# UAS Airport Applications

Presented to: **REDAC Sub-Committee**

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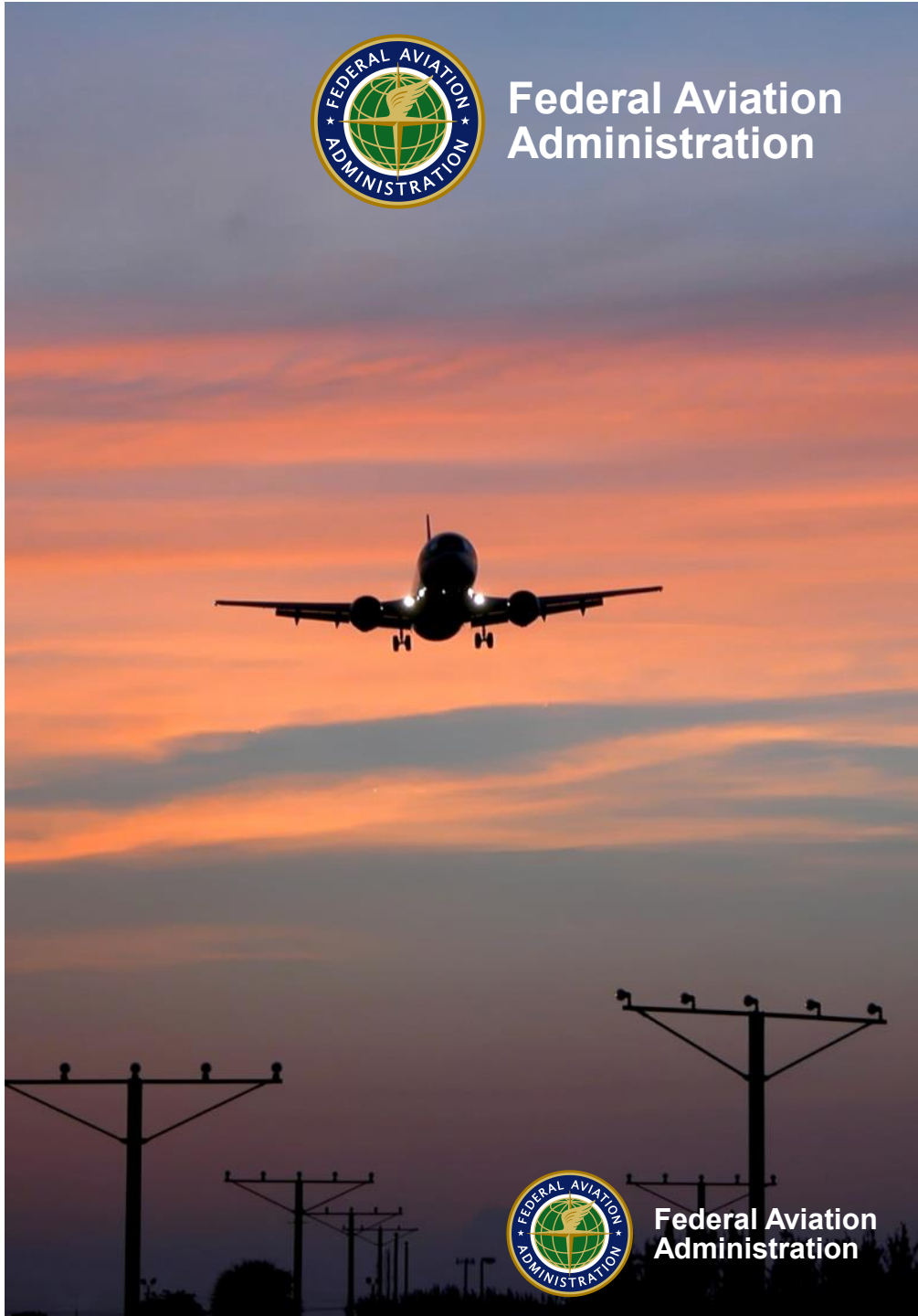
Date: **August 20, 2018**



# UAS Airport Applications

- **Objective: Assess how UAS technology can be integrated into the airport environment for various airport safety and security applications.**

- **Research Goals: Develop Concepts of Operation (CONOPS) for the following UAS Airport Applications:**

