

**SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION:
QUESTIONS FOR THE RECORD**

**HEARING ON
UNMANNED AIRCRAFT SYSTEMS: INNOVATION, INTEGRATION, SUCCESSES,
AND CHALLENGES
MARCH 15, 2017**

**Written Questions Submitted to Mr. Earl Lawrence, Director of the Office of Unmanned
Aircraft Systems, Federal Aviation Administration**

Submitted by Chairman Thune

Question 1. It has come to my attention that manned aircraft attempting to use the Eastern Oregon Regional Airport have been prevented from doing so because of safety concerns with UAS using the same airport. Are airports able to prioritize unmanned aircraft over manned aircraft to the extent that manned aircraft are unable to make full use of an airport? If not, what can the FAA do to ensure access to airports is equitable between manned and unmanned aviation?

Answer. The FAA's mission is maintaining the safest aerospace system in the world. All small UAS operating within existing regulations must give way to manned aircraft at all times, regardless of the type of operation. Under P.L. 112-95, Section 336, all recreational UAS users must notify all airports and air traffic control facilities prior to flying with five miles of the airport. Remote Pilots operating under part 107 (the small UAS rule) must have authorization from the FAA to operate in the controlled airspace around airports.

We are unfamiliar with the specific situation you referenced at the Eastern Oregon Regional Airport, however if your staff provides additional information to the FAA's Office of Government and Industry Affairs, we are happy to look into it.

Question 2. When we discuss the developing industries around UAS, we hear about the possibilities of UTM, or UAS traffic management, as a way of deconflicting unmanned air traffic from traditional manned aviation. Do you envision the hobbyist UAS owner and operator being a part of the UTM?

Answer. The FAA is currently working with industry to develop a notification and authorization system as a first step toward UAS traffic management. This system is expected to provide both authorization (part 107) and notification (hobbyist) services for small UAS operations. However, the primary objective of a UTM system is to provide a low-altitude air traffic management system for non-recreational operations. Hobby operators who operate under FAA regulations (part 107 or subsequent enabling rules) may be required to or have the option to take advantage of the anticipated opportunities of UTM, depending on future regulatory developments.

Submitted by Senator Blunt

Question 1. A recent Homeland Security paper noted: “the FAA estimates combined hobbyist and commercial UAS sales will rise from 2.5 million in 2016 to 7 million by 2020.” Missouri has a number of well attended amusement parks such as Six Flags of St. Louis, Silver Dollar City in Branson, and Words of Fun in Kansas City.

With this projected increase in the number of drones, the safety and security risks presented by drones at these parks will only increase.

What is the FAA doing about this potential threat?

Answer. The FAA Extension, Safety, and Security Act of 2016 (P.L. 114-190) requires the Secretary of Transportation to establish a process to allow applicants to petition FAA to prohibit or restrict the operation of an unmanned aircraft in close proximity to a fixed site facility, including amusement parks. The FAA is currently working with the Department to determine a way forward. Additionally, several of the facilities mentioned above are located in airspace that, per FAA regulation, already requires specific operational authorization.

Additionally, the FAA has engaged in “No Drone Zone” public outreach campaigns to educate the public about where UAS flight is prohibited. We also have “No Drone Zone” branding materials and signage available on our website at www.faa.gov/uas for state or local governments, and other stakeholders such as amusement parks, to use at their discretion. Further, state and local governments may utilize their land-use, zoning, and traditional police powers to implement certain requirements on UAS. The FAA has provided guidance in this area in a Fact Sheet on State and Local Regulation of UAS which can also be found on our website at www.faa.gov/uas.

Question 2. I understand there are many kinds of drones and many various purposes. Some involve small drones at low altitudes for delivery and other purposes, and others involve larger drones at higher altitudes for cargo.

I assume a “one size fits all” approach won’t work for the communications links for these different kinds of drones.

What is being done to confirm the right spectrum solutions for communications links for small, low-altitude drones?

Answer. The FAA is utilizing a risk-based approach to determine most UAS requirements, including those for communications links. Requirements for communications will stem from the risk level of the operation and the criticality of the link, which may dictate the use of protected spectrum and specific equipage versus unprotected spectrum and commercial off-the-shelf equipment. The FAA is exploring numerous solutions to determine the best path forward for spectrum concerns. We are working with industry, including mobile data providers, and the Federal Communications Commission (FCC) to assess the current spectrum capacity and develop solutions amenable to all parties.

