

Cooperative Vehicle-Highway Automation Systems (CVHAS)

REQUEST FOR PROPOSALS

2003 FUNDING YEAR

Pre-Proposals Due December 2, 2002

Full Proposals Due March 14, 2003

California Department of Transportation
Division of Research and Innovation

Overnight Mail:

1227 "O" Street, 5th Floor, MS-83
Sacramento, CA 95814

US Mail:

PO Box 942873, MS-83
Sacramento, CA 94273-0001

(916) 654-7252 (Pete Hansra)

**This document is available on-line in Adobe Acrobat at the CVHAS website:
<http://www.cvhas.org>**

CONTENTS

| SECTION | | PAGE |
|---------|---|------|
| 1. | OVERVIEW | 1 |
| 2. | RESEARCH TOPICS | 3 |
| 3. | FUNDING RESTRICTIONS | 6 |
| 4. | SUBMITTAL PROCESS AND CONTACT INFORMATION | 7 |
| 5. | REQUEST FOR PRE-PROPOSAL | 8 |
| 6. | SUBMISSION OF FULL PROPOSAL | 9 |
| 7. | TERMS AND CONDITIONS | 12 |
| 8. | PUBLICATION PROVISIONS | 15 |

Cooperative Vehicle-Highway Automation Systems (CVHAS)

REQUEST FOR PROPOSALS

2003 FUNDING YEAR

1. OVERVIEW

Within national Intelligent Transportation Systems (ITS) activities, the long-term planning, research, development, and deployment of the next generation of surface transportation systems has not been fully considered. Complex challenges related to traffic congestion, safety, and environmental impact are not being adequately addressed and can no longer be solved by traditional highway technologies, or even by deploying mainstream ITS. These challenges threaten to adversely affect the ability of transportation infrastructure operators to provide for the mobility of people and goods. One ITS area that has the potential to significantly alleviate these more complex challenges is Cooperative Vehicle-Highway Automation Systems (CVHAS).

CVHAS is a federal pooled-fund program. Its main purpose is to use the pooled resources from public and private sector partners to research, develop, evaluate and deploy solutions that reduce traffic congestion and air pollution, improve transportation safety, mobility, and fuel efficiency. As part of its mission, the CVHAS Program seeks to facilitate the sharing of technological and institutional experiences gained from its projects and the projects of its individual members.

The California Department of Transportation (Caltrans), Federal Highway Administration (FHWA), ten other State Departments of Transportation (DOTs) and Honda R & D (America) have joined forces to improve transportation system performance. The Program strategy proposed is to further develop CVHAS, initially using as the foundation the results of previous research performed by private industry, academia, the National Automated Highway System Consortium, and the Intelligent Vehicle Initiative (IVI).

While the USDOT sponsored IVI program will address near-term vehicle safety needs, Cooperative Vehicle-Highway Automation Systems will address the nation's long-term surface transportation needs. As the technologies developed under this program mature, they will help to ease traffic congestion, in addition to increasing traveler safety, comfort, and convenience. Achieving that vision will require the development of "building-block" or precursor systems that will also have applications in the current transportation system. There will be "spin-off" technologies developed from this research, such as lane and roadway departure warning/assistance, merge and lane-change driver assistance, and safer braking systems for heavy vehicles. For example, the sensors designed to detect obstacles ahead of a truck on an automated truck lane could also be used to warn the driver of danger when the truck is operating on conventional highways, thereby increasing safety for all parts of the roadway transportation system. This program is intended to benefit state DOTs by:

- ❑ Identifying and planning a research agenda that addresses major transportation challenges and attains the long-term CVHAS goals in an efficient and achievable manner
- ❑ Focusing on research, development, and deployment of near-term solutions while retaining a long-term vision of CVHAS
- ❑ Encouraging the creation of partnerships; cooperative systems necessitate collaboration among infrastructure owners and operators, communications service providers, and the manufacturers and suppliers of vehicles
- ❑ Unifying the market demand, which will, in turn, help achieve the deployment of both the near-term and long-term solutions
- ❑ Building the research foundation to support the deployment of automated transportation systems
- ❑ Addressing state DOT concerns regarding CVHAS, such as public safety and maintenance and operations needs