1. Geo-analysis of obstacle clearance surfaces
2. Pavement Inspections
3. Perimeter Security
4. Wildlife Hazard Management
5. Airport Rescue and Fire Fighting (ARFF)

***Ranked by Acting ARP- 1**

# FY 18 Research Plan

- Airport Interviews - “State of the Union”
- UAS Airport Applications Demonstrations and Case Studies
- Guidance Document for UAS Operators and Airports
- Framework for UAS Airport Applications Concepts of Operation (CONOPS)

# Airport Interviews – "State of the Union"

- **Interviewing airports operators, consultants, and vendors on current and planned UAS airport application activity.**
- **Interviews focus on the following:**
  - Current UAS activity and details about these activities
  - Benefits/results they see or expect to see from UAS
  - Challenges/hurdles to incorporating UAS
  - Lessons learned
  - Their planned/future UAS activity plans
- **To date, 19 interviews have been conducted.**
  - 13 Airport Operators
  - 6 Consultants/vendors
- **Final Report will be completed by the end of FY 18**

# Airport Interviews – "State of the Union"

| Airports with UAS Activity | Synopsis of UAS Activity/Plans |
|---|---|
| Dallas/Fort Worth International Airport | • Emergency Response – 5 Training Missions |
| Hartsfield-Jackson Atlanta International Airport | • Captured UAS imagery for two runways, a cargo apron, and a landside parking garage.<br>• Further UAS activity currently on hold until policies and procedures are developed. |
| South Carolina Aeronautics Commission | |
| Savannah/Hilton Head Airport | |
| USDA Wildlife Services | |
| Golden Triangle Regional Airport | |
| Ventura County Department of Airports | |
| Salisbury-Ocean City Wicomico Regional Airport | • Contracted with a company to collect aerial imagery of pavement and conduct obstruction surveys |
| | • Not interested in using UAS for airfield applications. Used UAS for aerial imagery at two GA airports |

# Airport Interviews – "State of the Union"

| Airports with no UAS Activity and/or future plans | Synopsis of UAS Activity/Plans |
|---|---|
| Port of Portland | • Using UAS for wildlife management (habitat monitoring) in areas adjacent to the airport |
| | |
| | |
| | |
| | |

# Airport Interviews – "State of the Union"

| UAS Consultant/Vendor | UAS Activity | Synopsis of UAS Activity/Plans |
|---|---|---|
| Aerium Analytics | Yes | • Wildlife harassment, aerial imaging, and asset management at Edmonton International Airport. |
| Hanson Professional Services | Yes | • Topographical mapping and obstruction analysis at S. Illinois Airport<br>• Manages Built Field (Illinois) whom are using UAS for wildlife monitoring |
| Quantum Spatial/Planning technology | Yes | • Provided information regarding the current capabilities and limitations of sUAS for remote sensing applications. |
| Kimley Horn | Yes | • Conducted proof of concept pavement inspections at Front Range Airport (Colorado) for ACRP 03-42 research effort |
| Woolpert | Yes | • Woolpert is working with Savannah/Hilton Head Airport (SAV) as consultant to develop the airport's UAS program.<br>• Woolpert is also involved with UAS mapping projects at several additional airports (airport names not disclosed) |

# UAS Airport Applications Demonstrations/Case Studies

**The research team has participated in three UAS demonstrations and one case studies to better understand the various airport applications and start developing the framework for UAS Concepts of Operation (CONOPS).**

**Demonstrations:**

1. Sebring Regional Airport (FL) – Numerous Airfield Application Demos
2. Savannah/Hilton Head International Airport (GA) – Perimeter Security
3. South Carolina Aeronautics Commission (SCAC) – Obstruction Analysis

**Case Study:**

1. USDA – Wildlife Services – Wildlife Hazard Mitigation

# UAS Nighttime Emergency Response Demo: Sebring Regional Airport (FL)

- Conducted by ACRP 03-42 project team (Airports and UAS) at Sebring Regional Airport (FL).
- Tethered UAS with two (2) lights ~85 ft. high and ~50 ft. from the B727.

