All ALDOT UAS operators should develop and document operational procedures that will serve to guide flight operations, planning and execution. The operational procedures documents best practices and internal processes for safe and effective flight operations. This includes roles and responsibilities, mission phases, and emergency procedures. The aim is to document everything that needs to be done during a mission, so it can act as a reference point for team members. The information in this document is to provide a road map for ALDOT to ensure that UAS operations are conducted under FAA 14 CFR Part 107 and any applicable State of Alabama rules, procedures or guidance. When there is no applicable Federal, State or ALDOT guidance, use your best judgment and err on the side of safety.

**UAS Standard Operating Procedures**

**Consultant UAS Operations**

- **UAS Update**
  - Continue to Fly projects when Requested by Central Office, Regions & Areas
  - Working with our IT Group to develop “High Speed Virtual Processing Farm”
    - Official Testing to begin February on UAS Data, Mobile LiDAR data to follow.
  - UAS Command Center will be delivered February 15, 2018
  - Continue to be a member of and work with the Alabama UAS Working Group.
    - Focus on State Policy
  - Just completed the FAA UAS Integration Pilot Program application with ALDOT as the Lead Applicant, waiting on response.
  - Just completed an additional 1 year contract with enrGies to Include
    - ALDOT Focused Training for UAS Manager, Pilots & Technician within Group
    - Bridge Structure Training
    - ISAO – Information Sharing Analysis Organization. Database of Drone Pilots within the State and surrounding States which will include Names, Assets, Qualifications and Advanced Qualifications
  - Working with EnrGies, AeGIS to create Bridge Flight Simulator

**Survey 123 for ArcGIS**

**ALDOT UAS Current Operations**

- **Philosophy & Mission Statement**
  - All ALDOT UAS operators should develop and document operational procedures that will serve to guide flight operations, planning and execution. The operational procedures documents best practices and internal processes for safe and effective flight operations. This includes roles and responsibilities, mission phases, and emergency procedures. The aim is to document everything that needs to be done during a mission, so it can act as a reference point for team members. The information in this document is to provide a road map for ALDOT to ensure that UAS operations are conducted under FAA 14 CFR Part 107 and any applicable State of Alabama rules, procedures or guidance. When there is no applicable Federal, State or ALDOT guidance, use your best judgment and err on the side of safety.
**Current ALDOT UAS Applications**

- Geo Referenced Ortho's
- Point Cloud Data (Preliminary Design)
- 3D Reality Meshes
- Earthwork Volumes
- Rock Slide Inspections
- ATRIP Planning
- Vegetation Awareness/Eradication
- Project Progress/Updates

**ALDOT UAS Fleet**

- **Ebee**
  - Cameras
    - WX RGB
    - S110 NIR
  - GX9 RGB
  - S.O.D.A.
  - Thermo Map

- **Phantom 4**
  - 12 MP Camera
  - 4K Video

- **Albris**
  - 58 MP Camera
  - Thermal Camera
  - HD Video

**Software and Apps**

- **Pre-Flight and Missions**
  - Emotion 3: Ebee and Albris
  - DJI Go App/GS Pro: Phantom 4
  - Pix4D Capture App: Phantom 4

- **Post Processing**
  - Context Capture
  - Context Capture Engine
  - Pix4D Mapper Pro
  - Hydra Fusion
  - Drone to Map
  - Microstation / Inroads

**ALDOT UAS Projects**

**NADIR Imagery**

- **3D Reality Mesh**

**Combine NADIR/Oblique Imagery**
Combine NADIR/Oblique Imagery
8 eBee Flights at 250’
18 Phantom 4 Flights at 180’

Reality Mesh/Combined Imagery

Reality Mesh Zoomed In

Downtown Montgomery
6 Flights with Phantom 4
processed and delivered next day

ArcGIS Online Capabilities
One 6 minute flight with Phantom 4
modeled with 36 oblique images

ATRIP Project Flights
Alabama Transportation Rehabilitation and Improvement Program
ATRIP Project Number 37-01-03
Jefferson County
Add 1 lane on Cotton Ave. from 7th St. SW to Lomb Ave.
ALDOT UAS Command Center

Benefits, Cost Savings, & Safety
• ALDOT is No Longer Dependent on Aircraft/Mobilization for Certain Projects.
• Less Personnel for UAS Operations vs. Conventional Survey Crews.
• Post Processing can be Done “In House”, Quickly and Efficiently.
• Data can be Used for the “Life Cycle” of the Project.
• ALDOT Personnel/Crews Safety is Greatly Enhanced with the Use of UAS.

Future ALDOT UAS Applications
• LiDAR pod – Survey Grade Data
• Bridge / Structure Inspections (With FHWA Approval)
• Collect GIS Data for Integration within EGIS
• Asset Management
• Disaster Relief / Recovery
• “As Built” Digital Files of our Projects

Questions

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