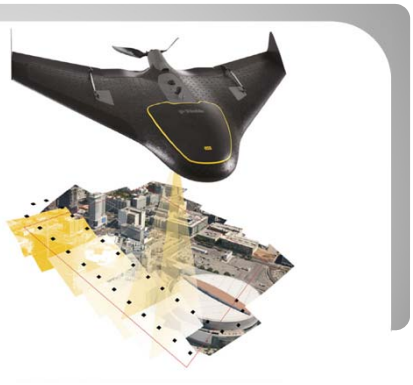
Unmanned Aircraft Systems

What's New



Ron Singh, PLS
Engineering Automation Manager/Chief of Surveys
Oregon Department of Transportation

ODOT Surveyors Conference
9 March, 2016

Definitions

- UA Unmanned Aircraft
- UAS Unmanned Aircraft Systems
- sUAS Small Unmanned Aircraft Systems
- NAS National Airspace System
- COA Certificate of Authorization
- GCS Ground Control Station
- PIC Pilot in Command
- FAA Federal Aviation Administration
- AGL Above Ground Level

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UAS Consists of:

- Unmanned Aircraft (UA)
- Control System, such as Ground Control Station
- Control Link - a specialized data link
- Other related support equipment

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sUA Platforms

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UA Onboard Systems

- GPS Positioning
- IMU/Accelerometer
- Barometer
- Autopilot
- Radio Link/Telemetry
- Cameras
  - Still
    - RGB, Infrared, Thermal
  - Video
- LiDAR

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Flight Control

- Autonomously by computers in the aircraft
- Remotely controlled by a pilot on the ground or in another vehicle
- Combination of the above

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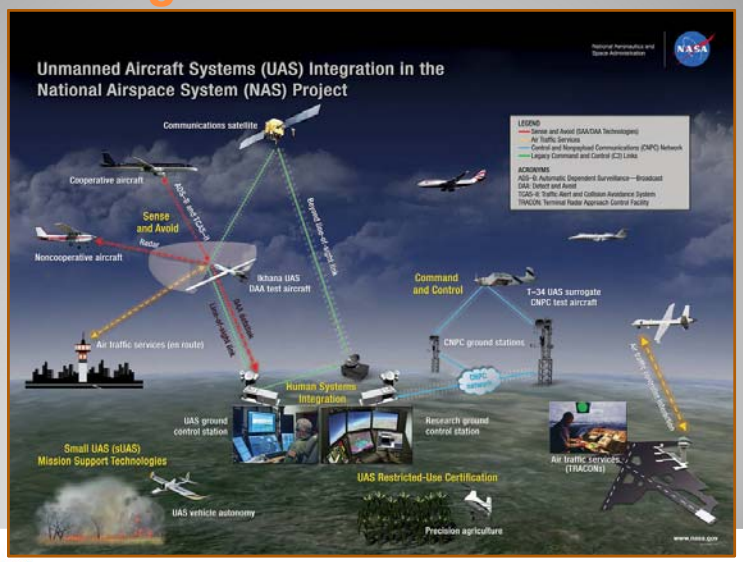
UAS Integration



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Approval to Operate

There are currently 3 ways to get FAA approval to operate a UAS:

1. Obtain an experimental airworthiness certificate for private sector (civil) aircraft to do research and development, training, and flight demonstrations.
2. Obtain a Certificate of Waiver or Authorization (COA) for public aircraft.
3. Section 333 Waiver for private aircraft

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UAS Operators

Public Operators (Government)

- Public aircraft
- Public interest
- Requires COA

Private Recreational Operators

- Below 400' AGL
- Not in congested areas
- No commercial use

Civil Operators (Others)

- Requires Special Airworthiness Certificate
- Commercial use w/Sec 333 Exemption

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Model Aircraft

- Recreational use of airspace by model aircraft is covered by FAA Advisory Circular 91-57A (revised 2 September, 2015).
- Generally limits operations to below 400 feet above ground level.
- Away from airports and air traffic.
- Excludes individuals or companies flying model aircraft for business purposes.

