

Unmanned Aircraft Systems in the University of California System

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CENTER OF EXCELLENCE ON UNMANNED AIRCRAFT SYSTEM SAFETY

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Topics

Role of the Center on UAS Safety

UASs in the UC System

Authorization Process for UC UASs

UC UAS Management

Upcoming UAS Laws

Student Drone Clubs

Enforcement of UAS Policies

Center of Excellence on Unmanned Aircraft System Safety

Coordinate the development of UC UAS policies through taskforces/working groups

Act as a point of contact for FAA for UAS registration and flight operations (Sec 333 and Public COA)

Ensure compliance with federal/state regulations

Provide assistance in UAS registrations, operations

Develop internal UC policies on certification and flight safety training

Implement effective reporting mechanisms

Act as a central repository for all UAS policies (Federal, State, UC)

Assess and manage risk for UC UAS operations

Enable UAS safety research through effective reporting systems

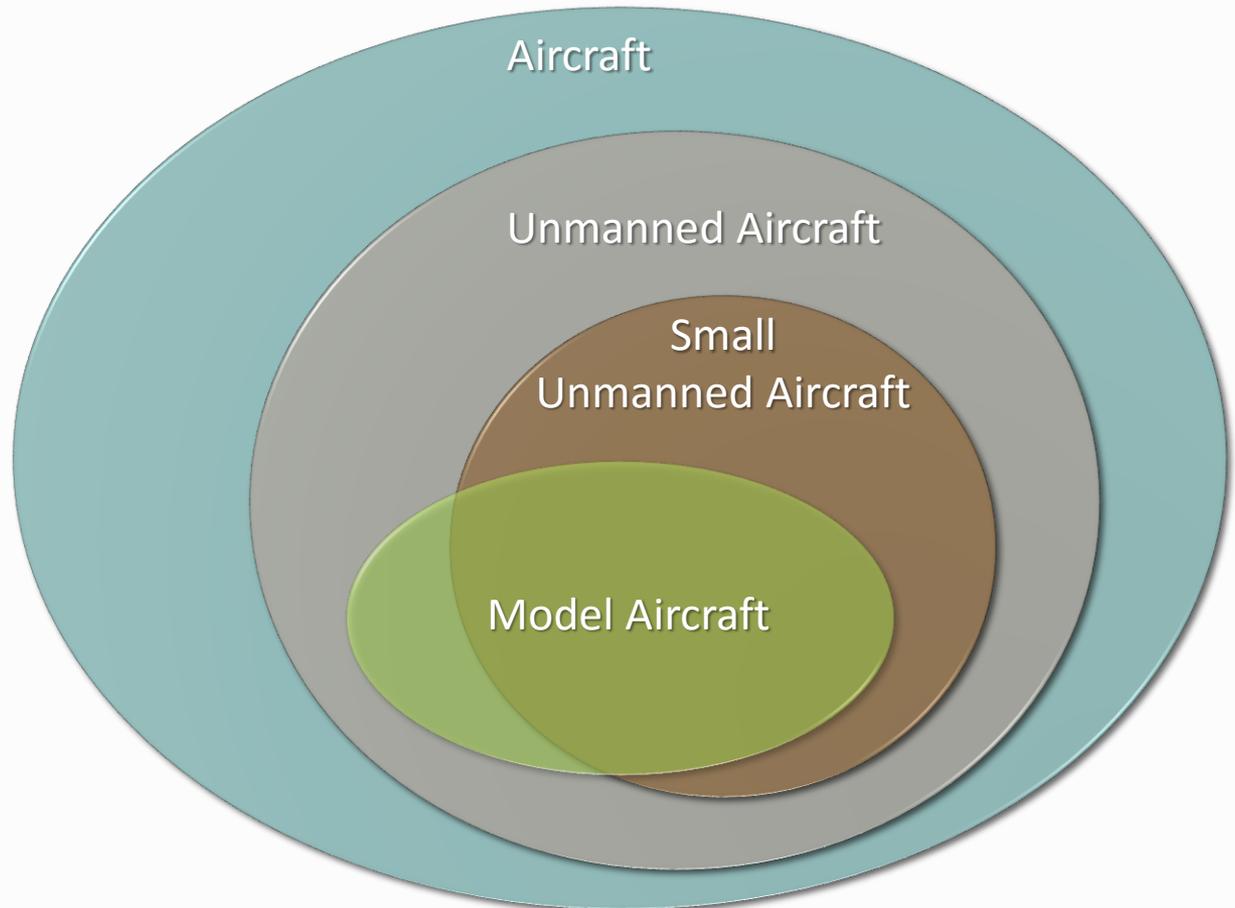
Guidance

1. Any UAS operated by the UC within the United States National Airspace is subject to FAA rules and regulations
2. Any UAS operated by a public university must apply to the FAA and receive either a Public Certificate of Authorization (COA) or a Section 333 Exemption.
3. A Public COA allows the UAS to be used only for the limited public purposes or activities specified in the approved COA.
4. A Section 333 Exemption allows certain UASs to be used for commercial purposes as specified in the approved exemption.
5. The UC must obtain authorization for any faculty, staff, or student operating or using a UAS in connection with or as part of his/her UC activities
6. Any UAS operated by UC faculty, staff, or students in connection with or part of his/her official activities does not qualify as a hobby or recreational use.

UAS or Model Aircraft

Model Aircraft are defined as a subset of Unmanned Aircraft.

