Development of Active Transportation Safety Performance Functions in California

Develop or calibrate the Safety Performance Functions for enhancement of active transportation safety in California.

WHAT IS THE NEED?

Non-motorists refer to the road users who are not in or upon a motor vehicle, generally meaning walking pedestrians, bicyclists, individuals in wheelchairs or motorized personal conveyances, skateboarders and others. Non-motorists are a vulnerable segment of the traveling public due to the lack of protective structure and difference in body mass between them and motor vehicles, which renders them prone to heightened injury susceptibility in case of a collision. However, active transportation, such as walking and bicycling, provides enormous benefits for addressing traffic congestion, health and environment issues. Therefore, encouraging individuals to adopt active transportation involves a societal obligation to protect commuters as they engage in these modes of travel.

One of the most popular methods is to develop the safety performance functions (SPFs) as adopted by the Highway Safety Manual (HSM), which also includes three other major components: crash modification factors (CMFs), calibration factors, and crash proportions.

WHAT ARE WE DOING?

The proposed study consists of the following main activities:

- Determine the base conditions of SPFs based on the main design features of roadways, the resultant data sample size, and variable selection features associated with decision tree-based methods.

- Develop the basic SPFs and CMFs using typical regression methods, which can satisfy the engineering need such as benefit to cost ratio analysis for active transportation related infrastructure.
• Develop the enhanced SPFs and CMFs using more sophisticated statistical models for verification and comparison purpose.

• Evaluate the developed SPFs and CMFs from different perspectives.

WHAT IS OUR GOAL?

To achieve more accurate results from the HSM procedures, states have been encouraged to customize the procedures using local data. However, there is still a lack of accurate active transportation-related SPFs calibrated using local data. Therefore, the goal of this research is to develop or calibrate the SPFs for enhancement of active transportation safety in California.

WHAT IS THE BENEFIT?

The proposed study will generate the following benefits:

• Yield more accurate SPFs and CMFs associated with active transportation-related accidents, which helps California Department of Transportation (Caltrans) direct limited budget to the most improvement-needed areas of active-transportation infrastructure.

• Assist Caltrans in satisfying the goal to enhance active transportation activities while committing to Vision Zero.

• Shed extensive light on the understanding of the impact of various factors to active transportation for traffic safety practitioners.

• Raise awareness of safety among general public with more information about activity transportation safety issues.

• Contribute to the traffic safety community with insightful findings associated with active transportation which should draw extensive practical and research interests.

WHAT IS THE PROGRESS TO DATE?

This research is waiting to be executed.