



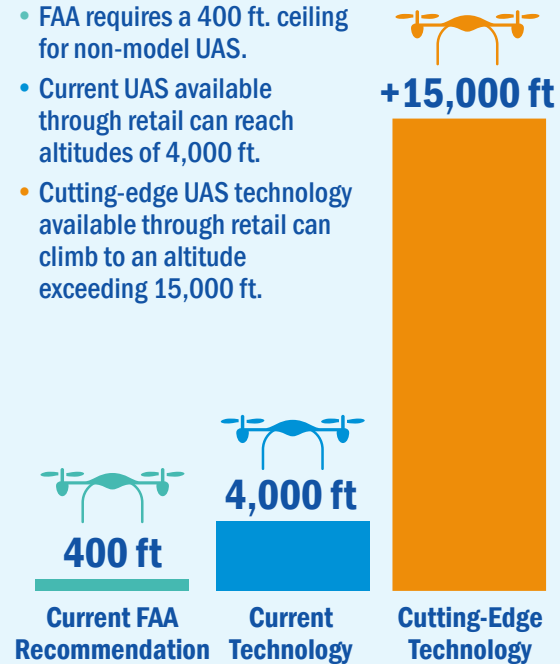
EMERGING RISK to INFRASTRUCTURE FROM UNMANNED AERIAL SYSTEMS (UAS)



UAS Capability Versus Policy

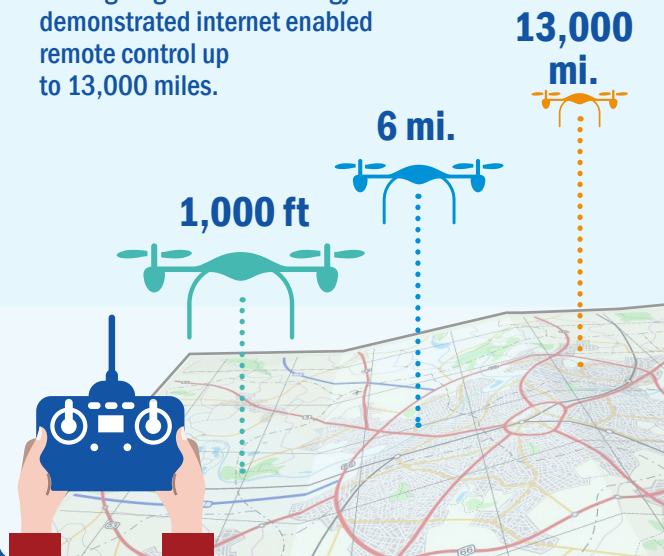
OPERATIONAL ALTITUDE CAPABILITIES

- FAA recommends a 400 ft. ceiling for model UAS.
- FAA requires a 400 ft. ceiling for non-model UAS.
- Current UAS available through retail can reach altitudes of 4,000 ft.
- Cutting-edge UAS technology available through retail can climb to an altitude exceeding 15,000 ft.



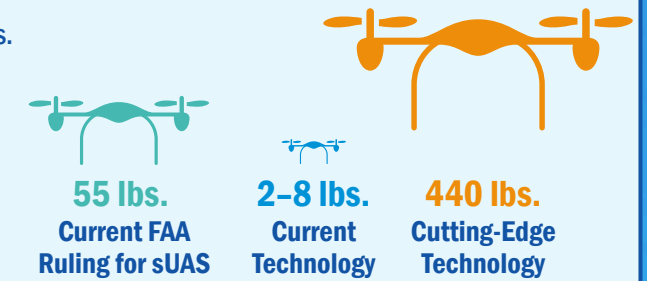
RANGE

- UAS are intended to be operated within line of sight, but may be capable of beyond line of sight operations.
- Current technology allows remote UAS operation up to 6 miles from operator.
- Cutting-edge UAS technology has demonstrated internet enabled remote control up to 13,000 miles.



GROSS WEIGHT OF DEVICE

- FAA regulations address small UAS (sUAS) up to 55 lbs.
- Current UAS commonly weigh approximately 2-8 lbs.
- Cutting-edge UAS can weigh 440 lbs. or more.
- 440 lb. UAS have a significantly larger payload capacity.