This program will also benefit state DOTs by developing a consensus on standardization and interoperability for Cooperative Vehicle-Highway Automation Systems. In addition, it will:

- ❑ Address transportation user needs at the national level to help bring consistency to the market and thus support both the supply and the demand for the various products that will eventually be developed
- ❑ Enable the tailoring of local solutions that can meet regional needs (transportation user needs differ among localities; the flexibility of the approach in this program is critical for success)
- ❑ Improve ITS planning and deployment by increasing the number and variety of potential solutions to traffic congestion, safety, and other challenges
- ❑ Enable manufacturers to realize the economic benefits that come from commercialization and implementation by building cooperative relationships between government, industry, and academia

Begin the development of guidelines that will eventually lead to standardization, interoperability, and widespread deployment.

This RFP is organized as follows:

- ❑ CVHAS research needs for the coming fiscal year
- ❑ Funding restrictions
- ❑ Process and contact information
- ❑ Pre-proposal procedure

- ❑ Full proposal submission
- ❑ Terms and conditions
- ❑ Publication provisions

2. RESEARCH TOPICS

The CVHAS Program is soliciting proposals for research in the 2003 fiscal year. We will consider proposals that will lead to solutions for surface transportation problems and also advance the state of the art in transportation technology. Any college, university or other non-profit organization may submit proposals. Private companies may also submit proposals. The roles and responsibilities of the private company and the university should be clearly delineated in the proposal. Funding is not available for proprietary product development or for commercialization.

This section outlines CVHAS research needs. Proposals should be directed to one (or more) of the RFP topics. Topics are sufficiently general to allow flexibility in selecting an appropriate methodology. The general project areas listed below and the specific information listed on the web page provide an indication of the types of projects to be funded by the CVHAS Program.

We are particularly interested in studies of vehicle highway automation concepts, architectures, and operations, as well as technologies that improve highway capacity and safety by use of sensor, communication, and control systems to enhance driver perceptions, speed up drivers' responses, augment driver control of vehicles, and finally assume full control of vehicle operations.

2.1 SENSOR-FRIENDLY VEHICLE AND ROADWAY TECHNOLOGIES

Vehicle- or infrastructure-mounted technologies could pose alternative means to improve the reliability and performance of vehicle sensing systems such as used in adaptive cruise control, forward collision warning and avoidance, and run-off-road countermeasures. Near- to mid-term and if possible, passive cooperative markings on vehicles and/or on the roadside could enhance the operation of such systems, particularly in the presence of a cluttered environment. The objective of this research is to develop and test sensor-friendly vehicle and roadway technologies, building on work already begun in prior research. That work has shown some preliminary indications of the advantages that could be gained from use of technologies such as passive radar-reflecting license plates, patterns of corner-cube reflectors to mark roadside obstacles, and modulation of LED brake lights to communicate data to following vehicles, but these have not yet been tested to the extent necessary to prove their viability. Further research is needed to enhance the availability and reliability of such systems, to reduce false and nuisance alarms, and to increase user acceptance. Proposers should plan on including both analytical and experimental studies to show these improvements, and should demonstrate their knowledge of the prior research on this subject. Also consider costs and ease of deployment.

