



Unmanned Aerial Vehicles (UAVs) in Delaware

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What is an Unmanned Aerial Vehicle



An unmanned aerial vehicle (UAV), commonly known as a drone and also referred to as:

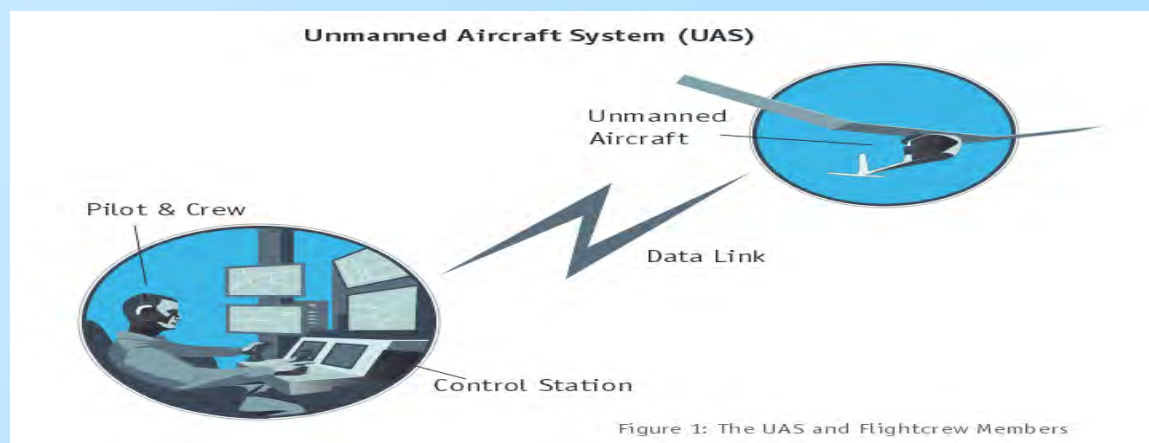
- (1) Remotely Operated Aircraft;
- (2) Remotely Piloted Aircraft;
- (3) Remotely Piloted Vehicle System;
- (4) Unmanned Aerial Vehicle;
- (5) Unmanned Aircraft System.



Unmanned Aircraft System (UAS)



- **Unmanned Aircraft System (UAS):** consists of three elements: Unmanned Aircraft; Control Station; and Data Link.



- It may include support equipment, payloads, flight termination systems, and launch/recovery equipment.

What is an Unmanned Aerial Vehicle

- Small UAV vs Large UAV = 55 lbs or less
- Fixed wing vs Propellers
- How many props =
4 is a Quadcopter



6 is a Hexacopter



8 is an Octocopter



Frequently asked questions:

	<u>DJI Inspire 1 Pro</u>
1. Range	1.2 miles
2. Endurance	17-22 minutes
3. Altitude	2 miles (10,560 feet)
4. Speed	50 mph
5. Payload	7.5 pounds
6. Video/pictures	4 k camera
7. Cost	\$4100

Uses (across the state)

- Crime, accident and fire scene investigation and documentation
- Search and rescue operations
- Law enforcement surveillance
- Fire suppression activities
- Tactical advantage and live imaging in hostile situations
- Monitoring and inspection of infrastructure
- Aerial photography, filming of events
- Property inspections and appraisals
- Water & sewer surveying
- GPS land mapping



UAV Sightings in Delaware

- University of Delaware Football game
- Mud Run
- Lewes Coast Guard Facility
- 2015 Lewes Polar Plunge for Special Olympics
- Delaware Junction
- 4th of July Fireworks



UAVs and DelDOT: How it Began



- Punkin Chunkin
- DJI Phantom 3
- Downlink to Smart Phone



Uses for DelDOT



- Situational Awareness
- Debris Assessments
- Traffic Mitigation
- Bridge Inspections
- Aerial photography of traffic projects
- Archeological inspections/photos

- I have to have one!

DENIED

National Guard Raven 10

- National Guard Raven 10
- Explored this option early on
- Looked at TMC downlink



- The FAA heavily regulates these things!

FAA distinguishes between three distinct classes of unmanned aircraft users:

1. Public Operations, comprising federal, state, and local government
2. Commercial Operations, comprising primarily commercial entities;
3. Model Aircraft Operations, comprising users that fly unmanned aircraft strictly for hobby or recreational purposes.

(the same UAV can be used for either class, the regulatory framework for each of these classes of users is unique)



Public/Governmental UAS Operations

- Public UAS operators are granted authority to fly by FAA on a case-by-case basis.
- The mechanism for obtaining this approval is the certificate of authorization (COA).
- Operators seeking this authority must provide extensive details regarding the UAS, desired location, flight altitudes, other operational characteristics, and the qualifications of the operator.
- FAA requires that operators be licensed pilots.



Commercial UAS

- UAS flights conducted for business purposes either by commercial entities or by individuals performing operations that are tied directly or indirectly to some form of commerce are fully regulated by FAA.
- Commercial UAS operations are approved by FAA on a case-by-case basis as an interim measure. This is called the Section 333 exemption.

Small UAS Operation and Certification Part 107 Rule

In February 2015, FAA proposed regulations allowing for the routine operation of small commercial UAS; these rules are expected to be finalized in April 2016.

Model UAS



Know Before You Fly

DO: FLY YOUR UNMANNED AIRCRAFT BELOW 400 FEET

DO: FLY WITH LOCAL CLUBS

DO: INSPECT YOUR AIRCRAFT BEFORE YOU FLY

DO: TAKE A LESSON BEFORE YOU FLY

DON'T: FLY YOUR UNMANNED AIRCRAFT BEYOND LINE OF SIGHT

DON'T: FLY NEAR AIRPORTS OR ANY MANNED AIRCRAFT

DON'T: FLY NEAR PEOPLE or STADIUMS

DON'T: BE CARELESS or RECKLESS. YOU COULD BE FINED IF YOU ENDANGER PEOPLE OR OTHER AIRCRAFT

DON'T: FLY ANYTHING THAT WEIGHS MORE THAN 55 LBS.

