

Design

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Project Title:
Development of a Maintenance
Prioritization Assessment and Safety
Tool

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2023

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Development of a Maintenance Prioritization Assessment and Safety Tool

The goal of this research project is to develop a maintenance task analysis and safety index tool

WHAT IS THE NEED?

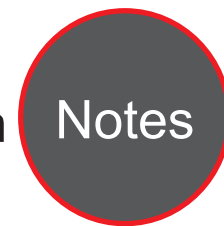
There is a need to develop operational performance metrics that can be used to evaluate the safety risks to highway workers in prioritizing and scheduling of maintenance operations. This research project plans to develop a maintenance planning dashboard that can be used by the maintenance personnel for planning and scheduling of their maintenance work activities, by providing detailed data to help determine the difficulty of a maintenance work activity and risk of collision to maintenance workers.

WHAT ARE WE DOING?

This research task plans to integrate data from relevant data sources and develop a maintenance planning dashboard (maintenance task analysis and safety index tool) that will help determine the difficulty of operations and associated collision risks for a particular highway maintenance task and location. The maintenance planning dashboard will support easier identification and input of the most pertinent parameters to determine the difficulty and collision risk index. The easier calculation of difficulty and collision risk indices can help Caltrans use objective data and measures for decision-making in planning and scheduling of maintenance operations. The results can be used in allocating resources in terms of personnel and equipment, considering additional safety measures, and deciding if and what type of lane closure is necessary in order to reduce the risk of collision and injury potential to personnel and roadside workers.



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WHAT IS OUR GOAL?

The goal of this research project is to develop a maintenance planning dashboard that will help maintenance personnel identify risks associated with a work task so that maintenance can develop protective measures based on the risks. For example, using a barrier truck, lane closure, or shoulder closure, etc. The dashboard will also help design personnel identify risks associated with work areas so they can develop corrective measures based on the risks. For example, widening shoulders, installing maintenance vehicle pull-outs, relocating roadside hardware etc.

WHAT IS THE BENEFIT?

The maintenance planning dashboard developed in this project will help improve the safety and efficiency for highway workers and traveling public by identifying additional countermeasures needed for planned maintenance work activities, based on location, type of activity, and accident data.

WHAT IS THE PROGRESS TO DATE?

The kick-off meeting for this project was held on January 6, 2022.

A project panel was formed. The research team reviewed work from previous phases to inform algorithmic design of maintenance planning dashboard backend. The research team also created a user interface mock-up.

On April 7, 2022, a project panel meeting was held. The research team has setup development/prototype host and the initial back-end implementation is in progress.

On July 7, 2022, a project panel meeting was held. The research team has developed an initial version of difficulty and risk calculation modules.

On October 18, 2022 and January 27, 2023, project panel meetings were held. Contractor migrated the current prototype maintenance planning dashboard backend code to the Spring Boot (open-source application development) platform. Contractor has developed the initial (nonprototype) version of front-end user interface and made various enhancements, including support for color-coded results.