

MassDOT Board Report

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MassDOT Drone* Program

(*aka UAS – Unmanned Aerial System)



Mission

-  Utilize drones across MassDOT and the MBTA to accomplish work safer, faster, cheaper, and where possible, better
-  Ensure all drone flying is in accordance with MassDOT policy, to ensure public safety, and respect for privacy

Objectives

-  Draft & implement MassDOT drone use policy, including privacy and standard operating procedures (SOPs)
-  Design, develop and deliver a drone training program
-  In the near-term, accomplish recommended drone pilot program option(s) for MassDOT Aeronautics, while also offering the program to other Divisions & MBTA
-  In the long-term, develop and implement an ongoing cross-divisional drone program

Rationale for Drone Use: Survey Example

-  Conventional Method: 2 people, 3-weeks on-site
-  Drone Method: 2 people, 10-min flight, 2-hrs on-site, 2-6 hour processing (unattended)

-  Identified Policy & Best Practices from Other State DOTs
-  Identified a set of conceptual UAS applications for each Division.
-  Recommendations based on survey results and MassDOT needs.
-  Three applications recommended for each Division except RMV. MBTA will also be considered.

Phased Approach

UMassAmherst

College of Engineering



Massachusetts Department of Transportation (MassDOT)
and
University of Massachusetts, Amherst

The State of the Practice of UAS Applications in Transportation



Preliminary Phase 1: Aug – Dec 2016 ✓

- Completed analysis of other state DOT's use of drones, including policy, SOPs, implementation strategy, and best practices
- Delivered a set of options for, "MassDOT Use of Drones to Improve Safety, Collect Data & Cut Costs" (Safer-Faster-Cheaper)

Pilot Program Phase 2: Jan – Jun 2017

- Complete preliminary Drafts of MassDOT "Interim" Drone Policy, Privacy and SOPs
- Design, Develop & Deliver a Drone Training program
- Accomplish first Drone Pilot Programs, starting in Aeronautics, then offer to the other MassDOT Divisions and the MBTA

Traffic and Safety Engineering – Bridge Inspection

 UAS technology provides a cost-effective and safe method for remotely performing visual inspections and inventorying of bridges

Construction – Construction Site Inspection

 UASs can potentially be used as aerial image and data capture devices viable for inspecting and monitoring construction and large infrastructure projects

District Offices – Roadway Asset Management

 UAS can be used for monitoring roadway conditions and traffic control devices

Rail Track and Right-of-Way Inspection

-  Use of UASs will improve safety by reducing exposure of track and right-of-way maintenance personnel to potentially hazardous situations

Confined-Space Inspection

-  UASs can potentially be used to inspect tunnels, pump stations, and wells that constitute unfriendly working environments that are often dangerous or inaccessible to workers

Park-and-Ride Lots Survey

-  UAS technology can be deployed to survey these lots and obtain real-time feedback of their usage, especially during rush hour

Airport Inspection

 The use of UASs is intended to reduce costs and minimize the time required to identify infrastructure deficiencies and to assure infrastructure safety

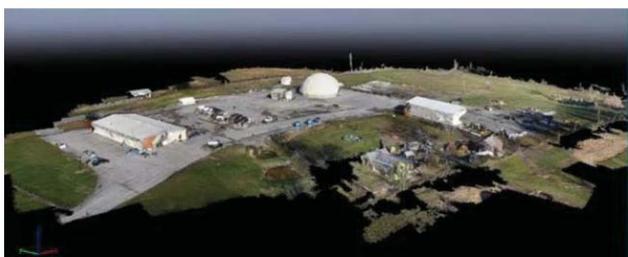
Airport Perimeter Control

 Airport perimeter control is intended to improve security at the airport by reducing the probability of unlawful penetration into its territory

Obstruction Evaluation/Airport Airspace Analysis

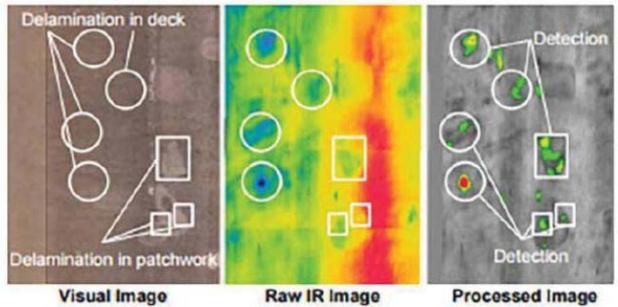
 Obstruction evaluation and airport airspace analysis helps to identify potential aeronautical hazards in advance to prevent or minimize the adverse impacts to the safe and efficient use of navigable airspace

Surveying



Kentucky: Surveying with UAS is more cost-efficient, aerial photography is sharper and clearer than conventional means.

Thermal Infrared Scanning



Michigan: Detect subsurface condition and delamination

Asset Management



Ohio: High resolution aerial photography to monitor roadway conditions

Confined Space Inspection



Michigan: Confined space not safe for a person

Thank You!

