



COORDINATING RESEARCH COUNCIL, INC.

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July 28, 2017

In reply, refer to:

CRC Project No. E-119-2

Dear Prospective Bidder:

The Coordinating Research Council (CRC) invites you to submit a written proposal to provide services for Hager Environmental & Atmospheric Technologies (HEAT) and Denver University (DU) Remote Sensing Device (RSD) Data Mining (CRC Project No. E-119-2). A description of the project is presented in Exhibit A, "Statement of Work."

Please indicate by letter, fax, or email by **August 11, 2017** if you or your organization intends to submit a written proposal for this research program. CRC will answer technical questions regarding the Request for Proposal if they are submitted in writing. CRC will then return written answers to all of the bidders, along with a copy of the original questions.

A CRC technical group composed of industry representatives will evaluate your proposal. CRC reserves the right to accept or reject any or all proposals.

The reporting requirements will be monthly progress reports and a summary technical report at the end of the contractual period. The reporting requirements are described in more detail in the attachment entitled "Reports" (Exhibit B).

The proposal must be submitted as two separate documents. The technical approach to the problem will be described in part one, and a cost breakdown that is priced by task will be described in part two. The cost proposal document should include all costs associated with conducting the proposed program. The technical proposal shall not be longer than 10 pages in length.

CRC expects to negotiate a cost-plus fixed fee or cost reimbursement contract for the research program.

Contract language for intellectual property and liability clauses is presented in Exhibit C and in Exhibit D, respectively.

Important selection factors to be taken into account are listed in Exhibit E. CRC evaluation procedures require the technical group to complete a thorough technical evaluation before considering costs. After developing a recommendation based on technical considerations, the costs are revealed and the recommendation is modified as needed.

Electronic copies of the technical and cost proposals should be submitted to:

Dr. Chris Tennant
Coordinating Research Council
5755 North Point Parkway, Suite 265
Alpharetta, GA 30022

Phone: 678-795-0506
Fax: 678-795-0509
E-mail: ctennant@crcao.org

The deadline for receipt of your proposal is **August 28, 2017**.

Yours truly,

Chris Tennant
Deputy Director

EXHIBIT A

Statement of Work - Request for Proposal

CRC Project E-101

Hager Environmental & Atmospheric Technologies (HEAT) and Denver University (DU) Remote Sensing Device (RSD) Data Mining

Background

An on-road emission tailpipe survey was conducted by CRC participants using the HEAT emissions data and reporting (EDAR) system and the DU fuel efficiency automobile test (FEAT) system in fall 2016. While these two systems differ greatly in how they operate, they measure the same pollutants. Performing data comparisons will provide further confidence to support the notion of low vehicle emissions across the fleet as well as provide an assessment of the two data sources.

Objectives

Analyze the two data sets from the collected vehicle emissions measurements from Chicago during September 2016.

Materials and Methods

Using the databases from HEAT (E-119) and DU (E-106), the contractor will analyze the tailpipe emissions results for CO, CO₂, NO, and HC from the two data sources to determine if they are statistically similar using a 95% confidence level. The DU dataset will be truncated to contain data that was gathered only when EDAR was also gathering data. Tailpipe emissions will be analyzed by comparing the matched EDAR and truncated DU datasets as well as comparing individual vehicles that were measured multiple times by both systems. Once the datasets have been analyzed, the results will be segmented by vehicle emissions certification levels (SULEV 30, Tier2Bin5, etc) to explore the detection capabilities at varying emission rates. If any of the above analysis fails to meet the 95% confidence level, the contractor will report at what confidence level the comparison between EDAR and DU data is statistically similar. In addition to determining similarity, the contractor will report the mean, median, & standard deviation for each emission for each dataset as described above.

In addition to the tailpipe emissions, the contractor will also analyze the frequency of missed sample events and the fraction of high emitting vehicles for 2005MY and newer between the DU and HEAT datasets. The classification of high emitting vehicles guidance can be provided by the databases. For example, high emitters could be defined by emission measurements that are greater than the standard deviation from the mean or emission measurements that are greater than the certified emissions for that vehicle. CRC is open to suggestions from the contractor.

The contractor will observe and analyze the speed and acceleration data collected by EDAR and FEAT to assess whether the differences are statistically significant.

Ultimately the goal of this project is to compare as many areas in the list below between EDAR and FEAT as possible. CRC is open to suggestions from the contractor if the contractor believes the methods described above are not ideal to answer the questions below.