2.2 DEVELOPMENT OF WIRELESS NETWORK CAPABILITY FOR ACCURATE VEHICLE POSITIONING

There are a number of reasons why it is necessary to be able to locate the position of a mobile vehicle. For vehicle position control applications, a vehicle location system is needed to provide information for controlling the vehicle position. The required level of accuracy and reliability is typically very high (cm-accuracy), and the information update rates are usually fast (20 Hz) for this class of applications. On the other hand, there are important transportation applications that do not require extremely accurate or very fast updates of position information. For example, vehicle position information can be used to provide traffic information to travelers, detect traffic incidents and congestion, or pinpoint the positions of other vehicles near an intersection for collision avoidance application. Also, if the vehicle position relative to a moving vehicle or a fixed base station, where the absolute position is known, are available, the incentive of not having to install location systems (e.g. GPS/INS) to compute the absolute positions of all vehicles could potentially reduce the cost of a vehicle positioning system. For this group of applications, the potential benefit of employing wireless communication technologies for vehicle location is potentially great and thus needs to be explored. The objective of this research is to develop wireless network capability (e.g. using cellular phone positioning and/or dedicated short range communication) for accurate vehicle positioning. For each wireless technology considered, address the questions of how a vehicle location system can be designed, implemented and tested. Identify the potential ITS applications, and the advantages or disadvantages (e.g. cost, performance limitations) in comparison with other positioning technologies.

2.3 DEVELOPMENT OF AN INTEGRATED CAPABILITY FOR VEHICLE-VEHICLE AND VEHICLE-ROADSIDE COMMUNICATION

Well-designed vehicle-vehicle (v-v) and vehicle-roadside (v-r) communication systems are essential in ensuring that data packets are communicated and made available for mobile data applications, ranging from traveler information to collision warning and vehicle control, especially those that are safety-critical. The objective of this research is to develop an integrated architecture for v-v and v-r communication, and to demonstrate it experimentally. The proposal should address the issues both on the selection of wireless communication technologies and the design of communication architecture and protocols. Wireless communication technologies such as Dedicated Short Range Communication (DSRC) are opening new possibilities for short-range v-v and v-r communication. Compare different promising technologies and evaluate their limitations. Select a communication technology that would be most applicable for v-v and v-r communication, taking into consideration the critical communication requirements such as range, resistance to multiple access interference, latency and reliability (low packet loss probabilities). An important issue is to distinguish those (v-v or v-r) data packets that are safety-critical, so that they would be transmitted with higher priorities and lower probabilities of packet loss.

2.4 AUTOMATED BUS RAPID TRANSIT TECHNOLOGY (BRT)

Bus systems provide a versatile form of public transportation with the flexibility to serve a variety of mobility needs at an unlimited range of locations throughout a metropolitan area. Low-cost investments in infrastructure, equipment, operational improvements, and technology can provide the foundation for Bus Rapid Transit (BRT) systems that substantially upgrade performance by offering a level of quality service, such as faster operating speeds, greater service reliability, and increased convenience, that can normally only be achieved with more expensive and less flexible rail transit systems. The automation of transit buses also has the potential for significant benefits in roadway transportation problem areas such as congestion, air quality, and fuel consumption. To develop a BRT deployment strategy, a number of issues related to operational characteristics and costs must be more clearly understood. The research should examine the major bus rapid transit areas such as technology (vehicle, guide-way, control systems, fare collection systems and passenger information systems), operating plan and customer interface. Also, this research should evaluate the benefits, costs and variations in BRT system designs for BRT deployment strategy development. In addition, the research should also compare the level of service anticipated from BRT and other transit alternatives.

2.5 AREA-WIDE TRAFFIC MANAGEMENT STRATEGIES

New approaches to corridor traffic management still need to be explored and conceptualized. The new approaches could involve roadway geometric changes, operational changes, incident response approaches, and may involve ATMIS. Once conceptualized, new approaches need to be evaluated by the use of modeling or analytical means. The next step would be to present the recommended approaches to a working group consisting of district staff and local transportation agency engineers for their input and consideration. The proposals need to consider institutional and legal constraints, but all reasonable strategies need to be considered, even those that would require change in the law.

Traditional traffic management has focused on the immediate area of traffic impact by using incident mitigation and queue management. Further evaluation is needed of the benefits of area-wide traffic management such that ATMIS is applied to neighboring corridors or to local arterials for the purpose of reducing region-wide travel delay due to incidents or delay due to acute, localized congestion (whether it be recurrent or non-recurrent). Specific real world area-wide traffic management strategies need to be developed and evaluated for congested urbanized areas.

