



Caltrans Division of Research,  
Innovation and System Information

# Research

# Notes

Transportation  
Safety and  
Mobility

MAY 2021

Project Title:  
Connected and Automated  
Vehicle (CAV) Application  
Development

Task Number: 3181

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## Improved Analysis Methodologies and Strategies for Complete Streets

Develop, analyze, and test improved strategies and analysis methodologies for complete streets to facilitate safe and effective mobility for all road users.

### WHAT IS THE NEED?

A complete street is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility. There is a need to research safe and effective facility designs and control strategies that facilitate the movements of all road users.

### WHAT ARE WE DOING?

The research team at the University of California at Berkeley (UCB) will develop and test improved strategies and analysis methodologies for complete streets (complete streets is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility), taking into consideration the emerging advances in technology on control devices and data availability from multiple sources.

Researchers at UCB will prepare a working paper that documents in detail the analysis methodologies for complete streets, the selected test sites and the data collection and analysis efforts.

Researchers will develop and test a bicycle signal priority system at one intersection in the California Connected Vehicle Test Bed in Palo Alto, California. They will integrate the bicycle signal priority with the existing transit signal priority and will conduct a proof-of-concept field test followed by a demonstration.



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The research team will also prepare and deliver a final report to Caltrans, describing the work performed and recommendations for implementation of the control strategies. They will also conduct a workshop to present the key findings and recommendations to Caltrans staff.

## WHAT IS OUR GOAL?

Our goal is to have researchers develop and test improved strategies and analysis methodologies for complete streets, taking into consideration the emerging advances in technology on control devices and data availability for multiple sources. The strategies and methodologies will be developed through analysis and simulation and will be field tested in real world complete street projects. Researchers will also develop and test a bicycle signal priority system at one intersection in the California Connected Vehicle Test Bed in Palo Alto, California. They will integrate the bicycle signal priority with the existing transit signal priority and a proof-of-concept field testing will be conducted at the selected intersection, followed by a demonstration at the completion of the test.

## WHAT IS THE BENEFIT?

Anticipated benefits of this research include an improved evaluation methodology for traffic performance of alternative designs for complete streets and development and testing signal control strategies that can improve the performance at signalized intersections for all users.

## WHAT IS THE PROGRESS TO DATE?

The quarterly progress meeting was held on November 22, 2020.

Market Street: simulation tests and sensitivity analyses were performed on the signal timing plans for busses and pedestrian/ bicycles.

Geary/O'Farrell streets: developed and tested additional transit signal priority strategies on the in San Francisco using the VISSIM microsimulation model.

A no-cost time extension to extend the end date for this task through June 30, 2021 is in place. Task 4 of the project (Testing and Evaluation) involves the field testing of a sensor for bicycle signal priority at an intersection in the El Camino test bed. The Sensor at the PATH testbed has been installed but due to COVID restrictions, the team has not been able to test if it works correctly. The PI expects more work on this to happen in March 2021.