start on or after **January 2, 2012**.)

Proposals shall be a fully developed bid with a clear Scope of Work linked to timelines in months after contract award. It is not necessary to use specific dates (i.e. October 30, 2012) for task durations, milestones, and deliverables within the schedule. It is sufficient to use days/weeks/months after contract award for timeframes within the schedule. Provide only a single text reference for the anticipated start date as part of the proposal. Each major line item in the schedule shall be fully justified within the budget.

9. Partnerships/Subcontracts

If assistance in the form of personnel, data, or equipment, etc is required from other agencies, public or private, describe the plans for obtaining such help or information. In the case where cooperative features play an important part in the conduct of the research, a letter of intent from agencies agreeing to provide cooperative features should be included in the appendices.

10. Appendices

The appendices may include such things as letters of intent from agencies agreeing to provide cooperative features, or letters of commitment regarding any arrangements that will be made to purchase, borrow or rent necessary equipment. Appendices shall be limited in use to important supporting information. Excessive use of appendices to expand the general overall proposal may result in a lower grade for the proposal.

11. Vitae

The proposer may include customized Curriculum Vitae for each member of the research team, highlighting only those items that are pertinent to this specific research proposal. The Vitae, including a list of publications and awards, should **not exceed four pages per researcher.**

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 on or before **5:00 PM (PST)** on **October 11, 2011**. Question submittals must include the name of the individual or research institution submitting the question and a point of contact in the event clarification is needed. All correspondence should be emailed to the following contact:

Yvonne Cooks at: yvonne.cooks@dot.ca.gov

After the indicated deadline for question submittal has passed, questions will be collected, answered and publically posted on the Department's DRI website per the indicated schedule. All information traceable to the individual and/or organization submitting the question will be removed prior to posting of a response by DRI. (See web link below).

http://www.dot.ca.gov/research/cfs/index.htm

A hard copy of written responses to the collected questions will be provided upon specific request.

V. PROPOSAL SUBMISSION/EVALUATION PROCESS

Proposal Submittal, Modification, Resubmittal, and Withdrawal

Proposals should be emailed, with the CFS# and Initial Description of Work identifier in the subject line, and Project Title and Respondent's Name/Research Institution in the email text. Respondents are to submit proposals to:

Yvonne Cooks at: yvonne.cooks@dot.ca.gov

Respondents submitting 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 proposal, a modified copy of the entire revised proposal should be emailed, with the CFS# and “Revised Substitution for (Initial Description of Work identifier and title)”, in the subject line of the email.

Evaluation Process

The proposal evaluations will be completed by the Department's Project Panels. The Department’s Program Steering Committees and Research and Deployment Steering Committee will make final selection. Proposals will be screened against the evaluation criteria below.

Proposal Evaluation Criteria

- Organization: Adheres to requested page limits and outline? Is the proposal well written?

- Research Plan: Comprehensive literature search completed? Are the plans, methods, techniques and procedures feasible, clear, valid, adequately referenced, and state-of-the-art? Are the research results valuable to the Department?
- Research objective: Are the stated objective, scope and motivation clear, valid, and logical? Responds well to problem statement and meets Department goals?
- Deployability 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? (See **Figure 2** for information on stages of deployment.)
- 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 research 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? Have cooperative features, partnerships and subcontracts been fully identified?

Acceptance and Rejection of Submissions

DRI retains the right to disregard a minor deviation from the requirements and may, at its sole discretion, request supplemental information or clarification of the information submitted by any respondent.

Negotiations with Selected Respondent

Once a proposal is submitted, DRI may elect to negotiate with the any selected respondent or group of respondents. These negotiations may or may not result in a written agreement with DRI about implementing the proposal. Any agreement as a result of this CFS will be subject to all necessary State, Federal, Agency and Department approvals. If an agreement cannot be reached, negotiations will cease and no contractual agreement, written or implied, will exist. DRI will not reimburse submitting organizations for any costs incurred in the preparation or submission of pre-proposals or proposals, nor for any expenses incurred in the negotiation process.