2.6 AUTOMATING COMMERCIAL HEAVY TRUCKS

Commercial heavy trucks will likely be the first users of vehicle automation technology due to the various economic benefits. Heavy trucks will gain significant benefits from automation technology because they will be able to carry freight with enhanced safety, increased fuel efficiency, and predictable travel times. The cost of automating a

commercial heavy truck is much lower, relative to its overall cost, than the similar ratio for passenger cars.

Control algorithms needs to be redesigned for commercial heavy trucks. Collision warning, collision avoidance and lateral and longitudinal control are some of the examples for commercial heavy truck technology. The challenges include extensive research and testing in order to design an automated heavy truck system capable of providing a safe, smooth ride.

2.7 INNOVATIVE NEW RESEARCH TOPICS

The CVHAS Program is soliciting a new category of proposals apart from those normally solicited through the annual RFP. The research topics that appear in the main section of the RFP reflect the judgments about importance of research issues made by CVHAS Program managers and participants in the CVHAS research focus group and Executive Committee meetings. However, there are likely to be other new and innovative ideas worth exploring that were not identified through the existing process.

3. FUNDING RESTRICTIONS

The maximum limit on individual project awards is \$200,000 total, and \$100,000 in any one fiscal year. High-cost proposals will have a significantly lower probability of success at being selected than low-cost proposals. Private sector involvement is strongly encouraged, though cost sharing may be required to be cost competitive. In all cases, funding requests must be justified relative to the research contribution and the effort required for each task. Caltrans reserves the right to modify proposed budgets.

3.1 Multi-Year Proposals

Multi-year proposals – up to a three-year maximum – are encouraged when warranted by the research. However, multi-year proposals will be funded by fiscal-year increments and are subject to an annual review by the CVHAS Technical Advisory Committee, of project performance, results, and continued relevance to program goals. In exceptional cases, CVHAS Technical Advisory Committee reserves the right to redirect funding or scope as priorities change.

3.2 Other Funding Restrictions

The CVHAS Technical Advisory Committee has established guidelines with respect to the following categories of funding:

Material and Supplies

Purchases over \$3000 must be itemized and justified relative to project objectives. At the completion of the project, all purchased equipment becomes the property of the California Department of Transportation.

Travel

Funding for conferences requires explicit justification, along with specification of the conferences to be attended. CVHAS will not pay for more than one trip per year per investigator unless there is a specific and strong justification. International trips are only granted in exceptional cases and must be justified in the proposal. There is no limit on travel required for the direct performance of the research when justified by the work.

Proposers should include travel costs for a project kickoff meeting, final project briefing and any other key milestones that would warrant briefings for the project sponsors.

4. SUBMITTAL PROCESS AND CONTACT INFORMATION

In order to ensure that RFP topics have been addressed appropriately and to save the Principal Investigator (PI) valuable time in preparing a complete proposal, We have decided to screen proposals in two phases: in phase one the PI will submit a short pre-proposal for separate evaluation; in phase two the full proposal will be submitted (See Section 5 and section 6 for format requirements and deadline dates).

We strongly encourage collaborations with the private sector, between academic campuses, and across disciplines. We especially encourage collaborations which increase the value of the research to enable integrated solutions to major transportation challenges.

Proposals will compete both within and across research topics and there is no guarantee that a project will be awarded for every topic. In some cases, multiple projects may be awarded within the same topic.

For information on the CVHAS RFP and proposal process, contact Pete Hansra (Tel: (916) 654-7252; e-mail: Gurprit_Hansra@dot.ca.gov)

Two complete sets of proposals and attachments should be sent to:

Mr. Pete Hansra
 California Department of Transportation
 Division of Research and Innovation
 CVHAS RFP 2003
Overnight Mail:
 1227 "O" Street, 5th Floor, MS-83
 Sacramento, CA 95814
US Mail:
 PO Box 942873, MS-83
 Sacramento, CA 94273-0001

