

# UAS America Fund

## Unmanned Aerial Systems

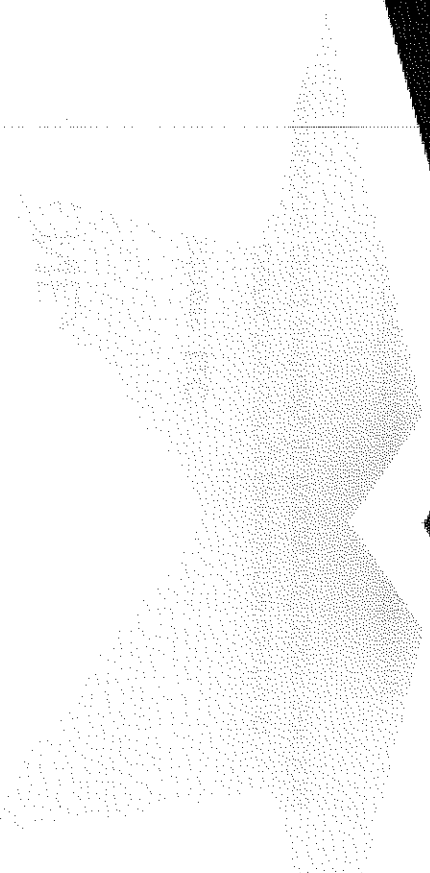
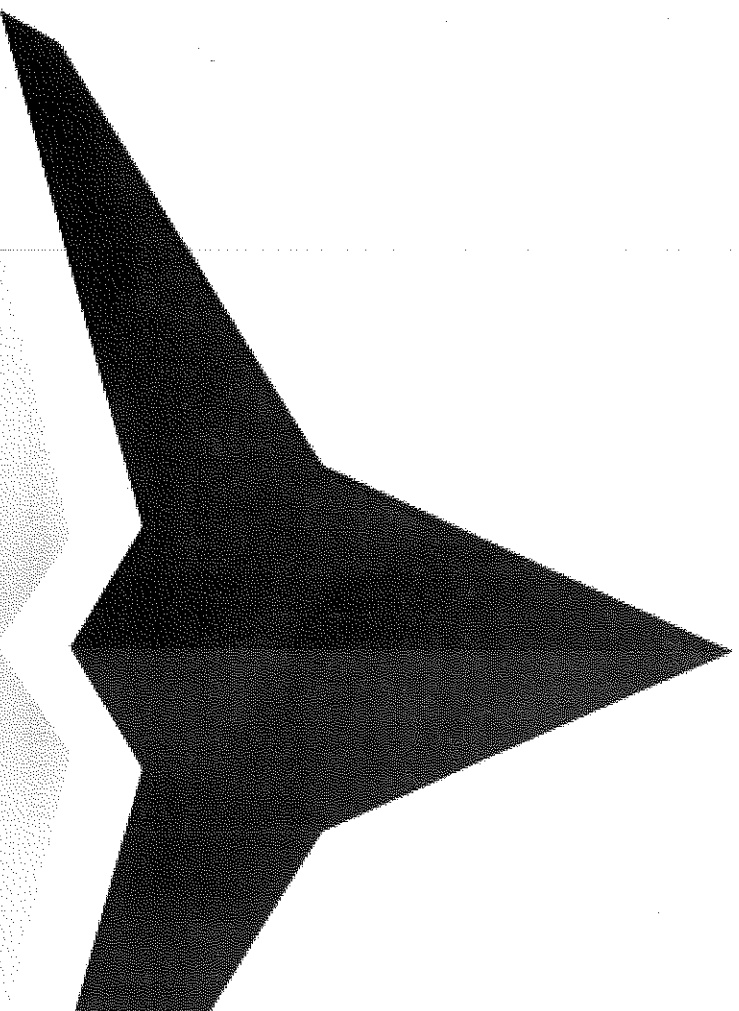
### A Path Forward

Office of Information and Regulatory Affairs  
Office of Management and Budget

17 December 2014



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# Introduction to UAS America Fund & NEXA Capital