Any law that affects the use of Unmanned Aircraft is applicable to Model Aircraft, except as noted in Sec 336 in H.R. 658 – “The FAA Modernization and Reform Act of 2012”

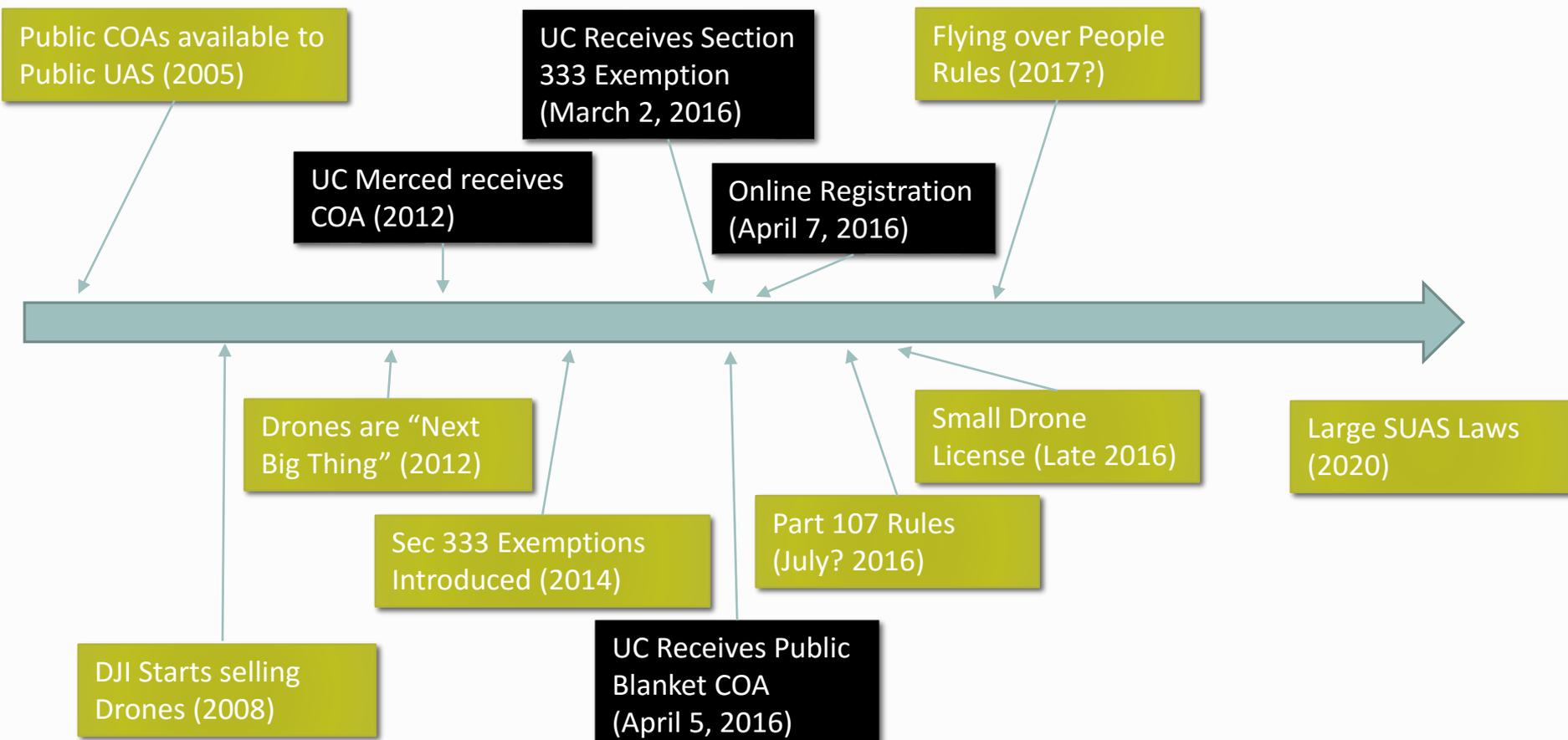


Model Aircraft

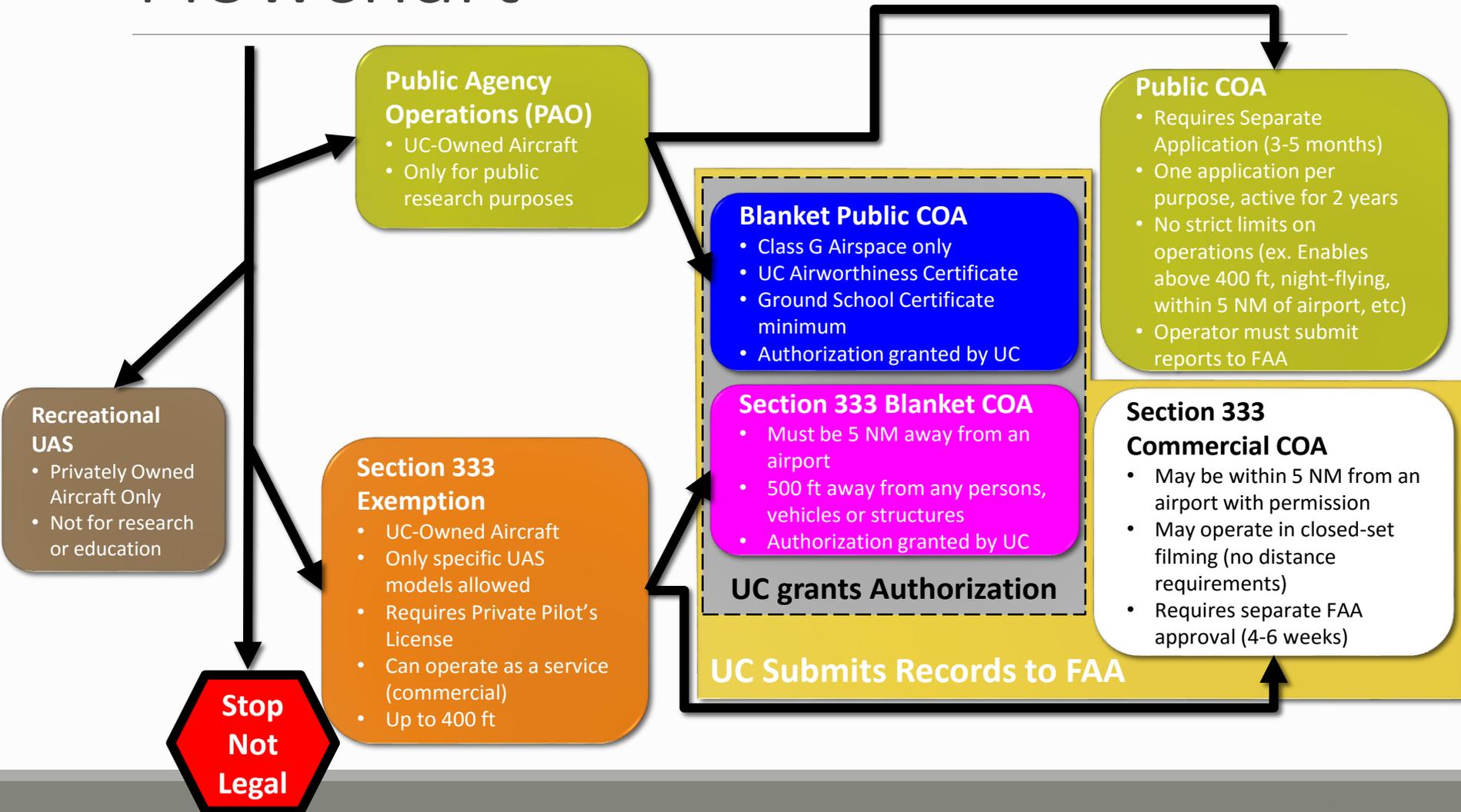
Model Aircraft is defined as

1. Capable of sustained flight in the atmosphere;
2. Flown within visual line of sight of the person operating the aircraft;
and
3. **Flown for hobby or recreational purposes**