5. REQUEST FOR PRE-PROPOSALS: DUE DECEMBER 2, 2002

5.1 PRE-PROPOSAL SUBMITTALS AND INSTRUCTION

- 5.1.1** Proposals submitted in response to Phase One of the RFP process should be identified on the proposal cover page as “Pre-proposals” and include the RFP topic or topics addressed.
- 5.1.2** The page limit for the pre- proposal should be no more than SEVEN pages, printed in 12-point font on 8.5 by 11 inch paper.
- 5.1.3** Each pre-proposal should follow this outline:
- A. Abstract of up to 250 words, describing the proposed idea and its significance
 - B. Clear definition of the idea being proposed for research
 - C. Explanation of why this idea is useful and needed and how it advances the goals of the CVHAS Program
 - D. Sketch out a general method of approach
 - E. Provide background information, identifying the most recent work relevant to the subject area and how the proposed work would advance beyond that
 - F. Identify relevant experience and qualifications of the proposer(s)
 - G. Identify resource needs, and include estimated budget in support of those needs
 - H. Identify project milestones and deliverables
- 5.1.4** The primary benefit of submitting a pre-proposal is to provide the opportunity for CVHAS management to request a complete / detailed proposal from the author
- 5.1.5** The evaluation criteria for these pre-proposals will be:
- Brief problem statement, proposed solution and methodology
 - Relevance of topic to CVHAS’s goals
 - Opportunity for this work to launch a significant, productive new research direction and/or to lead to a significant breakthrough discovery or development
 - Creativity and originality of the idea
 - Avoidance of duplication of other ongoing research elsewhere in the world
 - Degree of understanding of the relevant issues shown in the proposal
 - Estimated duration of the project
 - Deliverables

- ❑ Estimated budget
- ❑ A preliminary timeline for the ultimate product, even if it extends beyond the proposed work duration.
- ❑ Qualification sheet for the Principal Investigator and key personnel

After review of the pre-proposals, one of the following will occur within 30 days by (January 6, 2003):

1. *If we are interested in the pre-proposal, the Principal Investigator will be contacted and asked to submit a full proposal by January 31, 2003*
2. *The PI will receive a letter from us declining CVHAS interest in the pre-proposal.*

6. SUBMISSION OF FULL PROPOSAL: DUE MARCH 14, 2003

6.1 INSTRUCTIONS

In the event that the CVHAS Program is interested in the pre-proposal, the PI will be asked to prepare a full proposal. This proposal should address all of the items listed below, as well as addressing comments and concerns resulting from the pre-proposal screening.

Two hard copies of each proposal including cover page and budget should be submitted with the following format:

- Two single-sided copies on white 8-1/2 x 11 paper
- Stapled, upper left hand corner
- One separate stapled copy of the cover page and summary
- No binding
- No cardstock, plastic, or other covers

Proposals should be written in sufficient depth to allow assessment of the contribution both to transportation practice and to the state-of-the-art in research. Although there is no minimum or maximum length, we expect that most proposals will fall in the range from 10-30 pages single-spaced (excluding appendix). We also expect that proposal length will reflect the magnitude of the project.

The Actual Detailed proposal should be divided into nine sections as outlined below:

A. Cover Page

Standard cover page including project title, principal investigator name, funding requested, start date, end date, topic number and topic name.

B. Summary

- i. One paragraph summary of the problem statement, significance of research contribution, and contribution of research to the CVHAS Program.
- ii. 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.

C. Background/Business Case

- i. Separately review:
 - Related research in the problem area (literature search);
 - Complementary research completed or underway
- ii. Problem statement
 - Explain what created the problem or how the problem was recognized.
 - 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
- iii. Proposed solution
 - State project scope, objectives, and motivation.
 - 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
- iv. Describe how the proposed research will complement existing projects.
- v. 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? Be as specific as possible. The emphasis of the CVHAS Program is on applied research, even if the application may not be deployed in the near-term. Long-term research that has a clear path to deployment is acceptable.

D. 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. For multiple-year projects, later year tasks need not be described in as much detail as the first year.

However, a detailed plan will be required in each subsequent year, in sufficient detail that we can evaluate the reasonableness of progress, workload, and budget estimates.

E. Research Plan and Deliverables

Provide a research plan with specific milestones and deliverables. Deliverables should be described precisely and in depth, and should be clearly related to the methodology. 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. At the conclusion of the project, the PI will deliver a final report and present his/her results 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. Also include in the proposal a list of tasks and a set of deliverables summarized in two separate tables.