DON'T: FLY FOR PAYMENT or COMMERCIAL PURPOSES UNLESS SPECIFICALLY AUTHORIZED BY THE FAA

www.faa.gov/uas • www.knowbeforeyoufly.org

FAA predicted that 1.9 million hobbyist drones will be sold this year, along with more than 600,000 commercial drones.

The FAA predicts that 4.3 million hobbyist drones could be sold per year by 2020.

The agency predicts that sales of small commercial drones could jump to 2.7 million by 2020.

All Model/Hobbyist UAV pilots must register with the FAA before you fly!

Public and Commercial UAV aircraft must register with the FAA and obtain a “N” number

Security Concerns



- UAS pose a potential threat to security. Small UAS can be used by criminals and terrorists for espionage, surveillance, and intelligence gathering at critical government and industrial facilities.
- Criminals are also using unmanned aircraft to smuggle drugs and contraband across U.S. borders and over prison walls and fences.
- Somewhat larger UAS could be used to carry out terrorist attacks by serving as platforms to deliver explosives or chemical, biological, radiological, or nuclear weapons. Chemical and biological agents pose a particular concern, as UAS used for aerial pesticide applications could readily serve as platforms to carry out attacks.
- Small UAS could similarly be used to disperse small amounts of certain agents that may be lethal in minute quantities. Even a hoax attack—for example, releasing a powdery substance and making false claims that it contains anthrax virus—could cause widespread panic.
- UAS could also be used as platforms for firearms or other weapons.



Drone Caught Delivering Drugs, X-Rated DVDs, Firearm at a High-Security Prison





While many attack scenarios involving UAS may sound far-fetched, most are technically feasible with already-available technology.



135 pound payload



Confirmed, planned, or suspected use of small UAVs in support of violent actions



- Homeland Security Advisory Council HSAC is briefed.
- Decision is based to create a UAV Sub-committee to further investigate the use of UAVs in Delaware and keep the HSAC informed.
- Dwayne Day was elected the Chairman of the Committee.



UAV Committee Membership

- Delaware Department of Transportation
- Delaware State Fire School
- Delaware Department of Agriculture
- University of Delaware
- Delaware State Police
- Delaware Department of Safety and Homeland Security
- Delaware National Guard
- Dover Air Force Base
- Wilmington Police Department
- Private Hobbyist

UAV Committee History

- 4/17/14 – UAV Exploratory Committee Kick-off Meeting
- 6/17/14 – HSAC accepts UAV Exploratory committee as a full subcommittee
- 7/9/14 – 1st official committee meeting



Homeland Security Advisory Council (HSAC) UAV Subcommittee



- April 2014 – kick-off meeting
- Mission statement:

The mission of the UAV Committee is to look at all aspects for the safe integration, and responsible use of unmanned aerial vehicles within the State of Delaware.

How does law enforcement respond to a UAV incident?

Do they know the rules for flying UAVs?

Can Law Enforcement restrict where UAVs can fly?

Can the State restrict where UAVs can fly?

HB 195

HSAC UAV (cont.)



- HB 195 – This bill creates the crime of unlawful use of an unmanned aircraft system.
- The bill prohibits unmanned aircraft systems from flying over sporting events, concerts, automobile races, festivals, and events at which more than 5000 people are in attendance and critical infrastructure in the State of Delaware.
- The penalty for the crime is an unclassified misdemeanor for a first offense and a class A misdemeanor for a second or subsequent offense unless injury occurs to a person or property damage occurs as a result of a violation in which case it is a Class G. Felony.

HB-195



- HB #195 came from recommendations from the UAV committee and was introduced June 16th, 2015.
- The bill passed the House and went to the Senate Public Safety Committee on March 22nd, 2016.
- The FAA was providing comments on the bill so it was put on hold until the Senate reconvened after the spring holiday.



Items the committee is closely watching

- To address both safety and security concerns, a number of technology solutions are being examined to detect airborne UAS and pinpoint the location of the operator.
- Technologies to disable, jam, take control over, or potentially destroy a small UAS are also being developed and tested.

Delaware UAV Task Force

January 2016

- The Association for Unmanned Vehicle Systems International (AUVSI) economic analysis section estimates the UAV industry will to be 75 billion dollars by 2025. There is potential to attract businesses in manufacturing and research. AUVSI estimates the UAV industry is anticipated to create about 104,000 jobs in the U.S. by 2025.
- UAVs could aid the economy through revenue generated by registration licensing and insurance for commercial and public agency UAV.



Delaware UAV Task Force

- Focus on economic development
- Facilitated by DelDOT Aeronautics
- 24 members
 - Government
 - Academic
 - Private Interest
- 14 Auxiliary members

DelDOT UAV Program

January 2016

DelDOT UAV Program



DelDOT is developing their own UAV program.

- Training facility will be at the Delaware Fire School.
- Homeland Security Grant Funds will be used to develop a curriculum and then training program.
- Step by step documentation will be available for all state agencies to follow while developing their own programs.
- TMC video downlink capabilities

Focus is to eliminate as many “stove pipes” as possible across the state.

DelDOT UAV Program



- DJI Inspire 1 Pro
- DelDOT UAV Guidelines
- Application to FAA for “N” numbers
- Letter from Attorney General office
- COA request for PUBLIC AGENCY use.



The End

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