UAS Roadmap



UC UAS Authorization Flowchart



FAA Sec 333 Approved Aircraft

DJI Phantom 1, DJI Phantom 2, DJI Phantom 2 Vision, DJI Phantom 2 Vision+, DJI Phantom 3, DJI F550 FlameWheel, DJI Inspire 1, DJI Spreading Wing series,

3D Robotics Iris, 3D Robotics Iris+, 3D Robotics X8, 3D Robotics X8+, 3D Robotics Solo, 3D Robotics Aero-M,

PrecisionHawk Hawkeye Mk-III,

Draganflier X4-ES, Draganflier X4-P, Draganflier X6, Draganflier Guardian,

CyberQuad Maxi and the

Pulse Aerospace VAPOR 55

15/36 aircraft models were rejected by the FAA

Petition to Increase List of Approved Aircraft is in progress

New Online Registration

Federal Aviation Administration

Hi, Brandon Logout

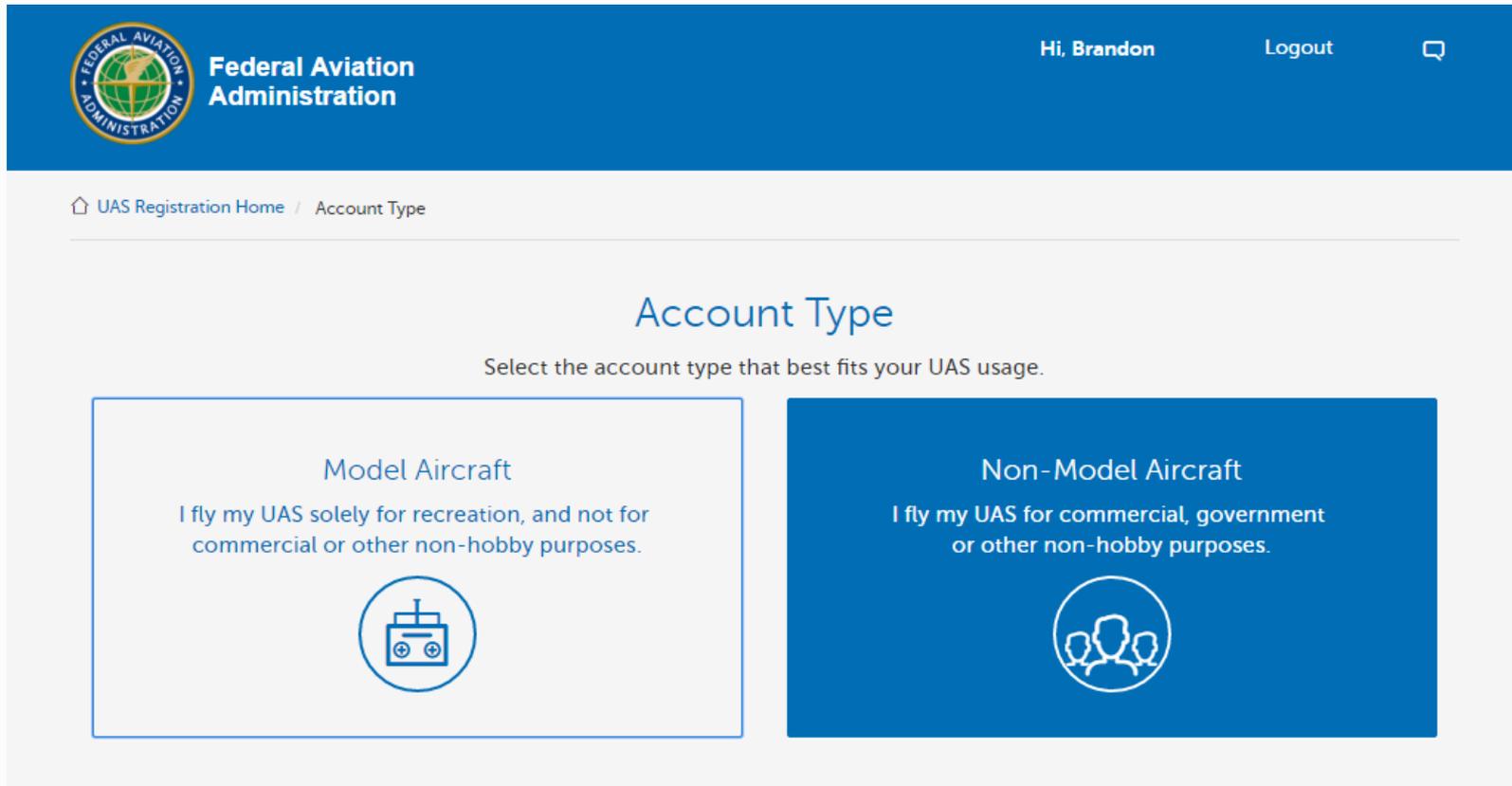
Welcome to the Small Unmanned Aircraft System (sUAS) Registration Service

This site will allow you to register your small UAS with the FAA and update your registration.

REGISTER LEARN MORE

Now Valid for UC's Sec 333 Exemption and Public COAs

Online Registration



The screenshot shows the Federal Aviation Administration's online registration interface. At the top, there is a blue header with the FAA logo on the left, the text "Federal Aviation Administration" in the center, and user information "Hi, Brandon" and a "Logout" link on the right. Below the header, a breadcrumb trail reads "UAS Registration Home / Account Type". The main content area is titled "Account Type" and includes the instruction "Select the account type that best fits your UAS usage." There are two selection options: "Model Aircraft" (described as recreational use) and "Non-Model Aircraft" (described as commercial or government use). The "Non-Model Aircraft" option is highlighted with a blue background.