Note that the deliverables must be described in the proposal text in more depth than the single-line titles of the deliverables list. It is important to describe the contents of any deliverable reports or briefings and how these are expected to be used by the recipients of these deliverables.

F. Qualifications of Principal Investigator, Key Researchers and Collaborators

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.

G. Vita

Curriculum vita or resume for the PI and each key researcher (2 pages maximum per individual).

H. Budget

Each proposal must include a project budget for each fiscal year and a total budget. **Multi-year** proposals must include a **separate** budget for each fiscal year. Also include a total budget for the project. Non-university respondents should specify cost-share as well as funds requested.

I. Resources

Justify each major budget category relative to the research plan, project objectives and research contribution. Private sector respondents should highlight cost-sharing, and clearly state how funds will be directed to the specific project.

7. TERMS AND CONDITIONS

7.1 Data Rights

The contractor agrees to maintain (in sufficient detail as will properly reflect research done and results achieved in the performance of this project) books, records, reports, research notes, charts, graphs, comments, computations, analyses, recordings, photographs, computer programs, and documentation thereof, computer information storage means, samples of materials, and other written graphic or written data generated by the contractor concerning the work performed under this project (hereinafter called "Data"). All Data and equipment produced or generated under this Agreement, including under any subcontracts or purchase orders for customized equipment or services, shall become the sole and separate property of contractor. Contractor shall have the rights in any resulting invention provided in 37 CFR part 401 "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency. Contractor agrees that any work under this project, but excluding preexisting work, constitutes a work(s) made for hire under the federal Copyright Act of 1976 ("the Act"). To the extent said concept development does not constitute a work made for hire under the Act, Contractor will assign all rights, title, and interest, including the copyright and all copyright rights, in the work to Caltrans. Contractor hereby grants to Caltrans a royalty-free, non-exclusive irrevocable license to reproduce, translate, publish, use and to authorize others to do so, all data collected. As used in this clause, data collected means the original records of scientific and technical data collected during the performance of the work by the Principal Investigator. Data collected includes, but is not limited to notebooks, drawings, lists, specifications, and computations, in written, pictorial, graphic, or machine form.

7.2 Patent Rights

Since Federal-funding participation is provided for these research projects, the contractor will provide the State of California and the Federal government with the same patent rights accorded the Federal government under public law 98-6520, "Patent Rights in Inventions Made with Federal Assistance."

7.3 Inspection of Work

The contractor shall permit CVHAS staff to review and inspect the research project activities at all reasonable times during the performance period of a contract or memorandum of understanding. When there is Federal participation in the research project, the contractor shall also permit the applicable Federal agency to review and

inspect the research project activities at all reasonable times during the performance period. Any resulting award(s) will be subject to the examination and audit of the Auditor General of the State of California for a period of three (3) years after submission of the final invoice. The examination and audit will be confined to those matters connected with the performance of the contract including, but not limited to, the costs of administering the contract.

7.4 Publications

The contractor will provide CVHAS staff the opportunity to review any proposed manuscripts describing results of work performed in whole or in part under any resulting contract. The reviews of draft reports will normally be completed within 90 days. In the event that CVHAS staff fails to provide the contractor with any comments on the draft report within 130 days of its submission, the contractor may proceed to the preparation of the final manuscript and its submission for formal acceptance in documentation of completion of contract objectives. Reference: Publication Provisions Non-Federal Participating, dated December 20, 1974, incorporated herein as "Section 10"; and Publications Provisions Federal Participating, dated December 13, 1974, incorporated herein as "Section 11."

7.5 Non-Discrimination

The contractor shall comply with regulations relative to Title VI (non-discrimination in federally-assisted programs of the Department of Transportation - Title 49 Code of Federal Regulations Part 21 - Effectuation of Title VI of the 1964 Civil Rights Act). Title VI provides that the recipients of federal assistance will implement and maintain a policy of non-discrimination in which no person in the state of California shall, on the basis of race, color, national origin, religion, sex, age, disability, be excluded from participation in, denied the benefits of or subjected to discrimination under any program or activity by the recipients of federal assistance or their assignees and successors in interest. (See Appendix.)