## UAS America Fund, LLC

- Established to benefit the emerging unmanned aerial systems sector of the US aerospace industry
- Collaboration with US Congress, FAA, State & Local economic development agencies
- Partnership-building between aerospace investors, state & local governments, and UAS companies
- Advocacy and coalition-building specific to:
  - Standards-setting
  - Infrastructure requirements
  - Legislation, including privacy & safety
- Evaluation of investment opportunities, including short- and long-term prospects across platforms, operating entities, and provision of supporting infrastructure
- UAS Fund has already invested capital into commercializing UAS and leading advocacy efforts

## NEXA Capital Partners, LLC

- Investment bank focusing predominantly in aerospace and entirely in transportation sectors
- Emphasis on transformational investment opportunities
- Services include financial advisory, corporate finance, private placements, M&A advisory, PPPs
- General Partner in unlisted specialty funds:
  - NextGen Equipage Fund, LLC
  - NextGen GA Fund, LLC
  - UAS America Fund, LLC
- NEXA Capital staff includes:
  - Former FAA COOs
  - Former airline COO & Chief Pilot
  - Seasoned management consultants
  - Infrastructure finance & banking professionals
  - Aerospace industry experts



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# FAA's efforts are focused on activities that do not meet the near term needs of the industry

## FAA's small UAS rule is expected to include:

- Fully-licensed Private (or higher) license
- Significant added costs for pilots & FAA
- No real safety improvement
- 55 pound threshold
- One size does not fit all
- Fails to adequately factor technical innovation to offset operational risks
- Time horizon to implementation
  - Lost economic development, jobs, tax revenue
  - US businesses falling behind or closing
- Other likely onerous compliance requirements, with large FAA administrative cost & burden
  - COA & NOTAM reporting
  - Inspection, maintenance, and training procedures, record-keeping, and reporting
  - Aircraft registration and marking (N-numbers)
  - Additional FAR requirements

## Effect of FAA's Focus:

- Provides no clear path for routine near term authorization of commercial UAV operations
- No safety differentiation between impulse hobbyists versus serious, safe commercial operations
- Applies severe limitations for commercial research, development, and testing of UAS
- Current FAA processes provide inefficient path for approval of commercial operations

## A proper industry focus would:

- Segment the market (many reasonable options and alternatives exist)
- Focus incrementally on the segments
- Begin where there is demand
- Begin where problems are more tractable
- Some segments need minimal regulation



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Initially, reasonable and logical market segmentations, and their associated regulatory requirements, are possible

	Regulatory Requirements												Certification Requirements										
	Low Altitude (below 400' AGL)	High Altitude (above 400')	Micro UA (< 3 lbs)	Small/Large (>3 lbs)	Non-populated Area	Populated Area	Public Property	Private Property with Permission	Line of Sight	Beyond Line of Sight	Daytime VFR	Nighttime	IFR	Insurance Necessary	Geo-fencing	Return to Origin / Fix	Collision Avoidance System	Constant Position Reporting	Descent Control	Pilot (UAS-specific)	Aircraft (UAS-specific)	Operator (UAS-specific)	
Example Applications																							Incremental characteristics of each category
Recreational Flights: Minimal Regulations	●																						Across all categories, the following are assumed: - Common-sense operating rules - No careless or reckless flight - Fly in good weather conditions - Respect others' privacy - No-fly restrictions: near airports, over crowds, etc.
Hobbyist and recreational flights	●				●	●	●	●	●	●	●	●	●	●									
Recreational Flights: Certification & Technical Requirements	●				●	●	●	●	●	●	●	●	●	●		●				●	●	●	
Hobbyist and recreational flights																							Base hobby / recreation category
Commercial Flights - Category 1A (Micro Unmanned Aircraft): Minimal Regulations	●				●	●	●	●	●	●	●	●	●	●							●	●	Base commercial Category 1A - Micro Unmanned Aircraft  Additional commercial categories (1B, 1C, etc) expected to be added incrementally, over time and with sufficient supporting information to justify economic impacts and safety concerns. Anticipated future categories: - Increased weight thresholds (5#, 10#, 25#, etc) - Higher tiered altitude limits (floor of Class E or D) - Increasingly robust Pilot certification requirements
Close-proximity and Line-of-Sight commercial operations such as: - Training & certification - Aerial photography - Infrastructure inspection - Small-scale precision agriculture - Firefighting, discrete-area SAR - Insurance investigation														●									
Commercial Flights - Category 2: Minimal Certification / Regulation and Technical Requirements																					●	●	UAS-specific pilot certificate will be required
Aerial imaging, surveys, Photogrammetry, Agriculture, etc	●				●	●	●	●	●	●	●	●	●	●		●							
Commercial Flights - Category 3: Pilot, Aircraft, & Operating Certifications Necessary and Technical Requirements	●				●	●	●	●	●	●	●	●	●	●		●					●	●	
Dispersed-area operations such as long-distance BLOS flights for - Search & Rescue - Infrastructure inspection - Agriculture monitoring, etc														●		●				●	●	Adds allowance for BLOS when pilot, aircraft, and operator obtain UAS-specific certification; Adds large aircraft operations when obtaining UAS-specific aircraft certification; Adds requirement for on-board constant position reporting and descent control	
Commercial Flights - Category 4: Full Certification Necessary and full suite of Technical Requirements required	●				●	●	●	●	●	●	●	●	●	●		●				●	●		●
No restrictions - governed by Operating Certificate(s) and aircraft limitations	●				●	●	●	●	●	●	●	●	●	●		●				●	●		●
																							Adds high altitude and IFR allowances; NAS integration necessary if flying in controlled airspace

