

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

TRANSFORMING IDEAS INTO SOLUTIONS

Research

Results

Maintenance

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Project Title:

Evaluation of Heavy Equipment Simulator Systems

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Evaluation of Heavy Equipment Simulator Systems

Provide the best available training to heavy equipment operators using simulators

WHAT WAS THE NEED?

California Department of Transportation (Caltrans) needed 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.

WHAT WAS OUR GOAL?

The goal was to revamp Caltrans' training efforts and thereby improve staff skills at operating heavy equipment by obtaining one or two heavy equipment simulators. This equipment was evaluated to determine the value and efficiency they bring to Caltrans' training efforts. The end products were a final report summarizing the evaluation effort that will be used in decision making and two equipment simulators that Caltrans will keep.

WHAT DID WE DO?

The Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center procured two heavy equipment simulators and evaluated the applicability and benefits of these simulators for Caltrans' training purposes. Specifically, the transport and use of equipment in a traveling training scenario was analyzed. First, AHMCT co-developed training plans (e.g., how much training is needed over what time period for initial training) to evaluate simulators for Caltrans staff. Second, the mobility of simulators was analyzed for possible transport across districts. Third, traveling training scenarios were developed and analyzed with regards to feasibility and cost-benefits.



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WHAT WAS THE OUTCOME?

This research determined the State-of-the-art heavy equipment simulators proved to be feasible for Caltrans to use as a training tool. Training plan templates were developed for new employee training with simulators, including a self-guided training plan.

Cost-benefit analysis of simulator use versus real equipment use showed much lower ownership and operating costs for the simulators. Cost-benefit analysis of stationary simulator use versus traveling simulator training showed that training at META with stationary simulators has the lowest cost per student if the students are local to META. If simulators are driven to a district and local students attend, the total costs and costs per student are very competitive. Flying in students to the training location increases the costs significantly so that the scenarios where local students are trained are the most cost-effective.

A new research project has been proposed to develop optimization of training on the Heavy Equipment Simulator Systems.

WHAT IS THE BENEFIT?

The research completed under this task will lead to safer and more effective training, leading to safer maintenance operations. This research can also help to reduce training costs and better/faster/safer outcomes in Maintenance operations as more staff are better trained to do their jobs correctly.

LEARN MORE

The final report has not yet been posted on the AHMCT website.

IMAGES

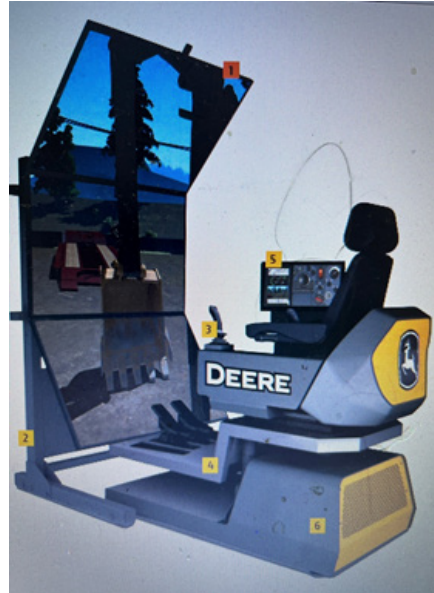


Image 1: John Deere Simulator System



Image 2: Cat Simulator System