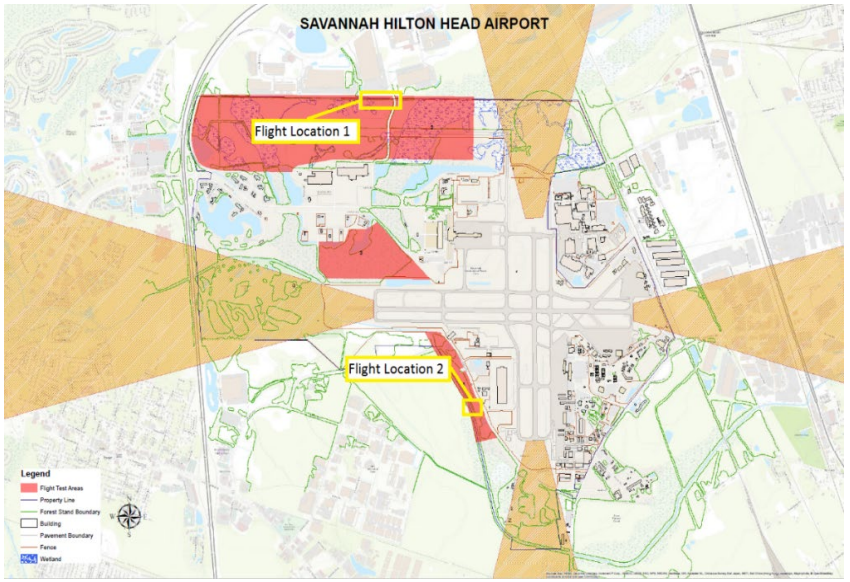
Lights Off


1 Light On


2 Lights On

# UAS Perimeter Security Demo: Savannah/Hilton Head Airport

- **Conducted under the Safe Skies Alliance Program for Applied Research in Airport Security (PARAS)**
  - Project 0012: Guidance for Integrating UAS into Airport Security.
- **Explored procedures, techniques and best practices for airports to safely and effectively integrate UAS into their security plans**
- **Missions:**
  - Time Response Benefit
  - Interference with Communicants of UAS
  - Track and Monitor a Target
- **Identified Shortfalls:**
  - FAA visual line of sight requirements
  - Establishing safe flight paths
  - Data bandwidth and storage constraints

