Evaluate Remote Control Mowers for Roadside Management

Evaluating remote control mowers to enhance workers' safety in roadside vegetation control operations with an emphasis on steep sloped terrain.

WHAT IS THE NEED?

The California Department of Transportation (Caltrans) currently uses tractors and gang mowers to manage roadside grasses and vegetation. To prevent or reduce the severity of roadside fires, provide sight distance, and provide pleasing aesthetics requires proper vegetation control. In areas not accessible to mowers, workers on foot use string trimmers to complete the work, with associated risks from working on steep slopes with hand tools. Traditional vegetation control with tractors and gang mowers exposes employees to traffic and potential injury from mowing steep slopes due to rollovers. Reducing worker exposure to traffic and vehicle rollovers due to steep slope operations necessitates research into new, advanced technologies.

When new technology and equipment become available in various industries, Caltrans conducts reviews to determine if implementation could improve the safety and effectiveness in its operations. Therefore, confirming whether remote control mowing equipment increases employee safety requires further research and investigation. The Landscape Maintenance team plans to deploy remote control mowers to the districts, if the research findings show improvements of employees' safety.

WHAT ARE WE DOING?

The research involves evaluating remote control mower (RCM) systems to determine their ability to improve workers’ safety in roadside vegetation control operations. First, the research team conducts a detailed literature search on current RCMs and relatable applications successfully employed by highway maintenance agencies and private industry contractors. Next, the researchers develop test methods to measure maneuverability, mowing ability on steep slopes, and the remote control's effective range. In addition,
the researchers develop data acquisition approach with an intent of providing Caltrans with the ability to estimate mowing areas. Following the development of test methods, the development engineer observes RCM usage; RCM utilization and evaluation plan developments; and performs controlled testing of RCMs, which includes data gathering and operator interviews.

Caltrans requires all operators to receive training on all equipment. Therefore, the research includes reviewing current mowing training protocol at the Caltrans Maintenance Equipment Training Academy (META), and developing draft training plans that META can use to create a Caltrans RCM training plan and operating protocol. Also, the research entails developing a detailed cost/benefit analysis that includes an estimation of the benefits from the new RCM systems, as well as worker safety benefits quantified as dollar savings to Caltrans. Moreover, the cost analysis will compare all costs to those of a conventional mower, costs such as RCM system acquisition costs, ongoing maintenance costs, production rates, and anticipated system lifespan. A final report that encompasses the research findings will be presented to Caltrans, as a decision making tool for potential RCM implementation into Caltrans districts.

WHAT IS OUR GOAL?

The goal of this research is to evaluate Caltrans-acquired RCM systems to determine their ability to improve worker safety in roadside vegetation control operations. Ultimately, the research strives to eliminate or reduce worker exposure to traffic and steep slopes, and workers’ injury accidents while performing routine, roadside maintenance operations with the assistance of RCMs.

WHAT IS THE BENEFIT?

Implementing remote mowing equipment would immediately benefit and support Caltrans in improving business practices of enhancing worker safety. Furthermore, any organization involved in vegetation roadside maintenance operations could adopt the research developments into their practices, to receive the enhanced safety and efficiency benefits.

WHAT IS THE PROGRESS TO DATE?

The Advanced Highway Maintenance and Construction Technology (AHMCT) research team observed Caltrans personnel test, and use RCMs and tractor-based mowers along the I-80, SR-113, and I-5 freeways. Additionally, AHMCT initiated a cost/benefit analysis, with a comparison of calculated mowing rates, and initiated preparing survey questions. The researchers submitted a literature search report and a draft interim report on September 27, 2017. The report documents the research findings including test methodology recommendations for the first year of the research.