

Research

Notes



FEBRUARY 2023

Project Title: Investigating Teleoperated Equipment for Use in Caltrans Operations

Task Number: 3869

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Completion Date: December 30, 2023

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Investigating Teleoperated Equipment for Use in Caltrans Operations

Investigating the operations of non-line-of-sight remote control technology for Caltrans operations.

WHAT IS THE NEED?

Advances in the field of teleoperated / autonomous vehicles has shown potential for new and innovative applications that could change how State Departments of Transportation (DOT's) maintain roadways and roadside vegetation, and roadway and roadside construction, among other operations. Mowing of medians and right-of-way is an important vegetation management practice for Caltrans, but it is labor intensive and requires expensive and specialized equipment.

With the advent of teleoperated/ autonomous vehicles, it may be possible to reduce worker's exposure and risk by utilizing driverless tractors for mowing operations. In addition, cost savings are also possible by utilizing one operator to control more than one mower.

WHAT ARE WE DOING?

The research will assess ease of use, safety, and appropriateness of non-line-of-sight, remote control/autonomous technology for Caltrans maintenance operations. The project tasks include:

- 1. Literature Review
- 2. Draft Specifications/Requirements
- 3. Assess and Verify Industry Capability
- 4. Caltrans demonstration

WHAT IS OUR GOAL?



DRISI provides solutions and knowledge that improves California's transportation system The goal of this study is to demonstrate in the field, a vehicle capable of meeting the requirements for teleoperated / autonomous vehicles as requested by the Division of Equipment.

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WHAT IS THE BENEFIT?

The benefit of this research to California is increased worker safety. Implementation of this technology would allow a maintenance worker to control the vehicle (i.e., mower in this instance) from a safer location while mowing "steep" grades along the state right of way. Furthermore, labor costs may be reduced by having one operator controlling multiple mowers.

WHAT IS THE PROGRESS TO DATE?

- Questionnaire completed to gain a better understanding of other DOTs needs to add to the draft specification created for Caltrans to send to original equipment manufacturers (OEM). Received responses from 23 different state agencies.
- The researchers completed draft specifications that can help assess what equipment OEMs may have (or may not have) that will satisfy Caltrans needs and requirements.
- The researchers completed Interim report summarizing work to date completed.
- The researchers conducted a field inspection with Caltrans staff to assess possible demonstration sites for vendors.

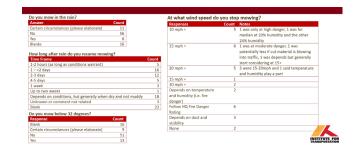


Image 2: Example of Survey Results - Weather Responses Summarized

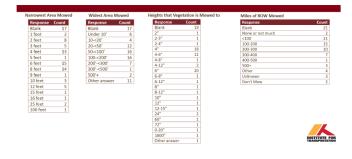


Image 3: Example of Survey Results – Roadside Characteristics Responses Summarized

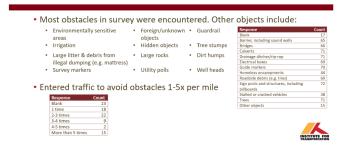


Image 4: Example of Survey Results – Obstacles encountered



- Contacted a newly established company (MACH)
- Followed up again with:
 Case/New Holland
 - John Deere
 - Monarch

IMAGES

Phantom

Raven Autonomy



Image 1: List of OEMs contacted

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