Proposal Instructions

2005 Research Program

Center for Advanced Vehicle Technologies

Center for Advanced Vehicle Technologies
275 Hardaway Hall
Box 870277
(205) 348-9090 (voice)
(205) 348-6419 (fax)
sbarrow@eng.ua.edu

July 22, 2005
Introduction:
The Board of Trustees of The University of Alabama established the Center for Advanced Vehicle Technologies (CAVT) in the fall of 1998. Through the Transportation Equity Act for the 21st Century (TEA-21), the U.S. Department of Transportation has provided funding to The University of Alabama for conducting advanced vehicle research. Funding in addition to that provided by TEA-21 has recently been provided from the USDoT as a result of the continuing resolution(s) passed by Congress in lieu of passage of a new Transportation Equity Act, commonly referred to as the “Highway Bill.” The funding provided in 2005 will support two CAVT “seed” research projects.

In response to global environmental, economic and energy challenges, increasingly sophisticated technologies will be required in the design of all classes of transportation vehicles and systems. A new generation of vehicles will employ a number of technologically advanced systems and materials including: advanced propulsion power plants such as hybrid-electric power, fuel cells, and alternative fuels; ultra-low emission systems; light-weight and smart materials; intelligent vehicle systems and; low noise and acoustically designed systems. Integration of design and manufacturing processes will be critical to achieving cost effective transportation with rapid introduction to the market.

Center Vision:
The vision of the CAVT is "through discovery, research and education to become a nationally recognized institution supporting the development of efficient, safe, energy secure and environmentally-friendly vehicles for meeting the transportation needs of Alabama and the Nation." The research programs will strengthen existing industrial relationships and develop new partnerships with key automotive and transportation-related companies and federal agencies. Activities will be aimed towards:

- Discovering, through research and development, new technologies for advancing the vehicular state-of-the-art.
- Developing a new generation of vehicles with improved energy efficiencies, lowered pollutant emissions to the environment, and increased safety.
- Conceiving and applying computer-based tools for modeling and analyzing vehicles and vehicle components such as the engine, suspension and power transmission equipment.
- Teaching advanced technology through undergraduate and graduate education programs, interactions with industrial partners and outreach activities to regional industry.
Goals of the Center:
The Center provides faculty and students with an organized structure for interdisciplinary education and research for the discovery and development of new vehicle technologies. The goal of the Center for Advanced Vehicle Technologies is to establish sustainable and nationally competitive education and research programs in advanced vehicle technologies. Specifically, the Center will:

(1) Enhance the undergraduate and graduate education programs in the area of vehicle technology through the development of interdisciplinary courses, seminars, research and design experiences for undergraduate and graduate students, and summer internships for students with governmental laboratories and industry. The Center will prepare the next generation of engineers to meet the technological development challenges of the vehicle transportation field.

(2) Establish nationally recognized research and development programs conducted through the Center through the development of cooperative agreements and partnerships with major automotive companies, associated suppliers, governmental laboratories and other universities. Infrastructure resources including faculty, graduate students, research laboratory space and research equipment will be enhanced through Center programs.

(3) Serve and assist regional and national transportation related industries and government agencies for development of vehicle technology and economic growth of the State.

Focus Areas for Proposal Submissions:
This solicitation is for faculty at The University of Alabama and is for technical research, and/or research facility and program development. The thrust technology areas identified in the Center proposal to the U.S. Department of Transportation are shown below for reference. However, proposals in other areas of advanced vehicle technology research areas will also be considered. The selected topic area should be consistent with the vision of the Center.

Propulsion Technologies – this area includes the topics of:

- Advanced reciprocating engines, direct injection engines, low emission and high energy efficiency engine designs and alternatively fueled engines;
- Electric and hybrid-electric propulsion systems and components; and
- Advanced propulsion concepts such as fuel cells (including the constituent components such as reformers, catalytic surfaces, materials, etc.).

Vehicle Structure Technologies – this area includes the topics of:

- Noise, vibration and dynamic analysis of powertrain and structural vehicle components; and
Advanced structural technologies such as lightweight or smart materials specifically targeted at vehicular applications.

Vehicle Manufacturing Technologies – this area includes manufacturing research that supports and enables propulsion and vehicle structure research.

Proposal Guidelines:
Seed projects for individual faculty will be the type of research proposals considered under this solicitation. In general, the seed projects will have a limited scope of work and will be fully completed within the 12-month period. Proposers must follow the guidelines below.

1. Projects must be for a 12-month period, starting August 16, 2005.
2. Projects must include a regular UA faculty investigator as PI.
3. Allowable proposed direct costs include one 12-month GRA stipend (a maximum of $1,200/mo for MS and $1,400/mo for PhD students); full-time in-state academic year tuition for GRA; $8,333 of faculty summer salary, up to $3,000 for supplies; and up to $1,500 for travel. No equipment funding is available. The proposed costs must be identified in detail and should be appropriate for the scope of work.
4. Only one project proposal may be submitted by an individual faculty member.
5. Participation by a partner external to the University (government agency or company) is not required. However, PIs are encouraged to include such partnerships if they believe the partnership would strengthen the proposal.
6. The faculty investigator must commit a minimum of $2,250 academic year time as an in-kind contribution to the project. This time commitment will be captured in the grant accounting system for documentation of cost sharing.
7. Indirect cost rates of 41 percent are to be charged on GRA stipend, supplies, travel, and faculty salary and benefits cost share.

