Research in Progress

The Application of Unmanned Aerial Systems in Surface Transportation

Research Need

Unmanned Aerial Systems (UASs) can be used for a variety of civilian tasks, including many surface transportation applications. State Departments of Transportation (DOT) are in a unique position to leverage the emerging UAS technology to reduce costs and improve efficiency and safety in areas including pavement management, incident response, speed limit setting, and bridge and rail inspection. Research into how best to integrate UASs into DOT activities is needed to ensure it is done safely and in a manner that meets the needs of DOT personnel.

Goals/Objectives

The objective of this project is to develop a pilot program for applying UASs to surface transportation needs in the Commonwealth. The project includes six primary research tasks divided into two groups: the first group explores the potential uses for UAS technology, while the second group looks at the safety and security challenges. Each research task generally includes the development of a literature synthesis to provide MassDOT with a summary of the current state-of-the-practice of UAS implementation at other state DOTs, as well as an implementation plan and list of selected technologies. Several tasks include field data collection and pilot tests of a recommended strategy or a selected technology. A separate task encompasses all project coordination and management.

Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

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Performing Organizations: University of Massachusetts, Amherst University of Massachusetts, Lowell University of Massachusetts, Dartmouth

Project Champion: Jeffrey DeCarlo, MassDOT

Project Start Date: June 2018

Expected Project Completion Date: May 2019

Methodology

1. Development of a pilot program to integrate UASs into bridge and rail inspections
2. Assessment of roadway pavement condition with UAS technology
3. Evaluation of UAS highway speed sensing application
4. Development of UAS emergency service drone network
5. Assessment of UAS situational awareness technology
6. Evaluation of UAS cybersecurity threats and countermeasures
7. Implementation, outreach, and technology transfer coordination and management

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