DRISI

Caltrans Division of Research,
Innovation and System Information

Research Notes

Advanced
Research

Application Development for Connected Fleet

Develop Connected Vehicle (CV) applications
for improving safety

WHAT IS THE NEED?

Connected vehicles have significant advantages over new technologies which are now appearing in high-end vehicles, such as radar, lidar, cameras, and other sensors. CV technologies and applications have a greater range than on-board vehicle equipment, which will allow drivers to receive alerts of hazardous situations much earlier, providing more time to react and prevent crashes. Also, unlike radar, CV technology doesn't depend on "line of sight" communications to be effective. In situations when a driver is unable to see and is not aware of a dangerous situation developing ahead, there is a need to notify the drivers so they can have time to lower their speed or stop if needed. The applications developed under this task will provide such notifications. CV technology is also less expensive to install than radar and camera equipment in vehicles. This will enable it to become standard equipment in the future on practically all vehicles, not just luxury cars.

Furthermore, connected fleet vehicles are usually first on scene where lane(s) need to be closed due to work-zone or accidents. The applications developed under this task will provide tools for staff at the scene to gather information about the lane closure and to transmit this information from connected fleet vehicles to nearby connected vehicles using On Board Units (OBU) so that they are informed about the lane closure in time.

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WHAT ARE WE DOING?

The research team will work with Caltrans to identify use cases and select use cases with high potential to improve safety for the application development under this task. A system architecture will be developed in support of the application development.

The research team will develop connect fleet applications and test them first at Richmond Field Station (RFS) to ensure the hazard information transmitted from a fleet vehicle is compliant with Society of Automotive Engineers (SAE) J2735 message standard and is received and processed properly to provide hazard notification.

Proof-of-Concept testing will be conducted on public roadway with work zone and a demonstration will be provided at the close-out of this task.

WHAT IS OUR GOAL?

The goal of this task is to develop CV applications that go beyond the basic functions of Connected Fleet for Basic Safety Message (BSM) broadcasts and verification of the receipt of Signal Phase and Timing (SPaT), High Definition Maps (MAP), Radio Technical Commission for Maritime Services (RTCM) corrections, and other messages that are being broadcast from Roadside Units (RSUs).

WHAT IS THE BENEFIT?

Emergency vehicles and Caltrans maintenance vehicles are often first-to-arrive at areas that have safety concerns. The applications developed under this task can improve the safety of not only the fleet staff bus also travelers near the hazard areas.

WHAT IS THE PROGRESS TO DATE?

1) Project kickoff meeting was held on July 21, 2021.
2) Project was delayed due to COVID-19 and work from home policy which impeached the availability of the key personnel and access to testing vehicle and modeling tools needed for this project and increased workload on multiple active projects after returning to workplace.
3) A 1-year no-cost extension has been requested for this project.