DRISI
Caltrans Division of Research, Innovation and System Information

Research Results

Pedestrian Safety Improvement Program Phase 2

Develop a program to identify and address pedestrian safety problems in California, with the goal of reducing pedestrian fatalities and injuries.

Transportation Safety and Mobility

MAY 2019

Project Title:
Pedestrian Safety Improvement Program: Phase 2

Task Number: 2452

Start Date: October 1, 2015

Completion Date: January 31, 2018

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WHAT IS THE NEED?

Pedestrian volume data are important for safety analysis because they can be used as a basic measure of exposure at a specific location. Exposure, in this context, refers to the number of times pedestrians expose themselves to the potential hazard of automobile traffic by crossing a street and it serves as the denominator in the calculation of risk. For example, the risk of pedestrian crashes for people traveling along state highways can be estimated as the number of pedestrian crashes per million pedestrian crossings. Caltrans previously had only short-term counts at a limited number of state highway intersections.

In the absence of readily available pedestrian exposure data for the entire state highway system, it is important to develop crash frequency-based network screening methods for identifying pedestrian-specific high collision concentration locations (HCCLs).

WHAT WAS OUR GOAL?

The goal of this project was (i) to develop a pedestrian exposure model for intersections on the state highway system, (ii) enhance the network screening approaches for pedestrian HCCLs and (iii) enhance the pedestrian safety monitoring (PSMR) tool used to conduct the network screening for pedestrian crashes.

WHAT DID WE DO?

Caltrans, in partnership with the University of California, Berkeley Safe Transportation Research and Education Center identified a set tasks and activities to accomplish this research. For the pedestrian exposure model, the activities included: (i) compiling

short-term pedestrian counts collected throughout the state and normalizing into annual exposure estimates; (ii) collecting environmental attributes of the areas surrounding each short-term count site; (iii) developing a statistical model to predict annual exposure based on the environmental attributes; and (iv) applying the model to state highway intersection locations. For the network screening approaches, the activities included: (i) developing a pedestrian crash typology to help summarize HCCLs and assess any emerging trends associated with the dominance of specific crash types, and (ii) enhancing the capabilities of PSMR tool to provide improved querying options for network screening, and provide greater flexibility for importing both text and Excel-based crash data importing.

WHAT WAS THE OUTCOME?

We developed 2016 annual pedestrian exposure estimates for more than 12,000 intersections along the state highway system. The modifications to the PSMR tool made improvements to the HCCL identification process. In addition, a new tool, referred to as TSAR2XLS, now provides Caltrans the capability to input text-based files from TASAS Selective Accident Retrieval (TSAR) records and convert them into Excel files.

WHAT IS THE BENEFIT?

This research provides Caltrans with the first statewide estimates of pedestrian exposure, which will allow Caltrans to improve the quality of their pedestrian safety analyses by evaluating risk. In addition, the identification of a pedestrian crash typology allows alternative crash frequency-based HCCL identification methods to be applied which can evaluate the statistical significance of the presence/absence of specific crash types.

LEARN MORE

Review the complete report.

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IMAGES

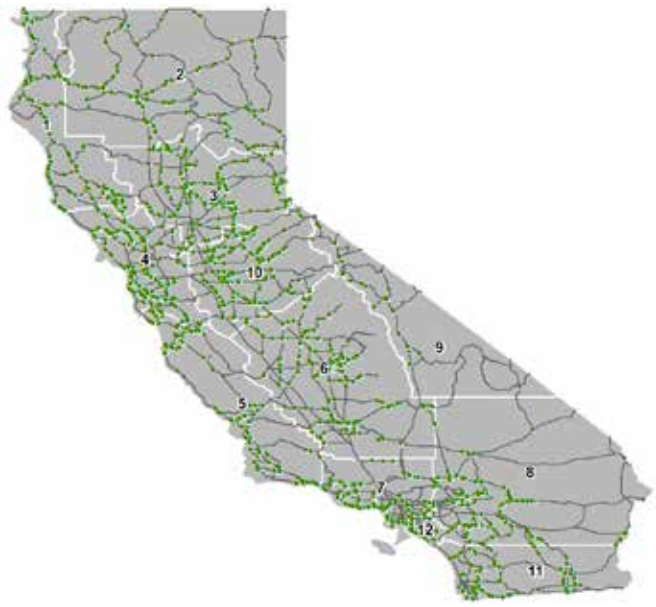

FIGURE 1: Final pedestrian exposure model scope – intersections with volume predictions