Phase 3: Pedestrian Safety Improvement Program

To identify and address pedestrian safety problems in California with the goal to reduce fatalities and injuries.

WHAT IS THE NEED?

The Pedestrian Safety Improvement Program is an effort of the California Department of Transportation (Caltrans) to identify and address systemic problems regarding pedestrian safety in California, with the long-term goal of substantially reducing pedestrian fatalities and injuries.

While California has seen improvements in traffic safety compared to ten years ago, these gains disproportionately reflect improvements in safety of motorized modes. For example, while there was a nearly 10% decrease in overall traffic fatalities from 2007–2016, the gains were mostly realized for motorized modes (19% reduction in fatalities) but pedestrian deaths increased by 33%.

WHAT ARE WE DOING?

The techniques and tools developed in this study will help Caltrans to target highway improvements and countermeasures at locations more efficiently, which will lead to the greatest reduction in fatal and injury pedestrian collisions. To achieve this, the research team is conducting study to enhance the pedestrian exposure modeling process, develop pedestrian-specific Safety Performance Functions (SPFs), and develop new High Collision Concentration Locations (HCCL) identification and prioritization approaches.
WHAT IS OUR GOAL?

The proposed project has seven goals:

i. Develop enhancements to the pedestrian exposure modeling process
ii. Develop and incorporate a pedestrian corridor identification methodology
iii. Incorporate crash typology into prioritization of HCCLs
iv. Develop protocols for calibrating pedestrian exposure estimates in future years
v. Develop pedestrian-specific SPFs
vi. Incorporate exposure estimates into HCCL identification and prioritization
vii. Incorporate the new HCCL identification and prioritization techniques into the pedestrian safety monitoring report tool

WHAT IS THE BENEFIT?

This project represents an effort to enhance pedestrian safety and to refine the capabilities and resources needed to address the imbalance between pedestrians and motorized roadway users in California. The improvements to the pedestrian exposure modeling will allow Caltrans to perform more advanced safety analyses, involving risk. Pedestrian-specific SPFs will allow Caltrans to incorporate Empirical Bayes methods in their evaluation of pedestrian countermeasure effectiveness.

Furthermore, the crash typology and risk-based HCCL identification and prioritization techniques are intended to identify HCCLs more efficiently with the greatest potential of safety improvements and reduce the number of false positives. Pedestrian corridor identification is meant to identify groups of contiguous segments or intersections with similar features and safety problems that can be addressed systematically.

WHAT IS THE PROGRESS TO DATE?

The research team accomplished the following tasks:

• Worked with Caltrans to access new Geographic Information System data file with postmiles at 0.01-mile intervals. Began incorporating these data into the process to match intersections.
• Compared pattern recognition methodologies. Used simulation to begin exploring the pattern recognition methodologies, including direct diagnostic approach and the probability of specific crash types exceeding a threshold proportion.
• Continued work on location prediction and event summarization using automated text analysis techniques.
• Began exploring approaches to calibrating the pedestrian exposure model for future years.