1. How well do the measured emissions compare?
 - a. How does this comparison vary across vehicle types and emissions levels?
2. How well can the two measurement systems detect classes of vehicles; such as high emitters?
3. How do the measurement variabilities of the two systems compare?
4. How well can the systems measure at low levels? What is the limit of detection?
5. What is the fraction of valid readings for both systems?
6. How well do the systems record vehicle speed and acceleration?
7. How effectively can the systems cover a range of vehicle specific power bins (as used in EPAs MOVES model)?

The report will describe the measurement systems used as described by HEAT and DU, but will *not* identify which system produced which results (e.g. results will be blinded as 'A' and 'B'). Comparisons will be limited to only the measurements reported by both systems to avoid revealing the source. The report shall not make any value judgments about which answer is 'correct' or which system is better than the other.

EXHIBIT B

REPORTS

MONTHLY TECHNICAL PROGRESS REPORTS

The contractor shall submit a monthly technical progress report covering work accomplished during each calendar month of the contract performance. An electronic Microsoft® Word compatible file (<1 MB) of the monthly technical progress report shall be distributed by the contractor within ten (10) calendar days after the end of each reporting period. The report shall contain a description of overall progress, plus a separate description for each task or other logical segment of work on which effort was expended during the reporting period.

FINAL REPORT

The contractor shall submit to or distribute for CRC an electronic pdf-compatible copy transmittable via email) of a rough draft of a final report within thirty (30) days after completion of the technical effort specified in the contract. The report shall document, in detail, the test program and all of the work performed under the contract. The report shall include tables, graphs, diagrams, curves, sketches, photographs and drawings in sufficient detail to comprehensively explain the test program and results achieved under the contract. The report shall be complete in itself and contain no reference, directly or indirectly, to the monthly report(s).

Within thirty (30) days after receipt of the approved draft copy of the final report, the contractor shall make the requested changes and deliver to CRC thirty (30) hardcopies including a reproducible master copy of the final report. The final report shall also be submitted as an electronic copy in a pdf or pdf-convertible file format. The final report may be prepared using the contractor's standard format, acknowledging author and sponsors. An outside CRC cover page will be provided by CRC. The electronic copy will be made available for posting on the CRC website.

EXHIBIT C

INTELLECTUAL PROPERTY RIGHTS

Title to all inventions, improvements, and data, hereinafter, collectively referred to as (“Inventions”), whether or not patentable, resulting from the performance of work under this Agreement shall be assigned to CRC. Contractor X shall promptly disclose to CRC any Invention which is made or conceived by Contractor X, its employees, agents, or representatives, either alone or jointly with others, during the term of this agreement, which result from the performance of work under this agreement, or are a result of confidential information provided to Contractor X by CRC or its Participants. Contractor X agrees to assign to CRC the entire right, title, and interest in and to any and all such Inventions, and to execute and cause its employees or representatives to execute such documents as may be required to file applications and to obtain patents covering such Inventions in CRC’s name or in the name of CRC’s Participants or nominees. At CRC’s expense, Contractor X shall provide reasonable assistance to CRC or its designee in obtaining patents on such Inventions.

To the extent that a CRC member makes available any of its intellectual property (including but not limited to patents, patent applications, copyrighted material, trade secrets, or trademarks) to Contractor X, Contractor X shall have only a limited license to such intellectual property for the sole purpose of performing work pursuant to this Agreement and shall have no other right or license, express or implied, or by estoppel. To the extent a CRC member contributes materials, tangible items, or information for use in the project, Contractor X acknowledges that it obtains only the right to use the materials, items, or information supplied for the purposes of performing the work provided for in this Agreement, and obtains no rights to copy, distribute, disclose, make, use, sell or offer to sell such materials or items outside of the performance of this Agreement.

EXHIBIT D

LIABILITY

It is agreed and understood that _____ is acting as an independent contractor in the performance of any and all work hereunder and, as such, has control over the performance of such work. _____ agrees to indemnify and defend CRC from and against any and all liabilities, claims, and expenses incident thereto (including, for example, reasonable attorneys' fees) which CRC may hereafter incur, become responsible for or pay out as a result of death or bodily injury to any person or destruction or damage to any property, caused, in whole or in part, by _____'s performance of, or failure to perform, the work hereunder or any other act of omission in connection therewith.

EXHIBIT E

PROPOSAL EVALUATION CRITERIA

- 1) Merits of proposed technical approach.
- 2) Previous performance on related research studies.
- 3) Personnel available for proposed study – related experience.
- 4) Timeliness of study completion.
- 5) Cost.