 **Federal Aviation Administration**

Hi, Brandon Logout 

[UAS Registration Home](#) / [Account Type](#)

Account Type

Select the account type that best fits your UAS usage.

Model Aircraft

I fly my UAS solely for recreation, and not for commercial or other non-hobby purposes.



Non-Model Aircraft

I fly my UAS for commercial, government or other non-hobby purposes.



Online Registration

UAS Registration Home / Account Type / Organization Profile

PROFILE INVENTORY

Your Profile

To edit your profile, click the **Edit** button at the bottom of the page.

Applicant

(or Authorized Representative)

FIRST NAME	Brandon	MIDDLE	
LAST NAME	Stark	SUFFIX	
TITLE	Director, Center of UAS Safety		
PHONE		ALT EMAIL	brandon.stark@gmail.com

Organization Information

ORGANIZATION NAME	Regents of the University of California
DBA	

Currently, we're letting the individuals complete the registration under the name of "Regents of the University of California"

While it would be more uniform for a centralized approach, it may not be as effective. This will be a discussion topic for the summer Advisory Board

UAS Registration

Add New UAS

UAS TYPE: Select UAS Type

NICKNAME: Enter a Nickname

MANUFACTURER: Enter a Manufacturer

MODEL: Enter a Model

SERIAL NUMBER: Enter a Serial Number

SERIAL NUMBER NOT APPLICABLE

Cancel Add

NICKNAME	MANUFACTURER	MODEL	SERIAL NUMBER	REGISTRATION	ISSUED	EXPIRES
Phantom 2 Vi...	DJI	Phantom 2 V...	PH645454772	FA3XKW7ELR	04/01/2016	04/01/2019

FAA Aircraft Registry

The FAA has not developed a registry for the new online registrations, but is expected mid-2016

Aircraft Inquiries

N-number
Serial Number
Name

Make / Model
Engine Reference
Dealer
Document Index
State and County
Territory and Country
Pending / Expired /
Canceled Registration
Reports

Recent Registration

N-number Availability

- Request A Reserved N-Number
 - Online
 - In Writing

• Reserved N-Number Renewal

- Online

• Request for Aircraft Records

- Online

Help

Main Menu
Aircraft Registration
Aircraft Downloadable Database
Definitions
N-Number Format
Registrations at Risk
Contact Aircraft Registration

FAA Home » Licenses & Certificates » Aircraft Certification » Aircraft Registration » Aircraft Inquiry » Name Inquiry

FAA REGISTRY

Name Inquiry Results

Name: REGENTS OF THE UNIVERSITY OF CALIFORNIA

Sorted By: N-Number

Data Updated each Federal Working Day at Midnight



Showing 1 - 7 of 7 (Page 1 of 1)

N-Number	Serial Number	Manufacturer Name Model	Name Address
12UC	DC-3DRQ1	3D ROBOTICS DIY QUAD KIT	REGENTS OF THE UNIVERSITY OF CALIFORNIA
539UU	DC1	UTAH STATE UNIVERSITY AGGIE AIR MINION	REGENTS OF THE UNIVERSITY OF CALIFORNIA
591EC	201508251	PHOENIX AERIAL SYSTEMS S1000	REGENTS OF THE UNIVERSITY OF CALIFORNIA OF BEHALF
591FC	MESA-IRIS001	3D ROBOTICS IRIS+	REGENTS OF THE UNIVERSITY OF CALIFORNIA
637WC	EB-03-22184	SENSEFLY EBEE	REGENTS OF THE UNIVERSITY OF CALIFORNIA
658YU	MESA-SS-01	UC MERCED SKYSURFER	REGENTS OF THE UNIVERSITY OF CALIFORNIA
659NS	MESA-AT-01	UC MERCED AIRTITAN	REGENTS OF THE UNIVERSITY OF CALIFORNIA

Showing 1 - 7 of 7 (Page 1 of 1)

Sec 333 Obligations

All Sec 333 Flight Operations must submit a Project Packet to the UC

- Date and times of the flights;
- Purpose of the flight;
- Name and certificate number of the PIC;
- Geographic location of the flights and, if applicable, a map of the area with sufficient detail to assess possible obstacles or hazards for the flight;
- A listing of any airports or heliports within 5 NM of the proposed flight area as well as the location of any structures or hazards to the flight;
- Name and contact information for the University UAS Operations Manager;
- Maximum operating altitude;
- What sensor or payload is necessary to successfully complete the mission and whether the sensor selected requires a separate Sensor Operator to ensure the safe completion of the flight;
- Locations for the PIC, Observers, and Sensor Operator (if any);
- Contact information for local first responders such as fire and rescue or police;
- Contact information for local ATC controlling facility (if applicable);
- Copy of the COA governing the flight;
- Copy of the NOTAM for the flight operations;
- Sectional chart overlay, if available, of the operation area with special focus on possible air traffic deconfliction areas.

Sec 333: The Fine Print

The UAS may not be operated over congested or densely populated areas.

The University shall report any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by an applicable COA will be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours.

The University shall comply with the periodic reporting requirements contained in the applicable COA.

Sec 333: Documentation Requirements

- **Post Flight Summaries**
 - The University will maintain Post Flight Summaries using manufacturer provided checklists or, if unavailable, using a **Post Flight Summary form**. The Post Flight Summary form may be used to establish the operational history of the UAS, as necessary.
- **Incident Reports**
 - The University will maintain a record of any accidents, incidents or deviations encountered using an **Incident Report form**.
- **Lost-Link Report**
 - The University will maintain records of any lost-link encountered using a **Lost-Link form**.
- **Maintenance Records**
 - The University will maintain records of all required UAS maintenance, preventative maintenance, inspections, repairs, modifications, alterations and overhauls using the **Maintenance Log**.
- **Flight Logs**
 - The University shall maintain a record of all flights using the **Flight Log**.
- **FAA Reporting Requirement**
 - The University shall document all operations associated with UAS activities as required by the applicable COA.
 - To ensure compliance with FAA reporting requirements under a University's COA, the following information must be maintained for each UAS flight:
 - Operator name, and exemption/aircraft registration no.'s;
 - UAS types and models;
 - All operating locations, to include location city/name and latitude longitude;
 - Number of flights (per location, per aircraft);
 - Total aircraft operational hours;
 - Takeoff and Landing damages;
 - Equipment malfunctions.

