DEVELOPMENT OF AN UNMANNED AIRCRAFT SYSTEMS (UAS)
PROGRAM 43272B

$308k
The amount UAS saved on **ONE** large construction project over four years. (CALIFORNIA DOT)

74% **COST SAVINGS**
The value UAS can produce across structural inspection programs while improving safety. (MICHIGAN DOT)

INTRODUCTION

Unmanned Aircraft Systems (UAS) have seen increased adoption by State Departments of Transportation (DOTs). UAS have proven to be an additional data collection tool that can increase safety, efficiency, and cost savings while meeting robust data quality standards.

New Hampshire Department of Transportation (NHDOT) requested an evaluation of the maturity level of its existing UAS program, analysis of use cases ideal for UAS integration, and the development of an implementation plan to increase internal UAS capabilities.

The report evaluated the following UAS use cases:

- Surveying and Mapping
- Construction Monitoring
- Structural Inspection
- Traffic Systems Management & Operations
- Emergency Response
- Asset Maintenance and Operations

LESSONS LEARNED & RECOMMENDATIONS

The report evaluated NHDOT's UAS program, identified use cases, and other organizations' best practices. The following lessons learned and recommendations are:

UAS Organizational Structure

- NHDOT has an organized structure for its UAS program with it housed in the Bureau of Aeronautics with the lead, or program manager identified and enlisted.
- It will be beneficial to form a UAS Stakeholder Committee to assist in the finalization and approval of UAS program governance documents and to coordinate ongoing program growth and successes.
- Staff availability was a common challenge identified.
  - Dedicating the UAS Program Manager to full-time on the UAS program development, non-shared duties.
  - Use newly dedicated UAS staff within Bureau of Aeronautics to support the UAS data processing and management services for requesting bureaus.

Return on Investment (ROI)

- It is recommended that through the three phases of the implementation plan that a process is developed to accurately track the ROI of the program.

Governance Documents

- NHDOT should finalize and formally adopt UAS policy and procedures documents to align the vision and ensure clarity as the implementation plan is carried out.

UAS Fleet

- NHDOT has acquired five UAS platforms since the inception of the program, these can largely be leveraged across all of the identified use cases.
- In the latter stages of the implementation plan UAS technology needs and associated costs should be identified, along with the necessary funding.

Data Management

- Implement data management processes to manage UAS data.
- Data management process should dedicate sufficient data storage capacity for exponential growth of data as UAS implementation matures.
- Implement a data lifecycle process to increase ROI.

USE CASE SPECIFIC LESSONS & RECOMMENDATIONS

Surveying and Mapping

- The NHDOT Chief of Survey and Mapping is receptive to internal UAS services.
- UAS can be immediately integrated as an additional survey tool for topographic mapping needs for design purposes.

Construction Monitoring

- Contractors have used UAS on NHDOT construction projects for the last six years, several immediate uses were identified for internal UAS services: project monitoring, prestriping planning, and quantity calculations.

Infrastructure Inspection

- NHDOT bridge leadership is interested in exploring opportunities for UAS implementation.
- UAS can assist in reducing inspection time, especially on the large structures, and can mitigate risks associated with bridges over railroads or bridge strikes.

Asset Maintenance and Operations

- UAS can be used to supplement the 5-year data collection cycle of Geographic Information System (GIS) data using traditional fixed-wing aircraft.
- UAS can assist with NHDOT asset inspection and monitoring to enable data driven decision-making regarding maintenance.

Traffic Systems Management and Operations (TSMO)

- TSMO has responsibility over certain infrastructure inspections, UAS could greatly assist with increasing the quality and frequency of these inspections.
- UAS can assist with line-of-sight analysis for the placement of new cameras.
- UAS can be used for accident scene mapping and documentation which could enable a reduction in closure and delay time.

Emergency Response

- As the UAS program matures and more NHDOT staff are trained on the UAS operations, these internal capabilities could serve a greater role in the state-wide coordinated response to emergencies.