



## NETC 18-3 INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS (UAS) INTO OPERATIONS CONDUCTED BY STATE DEPARTMENTS OF TRANSPORTATION

### INTRODUCTION

Unmanned Aerial Systems have seen increased use in the transportation sector. They have provided significant savings in data collection and the ability to collect information in challenging environments.

New England State Departments of Transportation (DOTs) have requested an evaluation of their program and to identify best practices for establishing and sustaining a UAS program.

The report reviews existing guidelines, standard operation procedures (SOPs), use cases, and UAS policies at the DOTs.

The report evaluated the following UAS use cases that are being used in New England states:

- Emergency response and recovery
- Public outreach and engagement
- Bridge inspection
- Surveying and mapping
- Construction inspection
- Traffic analysis

### LESSONS LEARNED AND RECOMMENDATIONS

The report evaluated New England DOTs use cases and other organizations' best practices.

The following lessons learned and recommendations are:

#### UAS Organizational Structure

- New England DOTs have an organized structure for a UAS program with the lead, or program manager identified and enlisted
- It will be essential to consider future goals for the program to determine if their current organizational structure or another organizational structure aligns best to meet their goals
- Staff availability was a common challenge identified
  - Dedicating additional DOT staff for UAS operations
  - Procurement guidelines to create a UAS pool to procure additional resources will be beneficial

#### FAA Part 107 and Public Aircraft Operations

- It may be beneficial for New England State DOTs to consider using Public Aircraft Operations in addition to Part 107 for additional flexibility for flights

#### FAA Certificate of Waiver or Authorization (COA)

- Utilize the FAA Certificate of Waiver or Authorization (COA) to allow additional UAS operations
- New FAA Remote ID, Operations over People/Moving Vehicles, and Night Operations amendments will allow for operations without receiving a COA
- Using LAANC through third-party apps can expedite authorization
- Create detailed safety cases to expedite approval of COAs

#### Risk Management

- New England State DOTs can enhance existing guidelines for Specific Operational Risk Assessment

#### Data Processing

- Post-flight data processing could be enhanced to incorporate Real Time Kinematics, Post-Processed Kinematics (PPK), and Ground Control Points for best accuracy
- Implement additional quality control to ensure accurate data

#### Data Management

- Implement data management processes to manage UAS data
- Implement a data lifecycle process to increase return on investment

#### Use Case Specific

- Emergency response and recovery
  - Create an integrated organization to coordinate with external stakeholders, include roles and responsibilities in the SOP
  - Create a data processing workflow for video-streaming applications and image processing solutions

- Public outreach and engagement
  - Procure appropriate UAS systems and organize staffing for key roles
- Bridge Inspection
  - Procure UAS with autonomous flight controls
- Surveying and mapping
  - Create data processing workflow and expand accuracy assessment
- Construction inspection
  - Develop UAS pilot training for construction inspection
  - Fully automate sUAS system for routine inspection flights
- Traffic analysis
  - Develop UAS pilot training for traffic analysis
  - Create data output guidelines and integrate UAS traffic analysis into the current procedures

### UAS PROVIDE SIGNIFICANT SAVINGS FOR DOTs

UAS can reduce surveying time by as much as

**50%**  
(UTAH DOT)

UAS saved

**\$10.2K**  
per bridge inspection project  
(OREGON DOT)

Principal Investigator: Jagannath Mallela, Ph.D.  
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