THE INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS TO INCREASE SAFETY AND DECREASE COSTS OF TRANSPORTATION PROJECTS AND RELATED TASKS

Unmanned Aircraft Systems (UAS) are a new capability that has the potential to reduce costs dramatically and increase safety for transportation operations. Despite the considerable amount of existing research and case studies surrounding UAS, there appear to be few, if any, that have focused on analyzing the costs, benefits, and barriers associated with integrating UAS into a state department of transportation's operations. The overall objective of this project focused on evaluating UAS technology for a broad range of case studies relating to the specific needs of the New Hampshire Department of Transportation (NHDOT). This project was a partnership between NHDOT and the University of Vermont's (UVM) UAS Team. UVM's UAS Team conducted flight operations and generated products for eight case studies. These case studies served the purpose of evaluating the applicability of UAS for NHDOT, comparing UAS to existing methods and analyzing the barriers to UAS implementation.

Case Studies Overview

Accident
New Hampshire Motor Speedway

Emergency Management
Murphy Dam

Aeronautics Inspection
Jaffrey Airport

Traffic Monitoring
I-95 & Franconia Notch State Park

Bridge Inspection
Lebanon, New Hampshire

Rail Mapping & Bridge Inspection
Lancaster, New Hampshire

Construction Monitoring
I-93

Rock Slope Inspection
Crawford Notch State Park

UAS Workflow

Planning → *Operations* → *Processing* → *Value Added* → *Products*

More Information

For more information on the New Hampshire Department of Transportation case studies project view the **final report**.

View each case studies **ESRI Story Map** and **Fact Sheet** for more detailed information on each case study.

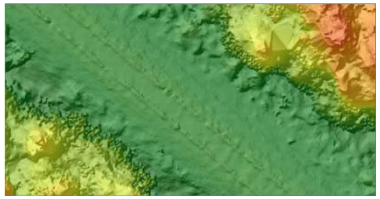
Orthomosaic

Overhead true color imagery of Jaffrey Airport.

Inspection Photos

High resolution inspection photo of a structure at Murphy Dam.

Digital Elevation Model



Raster elevation model of the rail mapping case study in Lancaster, NH.

Virtual Reality

Virtual reality products captured at the New Hampshire Motor Speedway.

3D Point Cloud

Rock slope inspection of Crawford Notch State Park.

Aerial Photos/Videos

Traffic monitoring aerial photos of Franconia Notch State Park.

Benefits

- Cost Saving
- Safer & Faster than other methods
- Ability to access difficult locations
- GIS/CAD ready data

Limitations

- Weather (no rain or high winds)
- Battery life
- Equipment malfunction
- Often cannot be used stand alone

Considerations

- Volume of data
- IT
- Expertise required
- Specialized equipment
- GIS/CAD expertise