# UAS America Fund's proposed rule for Micro Unmanned Aircraft (mUA) in Category 1A commercial operations

## Lowest-risk operational parameters proposed:

- 3 pound MTOW
- Line of Sight only
- 400' AGL
- 100' from persons
- 5+ mi from airports
- Insurance required
- VMC & clear of clouds

## Safety study concludes minimal risk to aircraft

- Despite 10 billion birds in US, no fatalities from a small/medium bird strike < 400' & 5+ mi from airports
  - FAA data spanning 25 years
  - Small & medium birds (3.8lb seagull)
    - Only 6 instances of injury
- Of more than 150k bird strikes over 25 years and in all airspace only 230 (0.15%) caused injury or fatality
- Potential mUA – manned aircraft conflicts are extremely unlikely
- No significant added risk to other airspace users

## Pilot certification must be streamlined

- UAS-specific certificate program
- Aeronautical knowledge is key
- Maneuvers, navigation, systems unnecessary
- PPL cost prohibitive & FAA burden significant
- Ground School required or PPL/CPL/ATP

## Costs and benefits are significant

- Very minimal, if any, burden on FAA budgets
- mUA applications either increase efficiencies through cost savings or reduce risk
- Burdening regulation and associated costs can be alleviated
- Strict US rules offset by minimal foreign rules
- Market size & econ impact hard to quantify, but clearly in the billions and immediately
- US is losing its competitive advantage



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# UAS America Fund's proposed rule for Micro Unmanned Aircraft (mUA) in Category 1A commercial operations

## **§107.1 Applicability.**

This part prescribes rules governing the operation of micro unmanned aircraft in the United States. For purposes of this part, a micro unmanned aircraft means a device capable of sustaining its own powered flight in the air, that is operated without the possibility of direct human intervention from within or on the device, and that:

- (a) weighs 3 pounds or less gross takeoff weight, including power source and payload;
- (b) is powered by an electric battery or other non-combustion power source;
- (c) is operated for a business, commercial, scientific, academic, research or other non-recreational purpose; and
- (d) is not a "model aircraft" subject to Public Law 112-95 § 336.

## **§107.3 Waivers.**

No person may conduct operations that require a deviation from this part except under a written waiver issued by the Administrator.

## **§107.5 Careless or reckless operations.**

- (a) No person may operate a micro unmanned aircraft in a careless or reckless manner so as to endanger the life or property of another.
- (b) No person may allow an object to be dropped from a micro unmanned vehicle if such action creates a hazard to other persons or property.