Blanket COA

Requires a pilot with one of the following certificates

- Airline transport
- Commercial
- Private
- Recreational
- Sport

Must operate at least 500 ft from all nonparticipating persons, vessels, vehicles and structures

- The only people declared as not nonparticipating is the pilot, visual observer, any trainees or flight essential personnel.

Must be operated over private or controlled-access property with permission from the property owner/controller or authorized representative

Specific Aircraft Only

Flights at or below 400 ft

Aircraft under 55 lbs

Operate during VFR conditions during daylight only

Operate within VLOS

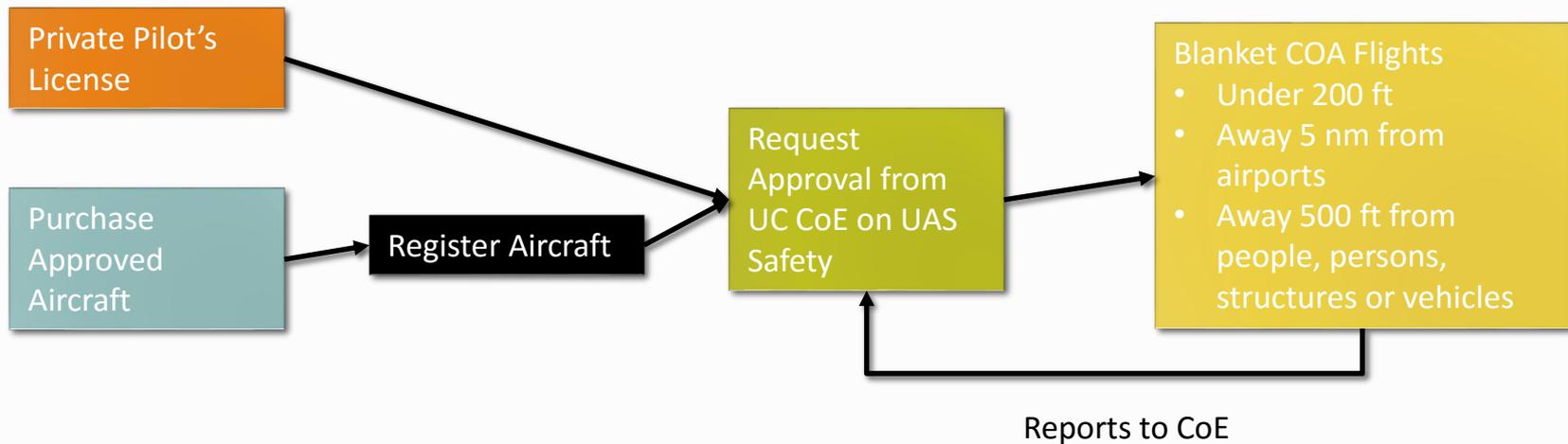
5 NM away from an airport tower

3 NM away from an untowered airport with instrument flight procedures

2NM away from an untowered airport without instrument flight procedures

2NM away from a helipad

Section 333 Exemption Flow – Under 400 ft



Sec 333 COA

Requires a pilot with one of the following certificates

- Airline transport
- Commercial
- Private
- Recreational
- Sport

Must operate at least 500 ft from all nonparticipating persons, vessels, vehicles and structures

- The only people declared as not nonparticipating is the pilot, visual observer, any trainees or flight essential personnel.

Must be operated over private or controlled-access property with permission from the property owner/controller or authorized representative

Flights at or below 400 ft

Must apply from FAA

Aircraft under 55 lbs

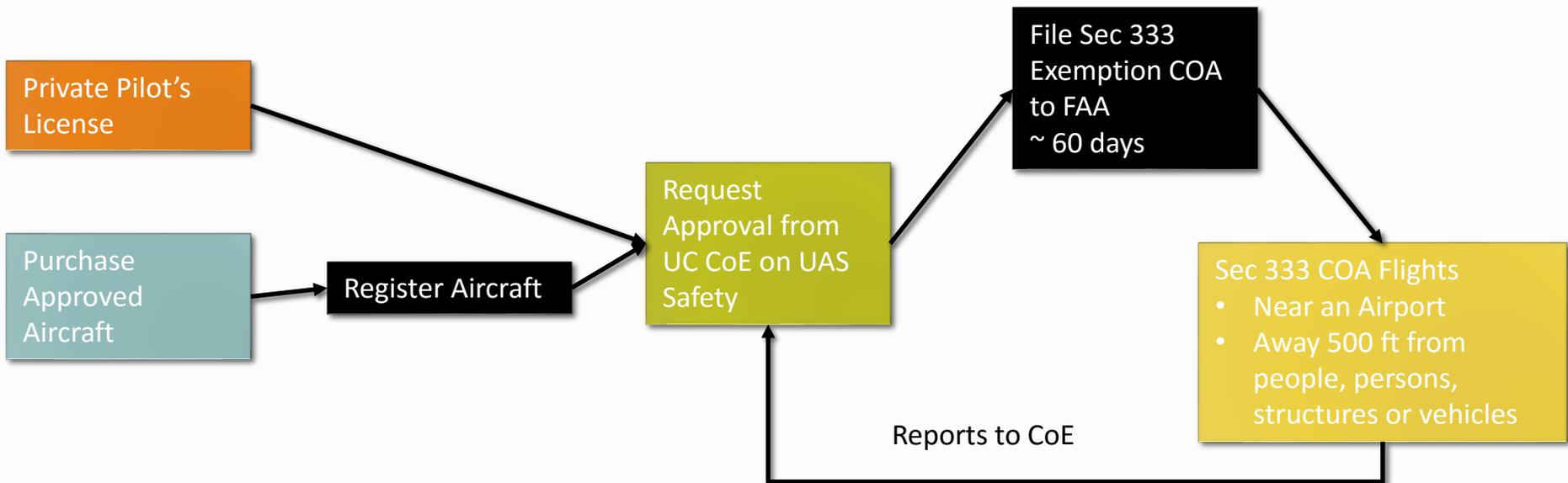
Operate during VFR conditions during daylight only

