Caltrans Autonomous Vehicles Industry Survey of Transportation Infrastructure Needs

What transportation infrastructure improvements or modifications are needed to improve AV performance

WHAT IS THE NEED?

As Automated Vehicles (AV) continue to advance from research towards deployment, many optimists in the AV industry predict that fully automated vehicles will be introduced to public roadways by 2025 or even earlier. However, there are variety of open questions and issues that need research, planning, and resolution at State and local transportation agencies to enable successful broad deployment of AV. A key question among these is “what transportation infrastructure improvements or modifications are needed to improve AV performance?”

Several AV companies have reported that certain aspects of in transportation infrastructure (e.g., poor pavement markings, poor sign visibility, unexpected lane closures, etc.) are impacting the reliability of AV systems being tested on public roads. At the same time, California is looking to modify/improve roadways so that they can accommodate the vehicles of the future. However, currently there is very limited dialog occurring between the AV industry and infrastructure owner operators to ensure that AV needs are being factored in to infrastructure design plans.

WHAT ARE WE DOING?

This task will facilitate meaningful communication between the government agencies and the AV industry. A survey will be designed and conducted by inviting various AV industry players. Based on the survey results, selected AV companies will be interviewed. The purpose of the interviews will be to have in depth dialog with the AV companies in a private, one on one setting on what modifications or improvements they would most desire to improve the performance and reliability of automated vehicles.
The topics to be discussed will range from basic infrastructure features such as striping and signage to more advanced topics such as availability of real time information on road conditions, digital mapping, vehicle to roadside communication infrastructure and use of dedicated facilities for AV operations. The findings of the interviews will be summarized in a report. The final version of the report will be shared with Caltrans and other interested departments like Department of Motor Vehicles, California Highway Patrol etc.

WHAT IS OUR GOAL?

The end goal of this task is to find out what is infrastructure modifications are needed to safely operate AV on the state highway system.

WHAT IS THE BENEFIT?

Caltrans will find out recommendations from key AV industry players to be considered as related to making changes or improvements to the state highway infrastructure to enhance AV operations. The recommendations will be grouped into high, medium and low priority. These recommendations will help Caltrans in future planning and policy formation on infrastructure improvements relating to AV.

WHAT IS THE PROGRESS TO DATE?

To collect as many survey responses as possible, the team continuously sent emails to the AV companies, to persuade them about the mutual benefits of providing their feedback. In order to keep the project on schedule, the survey was concluded in the middle of July.

As a summary, starting from the beginning of launching the survey in May till the middle of July, the research team sent out four rounds of emails to the companies who had not yet responded. In total, they collected survey responses from 20 companies, including traditional car manufacturers, automotive suppliers, start-up AV companies focusing on passenger vehicles, start-up AV companies focusing on heavy-duty trucks, as well as start-up AV companies focusing on low-speed shuttles, and others. The survey respondents are highly representative of the important players in the AV industry. After completing the survey, the research team analyzed each survey response, which were used as the basis for the follow-up interviews.

The research team started contacting the survey respondents to schedule follow-up interviews. They developed the interview guide for each individual interviewee, based on their initial survey responses. Duration of each follow-up interview was about one hour. The interview was voice-recorded for transcription and further analysis after the interview. For some companies, it was not convenient to schedule a zoom-meeting interview. They provided written feedback to the follow-up questions based on their survey responses.

The interviews started in August and completed in September. In total, 8 companies participated in the interview, with 6 of them carried out in the zoom-meeting format and the remaining 2 provided written feedback.