7.6 Publicity/Use of Name

The contractor will not use either the name of CVHAS or any participants in the CVHAS Program either expressly or by implication, in any publicity or advertisement without the express written approval of the named party.

7.7 Major Personnel Changes

There shall be no change in the Principal Investigator or key researcher on a project without prior written approval by Caltrans.

7.8 Progress Reporting

As a condition of acceptance, all PIs will be required to submit quarterly progress reports and a final report. At the conclusion of the project, the P.I. will present his/her results in a workshop forum.

7.9 Inventory

7.9.1 The contractor and any subcontractor shall maintain an inventory record for each piece of nonexpendable equipment purchased or built with funds provided under terms of a contract. The inventory record for each piece of such equipment shall include its inventory control number, the date acquired, total cost, serial and model identification (on purchased equipment), and any other information or description necessary to identify the equipment. The inventory record shall include the location or section to which each piece of equipment is assigned, the number of the applicable research project's contract to which the special equipment is charged, and whether or not Federal money was involved in its purchase or construction.

7.9.2 Nonexpendable equipment to be so inventoried shall be those items of equipment, which have a normal life expectancy of two years or more, and an approximate unit price of less than five thousand dollars. In addition, other items of equipment costing less than five hundred dollars and being especially popular or attractive shall also be inventoried. Each item of nonexpendable equipment inventoried will have a tag affixed to it with its inventory control number shown thereon or with its inventory control number engraved directly on the item of nonexpendable equipment.

7.9.3 Periodically, but at least annually, the contractor shall provide Caltrans with a copy of inventory record for nonexpendable equipment purchased with or built with funds provided under terms of the applicable contract. If no such nonexpendable equipment was purchased or constructed with said funds, the contractor to that effect shall provide formal notice to Caltrans at least annually.

7.10 Minority Business Enterprises

7.10.1 It is the policy of the State of California that disadvantaged business and women business enterprises as defined in 49 CFR Part 23 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal funds under this contract. Consequently, the disadvantaged business and women business enterprises requirements of 49 CFR Part 23 shall apply to this Interagency Agreement.

7.10.2 The contractor agrees to ensure that disadvantaged business and women business enterprises as defined in 49 CFR Part 23 have the maximum opportunity to participate in the performance of any subcontracts financed in whole or in part with Federal funds provided by contract. In this regard, contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 23 to ensure that disadvantaged business and women business enterprises have the maximum opportunity to compete for and perform any subcontracts. Contractor and any subcontractors shall not discriminate on the basis of

race, color, national origin, or sex in the award and performance of any work done under the provisions of this Interagency Agreement.

8. PUBLICATION PROVISIONS – FEDERAL PARTICIPATING

8.1 General

The word “State,” as used herein refers to the California Department of Transportation. These Publication Provisions are to provide for adequate documentation of the completed contract obligations, to encourage publication and distribution of research information, and to protect the State and the Federal Highway Administration from unwarranted implications of policy or concurrence with the conclusions of the contractor.

8.2 Review of Reports

The process of the State’s and the Federal Highway Administration’s review of the drafts of interim and final research reports to ensure adequate compliance with provisions of this agreement will include:

8.2.1 A general technical review to ensure that all aspects of the study provided for by this agreement have been adequately carried out and documented. Correction of deficiencies found in this review is a requirement for the State’s and the Federal Highway Administration’s acceptance of a report as evidence of partial or final fulfillment of the agreement objectives.

8.2.2 Consideration as to whether or not the organization, language and content of the report are presented in a manner, which will be intelligible to its intended audience. Reports on studies which produce an implementable product in the form of a device, procedure or the like must be written in a manner understandable to the user. Where studies conclude with intermediate research results, they may be written in the language of that research field but must contain a technical summary in terms intelligible to the user of the ultimate system to which the research is expected to contribute and in sufficient detail to permit the practicing engineer to implement the items. Correction of deficiencies found in this review is also a requirement for the State’s and the Federal Highway Administration’s acceptance of a report as satisfactory documentation of the agreement requirements.