Operate within VLOS

Requires a letter of agreement from an airport to operate within 5 NM

Must file a NOTAM

Section 333 Exemption Flow – Near airports



Closed Set Blanket COA

Requires a pilot with one of the following certificates

- Airline transport
- Commercial
- Private
- Recreational
- Sport

Requires a veteran pilot with at least 25 hours of logged flight time

May operate within 500 ft of authorized persons

Must be operated over private or controlled-access property with permission from the property owner/controller or authorized representative

Flights at or below 400 ft

Aircraft under 55 lbs

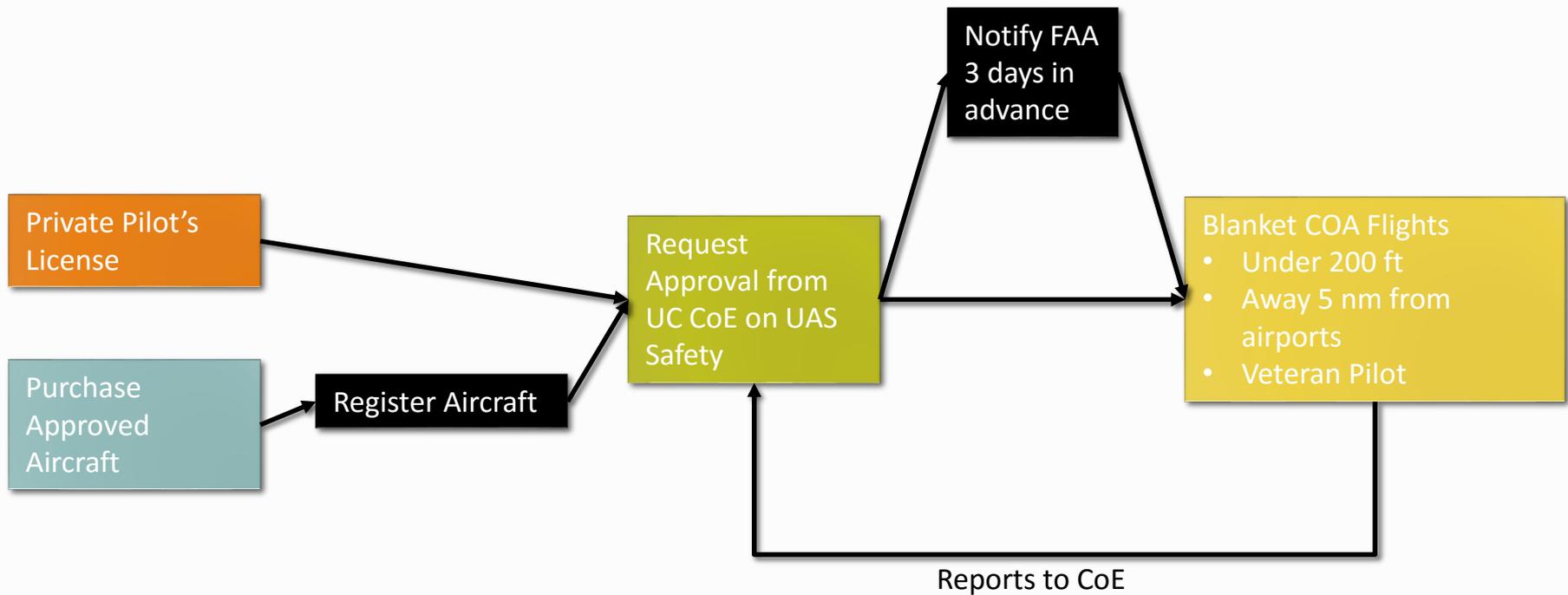
Operate during VFR conditions during daylight only

Operate within VLOS

Requires a letter of agreement from an airport to operate within 5 NM

Must file Project Packet with local FSDO

Section 333 Exemption Flow - Closed Set – Under 200 ft



Public Blanket COA

Requires a pilot with one of the following certificates

- Airline transport
- Commercial
- Private
- Recreational
- Sport

Must operate at least 500 ft from all nonparticipating persons, vessels, vehicles and structures

- The only people declared as not nonparticipating is the pilot, visual observer, any trainees or flight essential personnel.

Must be operated over private or controlled-access property with permission from the property owner/controller or authorized representative

