

Research in Progress

A UAS Network for Transportation Emergency Response

Research Need

Unmanned Aerial Systems (UAS, or “drones”) have demonstrated great potential for surface transportation applications. MassDOT recently completed the research project “*The Application of Unmanned Aerial Systems in Surface Transportation*,” which explored potential new opportunities and identified challenges associated with UAS applications. That project produced a conceptual framework for laying out a UAS emergency response network for both highway incidents and natural disasters. MassDOT is now interested in moving this effort into the application stage, which requires a deeper understanding of the practical utility, operational constraints, and emergency integration steps required to transition the concepts into reality.

Goals/Objectives

This research is designed to answer three questions listed below:

- (1) Which types of highway incidents are most suitable for using UAS?
- (2) What are the key UAS operational parameters for successful highway emergency response applications?
- (3) How can UAS be effectively integrated into highway emergency response practices?

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.

Principal Investigators:

Danjue Chen & Yuanchang Xie

Performing Organizations:

University of Massachusetts, Lowell

Project Champion:

Jeffrey DeCarlo, MassDOT Aeronautics
Chester Osborne, MassDOT Highway

Project Start Date:

March 2021

Expected Project Completion Date:

April 2022

Methodology

1. Analyze historical incident data to identify incident responses that can benefit most from UAS.
2. Analyze new data collected from a emergency response pilot exercise using UAS.
3. Develop a proposed decision-making protocol on how the MassDOT Drone Team could be integrated into existing emergency response activities.
4. Update the conceptual UAS network for emergency response applications.
5. Develop an integrated and implementable plan to incorporate UAS into highway emergency responses in Massachusetts.

Research and Technology Transfer Section
MassDOT Office of Transportation Planning
Planning.Research@dot.state.ma.us