Guidelines for Proposal Format and Content:
The proposal must be developed and assembled in a logical fashion and order. Proposals should not exceed 10 pages including title page and all appendices.

The following elements must be included in the proposal:

1. Title page
   The cover must include the project title, principal investigator's name, partner names (if applicable), and contact information for the PI and partner (addresses, telephone, fax number and email).

2. Executive Summary (maximum of 250 words)
   This section will provide a general description of the project including the highlight information from each of the other sections.
3. Introduction and Project Background
   This section will provide a brief background of the project including a description of the motivations, goals and technical approach for the project. This section must present a convincing picture of the importance of the project. This should include a clear description of the technical problem being addressed, why this problem is important to the vehicle field, and how the proposed research will solve or contribute to the solution of the problem/issue. The section should also demonstrate how the requested funding will improve the research infrastructure for the team and how partnerships with federal agencies and/or companies will be developed (if appropriate).

4. Plan of Work
   This section should describe the task-by-task activities that the research team proposes for accomplishing the goals and objectives of the project. The tasks should be adequately developed and defined to allow evaluation of the technical approach of the project.

5. Project Schedule
   A chart-type schedule should be included which delineates the task schedules by project month.

6. Project Personnel
   A brief description of the key research personnel should be included here. A one-page resume of the PI should be included in an appendix.

7. Project Budget
   Briefly explain how the requested funds relate to the project tasks. Provide a line-item budget including the normal divisions of expenditures (personnel, fringes, supplies, travel, and tuition). Remember that all faculty salary must be academic year cost share. If appropriate, columns for "CAVT Funds", "Partner Funds," "Cost Share" and "Total Project Funds" should be shown. The standard indirect rate should be applied to partner supplied funds and shown in the other columns.

8. Matching Funds and Letters of Commitment from Partners (where applicable)
   Describe the partnership commitment to the project and potential long-term relationship possibilities of the project. A letter of commitment from the external partner(s) for the project must be included for the matching funds (in-kind and cash) included in the budget.

Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
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<tbody>
<tr>
<td>July 22, 2004</td>
<td>Submitters identified from preproposals; proposal preparation instructions released.</td>
</tr>
<tr>
<td>August 5, 2005</td>
<td>Proposals due – two copies</td>
</tr>
<tr>
<td>August 12, 2005</td>
<td>Notification of awards (tentative)</td>
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**Evaluation Criteria:**
The following general criteria will be followed in evaluating the proposals.

*Technical Approach (60 points)*
An evaluation of the technical approach proposed for achieving the objectives of the proposal will be made. Consideration will be made regarding the importance of the proposed topic to the vehicle field, the research approach proposed, the importance and impact of the project’s anticipated results on the needs of the vehicle field and the relevance of the proposed project to the goals, objectives and vision of the CAVT. The project goals and tasks must be clearly defined in the proposal. The experience and background of the investigator(s) should be appropriate.

*Partnerships (10 points)*
A goal of the CAVT is to promote the formation of partnerships between The University of Alabama and governmental agencies and companies. Therefore, the proposal will be evaluated based on the level of partnership developed and documented in the proposal. Both the immediate 12-month project partnership characteristics and the longer-term potential for partnering will be considered.

*Research Infrastructure Building (15 points)*
The proposed project will be evaluated in terms of building student and faculty research capability. The proposal will be evaluated for evidence of building research capability in terms of technical and scientific expertise, the creation of interdisciplinary relations between faculty, the involvement of underrepresented students and faculty, etc.

*Budget (15 points)*
The budget will be evaluated based on the guidelines presented earlier and appropriateness of the budget to the plan of work. The level of cost match from non-CAVT sources will be considered as part of the evaluation.

**Deliverables:**
1. Award recipients are required to prepare and submit quarterly project reports (limited to two pages in length).
2. A final report is due to the CAVT within 60 days of the project completion date. If one or more journal papers are submitted for publication based on the project results, an abbreviated final report that includes the papers in an appendix is encouraged.
3. Projects are required to submit at least one proposal to an external funding agency that is related to the project during the award period. A copy of any related proposals should be sent to the CAVT when they are submitted to the Office for Sponsored Programs.
4. Recipients may be asked to make a short project presentation(s) at a Center meeting(s) during or after the project period.
5. Participants in CAVT research are expected to cooperate with the record-keeping function of the Center by providing copies of published papers and funded contracts that have stemmed from CAVT funded activities.
Submission Instructions:
The Final Proposal must be submitted by noon on August 5, 2005 to:

    Center for Advanced Vehicle Technologies
    The University of Alabama
    275 Hardaway Hall
    Attn: Ms. Sherry Barrow, Administrative Secretary

Publications:
The Center for Advanced Vehicle Technologies is supported through grants with the U.S. Department of Transportation. All work published or otherwise reported must acknowledge this partner and the supporting contracts. Investigators should contact Ms. Barrow at the CAVT regarding proper acknowledgement in publications.