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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION

Research Results

Roadside Safety Performance Measures for Specific Countermeasures to Protect Workers

This project developed draft engineering memos for specific safety recommendations.

Design

AUGUST 2024

Project Title:
Roadside Safety Performance Measures for Specific Countermeasures to Protect Workers

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WHAT WAS THE NEED?

The previously completed research project (Task ID 2761) developed a number of recommendations related to roadside features such as hardscape, which if implemented, are expected to enhance worker safety. There was a need to prioritize the list of recommendations and create draft guidance documents (such as draft engineering memos) that would provide templates for Caltrans Divisions of Maintenance and Design to use to update their Maintenance and Highway Design Manuals, and thus realize these safety benefits.

WHAT WAS OUR GOAL?

The goal of this project was to develop draft engineering memos for key safety recommendations and help Caltrans incorporate the selected safety recommendations into appropriate manuals, with the goal of enhancing worker safety.

WHAT DID WE DO?

In this project, researchers from the Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center, UC Davis revisited the list of safety recommendations identified in the previous research (Task ID 2761 "Performance Measures for Roadside Features") and developed an updated list of potential safety recommendations. This list was presented to the Caltrans project panel, and further input was solicited. Researchers worked with the project panel and developed a prioritized list. The AHMCT researchers discussed each topic with the panel to develop a clearer understanding of the issues, developed survey questions and conducted surveys of Caltrans

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maintenance managers from Caltrans districts (regarding these topics), and developed draft engineering memos for these topics. These draft engineering memos can be used by Caltrans Maintenance or Design as templates for updating their appropriate manuals. In several cases, a supplemental decision support tool was also developed by AHMCT to support the engineering memos or provide a useful tool to aid implementation.

WHAT WAS THE OUTCOME?

The key deliverables of this project are draft engineering memos for topics including 1) Develop Landscape Maintenance Practices Based on Weather, Conservation, and Climate Change, 2) Develop Additional Training to Keep Up with Existing Policies (e.g., Drought Guidance Is Changing Landscaping), 3) Identify Locations of Guardrails with Aesthetic Treatment, then Outline Expectations for Replacement and Installation, 4) Convert Metal Beam Guardrail Locations into Concrete Barriers to Reduce Maintenance Effort and Staff Exposure (While Ensuring this Approach Is Safe for End Users), 5) Utilize "Quick Change" from Districts 4 and 5, Including Support Sleeves and Posts, 6) Consider Pole Maintenance Issues in Non-Fire Areas (e.g., Gore Areas). Wooden Poles Must Be Completely Dug Out from the Ground to Replace, while Steel Pole Can Be Replaced by Removing and Replacing a Couple of Rivets, and 7) Install Metal Guardrail and Sign Posts Based on Fire Danger Rating Map (While Ensuring this Approach Is Safe for End Users).

For some of these topics, multiple draft engineering memos were developed. These draft engineering memos can be used by Caltrans Maintenance or Design to develop formal memos and manual updates that can improve the safety for roadside maintenance workers. As a side benefit, AHMCT also developed decision support tools (including flood map, sea level rise map, and fire danger map) to assist Caltrans managers in making decisions related to these engineering memos.

WHAT IS THE BENEFIT?

The engineering memos developed in this project will help facilitate the efforts of Design and Maintenance to incorporate the specific countermeasures into their Maintenance and Highway Design Manuals to improve worker safety.

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