## **§107.7 Certification and registration.**

- (a) Notwithstanding any other section pertaining to certification of aircraft or their parts or equipment, micro unmanned aircraft and their component parts and equipment (including ground station or radio control systems) are not required to meet the airworthiness certification standards specified for aircraft or to have certificates of airworthiness.
- (b) Notwithstanding any other section pertaining to registration and marking of aircraft, micro unmanned aircraft are not required to be registered or to bear markings of any type, except that the name, address, and telephone number of the owner or operator shall be affixed to at least two externally visible locations on the micro unmanned aircraft.

## **§107.9 Daylight operations.**

- (a) No person may operate a micro unmanned aircraft except between the hours of sunrise and sunset.
- (b) Notwithstanding paragraph (a) of this section, micro unmanned aircraft may be operated during the twilight periods 30 minutes before official sunrise and 30 minutes after official sunset, or, in Alaska, during the period of civil twilight as defined in the Air Almanac. If:
  - (1) The micro unmanned aircraft is equipped with an operating anticollision light visible for at least 3 statute miles; and
  - (2) All operations are conducted in uncontrolled airspace.

## **§107.11 Operation near aircraft, right-of-way rules.**

- (a) Each person operating a micro unmanned aircraft shall continually maintain vigilance so as to see and avoid aircraft and shall yield the right-of-way to all manned aircraft.
- (b) No person may operate a micro unmanned aircraft in a manner that creates a collision hazard with respect to any aircraft.
- (c) Each person operating a micro unmanned aircraft, upon hearing engine, rotor, or propeller sounds from an aircraft uninvolved in the operation, shall take precautionary steps to identify the altitude and flight direction of the uninvolved aircraft and yield right of way.

## **§107.13 Operating limitations: altitude, airspace and locations.**

- (a) No person may operate a micro unmanned vehicle of an altitude greater than 400 feet above ground level (AGL).
- (b) No person may operate a micro unmanned vehicle within Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport unless that person has prior authorization from the ATC facility having jurisdiction over that airspace.
- (c) No person may operate a micro unmanned aircraft within 5 nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless that person has prior written authorization from that airport's management. This restriction does not apply to airports that are closed or abandoned.
- (d) No person may operate a micro unmanned aircraft beyond his or her visual line of sight (VLOS). During the flight operation, the operator must be able to view the micro unmanned aircraft at all times using his or her own natural vision (which includes vision corrected by standard eyeglasses or contact lenses). The maximum operating distance of a micro unmanned aircraft system from the operator under this subsection is 2,640 feet, regardless of the visual acuity of the operator.
- (e) No person may operate a micro unmanned aircraft closer than 100 feet from any persons uninvolved in the operation.
- (f) No person may operate a micro unmanned aircraft over an open-air assembly of persons.
- (g) No person may operate a micro unmanned aircraft in special use airspace designated under Part 73 unless that person has permission from the using or controlling agency, as appropriate.
- (h) No person may operate a micro unmanned aircraft over privately-owned property without the express or implied permission from the property owner, tenant in possession, or an authorized representative thereof.
- (i) No person may operate a micro unmanned aircraft system within 5 nautical miles of any forest fire without authorization from the incident commander.
- (j) Prior to operating a micro unmanned aircraft under this part, the operator shall become familiar with all pertinent information concerning the proposed operational location, including but not limited to review of relevant NOTAMS.
- (k) Any person intending to operate a micro unmanned aircraft within one mile of any active emergency shall first check for any NOTAMS with respect to restrictions on operations in that location.

## **§107.15 Meteorological conditions.**

All flights under this part must be conducted under visual meteorological conditions. A micro unmanned aircraft may not be operated under this part less than 500 feet below, or less than 2,000 feet horizontally from, a cloud, or when visibility is less than 3 statute miles from the operator.

## **§107.17 Operating limitations: ground speed.**

No person may operate a micro unmanned aircraft in excess of 40 knots ground speed.



