DRISI
Caltrans Division of Research, Innovation and System Information

Research Notes

Improved Analysis Methodologies and Strategies for Complete Streets

Transportation Safety and Mobility

MAY 2020

Project Title:
Advanced Methodologies and Strategies for Complete Streets

Task Number: 3181

Start Date: February 11, 2019

Completion Date: August 11, 2020

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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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They will also prepare and deliver a final report to Caltrans, describing the work performed and recommendations for implementation of the control strategies. Researchers 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 devises 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?

Researchers conducted an additional literature review on pavement quality to develop a proposed pavement quality rating index for bicycles to replace the index used in existing methodologies, which is subjective and limited.

The following three main proposed analysis methodologies were developed by the researchers: 1. Add bicycle delay and traffic speed added to the Level of Service (LOS) score calculation. 2. Proposed pavement quality rating index is developed from expanded literature review. 3. Add separated bicycle facilities (e.g., cycle-tracks) to the street cross-section factor calculation.

Researchers developed and tested transit signal priority strategies on the Geary/O'Farrell streets in San Francisco using the VISSIM micro-simulation model. They also developed, in cooperation with the San Francisco Municipal Transportation Agency (SFMTA, signal timing plans for only busses and pedestrian/bicycles on Market Street in San Francisco, following the close to access of private cars on Market Street.

The next steps are for researchers to finalize the draft methodology for the analysis of complete streets. Install the sensor for the bicycle signal priority and prepare field test at the California test bed in El Camino Real. Begin preparing technical memorandum, and report.