Unmanned Aircraft Systems (UAS) 101

Presented to: The American Association of State Highway and Transportation Officials

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What is a UAS?

• A UAS is a system:
  1. Unmanned Aircraft
  2. Ground Control Station
  3. Command & Control Link(s)

• Also known as:
  – Unmanned Aerial Vehicle (UAV)
  – Remotely Piloted Aircraft System (RPAS)
  – RC Model Aircraft
  – Drone
Why Use a UAS?

- UAS operations are particularly effective for missions that are dangerous or dull
  - Humans are not put at risk
  - Continuous operations are possible
- Operations with UAS often cost less than using manned aircraft
What is the FAA’s Authority?

• **U.S. airspace is public space**
  - 49 U.S.C. §40103(a)(1)

• **UAS are aircraft subject to regulation**
  - 49 U.S.C. §40102(a)(6); 14 CFR 1.1; PL 112-95 §331, §336
  - An aircraft is any device used, or intended to be used, for flight

• **UAS must comply with FAA regulations**
## Types of UAS Operations

<table>
<thead>
<tr>
<th>Recreational Only Operations</th>
<th>Commercial and Other Operations</th>
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</thead>
<tbody>
<tr>
<td><strong>Pilot Requirements</strong></td>
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</tr>
<tr>
<td>• No FAA pilot requirements</td>
<td>• Must have Remote Pilot Airman Certification</td>
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<tr>
<td>• Must have Remote Pilot Airman Certification</td>
<td>• Must be 16 years or older</td>
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<tr>
<td>• Must pass TSA vetting</td>
<td>• Must be registered if over 0.55 pounds</td>
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<tr>
<td><strong>Aircraft Requirements</strong></td>
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<tr>
<td>• UAS over 55 pounds must be certified through a design, construction,</td>
<td>• Must be less than 55 pounds</td>
</tr>
<tr>
<td>inspection, flight test, and operational safety program administered by a community-based</td>
<td>• Must be registered if over 0.55 pounds</td>
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<tr>
<td>organization</td>
<td>• Must undergo pre-flight checklist</td>
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<td><strong>Location Requirements</strong></td>
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<tr>
<td>• Must notify all airports and air traffic control (if applicable) within five miles of</td>
<td>• Class G airspace without ATC permission</td>
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<tr>
<td>proposed area of operations</td>
<td>• Class B, C, D, and E require ATC permission</td>
</tr>
<tr>
<td><strong>Operating Rules</strong></td>
<td><strong>Operating Rules</strong></td>
</tr>
<tr>
<td>• Must ALWAYS yield right of way to manned aircraft</td>
<td>• Must keep aircraft in visual line-of-sight*</td>
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<tr>
<td>• Must keep aircraft in visual line-of-sight</td>
<td>• Must fly under 400 feet*</td>
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<tr>
<td>• Must follow community-based safety guidelines</td>
<td>• Must fly only during daylight hours*</td>
</tr>
<tr>
<td><strong>Definitions</strong></td>
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</tr>
<tr>
<td>• Education or recreational flying only</td>
<td>• Flying for commercial use</td>
</tr>
<tr>
<td>• Flying for commercial use</td>
<td>• Flying incidental to a business</td>
</tr>
<tr>
<td>• Flying public aircraft operations</td>
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</tbody>
</table>

*These requirements are subject to waiver.*
Online UAS Registration

• Operators flying under part 107 or a public COA must register online
  – You will need to provide an email address, physical address, and the make, model, and serial number (if available) of each small UAS

• UAS over 55 lbs. must use the paper-based registration process
The Small UAS Rule (Part 107)

- First rules for routine operation of small UAS (<55 pounds)
- Took effect August 29, 2016
- Recreational operators may fly under Part 107 or Public Law 112-95 Section 336
Part 107 Basics

- UAS operators must obtain a Remote Pilot Certificate
- Visual line-of-sight, daylight operations
- 400’ AGL ceiling, unless within 400’ of a structure
- No airspace authorization required for Class G and non-surface area Class E; all other airspace requires authorization
- UAS must weigh less than 55 lbs. and be registered
Becoming a Pilot under Part 107

• Must be 16 years old or older
• Must read, write, speak English
• Must pass an aeronautical knowledge exam at an FAA-approved Knowledge Testing Center
  – Part 61 certificate holders can take online training at faasafety.gov instead of the knowledge exam
• Must undergo TSA background security screening
Part 107 Airspace Requirements

- Operations in Class G without ATC authorization
- Operations in Class B, C, D & Class E surface areas require ATC authorization
- Online portal available at [www.faa.gov/uas/request_waiver/](http://www.faa.gov/uas/request_waiver/)
UAS Facility Maps

- Depict maximum altitudes that FAA may grant controlled airspace access for Part 107 operations without additional safety analysis

- Maps do not authorize operations
  - Job aid for airspace authorization requests
  - Assists the FAA in streamlining authorization process

- Maps released in phases
  - First phase: 238 Class E airports
  - Second phase: 101 B, C, and D maps released June 22
Strategies for Airspace Authorization Requests

**Only Ask for What You Need**
- Airspace waivers generally take longer than authorizations
- More complex requests = longer processing time

**Stay Low**
- Lower altitudes enable operations closer to airports
- Consider additional risk mitigations for requests in high traffic locations

**Location**
- Be precise with your latitude and longitude
- Be discrete and specific – smaller operating areas are easier to approve
Waivers to Part 107

- Waivers are an opportunity for remote pilots to conduct unique and novel operations
- Waivers represent agreements to operate under special conditions
- Operators must identify hazards and mitigate risks
  - Providing clear and precise risk mitigations allows remote pilots to undertake more complex operations and demonstrate they are prepared for the increased responsibility of these operations
Waivable Provisions of Part 107

- Operation from a moving vehicle or aircraft (§ 107.25)
- Daylight operation (§ 107.29)
- Visual line of sight aircraft operation (§ 107.31)
- Visual observer (§ 107.33)
- Operation of multiple small UAS (§ 107.35)
- Yielding the right of way (§ 107.37(a))
- Operation over people (§ 107.39)
- Operation in certain airspace (§ 107.41)
- Operating limitations for small UAS (§ 107.51)

Online portal available at [www.faa.gov/uas/request_waiver/](http://www.faa.gov/uas/request_waiver/)
UAS Outreach and Education

I FLY SAFE

All drones are aircraft—even the ones at the toy store. So when I fly a drone I am a pilot. Before I fly I always go through my pre-flight check list. I regularly check the safety guidelines at faa.gov/uas

FLY SMART, FLY SAFE, AND HAVE FUN!

PRE-FLIGHT CHECKLIST

- I fly below 400 feet
- I always fly within visual line of sight
- I’m aware of FAA airspace requirements: faa.gov/go/uastfr
- I never fly over groups of people
- I never fly over stadiums and sports events
- I never fly within 5 miles of an airport without first contacting air traffic control and airport authorities
- I never fly near emergency response efforts such as fires
- I never fly near other aircraft
- I never fly under the influence

FAA

B4UFLY

Unmanned Aircraft Systems Overview
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Questions?

www.faa.gov/uas
Backup Slides
Aeronautical Knowledge Exam Topics

• Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation
• Airspace classification and operating requirements, and flight restrictions affecting small unmanned aircraft operation
• Aviation weather sources and effects of weather on small unmanned aircraft performance
• Small unmanned aircraft loading and performance
• Emergency procedures
• Crew resource management
• Radio communication procedures
• Determining the performance of small unmanned aircraft
• Physiological effects of drugs and alcohol
• Aeronautical decision-making and judgment
• Airport operations
• Maintenance and preflight inspection procedures