

University of Maryland UAS Test Site Update

Matt Scassero

Director, UMD UAS Test Site Associate Director for MD, MAAP mscasser@umd.edu http://uas-test.umd.edu/

















What difference will it make to you and me?





Authorization Required to Fly UAS Activities completely contained in active Special Use Airspace No FAA approval required - range rules apply (Restricted and Warning Areas) In process for UAS Aircraft Certification • Special certifications have been issued (3) Section 333 Exemption Limited use, geography and users Only available for Public operations COA • Agency determines pilot certification and airworthiness Advisory Circular 91-57, Model Aircraft Operating Private recreational use Standards UNIVERSITY OF MARYLAND IAS TEST . JAMES CLARK SCHOOL of ENGINEERING

FAA Section 333

SEC. 333. SPECIAL RULES FOR CERTAIN UNMANNED AIRCRAFT SYSTEMS.

(a) IN GENERAL.—Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.







FAA Section 333 Approvals

- Expected FAA priorities for Section 333 applications
 - Pipeline and line inspections
 - Film production and journalism
 - Smokestack inspection
 - Agricultural and Crop inspections
- All 333 approved operations are required to comply with manned-aircraft Federal Aviation Regulations
- For FARs that cannot be complied with, applicant must propose an alternative method of compliance that provides an equivalent level of safety (ELS)





Compliance Alternatives Expected

- Airworthiness Certificate
- Location of flight manual and registration
- Preflight actions
- Flight Instruction
- Minimum Safe Altitude
- Altimeter settings
- Fuel requirements
- Maintenance Inspections







Industry Expectations of 333

- Outside controlled airspace
- Located in a defined, controlled area
- Away from persons or property
- Within Visual Line of Sight (VLOS)
- UAS that are less than 55 pounds
- UAS crew includes a Spotter and separate Sensor Operator





Public Interest

- All applications for a 333 exemption must state why the operations are in the public interest, i.e.
 - Congress has made commercial UAS operations a national priority
 - Enhancement of safety over normal operations







MAAP Ranges



- Early flight testing to occur in areas and with flight plans designed to manage risk.
- With demonstrated performance, testing will gradually increase in complexity.
- Long-term airspace analysis is in progress





Airspace development ongoing:

- Maximize safety/Manage risk
- Support
 - Agricultural applications
 - Utility applications
 - Emergency Response applications
 - Proximity to R and D centers
 - Leverage commercial use opportunity

UMD UAS Test Site Initial Airspace

TEST RANGE AIRSPACE 37.7588, -75.9775 37.9294, -76.0397 G 38.1077, -76.1286 38.3780, -75.8008 38.2880, -75.6377 38.0766, -75.775 G 37.9691, -75.8447 38.1394, -76.1461 0 37.6675, -76.0175 38.2219, -76.1852 38.2227, -76.0013 0 37.8947, -76.2302 38.0997, -76.5561 38.3111, -76.2797 38.3133, -76.2386 37.6802, -76.1755 37.8405, -76.0122 37.7572, -76.1916 G 37.7566, -76.385 37.8486, -76.5305 0 38.1902, -76.4169 37.6802, -76.0308 37.6941, -76.0125 37.9958, -75.7677 38.0530, -75.8905 37.7602, -76.0127









Assets-Fields/Facilities

10







Wallops Island-UAV field



- UAV Solutions in Jessup, MD
- "truck" for payload testing
- Versatile, proven
 - Carbon Fiber & Kevlar design
 - 15-20 minute deployment time
 - Electric power
 - Pneumatic launch and conventional skid recovery
 - Fully Autonomous Capability

Specifications Length: 9' Width: 20'

MGTOW: 80 lbs.

ISR mission weight: 60 lbs. (Includes batteries and payload)

Range: 20+ miles

Payload Capacity: 10 lbs.

Endurance: 4-6 hours









FAA Oriented Research Task Examples

| Research Tasks | Research Task Title | FAA-SIR Focal Area |
|-------------------|--|--|
| RT-1 | Levels of Automation and Control Algorithm Optimization for UAS | UAS command and control link issues |
| RT-2 | Fault Tolerance and Health Monitoring of UAS | UAS system safety and data gathering |
| RT-3 | Autonomous Path Planning and Conflict/Collision Avoidance for UAS | UAS system safety and data gathering |
| RT-4 | Modeling and Validation of Environmental Noise Impacts Associated with the Operation of UAS in the NAS | Environmental impacts associated with the operation of UAS in the NAS |
| RT-5 | UAS Low-Altitude Vision Based Sense and Avoid Technology | UAS ground and airborne sense and avoid research |

Sample Projects & Customers

- Tie stakeholders together
 - NOAA
 - Menhaden survey, Chesapeake Bay/Atlantic
 - Agriculture
 - Crop and vineyard surveillance
 - Precision agriculture
 - Utilities
 - Power line inspection
 - Public Safety
 - Fire, EMS, Search & Rescue, Law Enforcement
- Section 333 Exemptions









esearch inf

So what?

- Turn research into \$\$\$ into companies into jobs – THAT'S WHAT!!!
- Academic institutions and industry partnerships are critical and well-suited...
 - (Re)train workforce, new and established
 - Relatively nimble with resources
 - Focused on creating outcomes, not just activity
 - Funded for success
 - Aligned programs







Opportunity to Collaborate

- FAA UAS Center of Excellence
 - Funded program
 - Academia-based, matching grants with industry
 - Similar research agenda to test sites
 - Proposals are in, single award in FY2015
- Where are the demand signals coming from?
 - FAA, SC228, test sites, COE?







CENTER OF EXCELLENCE FOR



- Flying UAS **safely** & **efficiently** in NAS presents challenges, *both technical and rulemaking*.
- There is great *potential* for *high demand of skilled labor* as the UAS Commercial market grows.
- Academic programs will need to adapt and develop the next generation workforce.

There will be winners and losers with global competition...the difference will be investment and will.





