



Caltrans Division of Research,  
Innovation and System Information

# Research

# Notes

Maintenance

FEBRUARY 2022

Project Title:  
Evaluation of Heavy Equipment  
Simulator Systems

Task Number: 3833

Start Date: April 1, 2021

Completion Date: September 30,  
2022

Task Manager:  
Haniel Chung  
Transportation Engineer (Electrical)  
haniel.chung@dot.ca.gov

## Evaluation of Heavy Equipment Simulator Systems

Provide the best available training to heavy equipment operators using simulators.

### WHAT IS THE NEED?

California Department of Transportation (Caltrans) needs to provide the best available training to its Maintenance personnel, particularly those operating heavy equipment. Equipment availability for training is often limited, especially in remote areas of the Districts. In addition, in the early stages of training, it may be inappropriate for trainees to operate actual heavy equipment. Caltrans would benefit from state-of-the-art heavy equipment simulators to support training efforts at the Maintenance Equipment Training Academy (META) and in the Districts.

### WHAT ARE WE DOING?

This research would procure up to two heavy equipment simulators and evaluate the applicability and benefits of these simulators for Caltrans' training use. This will be accomplished by partnering Caltrans trainers at the META to develop a prototype training plan for the equipment operators. The challenges and successes of the effort will be documented by monitoring the training progress and obtaining feedback from trainer and operator surveys. The results will be compiled in a report to help Caltrans' business operations regarding how best to implement simulators for training purposes.

### WHAT IS OUR GOAL?

The goal is to revamp Caltrans' training efforts and thereby improve staff skills at operating heavy equipment by obtaining one or two heavy equipment simulators. This equipment will be evaluated to determine the value and efficiency they bring to Caltrans' training efforts. The end products are a final report



DRISI provides solutions and  
knowledge that improves  
California's transportation system

summarizing the effort that will be used in decision making and one or two equipment simulators that Caltrans can keep if desired.

## WHAT IS THE BENEFIT?

It's anticipated that this research will lead to safer and more effective training, leading to safer maintenance operations. This research will also confirm whether heavy equipment simulators bring value and efficiency to the operator training programs. This will lead to reduced training costs and better/faster/safer outcomes in Maintenance operations as more staff are better trained to do their jobs correctly.

## WHAT IS THE PROGRESS TO DATE?

To date, a total of two systems have been acquired. The systems consist of a base unit with a computing system, monitors, and input controllers (Image 1). The simulators have been delivered and successfully installed at the META.

Our research team has developed a training plan after getting extensive feedbacks from the Caltrans staff.

We have evaluated the feasibility to transport the simulators to various Caltrans Districts with existing transport equipment at Caltrans (including forklifts, trailers, trucks).

A decision tool has been developed to analyze the most cost efficient and accurate way to plan for operators training on the simulators.

Next steps:

A completed training plan and cost-benefit analysis for operators training will be presented to Caltrans staff.

## IMAGES



JohnDeereSimulators.com

Image 1: JohnDeereSimulators.com



Image 2: Catsimulators.com