



Caltrans Division of Research,  
Innovation and System Information

# Research

# Notes

Advanced  
Research

JULY 2015

Project Title:  
Vehicle Infrastructure Integration

Task Number: 2911

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## Evaluating Deployability of Cooperative Adaptive Cruise Control

Evaluate the specific effects of Cooperative Adaptive Cruise Control (CACC) and its on traffic flow smoothness and capacity.

### WHAT IS THE NEED?

Cooperative adaptive cruise control (CACC) is an enhancement to commercially available automotive adaptive cruise control (ACC) systems that enables them to operate at shorter headways, increasing traffic flow capacity and providing a smoothing of traffic flow dynamics. This project is evaluating the specific effects that this could have on traffic flow smoothness and capacity so that its benefits to traffic operations can be estimated and its deployment feasibility can be assessed.

This proposal covers research that is intended to be conducted in coordination with the research project, "Using Cooperative ACC to Form High-Performance Vehicle Streams", which the Federal Highway Administration's (FHWA) Exploratory Advanced Research Program (EARP) has funded at the California PATH Program of the University of California, Berkeley.

The task represents state cost sharing to match the federal funds provided by the FHWA EARP, so the task has been numbered to fit within the numbering scheme of the tasks in the federally funded project.

### WHAT ARE WE DOING?

Work under this task will evaluate the CACC operational alternatives under diverse conditions, identifying their effects on traffic flow and efficiency.

Task specifics cover the simulation of models developed under the federally funded part of the project. Work will cover the evaluation of calibrated and validated alternative maneuvering protocols and merge coordination strategies for a range of traffic volumes and traffic flow patterns.

The simulation models will be used to evaluate the trends in terms of energy consumption, traffic flow capacity and stability as a function of market penetration for the different classes of vehicles conventional manually driven, ACC, CACC, and Vehicle Awareness

These results will be used to determine the relative deployment feasibility of the different alternatives.



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## WHAT IS OUR GOAL?

The end goal of this task is evaluate the CACC operational alternatives under diverse conditions

## WHAT IS THE BENEFIT?

CACC systems will not only smooth out the traffic patterns it will also help the drivers in driving with added safety, reduce fuel consumption, and overall reduce their carbon footprint.

## WHAT IS THE PROGRESS TO DATE?

Work is already underway under a current federally funded project titled "Using Cooperative ACC to Form High-Performance Vehicle Streams", which the FHWA EARP has funded at the California PATH Program of the University of California, Berkeley.

The work completed under this task represents state cost sharing to match the federal funds provided by the FHWA EARP.