Question 3. Will it be possible for small low-altitude drones to use existing communications infrastructure (today’s wireless networks) to support small, low-altitude UAS communications

functions (control links, tracking, diagnostics, payload communications, collision avoidance)?

Will this help to avoid unnecessary costs and regulatory delays?

Answer. Mobile network providers and small UAS operators have been researching and testing UAS communications functions over the LTE network. The FAA is exploring the possibilities in consultation with mobile data providers and the FCC. We are working to ensure that the responsible data infrastructure – mobile data or otherwise – has sufficient capacity to support safe long-term UAS integration.

Submitted by Senator Sullivan

Question 1. The FAA UAS Center of Excellence has been operational for almost two years, but at this point one of the anchor members and the largest university UAS program in the U.S., the University of Alaska Fairbanks, has yet to receive any funding to support UAS research. Can you advise when you expect to leverage the skills of all the core members of the ASSURE program? (ASSURE is a coalition comprised of twenty-three of the world's leading research institutions and more than a hundred leading industry/government partners. The mission is to provide the FAA the research they need to quickly, safely and efficiently integrate unmanned aerial systems into our National Airspace System with minimal changes to our current system.)

Answer. The UAS Center of Excellence (COE), managed by ASSURE, is responsible for assigning projects based on partner competencies. The new Executive Director of ASSURE is from Alaska, and we're working with the COE to support their mission to provide the best possible UAS research. Alaska is best positioned for flight testing, which only one research project to date has required. Subsequent research projects utilizing flight tests may be better suited for the expertise provided by the University of Alaska.

Question 2. The U.S. Army Gray Eagle Unmanned Combat Air Vehicles stationed at Ft. Wainwright, Alaska, are some of the most proven and reliable unmanned aircraft in the world. The Gray Eagles are certified by the military as airworthy and the pilots are certified by the military as well. They have a real-time first person view that allows the operator to see what is in front of the aircraft and avoid any potential collisions. So, why is the FAA requiring that the Gray Eagles have chase planes when they transit between Ft. Wainwright and the restricted airspace they use for training?

Answer. The FAA is working with the Army to eliminate the requirement for a chase plane by establishing a Ground Based Sense and Avoid (GBSAA) system similar to what the Air Force is using at Cherry Point. The Army has submitted a list of bases flying the Grey Eagle where it wants to use GBSAA. The first COA request submitted was for Fort Campbell, which was approved on March 10. A subsequent request for Fort Riley is currently being processed, and the Army is operating with a chase plane in the interim.

First Person View (FPV) as a standalone safety mitigation does not adequately mitigate the potential for a mid-air collision or allow the UAS operator to comply with the requirements of 14 CFR § 91.113, Right-of-way. Research is ongoing by DOD and FAA to find low-cost detect and avoid systems that will help prevent mid-air collisions and allow compliance with 14 CFR § 91.113.

Question 3. Beyond visual line of sight operations will be key to meeting Alaska's infrastructure monitoring, hazard response, domain awareness, and other needs, but the infrastructure to support these operations is severely lacking. Will ADS-B and NextGen provide the infrastructure needed to conduct these operations in Alaska? If not, what would?

Answer. While ADS-B may provide solutions for larger UAS, it is not the only solution being considered. The FAA expects initiatives like the Low Altitude Notification and Authorization Capability (LAANC) and UAS Traffic Management (UTM) to contribute to the infrastructure needed for these operations. The FAA also plans to launch a new Aviation Rulemaking Committee (ARC) made up of a diverse group of aviation, technology, law enforcement, and safety stakeholders that will help the FAA create standards for remotely identifying and tracking unmanned aircraft during operations. These efforts will ultimately enable the technological solutions needed for more routine beyond visual line-of-sight operations (BVLOS) at lower altitudes (below 400 feet).

The FAA is also currently evaluating potential updates to existing Air Traffic Management (ATM) systems that form the NextGen infrastructure, including ERAM (En Route Automation Modernization), STARS (Standard Terminal Automation Replacement System), and NAS Voice Switch, that will support BVLOS operations with more complex unmanned aircraft at higher altitudes in the future.