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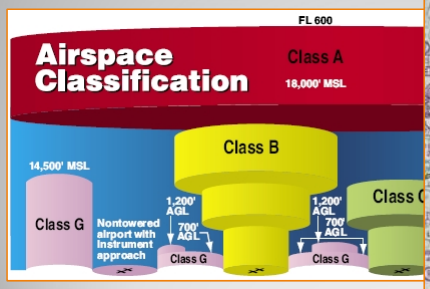
Where Can UAS Fly

- Not in Class A or B Airspace
- Not Over Densely Populated Areas (Yellow on Sectionals)



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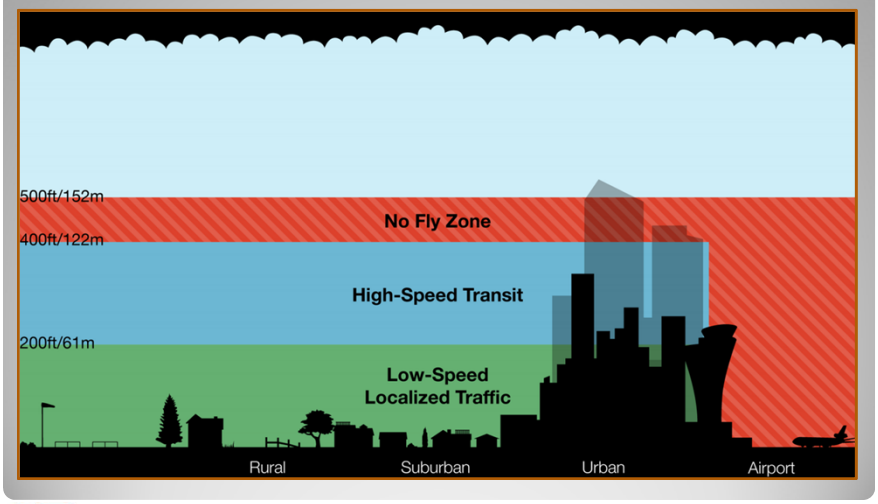
Amazon's Airspace Proposal



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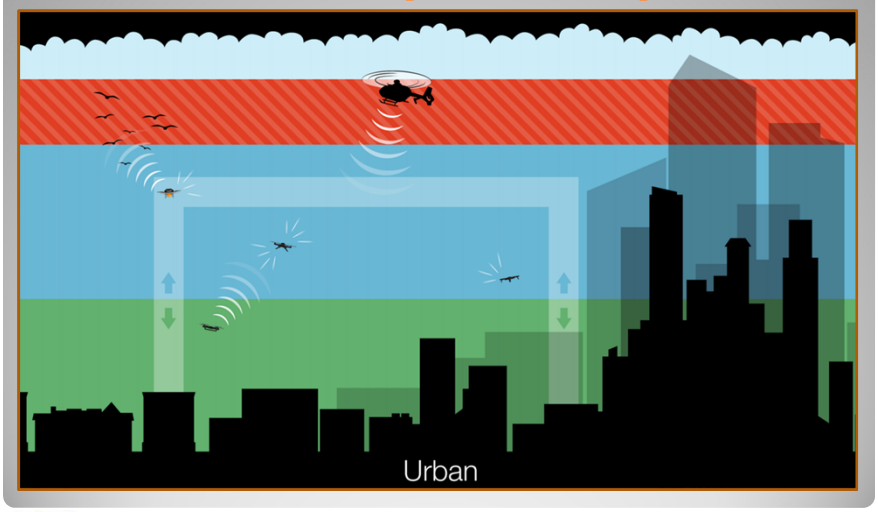
Amazon's Airspace Proposal



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State's Rights

By law, the FAA is charged with ensuring the safe and efficient use of U.S. airspace. This authority generally preempts any state or local government from enacting a statute or regulation concerning matters - such as airspace regulation - that are reserved exclusively to the U.S. Government.

