



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Equipment

SEPTEMBER 2021

Project Title:
Snow and Ice Removal Strategies

Task Number: 3300

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2021

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Comparison of New and Existing Caltrans Hopper Body and Tailgate Sanders

Evaluate new technology sander/spreader equipment and conduct a comparison to existing Caltrans standard sander/spreader equipment.

WHAT IS THE NEED?

California Department of Transportation (Caltrans) continuously seeks new methods and equipment that can help increase the safety and efficiency of winter maintenance operations. Winter maintenance operations represent a significant challenge to the Department, and by implementing improved methods and equipment, Caltrans can realize operational and safety improvements, cost savings, and reduced environmental impacts.

The Department currently has several different types of sander/spreaders in the fleet. To determine the most efficient and cost-effective equipment to move forward with in the long-term, Caltrans needs quantifiable results via testing. The testing will compare a tailgate spreader, a standard V-box spreader, an Epoke spreader with directional cast, and a Henderson First Responder System (FRS) with Direct Cast.

WHAT ARE WE DOING?

Caltrans is working with the Advanced Highway Maintenance Construction Technology Research Center (AHMCT) at University of California, Davis to conduct this research task.

A research project panel will be developed as the first part of this research task to help guide this effort. Test methods will be developed to compare the sander/spreader equipment for consistency of spreading application and spreading rates under various situations. The controlled testing will collect data on all four sander/spreader types at three different speeds and spread rates.

The directional sander/spreaders will also have data collected for spreading on right lane, center lane, left lane, and all three lanes.



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AHMCT staff will observe existing sander/spreader operations and data will be collected to compare the four sander/spreaders for speed of operations, routes traveled, and frequency of spreading. The data from the controlled testing and the data from the sander/spreader operation observations will form the basis of this research evaluation.

This research task will attempt to answer the following research questions:

- How do the Epoke and the Henderson FRS sander/spreaders compare to the V-box and tailgate sander/spreaders in terms of spreading pattern?
- How do the Epoke and the Henderson FRS sander/spreaders compare to the V-box and tailgate sander/spreaders in terms of material usage?
- Are the Epoke and Henderson FRS sander/spreaders maintainable in Caltrans' winter maintenance operating environment?
- Do the performance improvements, if any, for the Epoke and Henderson FRS sander/spreaders merit any cost increase over the V-box and tailgate sander/spreaders?

The main deliverable for this research is a final report that documents all aspects of this research and will include results from the controlled testing, an equipment cost analysis, sander/spreader recommendations, and a related lifecycle winter maintenance cost analysis.

WHAT IS OUR GOAL?

The main goal of this research is to compare the four different types of sander/spreaders and determine the most efficient and cost-effective sander/spreader.

WHAT IS THE BENEFIT?

This research has the potential to reduce the material lost due to waste, speed up sanding/spreading operations, and reduce the

environmental impact associated with sanding/spreading operations.

WHAT IS THE PROGRESS TO DATE?

The first phase of testing was completed in December of 2018. The second phase of testing was unable to find a suitable test site, so research funds were used to construct a pavement section at a McClellan Park for testing. Construction of the pavement section was completed in October 2020. Vacuum systems are being designed for faster collection of spreading material.

The second phase of testing started in June 2021 and will continue until sometime around mid-September 2021. The researchers have completed testing on one of the sander spreaders and have made progress on a second machine. All four pieces of equipment will be tested. The data from these tests will be used to create a spread layout for each machine showing the density of material and how effective each machine is at spreading the material evenly across the roadway.

IMAGE



Pictured on top is the Henderson V-box sander/spreader, on bottom is the Epoke sander/spreader with directional cast.