PROPOSED

State of California
AIR RESOURCES BOARD

**IDENTIFY OUTLIER MAKES AND MODELS OF LIGHT-DUTY VEHICLES
USING REMOTE SENSING DATA**

RESEARCH PROPOSAL

Resolution 18-6

March 22, 2018

Agenda Item No.: 18-2-3

WHEREAS, the California Air Resources Board (CARB or Board) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 17RD014, titled "Identify Outlier Makes and Models of Light Duty Vehicles Using Remote Sensing Data," has been submitted by Eastern Research Group for a total amount not to exceed $74,975;

WHEREAS, the Research Division staff has reviewed Proposal Number 17RD014 and finds that in accordance with Health and Safety Code section 39701, the results of this study will characterize fleet emission rates of light-duty vehicles using remote sensing data; and identify vehicles that have higher than average emissions for carbon monoxide, hydrocarbon, and oxides of nitrogen; and

WHEREAS, in accordance with Health and Safety Code section 39705, the Research Screening Committee has reviewed and recommends funding the Research Proposal.

NOW, THEREFORE BE IT RESOLVED, that CARB, pursuant to the authority granted by Health and Safety Code section 39700 through 39705, hereby accepts the recommendations of the Research Screening Committee and staff and approves the Research Proposal.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the Research Proposal as further described in Attachment A, in an amount not to exceed $74,975.

Resolution 18-6

March 22, 2018

<u>Identification of Attachments to Board Resolution 18-6</u>

Attachment A:
"Identify Outlier Makes and Models of Light Duty Vehicles Using Remote Sensing Data"
Summary and Budget Summary

ATTACHMENT A

**"Identify Outlier Makes and Models of Light-Duty Vehicles Using
Remote Sensing Data"**

Background
The recent discovery of high-emitting vehicles exposed that certain vehicle makes and models are using defeat devices to cheat certification tests but produce higher emissions during real-world driving. This discovery questions whether there are other vehicle makes and models exhibiting similar high-emitting behavior in the real world, and whether this behavior is a widespread problem in the light-duty vehicle fleet. Remote-sensing measurements are part of the state Inspection and Maintenance (I/M) programs in Colorado, and the Colorado Department of Public Health & Environment (CDPHE) has acquired millions of emission measurements from in-use light-duty vehicles. Previous analysis contracted out by the U.S. EPA focused on the data for the calendar years 2009 – 2015. The analysis covered over 3 million unique vehicles having over 40 million valid records, and found possible high emitting candidates and groups. However, the most recent data (January 2016 to June 2017) are not yet analyzed.

Objective
Using remote-sensing measurement records, the objectives of this project are to characterize LDV fleet emission rates and to identify high-emitting vehicles by make, model, engine size, fuel type, and model year.

Methods
The Contractor will obtain the remote-sensing measurement data for carbon monoxide (CO, hydrocarbon (HC), and oxides of nitrogen (NO_X) from CDPHE for 2016 and 2017. The Contractor will evaluate the data quality through their QA/QC procedures and characterize the vehicles by make, model, model year, engine size, and fuel type. The Contractor will investigate emission trends for relatively new vehicles whose emissions should not yet show significant evidence of deterioration and identify any types of vehicles with unexpectedly high emissions.

Expected Results
The Contractor will provide information for vehicles (grouped by make, model, model year, displacement, and fuel type) that have average or higher than average emissions for CO, HCs, and NO_X. Any vehicles with higher emissions than expected will be further investigated with a consideration of vehicle age, use patterns, and others. ERG proposes to provide CARB with a comprehensive technical report documenting the initial data assessments, analysis and comparisons, and preparation of a final data file.

Significance to the Board
Emission characteristics of relatively new vehicles with insignificant emission deterioration are expected to be similar in different states. Therefore, the results from this project will help the State of California to identify light-duty vehicle makes and models exhibiting high emissions during real-world driving.

Contractor:
Eastern Research Group, Inc.

Contract Period:
24 months

Principal Investigators (PI):
Sandeep Kishan
Cindy Palacios
Dr. Jim Lindner

Contract Amount:
$74,975

Basis for Indirect Cost Rate:
Eastern Research Group has listed a fully loaded rate.

Past Experience with this Principal Investigator:
Key staff of this project had extensive experience in extracting information from large datasets, including the CDPHE on-road dataset. ERG has been supporting CARB for more than 15 years to develop mobile source inventory tools.

Prior Research Division Funding to Eastern Research Group, Inc.:

Year	2017	2016	2015
Funding	$ 0	$ 0	$ 0

BUDGET SUMMARY

Contractor: Eastern Research Group, Inc.

Identify Outlier Makes and Models of Light Duty Vehicles Using Remote Sensing Data

Description of Services	Total Cost for Each Task
Task 1 – Data Acquisition and Research Plan – The Contractor shall acquire the most recent remote sensing data (Jan 2016 to Jun 2017) from CDPHE, and create a fully developed research plan.	$ 9,925
Task 2 – Remote Sensing Data Analysis – The Contractor shall analyze CDPHE's remote sensing data for high emitters of gaseous pollutants for Tier 2 LDV/LDTs. The Contractor must submit a progress report every quarter, using ARB designated template – Exhibit A, Attachment 2 – Progress Report Template.	$ 54,504
Task 3 – Draft and Final Reports – The Contractor shall prepare and submit a draft for approval. Then, the contractor will complete a revised and submit.	$ 10,546
Total Cost Offer (Tasks 1-3)	**$ 74,975**