Any registered vehicle

Class G Airspace only

Flights at or below 400 ft

Aircraft under 55 lbs

Operate during VFR conditions during daylight only

Operate within VLOS

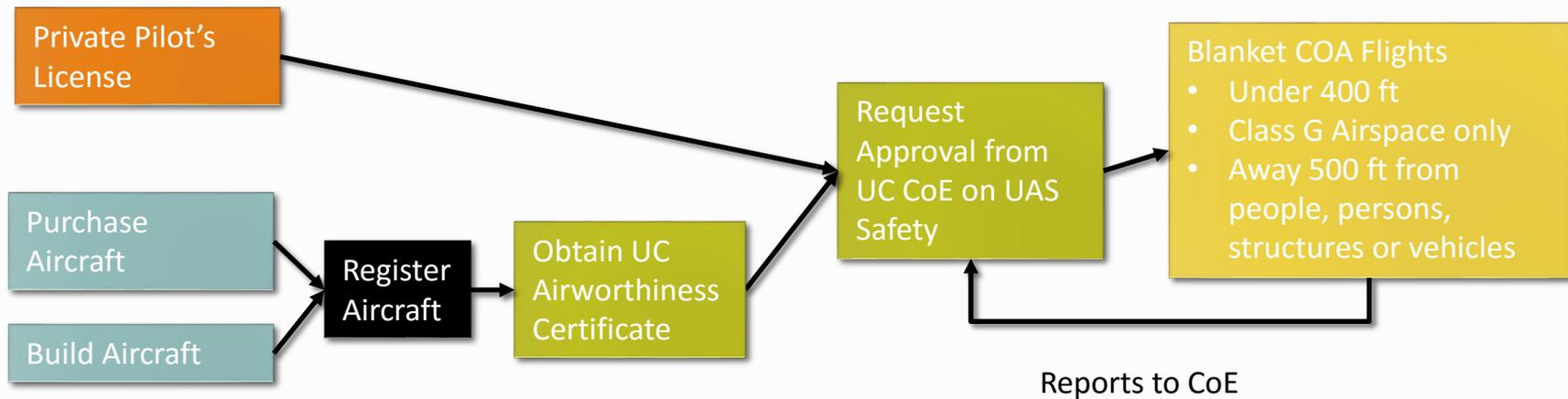
5 NM away from an airport tower

3 NM away from an untowered airport with instrument flight procedures

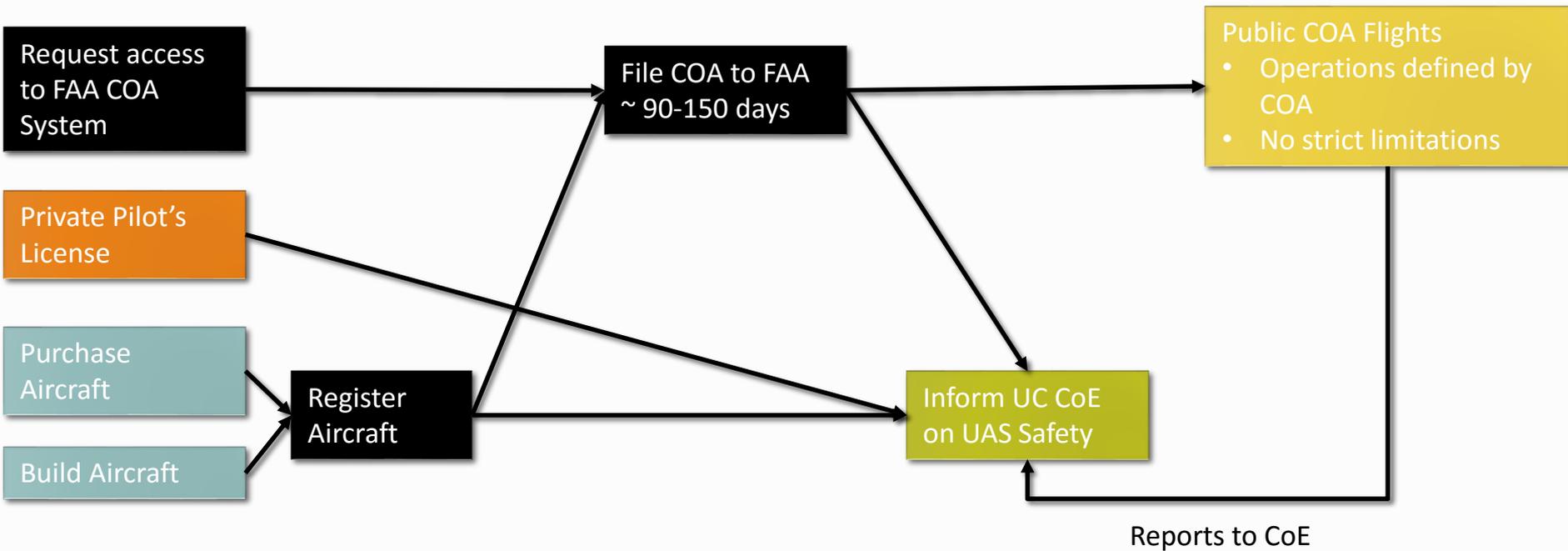
2NM away from an untowered airport without instrument flight procedures

2NM away from a helipad

Public Blanket COA (new)



Public COA



Center on UAS Safety

Develop an educational seminar to inform staff of UAS regulations and UC policies regarding UASs

- Center will propose site visits and interactions

Develop talking points for UAS-related incidents

Develop a biannual newsletter with regulatory updates

Develop a UC System UAS Policy Manual

Center on UAS Safety

Assistance on UAS Registration

- Form fillable forms and automatic registration

Sec 333 Forms and Logging Systems

Guidance on Public COA applications

Lists of approved pilots and vehicles

Lists of vetted Sec 333 contractors

Part 107 – Proposed Drone Laws

Similar to Blanket COA

Up to 500 ft, within VLOS, Daylight only, no flying over people

Requires records to be available to the FAA on request

Must have “Drone License”

- Involves taking an FAA-approved knowledge test at a FAA Testing Facility
- Renewable every 2 years