This CFS shall not commit DRI to negotiate and execute any contract or agreement. DRI reserves the right to accept proposals that, in the sole judgment of DRI, are in the best interest of the State or other research customers. DRI 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 DRI 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.

Supporting Documents
There may be supporting documents posted on the CFS web page. Respondents are encouraged to review these documents prior to submitting a proposal. These documents are intended to help establish and frame the amount of work needing to be done for selected elements of this Initial Description of Work.

Amendments to this CFS
DRI 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	September 27, 2011
Proposal Written Question Submittal Deadline	October 11, 2011
Responses to Questions	October 18, 2011
Final Date for Proposal Submission	**November 1, 2011**
Proposal Selection	November 22, 2011

VII. RESEARCH INITIAL DESCRIPTION OF WORK

The name and title of the Initial Descriptions of Work are:

12_TS 01: Methods for Identifying High Collision Concentration Locations for Potential Safety Improvements

FIGURE 1
Example Cover Page

COVER PAGE

Proposal Title:	Use Initial Description of Work Number and Title: (Work Number and Title of Initial Description of Work as shown in Section VII)
Proposing Organization:	(Use respondent name that will appear on contract; include address, email, and telephone number)
Person Submitting Proposal:	(Name and Title)
Proposal Written by:	(Name and Title)
Proposal Date:	_____
Principal Investigator:	(Name, Title, Business Telephone Number and e-mail address)
Additional Investigators:	(Name, Title, Business Telephone Number and e-mail address; include all team members other than PI)
Administrative Officer:	(Name, Title, Business Telephone number and e-mail address)
Proposed Contract Start Date:	(i.e. "**January 2, 2012**")
Proposed Contract Period:	(In Months)
Fiscal Year 2011/12 Cost:	_____
Fiscal Year 2012/13 Cost:	_____
Fiscal Year 2013/14 Cost:	_____
Fiscal Year 2014/15 Cost:	_____
TOTAL COSTS:	_____

FIGURE 2
The Department's Five Stages of Research Deployment

1. CONCEPT STAGE

- First steps following problem statement and proposal
- Includes detailed literature search
- Involves experimental design, data collection, analysis and reporting
- Assesses results of research
- Defines barriers to implementation (e.g. policies, specifications, standards)
- Submits a Final Report and outlines a recommended implementation plan

2. LABORATORY PROTOTYPE STAGE

- Develops breadboard circuit or computer system modeling
- Demonstrates operation in laboratory setting
- May incorporate customized or one of a kind components
- Assesses results
- Submits Final Report and recommends design of full scale demonstration

3. CONTROLLED FIELD DEMONSTRATION STAGE

- Prepares for full scale testing of demonstration project
- Includes collaboration with outside agencies or other state DOTs and US DOT
- Controlled tests at specialized facilities are observed and supported by cooperating agencies, industry and technical associations
- Potential end users are enlisted to support the field pilot stage
- Assesses results
- Submits Final Report and recommends site/conditions for first application pilot stage

4. FIRST APPLICATION (CONTRACT) FIELD PILOT STAGE

- Works with potential end users to select site and to conduct pilot testing under real world operating conditions
- Test specifications and standards are developed
- Research assistance given to assure proper installation and operation
- Problems are corrected and adjustments made, as necessary, to complete pilot testing
- To the extent possible, potential end users operate the project under careful research surveillance
- Assesses results
- Submits Final Report and recommends initial sites for full corporate deployment

5. SPECIFICATION & STANDARDS WITH FULL CORPORATE DEPLOYMENT STAGE

- End users select site(s) and deploy the method/process/equipment using resident management, supervision, staff, and contracting forces (where applicable)
- Deployment is without research supervision or direction
- On call assistance is available upon request
- Assesses results