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# UAS America Fund's proposed rule for Micro Unmanned Aircraft (mUA) / Category 1A commercial operations

## **§107.19 Operator qualifications.**

- (c) An operator of a micro unmanned aircraft system under this part must be at least 18 years of age.
- (b) No person may operate a micro unmanned aircraft system under this part without first passing the FAA private pilot written airman knowledge test administered by an FAA-accrued pilot school or test center. Prior to any operation under this part, the operator shall send written notification to the FAA evidencing the test results together with the operator's name and contact information, which submission the Administrator will acknowledge in writing as constituting the operator's micro unmanned aircraft pilot certificate for purposes of 49 USC § 44711. This subsection shall not apply to micro unmanned aircraft systems operated as public aircraft.
- (c) The FAA may pursue investigation and enforcement procedures set out in part 13 with respect to the operator of a micro unmanned aircraft system, including potential suspension or revocation of a micro unmanned aircraft pilot certificate held by its operator.
- (d) Any other FAA pilot certificate that has as a requisite a written airman knowledge test may, if said certificate is current and in good standing, serve as a micro unmanned aircraft pilot certificate under subsection (b) even if the operator is unable to provide evidence of his or her written test results. Such pilot certificates will constitute the operator's micro unmanned aircraft pilot certificate for purposes of 49 USC § 44711 and part 13.
- (e) No person shall operate a micro unmanned aircraft for hire or for a commercial purpose (other than research and development activities relating to the micro unmanned aircraft or its related systems and components), without first undertaking and documenting the following steps to gain experience and proficiency with the micro unmanned aircraft model:
  - (1) Review of the micro unmanned aircraft manufacturer's operating manuals and any instructional videos provided by the manufacturer;
  - (2) at least 5 hours of total operating flight time; and
  - (3) at least 25 takeoff-and-landing sequences.
- (f) All operations under this part (including training) shall be documented and recorded in a permanent place such as a log book. For the purposes of meeting the minimum requirements of this subsection, each person must record the following information for each micro unmanned aircraft flight:
  - (1) Date and time
  - (2) Micro unmanned aircraft type, make, model
  - (3) Route and boundaries of flight
  - (4) Total duration of flight
  - (5) Weather conditions of flight
  - (6) Number of landings
  - (7) Total flight time and/or lesson time
  - (8) Remarks or other pertinent details

## **§107.21 Alcohol or drugs.**

- (c) No person may operate a micro unmanned aircraft —
    - (1) Within 8 hours after the consumption of any alcoholic beverage;
    - (2) While under the influence of alcohol;
    - (3) While using any drug that affects the person's faculties in any way contrary to safety; or
    - (4) While having an alcohol concentration of 0.04 or greater in a blood or breath specimen.
- Alcohol concentration means grams of alcohol per deciliter of blood or grams of alcohol per 210 liters of breath.

## **§107.23 Insurance.**

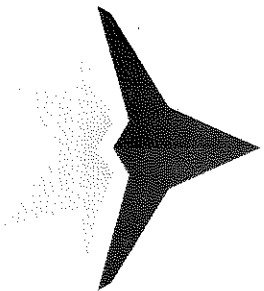
- (a) No person shall operate a micro unmanned aircraft for hire or for a commercial purpose (other than for research and development of the micro unmanned aircraft or its systems and components) unless he or she has in effect liability insurance coverage that meets the minimum motor vehicle insurance coverages for both property damage and bodily injury required in the state in which the operation occurs, and that has been issued specifically to insure against risks of the operation of the micro unmanned aircraft.
- (b) Insurance coverage to meet the requirements of this part shall be obtained from one or more of the following:
  - (1) An insurer licensed to issue aircraft accident liability policies in any State, Commonwealth, or Territory of the United States, or in the District of Columbia; or
  - (2) Surplus line insurers named on a current list of such insurers issued and approved by the insurance regulatory authority of any State, Commonwealth, or Territory of the United States or of the District of Columbia.
- (c) All person who have operated micro unmanned aircraft under this part must present their logbook, proof of insurance, and evidence of submission to the FAA Administrator their written test results or their valid pilot certificate, or any other record required by this part for inspection upon a reasonable request by—
  - (1) The Administrator;
  - (2) An authorized representative of the National Transportation Safety Board; or
  - (3) Any Federal, State, or local law enforcement officer.

## **§107.25 Accident reporting.**

In connection with any operation under this part, any incident involving \$1,000 or more in third-party property damage, and any accident involving any bodily injury, must be reported to the nearest FAA Flight Standards District Office within three business days. Accidents involving a serious injury or death shall be reported to the NTSB pursuant to 49 CFR part 830.



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