



Caltrans Division of Research,
Innovation and System Information

Research



Results



Transportation
Safety and
Mobility

JUNE 2013

Project Title:

Experimental Evaluation of the Continuous Risk Profile (CRP) Approach to the Current Caltrans Methodology for High Collision Concentration Location Identification

Task Number: 2192

Start Date: N/A

Completion Date: March 31, 2012

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Evaluating a New Methodology to Better Identify High-Collision Locations

Enhancing road safety with improved data analysis methods

WHAT IS THE NEED?

Caltrans routinely monitors traffic collisions on state roadways to identify locations that might require safety improvements. Determination is based on analyzing safety performance data using a sliding moving window (SMW) methodology. To ensure that this approach is the most effective at ascertaining high-collision locations, Caltrans surveyed the identified locations and noted that the SWM methodology has the potential to generate a high rate of false positives, resulting in some sites being unnecessarily identified for in-depth safety investigation.

To optimize the allocation of available resources and focus on sites that need safety improvements, Caltrans evaluated other methodologies and compared their accuracy to the SMW approach.

WHAT WAS OUR GOAL?

The goal was to perform a comparative analysis of current collision hot spot identification methodologies and to evaluate the newly developed continuous risk profile (CRP) methodology to reduce the number of false positive and false negative results.

WHAT DID WE DO?

Caltrans, in partnership with University of California, Berkeley Institute of Transportation Studies, compared the performance of three methods—sliding moving window, peak searching, and continuous risk profile—in terms of identifying locations with a high-collision rate. The researchers collected empirical data, including traffic collisions, traffic volume, and road characteristics. The empirical comparisons were conducted for 10 routes spanning 473 miles across eight Caltrans districts. They also compared the methodologies by simulating a



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representative California route with true hot spots. As part of this project, the team developed and tested the web-based California Safety Analyst (CASA) tool to assist traffic safety engineers in managing and improving road safety in their jurisdictions. CASA performs network screening using all three methods. Users can select a route on a map and perform the analysis to identify hot spots on the entire route or on selected sections.

WHAT WAS THE OUTCOME?

The three methods performed similarly in terms of false negatives—“not identifying true hot spots. However, the CRP method was more effective than the other methods at not falsely identifying a site as a hot spot when it was not. The CRP method is also able to track the collision profile of simulated crashes along a representative California highway.

The results of a survey of 98 Caltrans road safety professionals from 10 different districts indicated that using a web-based tool such as CASA could enhance overall productivity.

WHAT IS THE BENEFIT?

By implementing the CRP method, Caltrans can optimize the resources spent on investigating falsely identified locations by focusing on improving true high-collision locations. The CASA tool helps traffic safety engineers perform their functions more efficiently.

LEARN MORE

To view the complete report:
www.dot.ca.gov/research/researchreports/reports/2012/2012-03_task_2192-tsm.pdf

IMAGES



Figure 1: CASA helps traffic safety engineers analyze roadway safety.