Research to Develop Performance Measures for Maintenance of Roadside Features

Performing research on maintenance operations to develop a risk index tool.

WHAT IS THE NEED?

Currently there are no proper operational performance metrics that can be used to evaluate the safety risks to highway workers in prioritizing and scheduling maintenance operations. There is a need to develop a risk index for comparing operational safety risks for different relevant maintenance functions based on associated parameters, such as time of operation, location, road geometry, traffic counts, and type of operation. Such metrics or index can then be used to plan, prioritize, and schedule maintenance operations to increase the efficiency of maintenance operations, and improve the safety of highway workers and traveling public.

WHAT ARE WE DOING?

The research team will evaluate a list of maintenance operations and develop a risk index tool that can be used to identify the parameters that affect the risks associated with specific maintenance operations. This task involves providing a technical evaluation of maintenance activities, capturing the experiences of California Department of Transportation (Caltrans) maintenance personnel who are involved in operations, installation, and maintenance of roadside features; and evaluating the databases related to work zone accidents to determine the factors that cause injuries to highway workers.
WHAT IS OUR GOAL?
The goal is to improve efficiency of maintenance operations and improve the safety of highway workers and traveling public.

WHAT IS THE BENEFIT?
The benefits of this research are anticipated to include identification of factors that affect the risks associated with specific maintenance operations, which can help improve the safety of highway workers and traveling public.

WHAT IS THE PROGRESS TO DATE?
Maintenance work functions were identified, and a list of family function groups were obtained. Employee counts data for each maintenance work function was analyzed to show a comparison of crew members needed among each family group and how they change over time for years 2013 to 2019.

Data for year 2013 was analyzed to show distribution of maintenance work orders by districts and counties, identified maintenance activities in each district and average man hours by activity. The total cost for each activity was calculated using Labor, Equipment, Materials, and Other dataset.

Data from Statewide Integrated Traffic Records System, Work Zone Accidents database, and Lane Closure data was analyzed, which helped provide information such as number of collisions by the time of day, day of the week, population, road surface condition, weather condition, and lighting condition etc. Maintenance activities that resulted in the greatest number of collisions from 2013 to 2018 were also identified.

A survey of maintenance managers from all Caltrans Districts was conducted to help improve the design of index tool for estimating and predicting the risk of injury and level of difficulty associated with each maintenance activity. Plan to perform statistical analysis of the data.