Note: Payload capacities are being upgraded across a varying range of products at a rapid pace and do not correlate to the gross weight of the device.

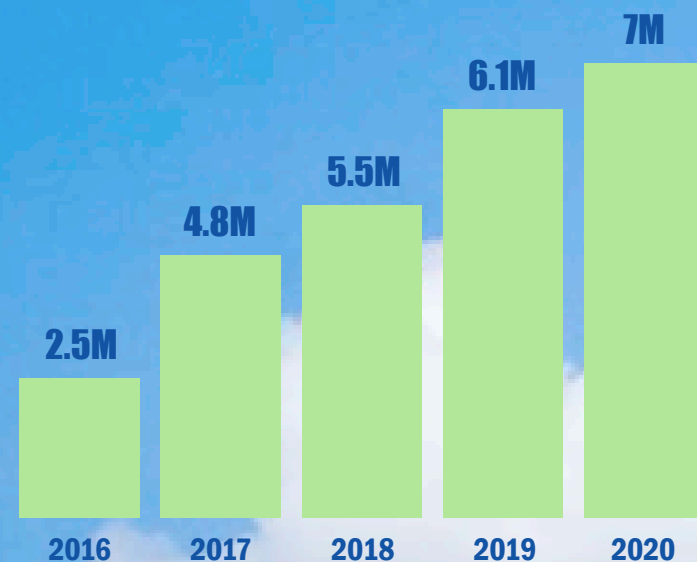
FIRST-PERSON VIEW (FPV) FLIGHT FOR HOBBYIST AND RECREATIONAL USERS

- The capability to fly UAS using the on-board camera's view.
- FPV control is allowed if the operator complies with Title 14 of the Code of Federal Regulations (CFR) part 107 (once effective).
 - Camera systems may enable operators to capture high definition video.
 - The capability is installed on a large number of retail UAS.

AUTONOMOUS FLIGHT

- The capability for the UAS to fly itself based on GPS coordinates and preinstalled flight paths.
- The FAA allows autonomous flight if the pilot maintains the ability to control the UAS.
 - Autonomous flight technology is used in many available UAS.

Number of UAS sales is projected to nearly triple by 2020.



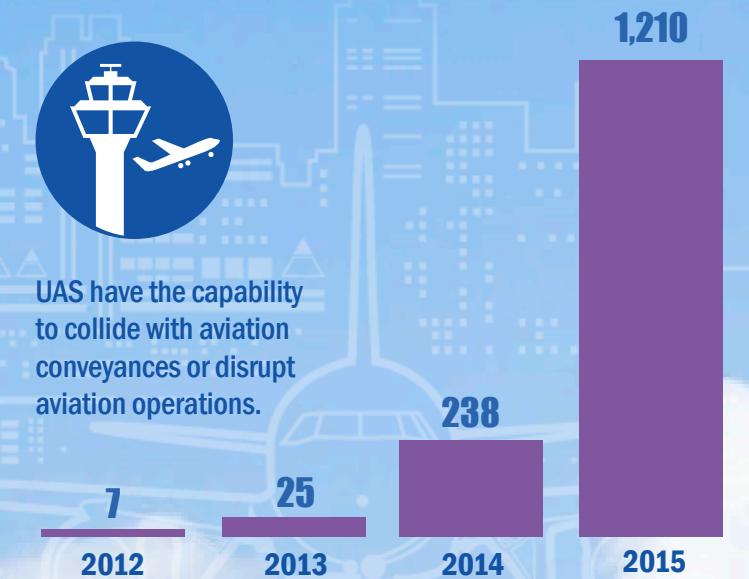
Source: FAA Aerospace Forecast 2016-2036

Exposed infrastructure systems and public gathering areas are vulnerable to UAS in the United States.



- UAS provide adversaries with the ability to circumvent traditional physical security measures such as gates, surveillance equipment, and security guards.
- Exposed infrastructure systems (such as electrical transmission facilities, pipelines, roads, and bridges) and public gathering areas (such as stadiums and public assembly sites) are vulnerable to UAS.
- UAS activity over public gatherings or infrastructure, while typically not malicious in nature, may pose a risk.

Since 2012 UAS aviation sightings have increased in the United States.



UAS have the capability to collide with aviation conveyances or disrupt aviation operations.