8.2.3 An analysis of the recommendations and conclusions of the report in relationship to the data and theories developed therein to determine whether or not the State and the Federal Highway Administration concur that the contractor’s recommendations and conclusions are supported by the data. Recognizing that professional differences of opinion do arise, the concurrence of the contractor with review comments of this type is not a requirement for acceptance, but may affect decisions regarding State and Federal Highway Administration distribution of the report and use of the research results.

8.2.4 General comments on the technical content and presentation may be furnished for the optional use of the author in preparing the manuscript for publication.

8.3 Acknowledgment and Disclaimer Statements

All reports published by the State and/or the contractor under provisions of this agreement shall contain the following:

8.3.1 Credit reference: “Prepared in cooperation with the State of California, Business Transportation and Housing Agency, Department of Transportation and the U.S. Department of Transportation Federal Highway Administration”.

8.3.2 Disclaimer statement: “The contents of this report reflect the views of the author who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.”

8.4 Publication Rights

Reports prepared by the contractor under provisions of this agreement may be published under the following conditions:

8.4.1 Any material contained in interim or final reports which have received final acceptance by the State and the Federal Highway Administration may be published in any form and through any media the contractor may desire without further written permission by the State or the Federal Highway Administration, subject only to the inclusion of credit and disclaimer statements of Sections C-1 and C-2 of these Publication Provisions.

8.4.2 In the event that the contractor cannot agree with the comments of the State or the Federal Highway Administration, the contractor may publish the material contained in the report 70 days after it has been resubmitted in final form to the State subject to the inclusion of (1) a statement that the Federal Highway Administration does not concur with the findings and conclusions of the research, and (2) the credit and disclaimer statements of Sections C-1 and C-2 of these Publication Provisions. In the event of said lack of agreement, the contractor may include the State’s and the Federal Highway Administration’s technical comments in the report in a clearly identified section such as “Sponsor’s comments.”

8.4.3 Federal Highway Administration reviews of draft reports will normally be completed within 90 days of submission by the State. In the event that the State fails to provide the contractor with any comments on the draft report within 130 days of its submission by the contractor, the contractor may proceed to the preparation of the final manuscript and its submission for formal acceptance in documentation of completion of contract objectives. The State will authorize the contractor to publish the material contained in the report 40 days after it has been resubmitted in final form to the State, subject to the inclusion of (1) a statement that the Federal Highway Administration has

not completed its review of the report, and (2) the credit and disclaimer statements of Sections C-1 and C-2 of these Publication Provisions.

8.5 Dissemination of Results

The contractor may publish the results of the study or any of its particulars in separate reports or by submission of technical papers to professional organizations subject to these Publication Provisions. Both written and oral releases are considered to be within the context of publication. However, there is no intention to limit discussions of the study with small technical groups or lectures to employees or students. Lectures to other groups that describe the plans but disclose neither data nor results are permissible without advance review by the State and the Federal Highway Administration.

8.6 Presentation of Papers and Articles

In unusual cases when the scheduled time for the preparation of a technical paper, containing previously undisclosed findings, for presentation at professional meetings or submission to professional organizations does not permit time for formal review and acceptance, an abstract and notification of intent to present the paper should be submitted through the normal channels for State and Federal Highway Administration concurrence. Such concurrence will normally be given unless there is indication of new and controversial findings and conclusions based on data that the State and the Federal Highway Administration have not been given adequate opportunity to review. To protect the interest of the sponsoring agencies, such presentation should contain (1) a statement that the sponsoring agencies have not reviewed the paper, and (2) the credit and disclaimer statements of Sections C-1 and C-2 of these Publication Provisions. Draft copies of these papers should be submitted through normal channels for State and Federal Highway Administration review as soon as completed.

8.7 Copyright

The contractor shall be free to copyright material developed under the agreement with the provision that the State and the Federal Highway Administration reserve a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, the work for Government purposes.