Flight records must be made available to FAA on request

- No specifications on what constitutes as flight records

Aircraft not required to receive an Airworthiness Certificate

- This provision is one of the exemptions provided by a Sec 333

Part 107 – Proposed Drone Laws – What it doesn't Allow

No flights above 500 ft

No flights at night

No Beyond Line of Sight

No Flying over people

UC System with Part 107

ADVANTAGES

Need for Sec 333 exemptions and public COAs significantly reduced

Very suitable for most research and commercial needs

Drone License ~ \$200-400 –
Suitable for a dedicated researcher or staff member

DISADVANTAGES

Vague recording requirements

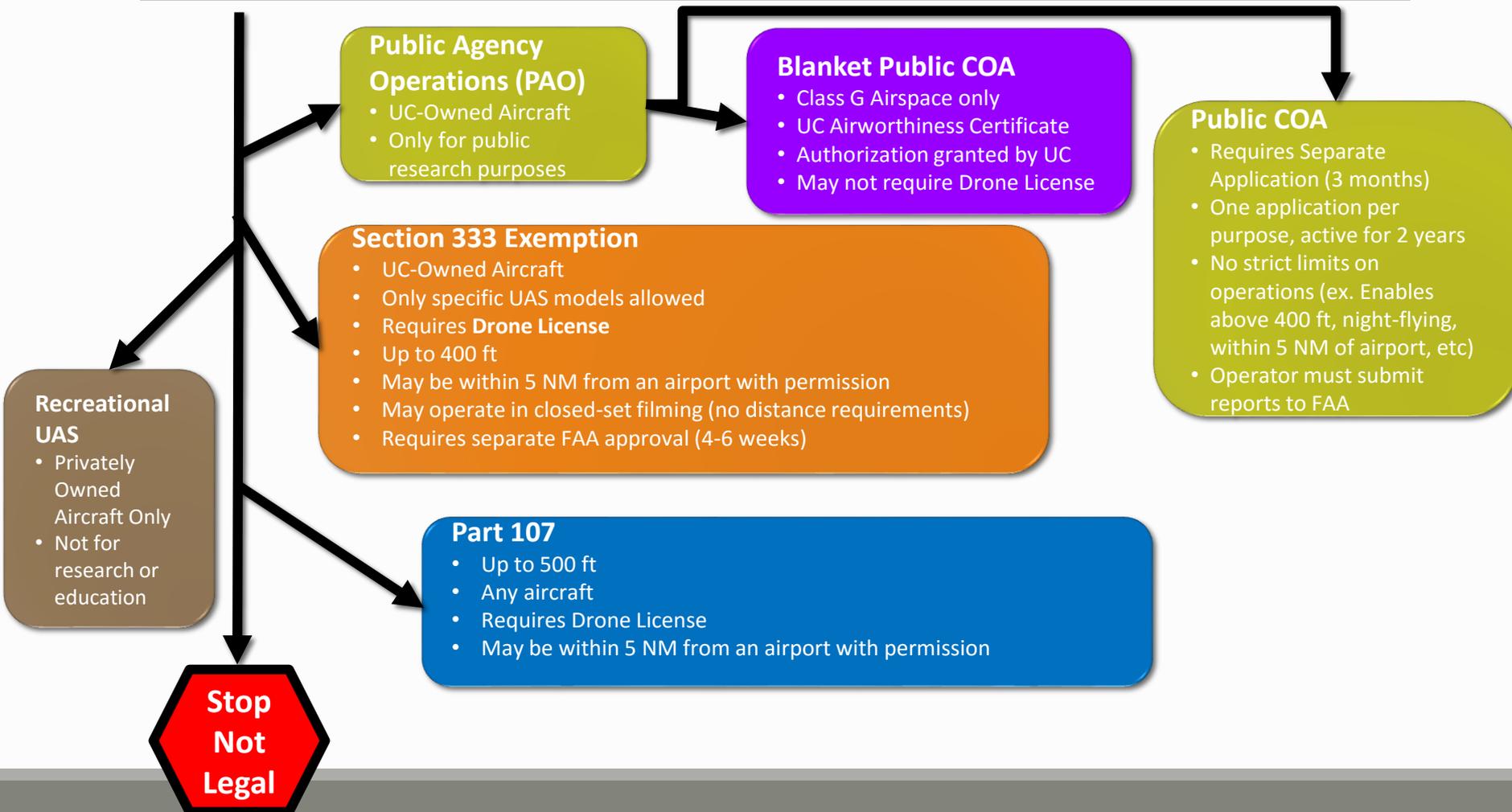
- UC System is the registered owner of the vehicle, hence the system is still liable for making records available

Drone License ~ \$200-400, still not suitable for an academic class

Altitude limit necessitates continued support for Public COAs or Section 333

Restriction on flying over people in place until next round of Proposed Laws (announced on 4/6/2016)

UC UAS Authorization Flowchart (Proposed Laws)



Example Scenarios

Researcher doing field work off-campus

- Part 107 Rules

Researcher flying above 500 ft

- Public COA – Needs to apply to the FAA

School Publicity Filming of Event or Campus

- Sec 333 motion picture rules

Researcher flying within an urban environment

- Sec 333 motion pictures or blanket COA, depending on environment
- May fall under proposed MicroUAS Laws (2017)

Proposed UC Policy under Part 107 Rules

(In addition to compliance with Part 107)

UC-owned vehicles must be registered to the Regents of the University of California

All UC UAS pilots must undergo an online safety training, similar to the lab safety training offered by EH&S

All UC UAS operations must be submitted to the portal prior to operations

All UC UAS operations must be recorded on the portal

While the pre-authorization is not federally mandated, it would serve as an efficient method to double check that Part 107 laws are being followed

Airports Near UC Campuses

UC Merced

Mercy Medical Center - 2.72 m - helipad

UC Davis

University Airport - 1 m - GA, university owned

UC Berkeley

Children's Hospital - 2.47 m - helipad
Sandhill - 4.86 m - helipad

UC Santa Cruz

Dominican Santa Cruz Hospital - 4.25 m - helipad

UCLA

Too many to list (11 Helipads)
Santa Monica Airport – 3.13 m – Class D airspace

UC Santa Barbara

Santa Barbara Airport - 1 m - Class C airspace
Platform Holly - 3.68 m - helipad
Elwood Onshore Facility 3.83 m - helipad

UC Irvine

The Atrium - 2.11m
Newport Beach Police - 2.3 m - helipad
Jamboree Center Helistop - 2.44m - helipad
John Wayne - 2.71 m - Class C airspace
Centerport - 2.73m - helipad
Opus Center Irvine - 2.89m - helipad
KCIN Emergency - 3 m - helipad
South Coast Metro Center - 3.73m - helipad
Costa Mesa Police Dept - 3.82m - helipad

UC San Diego

Scripps Memorial Hospital - 0.6m - helipad
UCSD Health System East Campus - 0.71m - helipad
Torrey Pines - 1.07m - Gliderport
Qualcomm Building N - 2.38m – Helipad
MCAS – 4.93 M – Airport -

UC Riverside

Johnson - 2.49m - helipad
City Hall - 2.76m - helipad
Riverside Metro Center - 2.86m - helipad
Riverside Community Hospital - 3.13m - helipad
FLABOB - 4.85m - Airport

UASs in the Classroom

Neither Section 333 or Part 107 Laws enable flying UASs as a part of a class

- Part 107 introduces a new license, but still pricey for students

Currently a flying cage is one of the better solutions

- \$4000-10,000
- Within the cage, FAA has no jurisdiction (ie, no license required).
- UC can develop policies to ensure safe flying

UAS Student Clubs

Student clubs may fall under “Recreational or Hobby” use

- Depends on the nature of the affiliation with the university

Students should be strongly encouraged to join a National Model Aeronautics group (such as the AMA)

- Safety Code
- Minimal Insurance (Secondary)

Recommend the students have a National Model Aeronautic Club charter to establish a clear paper trail of their Hobby/recreational status

The UC still has the authority to set the conditions for access to university property

- Including requiring the documentation of recreational flights

No National Aeronautic Group allows for flying over people in an unsafe manner

Enforcement of UAS Policies

Universities may not regulate FAA airspace, but they may put in place policies regarding student use of UAS on their campuses

Laws and Policies traditionally related to state/local police power – including land use, zoning, privacy, trespass can be implemented.

14 CFR 91.13 – Careless or Reckless Operation

Air Navigation is mentioned as contrast to operating an aircraft on the ground

- (a) *Aircraft operations for the purpose of air navigation.* No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another.

Contact Information

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Center of Excellence on Unmanned Aircraft System Safety

University of California, Merced

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Telephone by appointment