DRISI
Caltrans Division of Research,
Innovation and System Information

Research Notes

Advanced Research

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Project Title:
Vehicle Infrastructure Integration

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Application Development For Connected Fleet

Develop Connected Vehicle (CV) applications for improving safety.

WHAT IS THE NEED?

Connected vehicles (CV) have significant advantages over new technologies which are now appearing in high-end vehicles, such as radar, light detection and ranging, 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.

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 research 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 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 CV to inform them about the lane closure.

WHAT ARE WE DOING?

The research team will work with California Department of Transportation (Caltrans) to identify and select use cases with high potential to improve safety for the application development. 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 to ensure the hazard information transmitted from a fleet vehicle is compliant with Society of Automotive Engineers 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.

WHAT IS OUR GOAL?

The goal is to develop CV applications that go beyond the basic functions of Connected Fleet for Basic Safety Message broadcasts and verification of the receipt of Signal Phase and Timing, MAP, Radio Technical Commission for Maritime Services corrections, and other messages that are being broadcast from Road-Side Units.

WHAT IS THE BENEFIT?

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

WHAT IS THE PROGRESS TO DATE?

This task is not yet on contract.