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Inspection

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Lack of UAS Regulations

- Pilot/Crew Qualifications
- Medical Certification
- Aircraft Certification
- Ground Control Station Certification
- Dedicated and Protected Radio Frequency

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Fixed Wing Evaluation September, 2014

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Notice of Proposed Rule Making

- sUAS - Less than 55 lbs
- VLOS - Visual Line of Sight
- Not Over any Persons
- Daylight-Only Operations
- Max Airspeed – 100 mph
- Max Altitude – 500 feet AGL
- No Class A Operations
- Class G Operations Allowed without ATC
- MicroUAS – Relaxed Rules

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Notice of Proposed Rule Making

- Operators
  - Pass a Basic Aeronautical Knowledge Test
  - Be Vetted by the Transportation Security Administration
  - Obtain an Unmanned Aircraft Operator Certificate w/sUAS Rating
  - Recurrent Tests Every 24 Months
  - Be at Least 17 Years Old
  - Aircraft Registration Required
  - Aircraft Markings Required

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Solar Panel Inspection

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Recent Efforts

- Received COAs from the FAA
- UAS demo at Design to Paver
- Evaluating use at ODOT
  - Solar Panel Inspections
  - Bridge Inspections
  - Quarry Site Surveys
- Evaluated and purchased rotorcraft UAS for survey work.

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ODOT UAS

- Purchased a Leica Aibot H6 Hexacopter
- Waiting for COA
- Training Scheduled for the Week of April 25th

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Recent Efforts

- An ODOT team is discussing whether (in consideration of motorist safety) ODOT should and could regulate UAS flying over state highways
- Oregon State Representative John Huffman has assembled a UAS Stakeholders Group chaired by Mitch Swecker (ODA Director)
- I am ODOT's representative on this group

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UAS Registration (Federal)

- Effective December 21, 2015, anyone who owns a small unmanned aircraft of a certain weight must register with the Federal Aviation Administration's Unmanned Aircraft System (UAS) registry before they fly outdoors.
- People who do not register could face civil and criminal penalties.

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UAS Registration (State)

- Public Agencies are required to register all UAS with the Oregon Department of Aviation.
- Public Agencies shall provide an annual report to the Oregon Department of Aviation
  - Frequency of Use
  - Purpose

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New Oregon Law (HB 4066)

- It prohibits anyone from weaponizing a UAS.
- It requires state agencies that use UASs to develop a policy on their use and have it available to the public.
- It creates a violation for intentional operation of a UAS within 400 feet of a critical facility, and for UAS interfering with the take-off or landing of another aircraft.

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New Oregon Law (HB 4066)

- It exempts commercial UAS flights, in accordance with FAA authorization, from the state private right of action. That does not, however, block any other suit or potential invasion of privacy charge.
- Awaiting Governor's Signature

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ODOT UAS Program Management

The regulations surrounding the use of unmanned aircraft are complex and in constant flux. I have appointed Ron Singh, ODOT's Chief of Surveys, as the Unmanned Aircraft Systems Program Manager. The use of unmanned aircraft in ODOT will be limited, managed carefully and must be coordinated and approved by Ron. This also includes any proposed joint use by ODOT and other federal, state or local government agencies. In addition, we are also working with the Safety Division to establish appropriate employee safety practices.

The use of drones by any private entities on or around our facilities, for filming or other activities, is to go through the normal permitting practice of the District Maintenance offices.

Tom Lauer
Chief Engineer

Oregon Department of Transportation

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Rotorcraft Evaluation June, 2015

[redacted]

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** Recent News **

October 6th, 2015

FAA Proposes $1.9 million Civil Penalty Against UAS Operator for Unauthorized Unmanned Aircraft Operations.

"Flying unmanned aircraft in violation of the Federal Aviation Regulations is illegal and can be dangerous," said FAA Administrator Michael Huerta. "We have the safest airspace in the world, and everyone who uses it must understand and observe our comprehensive set of rules and regulations."

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Questions?
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