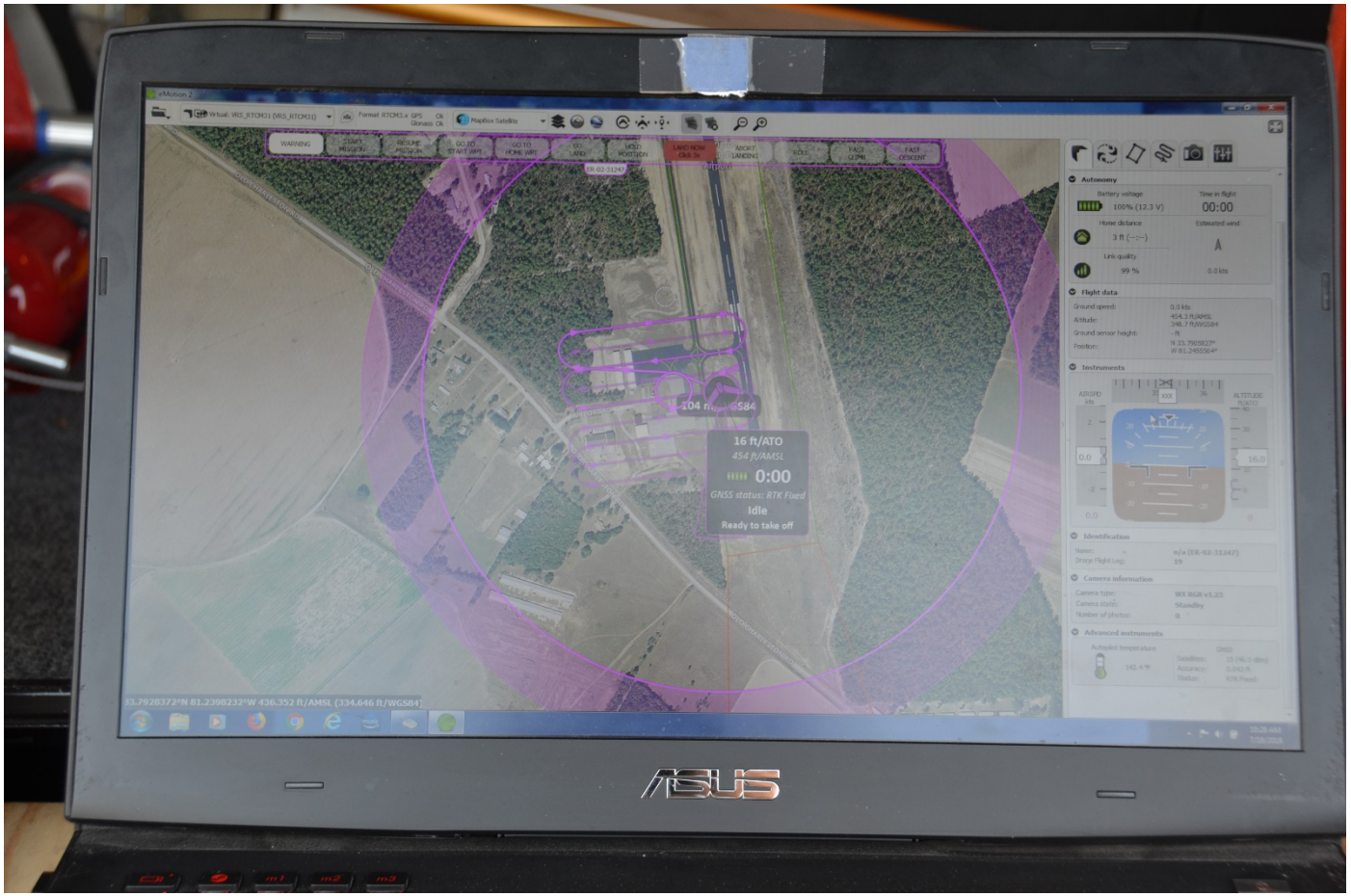


# UAS Obstruction Analysis: South Carolina Aeronautics Commission

- **Researchers met with personnel from South Carolina Aeronautics Commission (SCAC) to discuss how they are using UAS for obstruction surveying**
  - COA Process
  - Data collection – traditional and with UAS
  - UAS platform and software
  - Flight manual/procedures
  - Benefits
  - Data processing

- **Observed an abbreviated demonstration of aerial mapping at Lexington County Airport at Pelion (6J0), SC**
- **<u>Next Steps: Observe complete obstruction analysis</u>**
  - <u>Baseline (traditional surveying equipment) and with a UAS</u>
  - <u>Document procedures (initial CONOPS)</u>

# UAS Obstruction Analysis: South Carolina Aeronautics Commission



# UAS for Wildlife Hazard Mitigation: USDA – Wildlife Services

**Under an Interagency Agreement, USDA Wildlife Services is evaluating the effectiveness of various UAS platforms as a avian hazing tool in controlled and free ranging environments (not at an airport, yet).**

# UAS for Wildlife Hazard Mitigation: USDA – Wildlife Services

- **Researchers are drafting a manuscript that summarizes this research effort, which is expected to be submitted to a peer-reviewed outlet by December 2018.**
- **USDA's Wildlife Services is proposing to expand this research effort and initiate a three-year research effort to evaluate UAS for airport wildlife management.**

# Interim Guidance Document for UAS Operators and Airports

- **Drafting an interim document that will provide UAS operators and airports with guidance on the following:**
  - Notification and Authorization Process
  - Airport Implementation Plan/Best Practices
- **This interim document will provide guidance for conducting the necessary coordination to safely operate UAS in the airport environment.**

# UAS Airport Applications CONOPS Framework

- Identify existing requirements/standards for each application.
- Identify elements of each application that could be accomplished through the use of UAS.
- Initial development of standards and procedures for each application.
- The initial CONOPS framework will be completed by the end of FY 18.

# FY 19 Research Plans

- **Develop focus teams for each of the five applications**
- **Work with airport operators, government agencies, and consultants with active/planned UAS programs**
  - (e.g. DFW, ATL, SAV, South Carolina Aeronautics Commission, Woolpert, and others)
- **Conduct / attend UAS airport applications demonstrations**
- **Continue with the development of an airports UAS implementation plan**
- **Develop interim CONOPS for each application**

# Questions?

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# Back-up